

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 MARATHON OIL)
 COMPANY)
 _____)

CASE NOS. 11,163

(Consolidated)

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

December 15th, 1994

Santa Fe, New Mexico

JAN 3

This matter came on for hearing before the Oil Conservation Division on Thursday, December 15th, 1994, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, before Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

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

I N D E X

December 15th, 1994
 Examiner Hearing
 CASE NOS. 11,163, 11,164 (Consolidated)

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A P P E A R A N C E S

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By: DOW CAMPBELL

* * *

1 WHEREUPON, the following proceedings were had at
2 11:37 a.m.:

3 EXAMINER STOGNER: Call next cases, Number 11,163
4 and 11,164.

5 MR. CARROLL: Application of Marathon Oil Company
6 to amend the special rules and regulations for the Lea-
7 Devonian Pool, Lea County, New Mexico.

8 Application of Marathon Oil Company for an
9 unorthodox oil well location and simultaneous dedication,
10 Lea County, New Mexico.

11 EXAMINER STOGNER: I'll call for appearances in
12 both of these cases at this time.

13 MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of
14 the Santa Fe law firm of Kellahin and Kellahin, appearing
15 in association with Mr. Dow Campbell, a Texas attorney and
16 house counsel for Marathon in Midland.

17 We're presenting Marathon's case through two
18 technical witnesses today.

19 EXAMINER STOGNER: Are there any other
20 appearances in either Case 11,163 or 11,164?

21 Mr. Kellahin, you may proceed.

22 Oh, let's have the witnesses stand to be sworn.

23 (Thereupon, the witnesses were sworn.)

24 MR. KELLAHIN: Mr. Examiner, our first witness is
25 April Parson. Ms. Parson is a geologist with Marathon.

1 She resides in Midland.

2 APRIL PARSONS,

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

5 DIRECT EXAMINATION

6 BY MR. KELLAHIN:

7 Q. Ms. Parson, for the record would you please state
8 your name and occupation?

9 A. April Parsons, I'm a geologist with Marathon Oil.

10 Q. Summarize for us your education, please.

11 A. I received a bachelor of science degree in
12 geology in 1984 from University of Texas in Arlington, and
13 also a master of science degree from the same school in
14 1990.

15 Q. The amplification in this room doesn't exist; the
16 microphones are for the court reporter. So you'll have to
17 speak up. There's an incredibly irritating hum, at least
18 from my position in here, so I'm going to have trouble
19 hearing you. So you're --

20 A. Okay.

21 Q. -- going to have to raise your voice.

22 (Off the record)

23 Q. (By Mr. Kellahin) Subsequent to graduation,
24 would you summarize for us your employment experience as a
25 geologist?

1 A. I worked for about a year between my
2 undergraduate and graduate degrees for an independent in
3 Plano, and I've worked since 1990 for Marathon Oil,
4 primarily in international exploration in Houston. And
5 since August I've been located in Midland, working Lea and
6 Eddy Counties in exploitation and exploration.

7 Q. Have you made a geologic investigation of the
8 geologic components and factors in what has been identified
9 as the Lea-Devonian Pool?

10 A. Yes, I have.

11 Q. And based upon that study, do you now have
12 recommendations and conclusions for the Examiner?

13 A. Yes, I do.

14 MR. KELLAHIN: We tender Ms. Parson as an expert
15 petroleum geologist.

16 EXAMINER STOGNER: Ms. Parson is so qualified.

17 Q. (By Mr. Kellahin) Turn with me, if you will, to
18 what is marked as Marathon's Exhibit 1. Would you identify
19 that display for us?

20 A. It is a structure map of the top Devonian, which
21 shows the outline of the Lea unit in yellow, and it also
22 shows in red the outline of the 3-D seismic survey which
23 was conducted this spring.

24 Q. When we identify the Lea unit, that unit boundary
25 is different from the Lea-Devonian Pool boundary, is it

1 not?

2 A. Yes, it is.

3 Q. Within the current pool boundary, [REDACTED]
4 [REDACTED] Devonian wells, other than Marathon Oil
5 [REDACTED]

6 A. [REDACTED] are not.

7 Q. How many wells did you look at in terms of your
8 geologic investigation of this particular reservoir?

9 A. I've looked at all of the wells shown on this
10 map, which are only those wells which have penetrated the
11 Devonian.

12 Q. You have a combination at this point of
13 producers, producers that are now abandoned, and there are
14 some dryholes in the reservoir?

