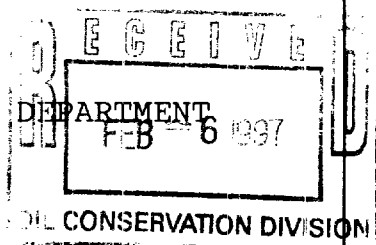


STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES
OIL CONSERVATION DIVISION



IN THE MATTER OF THE HEARING CALLED BY)
THE OIL CONSERVATION DIVISION FOR THE)
PURPOSE OF CONSIDERING:)
APPLICATION OF DEVON ENERGY CORPORATION)
(NEVADA) TO QUALIFY A WATERFLOOD)
EXPANSION PROJECT FOR THE RECOVERED OIL)
TAX RATE PURSUANT TO THE ENHANCED OIL)
RECOVERY ACT, EDDY COUNTY, NEW MEXICO)
_____)

CASE NO. 11,695
ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

January 23rd, 1997

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, January 23rd, 1997, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

I N D E X

January 23rd, 1997
 Examiner Hearing
 CASE NO. 11,695

	PAGE
APPLICANT'S WITNESS:	
<u>DICK MORROW</u> (Engineer)	
Direct Examination by Mr. Bruce	3
Examination by Examiner Catanach	9
REPORTER'S CERTIFICATE	16

* * *

E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	4	9
Exhibit 2	4	9
Exhibit 3	5	9

* * *

A P P E A R A N C E S

FOR THE APPLICANT:

HINKLE, COX, EATON, COFFIELD & HENSLEY
 218 Montezuma
 P.O. Box 2068
 Santa Fe, New Mexico 87504-2068
 By: JAMES G. BRUCE

* * *

1 WHEREUPON, the following proceedings were had at
2 1:53 p.m.:

3 EXAMINER CATANACH: At this time we'll call Case
4 11,695, which is the Application of Devon Energy
5 Corporation (Nevada) to qualify a waterflood expansion
6 project for the recovered oil tax rate pursuant to the
7 Enhanced Oil Recovery Act, Eddy County, New Mexico.

8 Call for appearances.

9 MR. BRUCE: Mr. Examiner, Jim Bruce from Santa
10 Fe, representing the Applicant.

11 I have one witness, Mr. Dick Morrow, who I would
12 ask that the record reflect was previously sworn and
13 qualified as an expert reservoir engineer.

14 EXAMINER CATANACH: Any additional appearances?

15 Okay, the record shall so reflect that Mr. Morrow
16 has been previously sworn in and qualified as an expert.

17 You may proceed.

18 DICK MORROW,

19 the witness herein, having been previously duly sworn upon
20 his oath, was examined and testified as follows:

21 DIRECT EXAMINATION

22 BY MR. BRUCE:

23 Q. Okay. Mr. Morrow, in this case, what is it that
24 Devon seeks?

25 A. Devon seeks to qualify the East Shugart Unit for

1 the recovered oil tax rate.

2 Q. What is the injection formation -- Well, let's
3 get into Exhibit 1 first, and then we'll outline the unit.

4 Could you identify Exhibit 1 and explain the
5 symbols on the map?

6 A. Exhibit 1 is a map of the area showing the East
7 Shugart Unit, which is outlined in red.

8 The red circles are the infill wells which we
9 have drilled since January 1st, 1994. There are 32.

10 The open triangles are the injection conversions
11 or reactivations after January 1st, 1994. There are ten of
12 those.

13 And the green dots are our remaining proposed
14 infill wells, which number twelve.

15 The dashed lines indicate our ultimate proposed
16 injection pattern.

17 Q. Okay, and what is the injection formation for
18 these wells?

19 A. The injection formation is the Queen at about
20 3200 to 4000 feet.

21 Q. Okay. Is Exhibit 2 simply a copy of the order
22 which approved the original waterflood back in the late
23 1960s?

24 A. Yes, it is.

25 MR. BRUCE: Mr. Examiner, I meant to submit it.

1 I believe there are some subsequent waterflood expansion
2 orders. I did not have those listed. I did not have those
3 available at the time. We can get those for you if
4 necessary.

