

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:) CASE NO. 12,885
)
APPLICATION OF ARMSTRONG ENERGY)
CORPORATION FOR APPROVAL OF A PRESSURE)
MAINTENANCE PROJECT AND FOR)
QUALIFICATION OF THE PROJECT AREA FOR)
THE RECOVERED OIL TAX RATE PURSUANT)
TO THE ENHANCED OIL RECOVERY ACT,)
LEA COUNTY, NEW MEXICO)

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

June 27th, 2002

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, June 27th, 2002, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

June 27th, 2002
 Examiner Hearing
 CASE NO. 12,885

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APPLICANT'S WITNESS:	
<u>BRUCE A. STUBBS</u> (Engineer)	
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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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P.O. Box 2208
Santa Fe, New Mexico 87504-2208
By: WILLIAM F. CARR

* * *

ALSO PRESENT:

WILL JONES
Engineer
New Mexico Oil Conservation Division
1220 South Saint Francis Drive
Santa Fe, NM 87501

* * *

1 WHEREUPON, the following proceedings were had at
2 11:44 a.m.:

3 EXAMINER CATANACH: All right, at this time we'll
4 call Case 12,885, which is the Application of Armstrong
5 Energy Corporation for approval of a pressure maintenance
6 project and for qualification of the project area for the
7 recovered oil tax rate pursuant to the Enhanced Oil
8 Recovery Act, Lea County, New Mexico.

9 Call for appearances.

10 MR. CARR: May it please the Examiner, my name is
11 William F. Carr with the Santa Fe office of Holland and
12 Hart, L.L.P. We represent Armstrong Energy Corporation in
13 this matter, and I have one witness.

14 EXAMINER CATANACH: Any additional appearances?
15 Okay, will the witness please stand to be sworn
16 in?

17 (Thereupon, the witness was sworn.)

18 MR. CARR: Mr. Examiner, in December of 1995 we
19 appeared before you -- and Mr. Stogner, there were two
20 hearing dates -- and sought approval of the pressure
21 maintenance project that is the subject of this
22 Application, and it was approved on February the 6th, 1996,
23 by Order Number R-10,541. There were difficulties in
24 getting certain interest owners to sign AFEs and the
25 project bogged down. But those matters have been resolved,

1 and what we're really here today to ask you to do is to
2 reinstate that order.

3 And so although we have filed a full new C-108,
4 we do not intend to go through that as we ordinarily might.
5 We will have Mr. Stubbs testify that it remains accurate
6 and in effect, and the data in that C-108 is correct.

7 There are certain minor changes. The well has
8 been moved slightly, the injection well. We will explain
9 why. There also is an increase we are seeking in the
10 pressure, but only to .2 pound per foot of depth to the top
11 of the injection interval and a slight increase in the
12 injection volumes.

13 But we will point those out as we go, and if that
14 is satisfactory to you, that's how we'll approach the case.

15 EXAMINER CATANACH: Certainly, Mr. Carr.

16 BRUCE A. STUBBS,

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

19 DIRECT EXAMINATION

20 BY MR. CARR:

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

22 A. Bruce A. Stubbs.

23 Q. And where do you reside?

24 A. Roswell, New Mexico.

25 Q. Mr. Stubbs, by whom are you employed?

1 A. I'm employed by Pecos Petroleum Engineering.

2 Q. And what is your relationship to Armstrong Energy
3 Corporation?

4 A. I'm a consulting petroleum engineer.

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

7 A. Yes, I have.

8 Q. And you were the witness in the 1995 hearings in
9 which this project was originally approved; is that right?

10 A. Yes, sir, that's correct.

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

14 A. Yes, they were.

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

17 A. Yes, I am.

18 Q. Are you familiar with Armstrong's plans to
19 implement a pressure maintenance project in the northeast
20 Lea-Delaware Pool in Lea County, New Mexico?

21 A. Yes, sir.

22 Q. Are you familiar with the status of the lands
23 which are the subject of the Application?

24 A. Yes, I am.

25 Q. Have you made an engineering study of the area

1 which is the subject of this case?

2 A. Yes, I have.

3 Q. Are you prepared to review this work with Mr.
4 Catanach?

5 A. Yes.

6 MR. CARR: We tender Mr. Stubbs as an expert in
7 petroleum engineering.

8 EXAMINER CATANACH: Mr. Stubbs is so qualified.

9 Q. (By Mr. Carr) Mr. Stubbs, would you briefly
10 summarize what Armstrong seeks with this Application?

11 A. Armstrong Energy operates four wells, the Mobil
12 Lea State 1, 2, 3 and 4, which produce out of what we call
13 the third sand, which is a Cherry Canyon sand.