15 A. Yes.

16 Q. As part of your geologic study, what did you in
17 fact look at?

18 A. I looked at the nature of the reservoir and was
19 trying to establish an oil-water contact for the field and
20 did quite a bit of work on the volumetrics of the
21 reservoir.

22 Q. As a result of your work, what did you determine?

23 A. I determined that the [REDACTED] reservoir is a /
24 carb[REDACTED]. It's composed of some dolomite
25 porosity [REDACTED] within an impermeable carbonate or

1 ~~This [redacted] reservoir tends to have an impermeable~~
2 ~~line [redacted] beneath that at a variable distance~~
3 ~~between [redacted] 100 feet down into the reservoir,~~
4 ~~before [redacted] encounter the main reservoir, the~~
5 ~~reservoir has a 6.5-percent average porosity/.~~

6 Q. Is there a structural relationship to the
7 productivity of the wells that have been drilled
8 successfully in this Devonian pool?

9 A. Yes, there is. ~~There appears to be a strong~~
10 ~~relationship between the success of the wells and~~
11 ~~structural position.~~

12 Q. Insofar as the pool rules deal with spacing unit
13 sizes and well locations, describe for us what those rules
14 are.

15 A. The current rules allow for 160 development and
16 -- Shall we refer to Exhibit 2?

17 Q. Not just yet. Just tell me the rule.

18 A. Okay, the wells can be drilled only in the
19 northwest quarter quarter section or the southeast quarter
20 quarter section, and they must be located within 150 feet
21 of the center of those quarter quarter sections.

22 Q. In addition to conventional geologic data, did
23 you also utilize 3-D seismic information?

24 A. Yes, I did.

25 Q. Why was that utilized for analyzing this

1 reservoir?

2 A. Well, we have wanted to drill some additional
3 wells in the field in 1994, but decided that in order to
4 best locate the optimal locations we would try to use 3-D
5 seismic over the field.

6 We did do about a 9-1/8-quarter-square-mile
7 survey over the field with very high resolution. As a
8 result of this, this map that you see here was generated,
9 and we found that there was quite a bit more detail to the
10 structure of the field than had previously been mapped.

11 Q. Conventional log interpretation in contouring of
12 structure based upon that log data did not reflect the full
13 extent of the structural components of the reservoir?

14 A. No.

15 Q. With the integration of the 3-D seismic
16 information, then, you were more able to fully understand
17 the structure of the reservoir?

18 A. Yes.

19 Q. When we look at Exhibit 1, are we looking at a
20 structural interpretation that has integrated not only the
21 conventional log interpretation but the 3-D seismic work?

22 A. Yes.

23 Q. To what extent have you attempted to integrate
24 the 3-D seismic data with the conventional log data?

25 A. The well data was used in order to determine a

1 velocity function for converting the seismic time map to
2 depth, and also just to verify the accuracy of that 3-D
3 map.

4 Q. Let's look at Exhibit 1 and have you tell us what
5 the significance is of the red dot that's shown within
6 Section 13.

7 A. The red dot is the proposed location of the Lea
8 Unit Number 17 well, which we would like to drill in 1995,
9 and we feel that is the best location to get at as yet
10 unproduced oil in the field.

11 Q. All right, that spacing unit for that well would
12 be the southeast quarter of Section 13?

13 A. Right.

14 Q. Which currently has in it the Well Number 3,
15 slightly to the north of this location?

16 A. Right.

17 Q. What are you attempting to achieve in this
18 spacing unit that you cannot now obtain with the existing
19 Number 3 well?

20 A. ~~We believe that we can get at about 35 feet of~~
21 ~~oil, which could not be produced by the Number 3~~

22 ~~well. w/ the #17 well.~~

23 Q. When you look at the opportunities in the
24 southeast quarter for an additional well, why have you
25 picked this particular location?

1 A. Primarily it's a result of the structural
2 position, and also the fact that the Number 11 well was
3 abandoned prematurely and did not produce all that we feel
4 it could have produced.

5 Q. Is that location standard, either on-pattern or
6 in terms of its footage setback under the existing rules?

7 A. No, it is not.

8 Q. It is unorthodox under both components of the
9 spacing rule?

10 A. Right.

11 Q. All right. Let's turn now to Exhibit Number 2.
12 Identify the display and then show us what you've done with
13 this checkerboard code.

14 A. Okay. Exhibit Number 2 is another map of the
15 Devonian structure, and superimposed on it is the current
16 legal locations, which are shown in the green squares.