5 EXAMINER CATANACH: I'm not sure they're
6 necessary, but if they are I'll contact you.

7 Q. (By Mr. Bruce) Mr. Morrow, would you -- Now, we
8 originally applied for EOR approval by -- administratively,
9 did we not?

10 A. Yes.

11 Q. And Exhibit 3 is a copy of that application?

12 A. Yes, it is.

13 Q. I think it omits Exhibit A attached to the
14 Application, which was simply the land plat which we've
15 submitted as Exhibit 1.

16 Could you go through the -- just briefly, at
17 least, the technical data on Exhibits B and C of Exhibit 3,
18 and talk about what Devon has done since taking over the
19 East Shugart Unit and its plans for the area?

20 A. Devon acquired this property in 1992 and has
21 since substantially expanded the scope of the waterflood,
22 which is why we are applying for the recovered oil tax
23 rate.

24 If you look on about the fourth page of Exhibit
25 3, which is marked as Exhibit B to our Application, this

1 kind of gives a summary of the East Shugart Unit in terms
2 of producing wells, capital investment, injection volumes
3 and dates.

4 The East Shugart waterflood was essentially
5 initiated in 1969 with a very, very limited peripheral
6 injection pattern. In January of 1994 there were only five
7 injection wells in the unit. We recognized the potential
8 for additional waterflood development and initiated infill
9 drilling and waterflood expansion project in the years
10 since 1992, when we acquired the property.

11 As I showed on Exhibit Number 1, we drilled 32
12 infill wells and converted or reactivated 10 injection
13 wells to this point in time. We spent approximately \$10
14 million with an additional \$3.5 million remaining to
15 complete the development.

16 Q. Now, this -- You didn't do the expansion -- I
17 mean, all at once or within a period of a few months; it
18 has been over a period of time, has it not?

19 A. It's been over a period of years. We converted a
20 few wells and drilled a few infill wells to test economics
21 and our theories behind the additional recovery we could
22 expect. So it's kind of been an ongoing process, since we
23 acquired the properties.

24 Q. And you believe that you will recover a return
25 over and above the development costs of this program?

1 A. Yes, we will. We anticipate additional
2 waterflood recovery of about 2 million barrels, which
3 amounts to a net value to us of over \$13 million, as shown
4 on the Exhibit B.

5 Q. Looking at the next page, Exhibit C, there was
6 originally quite a jump in production. Was this because
7 most of these wells were originally drilled as producers?

8 A. Yes, you can see the jump in production there in
9 about mid-1993, when we started drilling some of these
10 infill producing wells. A lot of them are still producing
11 wells but will be converted to injection as we progress.

12 Q. Now, the program you're talking about, although
13 the geographical area of the unit did not -- Let me put it
14 this way: The geographical area of the unit did not change
15 after you bought it; is that correct?

16 A. No, that's correct.

17 Q. And what you have done is substantially infill
18 drilled the unit?

19 A. Well, there are several things involved with this
20 project that we feel is an expansion. We've really
21 expanded the scope of the project in three areas:

22 Number one, well density. We've infill drilled
23 32 wells so far and have twelve to go.

24 Number two, we are installing a much more
25 efficient waterflood pattern. As I said, the initial

1 waterflood pattern was a peripheral pattern with very
2 limited injection. We have since discovered that there is
3 a northeast-southwest directional permeability in this
4 reservoir, which is why we're going to the northeast-
5 southwest line drive.

6 So our injection pattern is much more efficient
7 than they originally installed.

8 Number three, the new completion technologies,
9 including fracture stimulations, have allowed us to much
10 more efficiently flood the entire vertical section of the
11 Queen. There are numerous porosity intervals within the
12 Queen, and the new completion techniques allow us to more
13 effectively complete in each of those zones.