14 This is kind of a unique reservoir. It's bounded
15 on the north by a limestone facies. The Cherry Canyon sand
16 that they produce out of is 100 feet thick. It's very high
17 perm, it's currently mostly solution gas drive with
18 possibly a little influx of water. We're still on track.
19 It looks like we're going to recover about a million
20 barrels primary out of this one little pod of sand, if you
21 want to refer to it as a pod of sand.

22 We feel like that by injecting water in a downdip
23 position, maintaining reservoir pressure and replacing some
24 of the voidage and assisting the natural water drive, that
25 we'll enhance the recovery from this whole field.

1 Q. The project area for this pressure maintenance
2 project is the southwest quarter of Section 2, Township 20
3 South, Range 34 East; is that correct?

4 A. That's correct.

5 Q. And that's what we sought back in December of
6 1995?

7 A. That's correct.

8 Q. Can you identify for us the injection well?

9 A. The injection well, like Mr. Carr said, we
10 originally planned to have it in the southwest quarter of
11 the section, the southwest southwest, and we've now moved
12 it 660 feet farther east to the southeast southwest.

13 Q. And that's the Mobil Lea State Well Number 8?

14 A. Mobil Lea State Number 8.

15 Q. And what is the new location for that well?

16 A. It will be 1650 feet from the west, 330 feet from
17 the south line of Section 2, 20 South, 34 East.

18 Q. This project was originally qualified for the
19 recovered oil tax rate pursuant to the New Mexico Enhanced
20 Oil Recovery Act, was it not?

21 A. That's correct.

22 Q. And no action was taken pursuant to that
23 authorization?

24 A. No.

25 Q. And you're requesting that it be requalified

1 today in this proceeding so those timeframes can once again
2 be applicable to this effort?

3 A. That's correct.

4 Q. Now, you have explained that you intend to move
5 the well. You're going to also request an increase in
6 pressure, but you will not be requesting in excess of .2
7 pound per foot of depth; is that correct?

8 A. That is correct.

9 Q. You are also going to seek an increase in the
10 volumes injected?

11 A. That's correct. The original application, I
12 think we asked for 400 to 500 barrels a day of injection,
13 and this Application we're asking 500 to 700 barrels a day.

14 Q. Other than that, is everything that you presented
15 in 1995 identical to what you would present today?

16 A. With one other exception, the cost of the
17 injection well has increased.

18 Q. And that's reflected in the Application for
19 certifying the project for the enhanced oil recovery tax
20 credit?

21 A. Right.

22 Q. Let's go to what has been marked as Exhibit
23 Number 1. Would you identify that, please?

24 A. Let's see, that's the --

25 Q. The C-108.

1 A. The C-108, yes.

2 Q. Do you have a copy of that?

3 A. I believe I do. Okay.

4 Q. This Application, C-108, is dated 5-22-02?

5 A. That's correct.

6 Q. Did you check the information in this exhibit,
7 and have you confirmed that it is accurate and correct
8 today as it was in 1995?

9 A. Yes, I went back and reviewed the area and made
10 sure there wasn't any new wells in the half-mile radius,
11 and there's not. In fact, there's only been one or two
12 wells drilled within a mile of this project. Read and
13 Stevens drilled the North Lea Number 11 to the southwest,
14 and that's the only well that's really very close to this
15 thing, a new well.

16 Q. And this exhibit shows the project area being the
17 southwest quarter of Section 2?

18 A. That's correct.

19 Q. And you are injecting into what formation?

20 A. It's what we call the third sand in the Cherry
21 Canyon.

22 Q. Let's go to what has been marked Armstrong
23 Exhibit Number 2, Order Number R-10,541.

24 A. Okay.

25 Q. This is the order that originally approved the

1 Application?

2 A. That's correct.

3 Q. And this order provided that if injection did not
4 commence within one year, the authority granted therein
5 would terminate?

6 A. That's correct.

7 Q. The order was dated February the 6th, 1996, and
8 one year thereafter the authority terminated; is that
9 correct?

10 A. That is correct.

11 Q. And you're seeking the same approval here today
12 that was given then?

13 A. Yes, sir.

14 Q. The order identifies four wells that are going to
15 initially be affected by the injection, the Mobil Lea State
16 Wells 1, 2, 3 and 4.

17 A. That is correct.

18 Q. Are those the same four wells that will be
19 affected when you implement pressure maintenance project if
20 this application is approved today?

