

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. 10,830

IN THE MATTER OF CASE 10,830)
BEING REOPENED PURSUANT TO THE)
PROVISIONS OF DIVISION ORDER)
NO. R-10,026)

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

December 15th, 1994

JAN 3

Santa Fe, New Mexico

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 NO. 10,830

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A P P E A R A N C E S

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* * *

1 WHEREUPON, the following proceedings were had at
2 8:23 a.m.:

3 EXAMINER STOGNER: Call next case, the reopening
4 of Case 10,830.

5 MR. CARROLL: In the matter of Case 10,830 being
6 reopened pursuant to the provisions of Division Order
7 Number R-10,026, which order provided for a limiting
8 gas-oil ratio in the Paddock Pool, located in portions of
9 Townships 21 and 22 South, Ranges 36, 37 and 38, Lea
10 County, of 6000 cubic feet of gas per barrel of oil.

11 EXAMINER STOGNER: Call for appearances.

12 MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of
13 the Santa Fe law firm of Kellahin and Kellahin, appearing
14 on behalf of Conoco, Inc. I have one witness.

15 EXAMINER STOGNER: Any other appearances?

16 MR. BRUCE: Mr. Examiner, Jim Bruce from the
17 Hinkle law firm, representing Exxon Corporation.

18 I have one witness.

19 EXAMINER STOGNER: Are there any opening
20 statements at this time?

21 MR. KELLAHIN: No, sir.

22 EXAMINER STOGNER: Who was the original Applicant
23 in this matter?

24 MR. KELLAHIN: Conoco was, Mr. Examiner.

25 EXAMINER STOGNER: Okay. Are you ready to

1 present your testimony, Mr. Kellahin?

2 MR. KELLAHIN: Yes, sir.

3 EXAMINER STOGNER: Okay.

4 MR. KELLAHIN: Would you like to swear the
5 witnesses?

6 EXAMINER STOGNER: Yeah, will the witnesses
7 please stand in this matter, be sworn?

8 (Thereupon, the witnesses were sworn.)

9 EXAMINER STOGNER: Mr. Kellahin?

10 MR. KELLAHIN: Thank you, Mr. Examiner. My
11 witness is Mark McClelland, Mr. Examiner. He is the
12 engineering witness that presented Conoco's request back to
13 you in September of last year when you were the Hearing
14 Examiner in this case. Mr. McClelland testified then about
15 the necessity for increasing the gas-oil ratio in the pool
16 to 6000 to 1.

17 He's back before you again today to support
18 making that temporary gas-oil ratio permanent at this time
19 for the pool.

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

23 DIRECT EXAMINATION

24 BY MR. KELLAHIN:

25 Q. Mr. McClelland, for the record, sir, would you

1 please state your name and occupation?

2 A. My name is Mark McClelland. I'm a staff engineer
3 with Conoco. I work in Midland, Texas.

4 My responsibilities include reservoir engineering
5 assignments in Lea County, New Mexico.

6 Q. At the hearings conducted by the Division in Case
7 10,830 back in September of 1993, were you the engineering
8 witness for your company that supported the Division
9 entering an order increasing the gas-oil ratio in the
10 Paddock Pool to 6000 to 1?

11 A. Yes.

12 Q. As part of your continuing duties, have you
13 continued to study the performance of wells in the pool
14 that Conoco operates to see what if any benefit they have
15 received from increasing the gas-oil ratio?

16 A. Yes.

17 Q. And based upon those continuing studies, do you
18 have now engineering conclusions and recommendations for
19 the Examiner?

20 A. Yes, I do.

21 MR. KELLAHIN: Mr. Examiner, we tender Mr.
22 McClelland as an expert reservoir engineer.

23 EXAMINER STOGNER: Any objections?

24 There being none, Mr. McClelland is so qualified.

25 Q. (By Mr. Kellahin) Mr. McClelland, let's take a

1 few moments and quickly run through the basic geologic
2 framework that we presented to Examiner Stogner last year
3 that set up the predicate, if you will, for increasing the
4 gas-oil ratio in the pool.