17 Q. All right. When we move from 1 to 2, Exhibit 2
18 is the same structural interpretation?

19 A. Yes.

20 Q. Exactly the same map?

21 A. Right.

22 Q. On top of which, then, you've got this grid
23 system.

24 What does the green quarter quarter represent?

25 A. Those are the quarter quarter sections in which

1 we could now legally drill a well.

2 Q. All right. They would be the on-pattern 40-acre
3 tract?

4 A. Right.

5 Q. What are the red dots?

6 A. The red dots are other locations which we see
7 potential for further Devonian development.

8 Q. All right. Again, summarize for us the criteria
9 that you used in applying -- in determining where to locate
10 these additional wells?

11 A. ~~These wells have also been located on the~~
12 ~~basis of structural position. They're positioned in the~~
13 ~~highest elevation in the field.~~

14 Q. ~~What additional opportunities do you find in~~
15 ~~the area?~~

16 A. ~~Other than~~ besides the Number 17.

17 Q. ~~Of five wells~~ of five wells, how many of the five
18 would be at a standard well location under the current
19 rules?

20 A. There would only be one, located in Section 11,
21 that would be considered legal.

22 Q. The one in the southeast quarter?

23 A. Right.

24 Q. And that's standard as to footage and as to
25 pattern?

1 A. Yes.

2 Q. And all the other four, then, are both off-
3 pattern and too close to the side boundary?

4 A. Yes.

5 Q. If the Division were to adopt an amendment in the
6 rule to allow you to delete, if you will, the pattern where
7 you had to either be in the northwest or the southeast
8 quarter quarter and to provide the flexibility where you
9 could locate wells up to but no closer than 330 feet to the
10 side boundary of a 40, would that provide you flexibility
11 under the pool rules that all these well locations would
12 then be standard well locations?

13 A. Yes.

14 Q. ~~In terms of correlative rights, are you dealing~~
15 ~~with a unit that has, by operation of those agreements,~~
16 ~~consolidated all the interest owners so that you don't have~~
17 ~~offsetting spacing units that have different ownership?~~

18 A. No, they're all under the same operatorship and
19 ownership.

20 Q. Okay. All right, let's illustrate for the
21 Examiner, when we look at the Number 17 well -- that's the
22 one in the southeast of 13 -- do you have a cross-section
23 that illustrates the position of that projected well in
24 relation to the others in the area?

25 A. Yes, Exhibit Number 3 is a cross-section which

1 goes diagonally from the southwest to northeast through the
2 Number 11, Number 3 and Number 12 wells and also shows the
3 Number 17 location, projected onto that cross-section, and
4 depicts the high structural position as interpreted from
5 the 3-D seismic.

6 Q. Again, this structural interpretation, does it
7 also include utilization of the seismic data?

8 A. Yes, it does.

9 Q. In the absence of that data, how would you have
10 projected the location for the Number 17 well?

11 A. In the absence of the new 3-D seismic, we would
12 not have known that the 17 would be located in the high
13 position, probably would have just been a gentle slope down
14 to the southwest.

15 Q. And by incorporating 3-D seismic information,
16 then, you know, or at least you have inferred by the
17 interpretation that the 17 is at a structural position
18 higher in the reservoir than the current Number 3 well
19 within that feature?

20 A. Yes.

21 Q. All right. Have you worked with the petroleum
22 engineer assigned to this particular reservoir to integrate
23 your interpretations with his technical conclusions?

24 A. Yes.

25 Q. Based upon your work, summarize for us your

1 conclusions, Ms. Parson.

2 A. Well, we have looked at the production from the
3 wells, and we believe that the wells which have produced
4 the best to date have been those which are located in the
5 highest structural positions. And further development, we
6 would like to see us continue to look for the highest
7 structural elevations.

8 Q. In order to achieve that opportunity, then, you
9 either need numerous exceptions -- four, if you will -- to
10 the current rules, or simply an amendment to the rules that
11 gives you the flexibility to find these structural highs?

12 A. Yes.

13 Q. In terms of a water-oil contact in the reservoir,
14 how difficult is it to determine where that point is?

15 A. It's impossible, really, to determine with
16 accuracy, for a few problems.

17 First of all, the water is relatively fresh, and
18 the logs don't show a contrast.

19 Secondly, the oil-water contact occurs in the
20 tight portions of the rock, where it can't be established.

21 We have surmised an oil-water contact of
22 approximately minus 10,891, and that's been based on tests
23 of wells which have tested water. Primarily you'll see
24 located in Section 11, just outside the Lea Unit boundary,
25 is a U.S. Smelting well which tested water at the top of

1 porosity, which was located at minus 10,891. And that
2 tells us at least as shallow as it is, and we know from the
3 Number 1 well, which encountered porosity all the way down
4 to minus 10,814 and no water. So we can place it somewhere
5 between those two but we really can't narrow it down.