21 A. That is correct.

22 Q. Are all these wells still producing at
23 nonmarginal rates?

24 A. Yes, they are. If you will refer to -- Do you
25 want to go through it now or do you want to wait?

1 Q. Why don't we just run through just getting this
2 in place --

3 A. Okay.

4 Q. -- and then I'll ask you to explain the change in
5 the injection well.

6 What's the source of the injection water? Is it
7 still going to be produced water from the Delaware?

8 A. That's correct.

9 Q. The project allowable for this project was set at
10 300 barrels of water a day times the number of developed
11 proration units. Is that still what you seek?

12 A. It's barrels of oil per day, that's correct.

13 Q. Yes, right.

14 A. Yes, correct.

15 Q. And other than the change in pressure, you are
16 making no changes in how you intend to complete the
17 injection well; is that right?

18 A. No, the injection well mechanically is identical
19 to what we originally proposed.

20 Q. Okay, Mr. Stubbs, now let's go to Armstrong
21 Exhibit Number 3, and I'd ask you to refer to this and
22 explain to you why you have moved the injection well.

23 A. There's first -- There's two or three parts to
24 this exhibit. On page one there's production summary to
25 bring us up to date. To date we've cum'd 813,000 barrels

1 and slightly over 1 BCF of gas. The current production is
2 121.9 barrels of oil a day and 275 MCF of gas a day.

3 Ultimately, these wells will recover 1.25 million
4 barrels, but about 200,000 barrels is coming out of the
5 first sand. And since the first hearing in 1995, they've
6 completed the first sand in the Mobil Lea State Number 2
7 and Mobil Lea State Number 1. The Mobil Lea State 1 is not
8 a big contributor, but the Mobil Lea State 2 is, about
9 200,000 barrels ultimate recovery.

10 In the middle of that page 1 there's an injection
11 well location, and what we did -- what's transpired since
12 the original order was approved is, Read and Stevens has
13 done a field study on their field in Sections 3 and 10, and
14 we've done some reservoir simulation, and due to some
15 relative permeability data and a few other things, we've
16 run different simulations to determine which precise
17 location would be the best one.

18 And you can see at the original location, which
19 is number 4, would have ultimately recovered 1.68 million
20 barrels. And by moving it to these other locations we have
21 different increases or different recoveries which show some
22 increases.

23 And we're going to -- We've picked location
24 number 5, which has somewhat lower recovery than the
25 others, but it's on the same kind of north-south trend,

1 permeability trend. And the reason we want to move to that
2 location is, we want to be far enough south to be below the
3 oil-water contact as much as possible, so that our relative
4 permeability to water is higher, so we can get our
5 injection rates.

6 That's one thing that came out of the Read and
7 Stevens study, is that the relative perm to water is
8 relatively low and injection rates are tough to get. So
9 that's why we've moved it to that position, to get a little
10 bit lower downdip, a little bit more into the water column,
11 so we can pressurize the water side of it.

12 Q. Do Read and Stevens also own an interest in the
13 area which is involved in this pressure maintenance
14 project?

15 A. Yes, they own roughly 5 percent in the Mobil Lea
16 State project, plus they have the offsetting wells in
17 Sections 3 and 10.

18 Q. Is Exhibit Number 4 an affidavit confirming that
19 notice of this Application and a C-108 have been provided
20 to all affected parties as required by the Rules of the
21 Division?

22 A. Yes, it is.

23 Q. The only return receipt we do not have is the
24 receipt from Read and Stevens; is that correct?

25 A. That's correct.

1 Q. Read and Stevens has signed the AFE for this
2 project and is participating; is that right?

3 A. That's correct.

4 Q. Now, in terms of the request to certify the
5 project or qualify it for the recovered oil tax rate, have
6 you reviewed the material that you filed in 1995?

7 A. Yes, I have.

8 Q. What numbers have changed?

9 A. Primarily the -- well, really two numbers have
10 changed, and they kind of offset each other. The cost of
11 the well has increased. I believe it was originally
12 \$328,000. It's now \$612,000 -- or -- yeah, \$612,000. But
13 I think we used \$17 oil price back in 1995; and now,
14 depending on what day you pick, we'll use an average of
15 about \$22. So increase in product price offsets any
16 increase in capital cost.

17 Q. The value of the ultimate additional recovery
18 still far exceeds the capital costs and related costs that
19 are necessary to implement the project; is that correct?

20 A. That's correct.

21 Q. And the original application was Exhibit Number
22 6; it contained the information for seeking the approval of
23 the qualification of the project; is that right?

24 A. That's correct.

25 Q. In your opinion, will approval of this

1 Application and the re-approval of this pressure
2 maintenance project be in the best interest of
3 conservation, the prevention of waste and the protection of
4 correlative rights?