5 And to help me do that, if you'll turn to what
6 we've marked as Exhibit Number 1, if you'll take a moment,
7 Mr. McClelland, and refresh our recollection about the size
8 and the shape of the Paddock Pool. When we look at Exhibit
9 1, what are we seeing?

10 A. Exhibit 1 is a land map showing the outline of
11 the Paddock Pool in Lea County. The Paddock Pool
12 encompasses some 18,000 acres from Township 21 South to
13 Township 22 South in Range 37 East to 38 East.

14 Q. When we look at the Conoco-operated wells, how
15 are they identified or shown on this display?

16 A. The lease we'll be talking about today is the
17 Lockhart A-27, there in the north end of this pool in the
18 blue-stippled area. That's in Section 27, the north half
19 of Section 27.

20 Q. The unit project area that Exxon operates, how is
21 that defined on this display?

22 A. Exxon operates the Paddock waterflood unit
23 outline that's shown in blue just south of the Conoco blue
24 stippled area.

25 Q. All right, sir. Let's go now to Exhibit Number

1 2. What have you shown on this tabulation of names and
2 addresses on Exhibit Number 2?

3 A. Exhibit 2 is a -- shows both the operators that
4 operate within the Paddock Pool and also the operators that
5 are adjacent to Conoco's operations in the Lockhart A-27
6 lease.

7 Q. Have any of these operators or individuals
8 complained to you or to your knowledge complained about the
9 use of 6000-to-1 gas-oil ratio for the Paddock Pool in this
10 last year?

11 A. No, they have not.

12 Q. Let's turn to Exhibit Number 3. For the record,
13 Mr. McClelland, what is Exhibit 3?

14 A. Exhibit 3 is a structure map on the top of the
15 Paddock Pool.

16 Q. Is this the same structure map that was
17 introduced before the Division back in the hearing in
18 September?

19 A. It is.

20 Q. Describe its significance to us in the context of
21 this particular case.

22 A. This shows the structure in the Paddock Pool.
23 Paddock oil production is controlled primarily by the
24 structure in the pool.

25 You'll notice that we've darkened in the minus

1 1680 subsea structure line. This line fairly well outlines
2 the producing intervals of the Paddock Pool.

3 Q. When we look at the production information from
4 your wells in the Lockhart lease, identify for us, if you
5 can, on this display the wells that have received a benefit
6 from being allowed to be operated under the increased gas-
7 oil ratio.

8 A. Primarily the wells that have received the
9 benefit are the top row of wells in our Lockhart A-27
10 lease. The north half of Section 27 is our lease again.
11 The wells in Unit B and C have responded best to this
12 application, and those wells are right on the structural
13 high.

14 Q. As a result of the Division entering temporary
15 gas-oil ratio increase for the pool, what did Conoco do?

16 A. Conoco drilled one new well and worked over four
17 existing wells on our lease.

18 Q. What was the cumulative results of that renewed
19 effort to increase recoveries from the pool?

20 A. We increased production by 157 barrels of oil per
21 day.

22 Q. Is that benefit directly attributable to the fact
23 that the gas-oil ratio in the pool was increased to 6000 to
24 1?

25 A. Yes, it is.

1 Q. All right, sir. If you'll turn to the type log,
2 which is Exhibit 4, again, Exhibit 4 was presented to the
3 Division back in September of last year?

4 A. Yes.

5 Q. Summarize it for us.

6 A. Exhibit 4 is just a type log of the Paddock
7 interval. It also includes core data that was taken in
8 Chevron's well one mile west of the Lockhart A-27 lease.

9 Q. You have the Paddock subdivided into an A, B and
10 C interval. For those wells that achieve some benefit from
11 the increased gas-oil ratio, describe generally how you
12 obtain that.

13 A. Primarily, we open additional pay in zones B and
14 C, and in some wells we actually open pay in Glorieta in
15 zone A.

16 Q. As a result of opening that additional pay and
17 having the benefit of the increased gas-oil ratio, what
18 actually happened to the producing gas-oil ratio for these
19 wells?