6 MR. KELLAHIN: That concludes my examination of
7 Ms. Parsons.

8 We move the introduction of her Exhibits 1, 2 and
9 3.

10 EXAMINER STOGNER: Exhibits 1, 2 and 3 will be
11 admitted into evidence.

12 EXAMINATION

13 BY EXAMINER STOGNER:

14 Q. Looking at your Exhibits 1 and 2, I will take it
15 that the yellow line is the present pool boundary?

16 A. That is the unit boundary.

17 Q. The unit boundary.

18 MR. KELLAHIN: We have a subsequent map, Mr.
19 Examiner, that the engineer will present that shows the
20 pool boundary.

21 EXAMINER STOGNER: Oh, okay.

22 Q. (By Examiner Stogner) With the drilling of this
23 proposed location, the Number 17, and once information is
24 obtained from it, would it change the variables and would
25 it change the 3-D seismic interpretation as you're showing

1 here, once that information is known?

2 A. It's possible that it could change it somewhat,
3 but I don't think it would change it very much.

4 Q. And if there are any changes at all, would that
5 be just local, or could it affect your readings unitwide?

6 A. They would be local.

7 Q. Just local. The current wells that are there,
8 how old are they?

9 A. They're -- Most of them are from the early
10 Sixties. The Number 1 was drilled in 1961, and the bulk of
11 the other wells had been drilled by 1963. The Number 12
12 well is the exception; that was drilled in 1979.

13 Q. Did the age of these well logs have any effect on
14 your interpretation using the 3-D?

15 A. No.

16 Q. No? What type of log information are you going
17 to -- or do you plan to obtain from that Number 17 well?

18 A. We would like to do as extensive a log suite as
19 we can. We'd probably like to do an FMI, and we haven't
20 fully developed the logging program. You know, we see that
21 there are problems with the freshness of the water, and
22 we're going to do some additional work to firm up our
23 logging program.

24 The reservoir is extensively fractured, and we'd
25 like to get a better look at that as well.

1 Q. Now, this whole pool is a water drive; is that
2 correct?

3 A. Yes, strong water drive.

4 Q. Essentially what you're showing on here would be
5 all the -- essentially the little attic oil, or the attic
6 oil potential from the structural highs in the area?

7 A. Yes.

8 Q. Have you -- or the engineer, perhaps I need to
9 ask him this question. Do you have any figures of what the
10 potential of the attic oil with the five proposed
11 locations --

12 A. We have not done it for all of the other
13 locations, no.

14 EXAMINER STOGNER: I have no other questions of
15 this witness at this time. However, I may later on.

16 MR. KELLAHIN: All right, sir. We'd like to call
17 at this time Mr. Wade Wardlow. He spells his last name
18 W-a-r-d-l-o-w.

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

22 DIRECT EXAMINATION

23 BY MR. KELLAHIN:

24 Q. Would you please state your name and occupation?

25 A. My name is Wade Wardlow, and I'm a reservoir

1 engineer for Marathon Oil Company.

2 Q. Summarize for us your education.

3 A. I have a petroleum engineering degree from the
4 University of Oklahoma.

5 Q. In what year, sir?

6 A. May of 1986.

7 Q. Subsequent to graduation, summarize for us your
8 employment as an engineer.

9 A. I worked for a local measurement company in
10 Oklahoma City for a year, I took a job outside the industry
11 for three years, and then came back and went to work for
12 Marathon five years ago in Midland, Texas.

13 Q. As part of your duties, do you on a routine basis
14 make engineering calculations on pools in the Permian
15 Basin?

16 A. Yes, I do.

17 Q. As part of your duties, have you made an
18 engineering evaluation and assessment of the additional
19 recovery opportunities in the Lea-Devonian Pool?

20 A. Yes, I have.

21 MR. KELLAHIN: We tender Mr. Wardlow as an expert
22 petroleum engineer.

23 EXAMINER STOGNER: Mr. Wardlow is so qualified.

24 Q. (By Mr. Kellahin) Let me have you turn, sir, to
25 your first Exhibit. If you'll identify for us what you've

1 marked as Exhibit Number 4.