5 A. Yes, it will.

6 Q. Were Exhibits 1 through 4 either prepared by you
7 or compiled at your direction?

8 A. Yes, they were.

9 MR. CARR: Mr. Catanach, at this time we move the
10 admission into evidence of Armstrong Exhibits 1 through 4.

11 EXAMINER CATANACH: Exhibits 1 through 4 will be
12 admitted as evidence.

13 MR. CARR: That concludes my examination of Mr.
14 Stubbs.

15 EXAMINATION

16 BY EXAMINER CATANACH:

17 Q. Mr. Stubbs, are you guys going to inject into
18 both the first and the third sand?

19 A. No, not initially. Everything will go into the
20 third sand. The second sand is not a very continuous zone
21 over in this area. In fact, there's only -- Well, there's
22 one good well and then one poor well. So at this point in
23 time we're not contemplating flooding the first sand.

24 Q. Okay. Do you know why the first time around, why
25 we've limited the pressure to less than 0.2?

1 A. That's what we had requested. We had thought
2 because our permeabilities were so high that we didn't need
3 that additional pressure at that time. And the bottomhole
4 pressure is low. That's one reason we want to increase the
5 rate, is, we think the bottomhole pressure is fairly low,
6 so our initial rates are going to be higher than 500 but it
7 should settle down to around 500 barrels a day.

8 Q. Okay. The recovery that you're projecting
9 under -- on your Exhibit Number 4, I guess, or 3, page 2,
10 the number 5 that you've got circled, you're anticipating
11 -- is that going to be the ultimate recovery, is that
12 primary plus secondary there?

13 A. Yes, but that also includes some of the Read and
14 Stevens wells.

15 Q. Oh, it does.

16 A. If you'll look a couple more pages back where the
17 -- page 4, simulation outputs, and turn to -- well, any one
18 of them, the Number 5 is the one we're talking about. That
19 gives the -- over on the third column from the right, the
20 oil in stock tank barrels, those are going to be the
21 recoveries through 5500 days, which is roughly 15 years.

22 But there's one good Read and Stevens well in the
23 third sand in the North Lea Number 6, which is going to
24 make about 300,000 -- 337,000 barrels. But those wells are
25 far enough away, it has very little impact on them. It

1 increases their production like maybe 5000 barrels, is all.

2 Q. So which wells are the -- I guess the first four
3 wells are the Mobil --

4 A. Yes, sir, that's correct, the first four wells
5 are the Mobil Lea State wells.

6 Q. So if we total those four recoveries, that's what
7 you recover from those four wells?

8 A. Right. Well, up through 5500 days. Now, there's
9 going to be some additional production, but there's some
10 issues that we haven't resolved like water breakthrough and
11 when economic limit will occur, so I think you'll find that
12 there's a little over 200,000 barrels there, but there's
13 probably an additional -- you run the simulation on that,
14 it's an additional 100,000 barrels, plus.

15 But like I say, there's some issues due to the
16 layered nature of the reservoir. We're not sure when
17 breakthrough is going to occur on some of the layers and
18 how the water production is going to affect the economic
19 limit.

20 Q. Okay, the 5500 days, when is the starting point
21 on that?

22 A. Well, the 5500 days started on day one when
23 production started. We did the history match and then did
24 the injection.

25 Q. Okay. So roughly within this project area that

1 you're defining, what's going to be the secondary recovery
2 or the recovery as a result of waterflood operations?

3 A. Well, the recovery from this initial well could
4 be as high as 300,000 barrels additional oil. And like I
5 say, about 5000 barrels of that is attributable to the Read
6 and Stevens well. So we estimate at 306,000; 300,000 of it
7 would be from the Armstrong Northeast Lea, 5000 or so will
8 be from the Read and Stevens North Lea Number 6.

9 Q. So can you break that down for just the four
10 Mobil State wells or -- for just the wells on the project
11 area that we're talking about, what kind of numbers are we
12 looking at?

13 A. 300,000 barrels.

14 Q. Of additional recovery?

15 A. Right.

16 Q. As a result of waterflood operations?

17 A. That's correct.

18 Q. Okay.

19 A. Then if that's successful, there probably needs
20 to be at least one or maybe two more injection wells
21 surrounding that little pod of sand. So the plan is, when
22 we see a response and get some idea of the magnitude of the
23 response versus the injection, we'll run that back through
24 the simulator, and if everything checks out we'll probably
25 come back and want to put another injection well in.

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EXAMINER CATANACH: Okay, that's all I have.

MR. CARR: That concludes our presentation in this matter.

EXAMINER CATANACH: Okay, there being nothing further in this case, Case 12,885 will be taken under advisement.

(Thereupon, these proceedings were concluded at 12:02 p.m.)

* * *

12885
7900 27
Carr
David Catnach
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 2nd, 2002.



STEVEN T. BRENNER
 CCR No. 7

My commission expires: October 14, 2002