20 A. In several cases the producing gas-oil ratio went
21 down with an increase in oil production.

22 Q. All right. Let's turn to Exhibit 5 now, Mr.
23 McClelland. What is Exhibit 5, for the record?

24 A. Exhibit 5 is a cross-section. It cuts through
25 the northern row of wells on our Lockhart A-27 lease and

1 also goes into the next section west under Chevron's
2 structural high in Section 28.

3 Q. Can you use this display in any way to illustrate
4 what you attempted to do with some of your Lockhart wells
5 to achieve additional production?

6 A. Yes, if we look at the second well in from the
7 right, the Lockhart A-27 Number 6, this is the well that's
8 highest on structure in our lease.

9 Initially the Number 6 was perforated in Paddock
10 A, B and C. Due to the mature nature of the Paddock Pool,
11 we anticipated a marginal completion. We were surprised
12 when we had a top allowable well with over a million cubic
13 feet a day on the gas production. We went in and squeezed
14 off zones A and B.

15 Q. Okay, you're looking at the Lockhart A-27 6, and
16 it's -- what? The third well over on the right?

17 A. That's right, third well from the right, yes,
18 sir.

19 Q. All right, tell me what you did.

20 A. We concentrated production on Zone C to stay
21 within the gas allowable. After we received the 6000-to-1
22 GOR limiting approval, we went into Well Number 6, reopened
23 zone B and also re-perforated Zone C.

24 This is typical of the work we did in this
25 section -- in this half section, mainly, we opened

1 additional pay and restimulated what was already on line.

2 Q. How does that relate to increasing the gas-oil
3 ratio?

4 A. The higher GOR gave us a little higher gas
5 production; we didn't have to pinch our wells back. Right
6 now, the 6000-to-1, we're allowed to flow the Number 6 at
7 its capacity. We're wide open on a flowing choke, we're
8 wide open flowing on an open choke.

9 We're not -- We do not have to pinch this well
10 back to maintain it to a 2000-to-1 limiting GOR.

11 Q. As a result of the increase, then, are you
12 lifting more oil --

13 A. Yes.

14 Q. -- in this well?

15 A. We're lifting more oil at a reduced GOR.

16 Q. All right. And you have subsequent production
17 plots that show the specifics of that achievement?

18 A. That is correct.

19 Q. All right. Let's go now to Exhibit Number 6, Mr.
20 McClelland. Again, Exhibit 6 was used at the original
21 hearing, was it not?

22 A. Yes.

23 Q. Refresh our recollection about its significance.

24 A. Exhibit 6 shows cumulative oil production in the
25 Paddock Pool.

1 As I stated earlier, production here is
2 controlled primarily by structure. The higher the
3 structure, the greater the oil production. Greater oil
4 production on this plat is shown by a darker green color.

5 As you can see, our Lockhart A-27 lease is very
6 immature in cumulative production. It's a -- Production
7 did not start until 1991. We only have one well there
8 above 50 MBO.

9 Q. Do you see any opportunity to have correlative
10 rights adversely affected by the continuation of the 6000-
11 to-1 GOR?

12 A. No.

13 Q. Let's look at Exhibit 7. Again, Exhibit 7 was
14 used at the original hearing?

15 A. That's correct.

16 Q. Describe for us its significance for purposes of
17 this case.

18 A. What we're showing in Exhibit 7, we're showing
19 the cumulative gas-oil ratio that the Paddock wells have
20 produced at. Again, it's tied to the structure: The
21 higher the structure, the higher the GOR.

22 In our small area in Section 27, since we have a
23 high structure, we can anticipate wells producing with high
24 GORs.

25 Q. Again, with regards to the additional work that's

1 been conducted by Conoco on their Lockhart wells during
2 this last year's period, the results you've seen are
3 positive benefits by utilizing an increased gas-oil ratio?

4 A. That's correct.

5 Q. You don't see any negative consequences with
6 regards to the wells that you operate?

7 A. No. Again, we're actually increasing oil
8 production with the reduced GOR.

9 Q. All right, sir. Let's look at the current rate
10 of productivity in the pool. Do you have a display that
11 will illustrate that for us?