14 So even though the geographical area of the
15 waterflood is not expanding, we feel we're getting much
16 more efficient waterflood with our new project.

17 Q. Okay. In your opinion, is the granting of this
18 Application in the interests of conservation and the
19 prevention of waste?

20 A. Yes.

21 Q. And were Exhibits 1 through 3 prepared by you or
22 under your direction?

23 A. Yes, they were.

24 MR. BRUCE: Mr. Examiner, at this time I would
25 move the admission of Devon's Exhibits 1 through 3.

1 EXAMINER CATANACH: Exhibits 1 through 3 will be
2 admitted as evidence.

3 EXAMINATION

4 BY EXAMINER CATANACH:

5 Q. Mr. Morrow, this was originally an Arco flood?

6 A. Yes.

7 Q. Is it -- The five injection wells you've talked
8 about, do you know if that was -- was that all they ever
9 used in this flood?

10 A. I think there were some additional wells
11 initially, but historically they did not see the waterflood
12 response they had hoped for, and so a lot of the wells had
13 been shut in when we took over operations. So there were
14 really only five active wells at that time.

15 Q. Was this property actively waterflooded from 1969
16 until you acquired it, as far as you know?

17 A. It appears, looking at some historical data here,
18 that they pretty much shut down the waterflood in the late
19 1980s, and then it remained that way until we acquired the
20 properties in 1992.

21 Q. What data are you referring to?

22 A. I have a production plot that we keep on the
23 unit.

24 Q. Does that show water injection?

25 A. Yes, it does.

1 Q. So do you show that Arco shut down water
2 injection entirely in the late 1980s?

3 A. No, what they did was continue to recycle
4 produced water, but they did not take any additional make-
5 up water, which is required for a successful waterflood.
6 So basically at the time we took it over, they were just
7 recycling produced water.

8 MR. BRUCE: Mr. Examiner, in the late 1980s, that
9 might have been Hondo Oil and Gas.

10 THE WITNESS: Yes, it could have -- That's who we
11 acquired the properties from in 1992, is Hondo. I don't
12 know what the chain of operatorship was.

13 MR. BRUCE: I think Arco had the properties until
14 1987 -- I've looked at the title to these properties -- and
15 then they conveyed them to Hondo, and Hondo had them until
16 Devon acquired them.

17 Q. (By Examiner Catanach) So in your opinion, from
18 a period of approximately 12 years there was really no
19 waterflood operations being conducted in the unit?

20 A. That's right.

21 Q. Okay. You guys commenced drilling infill
22 producing wells when in 1993? Do you remember?

23 A. I don't know the exact date. It was the middle
24 of the year.

25 Q. Okay, and you drilled 32 new producing wells

1 during that period of time?

2 A. Yes. Several of those, I believe two, have
3 already been converted to injection. If you look on
4 Exhibit Number 1, two of the wells to the northwest have
5 already been converted to injection.

6 Q. Okay. And you've converted 10 wells that were
7 previously producers or previously injectors?

8 A. Yes, or that were -- injectors that had been shut
9 in.

10 Q. So you've now got a total of -- 10? Is it 10
11 injection wells, or --

12 A. Currently we have 15 injection wells.

13 Q. I only show 10 on your map. Are you showing the
14 injection wells as triangles, right?

15 A. Well --

16 Q. Okay.

17 A. -- the triangles are just the ones we've done
18 since January 1st, 1994. There are some additional
19 injection wells.

20 If you'll look along that northwest line, like
21 Number 16, Number 15, Number 2 -- I'm sorry, not Number 2,
22 but like Number 15 and Number 16 --

23 Q. Okay.

24 A. -- those are already injection wells. So they're
25 not shown as open triangles, but they are active injection

1 wells.

2 Q. The 2 million barrels that you've discussed, is
3 that additional recovery as a result of all of the infill
4 drilling and conversions and whatever you've -- that you've
5 done --

6 A. Yes, the total project.

7 Q. That's total additional recovery?

8 A. Correct.

9 Q. Okay. And you've got 12 wells that remain, that
10 you're going to drill?

11 A. Yes, we do.

12 Q. Producing wells?

13 A. Initially they will all be producing wells. Some
14 of them, as shown on Exhibit Number 1, will eventually be
15 converted to injection, those that fall on our proposed
16 line drive.