2 A. Exhibit Number 4 is a background summary of the
3 Lea Unit-Devonian Pool, initially discovered in 1960.

4 ~~There are four active producers and seven wells~~
5 ~~that have either been shut in or abandoned out of the~~
6 ~~Devonian.~~

7 ~~Devonian production is 173 barrels of oil~~
8 ~~a day. The drive mechanism is a strong bottom water drive~~

9 ~~reservoir.~~

10 ~~Since we have recovered approximately 8 million~~
11 ~~barrels from the Lea Unit-Devonian and over 82 million~~
12 ~~barrels of water, so it's an extremely strong water drive~~
13 ~~reservoir.~~

14 Q. When you and Ms. Parson analyzed the reservoir,
15 what type of conclusions did you ultimately reach on how to
16 best continue depletion of that reservoir?

17 A. ~~Based on the seismic data interpretation, we~~
18 ~~identified areas where attic oil is located in the~~
19 ~~reservoir~~ and also evaluating the production history from
20 the current wells in the field, in the Devonian. The
21 recovery has been hindered from the reservoir due to water
22 coning.

23 Q. When we look at the existing pool rules, are
24 there any of those rules that are a limitation on the
25 further development of the pool?

1 A. Yes, sir, the field rules specifying where wells
2 would be located.

3 Q. Okay. Have you examined the other rules that
4 apply to the pool to determine whether or not there are any
5 restrictions on those rules that are an impediment to
6 further development?

7 A. Yes, sir, I took a look at the allowable issue,
8 and there are no problems with that.

9 Q. All right. Give us a short summary of how the
10 allowable is assigned for this particular reservoir. The
11 pool rules for this pool were developed way back when?

12 A. ~~It is in 1960, the early sixties. The pool rules~~
13 ~~were based on the proportionality factor, and there has not~~
14 ~~been a horizontal well then, and based on fieldwide Rule 505,~~
15 ~~which was adopted in September, 1992, the allowable now~~
16 ~~falls under the depth bracket allowable for 160-acre~~
17 ~~spacing, which is currently 740 barrels of oil a day.~~

18 Q. All right. Are there any of the spacing units
19 that have the capacity to produce up to the current oil
20 allowable for that spacing unit?

21 A. No, there's not.

22 Q. Let's turn now to Exhibit Number 5. Identify
23 that display for us.

24 A. Exhibit Number 5 is an average daily production
25 plot of the Lea Unit-Devonian Pool.

1 Q. What's the number on top next to each well?

2 A. The top number is the current daily -- average
3 daily production. The bottom number is the current -- of
4 oil.

5 The bottom number is the current average daily
6 production of water.

7 Q. The color code?

8 A. The yellow outline is the Lea unit boundary, and
9 the green outline is the Lea Unit-Devonian -- or the Lea-
10 Devonian Pool boundary.

11 Q. All right. The color codes for the well symbols?

12 A. Green is active producers, blue are historical
13 Devonian producers, and the red location is the proposed
14 Lea Unit Number 17.

15 Q. All right, sir, let's turn to Exhibit Number 6,
16 identify and describe this display.

17 A. This is a cumulative production plot of the Lea
18 Unit-Devonian producers.

19 The top number is the cumulative oil production,
20 the bottom number is the cumulative water production in
21 thousand barrels per day, or thousand barrels of oil and
22 water, perspectivevely [sic].

23 Q. When we look at the southeast of 13, where you
24 propose the Number 17 well, as an engineer, do you know
25 whether or not there is remaining recoverable oil in that

1 spacing unit that cannot be recovered by the existing
2 Number 3 well?

3 A. Yes, sir, ~~the seismic structure map indicates~~
4 ~~there is approximately 100,000 barrels of attic oil that~~
5 ~~could not otherwise be recovered.~~ *by the #12 well.*

6 And looking at Lea Unit Number 3, if you'll
7 notice, it's the highest well on structure but also has
8 produced almost 17 million barrels of oil and just under a
9 million barrels -- I mean, I'm sorry, 16.

10 Q. Water?

11 A. Yeah, water. And just under a million barrels of
12 oil.

13 The production history, taking a look at this,
14 shows us that this well has had a severe coning problem and
15 therefore has not effectively depleted the oil in the area.

16 Q. Do each of these proposed well locations that Ms.
17 Parson testified to represent a similar opportunity in the
18 reservoir?

19 A. Yes, they do.

20 Q. ~~How would you propose to manage this~~
21 ~~water coning problem in the reservoir.~~

22 A. ~~By drilling additional locations, as we have~~
23 ~~presently doing in the reservoir.~~

24 Q. Let's turn now to Exhibit Number 7 and have you
25 identify that for us.

1 A. Exhibit Number 7 is a well-performance table. It
2 summarizes the Devonian producers in the Lea unit.

3 Q. On average, what's the current water cut for the
4 wells in the pool?

5 A. ~~It's right around 97 percent.~~

6 Q. ~~Exhibit 7 is used to illustrate for the~~
7 ~~Example of a strong water drive we have in the~~
8 ~~reservoir. What happens to the productivity of a well~~
9 ~~when you have water coning?~~

10 A. ~~Yes, the second column there identifies water-~~
11 ~~free production. And as you can see, all the wells came in~~
12 ~~water-free, and various wells had water break through at~~
13 ~~various times.~~

14 ~~The Number 5 is a good example of a well that~~
15 ~~produced 28 months water-free before water began to cone~~
16 ~~in.~~

17 The Number 3, as an example, is a well that coned
18 water in three months.

19 Q. And what happens? Once water breakthrough
20 happens, what happens to the productivity?

21 A. Oil productivity drastically reduces.

22 Q. Can you give us an illustration of a production
23 plot from what you would characterize to be a typical well
24 in this pool?

25 A. Exhibit Number 8 is a production history from the

1 Lea Unit Number 3.

2 Q. All right. Again, let's find that well. That's
3 the well that's slightly north of your proposed location
4 for the new 17 well?

5 A. Yes, sir.

6 Q. Describe for us its performance.

7 A. As you can see, just a couple months of water-
8 free production. And you can see, as water begins to cone
9 in, your oil production begins to decline and your water
10 continues to increase, your water production.

11 Q. From an operational point of view, is there
12 anything you can do in the field to minimize that water
13 encroachment once it occurs?

14 A. One of the things you could try to do is to
15 reduce the drawdown on a well, on your well.

16 Q. But ~~the spacing unit, the spacing unit,~~
17 ~~the spacing unit, it is to draw water down and minimize~~
18 ~~water production, so try to get the water production off~~
19 ~~the spacing unit?~~

20 A. Yes, that's correct.

21 Q. Okay, let's look at Exhibit 9 and have you --
22 First of all, why are you showing Exhibit 9?

23 A. Exhibit 9 is a -- I think is one of the better
24 examples we have in the field of a well adversely affected
25 by water coning.

1 The Number 5, as mentioned earlier, had 29 months
2 of water-free production. You can see as water began to
3 break through in around 1964 the oil production drastically
4 drops in this well.

5 Q. We've requested approval of the Number 17 well as
6 an unorthodox location, or in the alternative, to have the
7 Division simply amend the pool rules and let what looks to
8 be like a total of four potential locations become
9 approvable without special hearings.

10 Do you see, in terms of your perspective as a
11 reservoir engineer, any substantial difference with regards
12 to these other locations than what you have analyzed to be
13 the situation for the Number 17 well?

14 A. No, they're all similar locations where you have
15 attic oil identified, and also you will be able to recover
16 additional oil.

17 Section 13, there is one 160-acre proration unit
18 out here that had two wells drilled upon it.

19 Q. Okay, which one would that be?

20 A. The Number 9 was drilled --

21 Q. All right, you're looking at the northeast of 13?

22 A. The northeast section of 13.

23 Q. All right.

24 A. The Number 9 was drilled and completed in 1962.

25 The Number 12 was drilled and completed in 1979.

1 Q. 1972 versus 1979?

2 A. 1962 versus 1979.

3 Q. All right, 1962 versus 1979.

4 A. Correct.

5 Q. All right.

6 A. The Number 9, historically, as it produced --

7 When the Number 12 was completed there as no sign of
8 interference or effect on production from bringing the
9 Number 12 on line.

10 So taking a look at that, if the Number 12 would
11 not have been drilled and completed, we would have -- we
12 would not have recovered the 258,000 barrels that the
13 Number 12 recovered.

14 Q. They're 40-acre offsets, if you will, to each
15 other, and yet when the Number 12 was completed and began
16 to produce, you didn't see any change in the production in
17 the Number 9?

18 A. None.

19 Q. What does that tell you as an engineer?

20 A. That pressurewise they're not communicated, and
21 therefore they did not adversely affect each other as far
22 as production.