17 Q. Do you know what the original pattern was?

18 A. I do not have a map that shows the original
19 injection wells. But as I said, they were essentially a
20 peripheral pattern. They had some injection wells around
21 the border of the unit.

22 MR. BRUCE: Exhibit 2 does give the original
23 injection wells, I believe.

24 Q. (By Examiner Catanach) Okay. They didn't have
25 the -- They weren't in the alignment that yours are in, the

1 line drive --

2 A. No, they were not.

3 Q. -- in this orientation?

4 A. They were not.

5 Q. Okay. When you converted -- When you did the 10
6 conversions or the 10 reactivations, was that all done in a
7 kind of a short period of time, or do you -- was that -- I
8 mean, what I'm after is, when you actually started full-
9 scale injection into the unit.

10 A. I believe it was done in several groups. I don't
11 believe they were all done at once. It began in August of
12 1995, when we actually began doing some of this conversion
13 work and increasing the injection rates.

14 But the first -- Essentially what we did first
15 was connect this full line of injection wells to the
16 northwest as sort of a pilot flood. That was done
17 initially. And since that time, we've converted some
18 additional wells on the east side of the unit.

19 Q. Do you anticipate that your response will occur
20 sometime this year?

21 A. Yes, in a limited sense, since we've already
22 converted, as I said, the line to the northwest and some
23 injection wells to the east, we'll see some limited
24 response from those conversions here shortly.

25 The main response, if you look on our graph,

1 won't occur for another year or two, once we convert the
2 remaining two rows.

3 Q. Okay, I was going to ask -- the period -- the
4 first upward shift in that graph, could that be considered
5 a response to -- or a more -- not a waterflood response but
6 a response to the infill drilling you plan to undertake?

7 A. No, this forecast assumes that would be
8 waterflood response.

9 Q. Okay. But you are going to -- I mean, you should
10 realize an increase in production due to infill drilling?

11 A. Yes, we should.

12 Q. You talked about the new completion technology.
13 Do you think that that's considerably better than it was
14 back when Arco completed these wells?

15 A. I believe it was, both in terms of the number of
16 zones we're perforating and the fracture technology. We're
17 actually perforating some zones that had not been
18 perforated originally in some of these wells, opening up
19 some additional pay, and also fracture-stimulating some of
20 those wells.

21 So I believe the completion technology, yes,
22 allows us to much more efficiently flood the vertical
23 section of the Queen.

24 Q. Okay, you're opening up some additional pay in
25 some wells. Was this pay opened up in some of Arco's

1 wells? I mean, did they perf some of these zones in some
2 of the wells?

3 A. I'm not sure I understand the question. But let
4 me back up. Maybe I can explain it a little better.

5 In some of the original wells out there, not the
6 infill wells, we're going back in and perforating some
7 zones that had not been originally completed when the well
8 was originally drilled.

9 Q. Okay, so within the entire unit you're opening up
10 some pay that you believe Arco never tapped into?

11 A. Yes.

12 EXAMINER CATANACH: Okay. I have nothing
13 further.

14 MR. BRUCE: I have nothing further in this matter
15 either, Mr. Examiner.

16 EXAMINER CATANACH: Okay, there being nothing
17 further in this case, Case 11,695 will be taken under
18 advisement.

19 (Thereupon, these proceedings were concluded at
20 2:16 p.m.)

21 I do hereby certify that the foregoing is
22 a complete record of the proceedings in
the Examiner hearing of Case No. 11695,
23 heard by me on August 23 1997.

24 David L. Clark, Examiner
Oil Conservation Division

25

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 January 28th, 1997.

 STEVEN T. BRENNER
 CCR No. 7

My commission expires: October 14, 1998