23 Q. What happened in the Number 12? It apparently is
24 abandoned at this point.

25 A. Number 12 was lower on structure and became

1 uneconomical as water began -- water cut began to increase.

2 Exhibit Number 7 shows that the Lea Unit Number
3 12 began at a 44-percent water cut.

4 Q. I realize you've read all the old transcripts and
5 looked at the old information about the history of the
6 pool.

7 ~~Do you have an opinion or a statement with~~
8 ~~regards to why they originally set this pool up on such~~
9 ~~restrictive well locations, in such large oil spacing~~
10 ~~units?~~

11 A. ~~From what I can tell, they had done some initial~~
12 ~~interference tests with the Lea Unit Number 1 and Number 2,~~
13 ~~which is in Section 12, and they saw about a 15-pound~~
14 ~~pressure differential in measurement. And based on that,~~
15 ~~they felt like there could potentially be interference, and~~
16 ~~so they asked for the larger spacing.~~

17 Q. ~~Subsequent development and production from the~~
18 ~~pool has determined that that's in fact not what happened?~~

19 A. That's correct. We have the benefit of looking
20 at historical data at this point and can make a better
21 determination.

22 Q. All right. What we're really asking for is to
23 apply standard 40-acre oil spacing and well locations, if
24 you will --

25 A. Yes, as --

1 Q. -- grafted into the pool?

2 A. Yes, as economics justifies the various
3 locations.

4 Q. All right. Do you see any opportunity for -- Let
5 me ask you this way: ~~By increasing the flexibility of well~~
6 ~~locations, it provides an opportunity to recover oil that~~
7 ~~we might not otherwise recover?~~

8 A. That's correct.

9 Q. In addition, despite the fact that this is an
10 existing unit, even in the absence of a unit, there appears
11 to be no indication of an advantage gained between spacing
12 units if the well location rule is relaxed?

13 A. That's correct. Currently we only have about
14 200,000 barrels of oil remaining, with the current
15 development. If we do not drill additional wells out here,
16 we'll leave a significant amount of oil behind.

17 MR. KELLAHIN: That concludes my examination of
18 Mr. Wardlow.

19 We move the introduction of his exhibits, which
20 were 4 through 9.

21 EXAMINER STOGNER: Exhibits 4 through 9 will be
22 admitted into evidence at this time.

23 EXAMINATION

24 BY EXAMINER STOGNER:

25 Q. Mr. Wardlow, did I hear you right that you are

1 [REDACTED] additional barrels of attic oil from the
2 number 17 well?

3 A. Yes, sir.

4 Q. [REDACTED] estimated volumes of like attic oil
5 in [REDACTED] from wells?

6 A. [REDACTED], sir.

7 Q. Just by looking at the historical aspects of this
8 area, which came first: the unit or the pool?

9 A. The unit. It was a federal exploratory unit.

10 Q. And then the -- Then the spacing was added
11 subsequent to that, then?

12 A. Yes, sir.

13 Q. This is somewhat of a unique experience here,
14 that we've got a pool in the middle of a unit, and the
15 opportunity to perhaps do away with a 160-acre spacing or
16 go ahead and keep a 160-acre spacing, considering there
17 probably won't be exploration outside of this -- not
18 exploration, perhaps, but that much additional exploration
19 outside the present pool boundaries, therefore the present
20 unit boundaries.

21 One of the reasons it has come up, when you have
22 an increased acreage is getting away from that 330 offset
23 to keep from bunching of wells when the acreage varies
24 between parties. But in this particular case you've got a
25 unit, and it won't really matter. But I'm somewhat --

1 MR. KELLAHIN: Well, we took the easy answer, Mr.
2 Examiner. We said, Well, we just -- rather than take apart
3 the pool rules, we'll just ask to amend the well locations
4 as the quick and easiest fix to provide the opportunity for
5 the other three locations, if you will, rather than come on
6 a case-by-case exception for the other three.

7 EXAMINER STOGNER: I know the map doesn't show
8 it, but how extensively has the western boundary of this
9 pool been tested, and how many plugged and abandoned wells
10 have we had?

11 MR. KELLAHIN: You may want to recall Ms. Parson.
12 My recollection is, her testimony would be that she's
13 pretty confident that that boundary on the west side is
14 well defined.

15 EXAMINER STOGNER: Ms. Parson, I'll bring that
16 question to you then.

17 MR. KELLAHIN: You'll need to come back up. Why
18 don't you sit here?

19 MS. PARSONS: I'm sorry, could you re-ask your
20 question?

21 EXAMINER STOGNER: Essentially this pool was
22 somewhat depleted or on its last legs. Is there any
23 further expansion of this pool back to the west, do you
24 feel? Or do you feel that boundary has been adequately
25 explored and dry holes have been --

1 MS. PARSONS: I think it's adequately explored on
2 the western boundary.

3 Q. (By Examiner Stogner) Now, the question to you,
4 100 -- What, 700 barrels of oil a day is the allowable
5 presently?

6 A. (By Mr. Wardlow) 740, based on the 14,000- to
7 15,000-foot depth bracket allowable.

8 Q. I'm assuming that you don't think that this
9 Number 17 well will get that much.

10 A. No, we're anticipating 350 to 400 barrels of oil
11 a day, max.

12 Q. Do you know what the concurrent allowable would
13 be for a 40-acre unit?

14 A. 500 barrels a day.

15 Q. 500?

16 A. Uh-huh.

17 Q. That would more than adequately cover this,
18 wouldn't it?

19 A. Yes, sir.

20 EXAMINER STOGNER: Are there any other Devonian
21 pools within the area surrounding this one?

22 MS. PARSONS: No.

23 EXAMINER STOGNER: There isn't. So this is a
24 unique pod area.

25 Mr. Kellahin, do you have anything to add?

1 MR. KELLAHIN: Well, no, sir, I -- You know, now
2 that we see all the bits and pieces, perhaps we could have
3 simply asked to revert this back to 40-acre spacing. But
4 not having known that when we filed the case and not
5 wanting to have a significant delay while we refile
6 something else, I think the quickest answer is to grant a
7 change in the pool rules for well locations, and let these
8 wells be drilled.

9 EXAMINER STOGNER: Would there be any objection
10 at this time, should the Division feel that, with the
11 evidence supported today, the old rules that were
12 established by Marathon's predecessors, Ohio Oil Company
13 and, in this instance, a unit was formed in this particular
14 area, that -- do away with the 160-acre spacing in this
15 area?

16 MR. KELLAHIN: I don't see any reason not to. My
17 only problem is, to accomplish that you'd have to call a
18 new hearing. It would be late January before it would be
19 on the docket, and it would be sometime after that before
20 you could issue the order.

21 What we'd like to do is have permission to at
22 least start the 17 well and to follow with whatever
23 drilling sequence they want to for further development.

24 EXAMINER STOGNER: I was just kind of throwing
25 that out as -- I think we're going to see more and more of

1 this. It needs to become more and more easier to be able
2 to do this. And the usual circumstances when you go from
3 160-acre spacing to 40-acre spacing, you've got to take
4 into account how it's going to affect interest ownership.

5 MR. KELLAHIN: Oh, and it's a nightmare
6 sometimes, because in the absence of a unit you've got
7 correlative rights, a significant issue.

8 EXAMINER STOGNER: But in this instance you have
9 a unit. That doesn't -- So that's what might make this
10 unique.

11 Okay. Well, with that, wrap this particular one
12 up. I don't have anything further of either of the
13 witnesses.

14 MR. KELLAHIN: We have a notice of mailing to
15 operators in the area. I would like to submit that as
16 Exhibit Number 10, Mr. Examiner.

17 We are aware of no opposition to granting the
18 relief requested by the Applicant in this case.

19 EXAMINER STOGNER: Now, are these notifications
20 to unit -- parties to the unit, or are they actually offset
21 operators?

22 MR. KELLAHIN: They were any operator or, in the
23 absence of an operator, any interest owner within a mile of
24 the unit.

25 The unit interest owners were not notified.

1 Their participation in the project is controlled by various
2 agreements.

3 EXAMINER STOGNER: With that, Exhibit Number 10
4 will be admitted into evidence also.

5 We'll take Cases 11,163 and 11,164 under
6 advisement.

7 (Thereupon, these proceedings were concluded at
8 12:20 p.m.)

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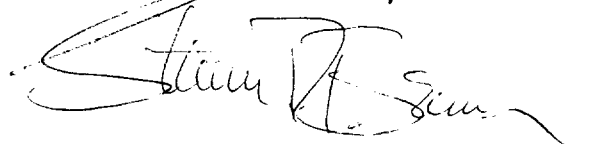
CERTIFICATE OF REPORTER

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 December 19th, 1994.



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 Nos. 11163 and 11164 heard by me on 15 December 1994.


 _____, Examiner
 Oil Conservation Division