12 A. The next exhibit, Exhibit 8, demonstrates current
13 rate.

14 Q. Where are we in the life of this reservoir and
15 its depletion, Mr. McClelland?

16 A. This is a mature reservoir. It was discovered in
17 1945 and developed primarily by the early 1950s. The wells
18 shown on Exhibit Number 8 are wells that produced in 1993,
19 which is the most recent production data we have.

20 On this exhibit the top number is the well
21 number. Below that you'll see three more numbers. The
22 first number below the well symbol is the current oil
23 production in barrels of oil per day. The second number is
24 current gas production in MCF per day. The third number is
25 the producing GOR in MCF per barrel of oil.

1 Q. What is your depth bracket allowable for the
2 pool?

3 A. The depth bracket allowable in the Paddock Pool
4 is 107 barrels of oil per day.

5 Q. And so you're on 40-acre oil spacing?

6 A. That's correct.

7 Q. Are the wells -- Are there any high -- top
8 allowable wells in the pool?

9 A. There are no wells that are exceeding the oil
10 allowable. The closest one to that is our well in Unit B,
11 the Number 6, again producing 95 barrels of oil per day.
12 The majority of these wells are 10 barrels a day or less.

13 Q. All right, sir. Let's turn now to the specifics
14 of the performance of your wells during this last year's
15 period. To introduce that topic, Mr. McClelland, if you'll
16 turn to Exhibit 9, let's have you identify and describe
17 that display.

18 A. Exhibit 9 characterizes the reservoir drive in
19 the Paddock Pool. It shows oil production, it shows the
20 production history of the reservoir from discovery in 1945
21 through the end of 1993.

22 The top graph shows oil rate, gas rate and water
23 injection volumes in red, dark green and blue.

24 The second graph shows gas-oil ratio and
25 bottomhole pressure.

1 The third graph shows water cut and the well
2 count.

3 And then there's a few descriptive comments at
4 the very bottom concerning the development of this pool.

5 In summary, this exhibit demonstrates that the
6 Paddock Pool is a solution gas drive reservoir. This is
7 characterized by the fairly rapid drop in bottomhole
8 pressure you see in the middle graph, associated with a
9 rapidly increasing in GOR once the pressure dropped below
10 the bubble point.

11 Q. All right, sir. Let's turn now to Exhibit 10.
12 Identify and describe that display.

13 A. Exhibit 10 shows Conoco's production in the
14 Lockhart A-27 lease. This is the total production from our
15 six wells on that lease, from 1991 through 1994.

16 Q. Describe for us how you've organized the display.

17 A. The top graph shows oil rate and gas rate in
18 barrels of oil per day and MCF per day. The bottom graph
19 shows the gas-oil ratio.

20 Q. All right, let's look at the gas-oil ratio
21 portion of the display and have you set up what's happening
22 before the vertical line that shows the point in time when
23 Order R-10,026 was issued, which increased the GOR. What
24 happened before, and then what happens after, as we look at
25 the gas-oil ratio line?

1 A. Before 1991 we perforated the Number 6, realized
2 that we had a -- basically a virgin reservoir in the
3 Paddock Pool. We had a good production in the Number 6, so
4 we offset that with four wells.

5 These four wells were not nearly as good in
6 performance as the Number 6. We had to fight the gas-oil
7 ratio to keep these wells pinched back to a limiting gas
8 rate of 214 MCF per day.

9 As a result, we saw fairly rapid decline in our
10 oil production while trying to maintain that gas at the
11 allowable rate.

12 Q. After the order is entered and you do the
13 additional work, what happens when you look at your total
14 production from your lease?

15 A. If you look at October, 1993, to October, 1994,
16 you see a production jump of 157 barrels of oil per day.
17 You see the gas production increase 1.1 million cubic feet
18 of gas per day.

19 But if you look at the bottom graph, the GOR
20 actually comes down from 16,000 to 9300.

21 Q. Why would that happen?

22 A. We're being more efficient in lifting our wells.
23 The wells are now allowed to flow at capacity. We're not
24 pinching the wells back, we're not loading liquid in the
25 tubulars, we're keeping the wells unloaded, having more

1 efficient flow rates.

2 Q. Would this continuation of the 6000-to-1 GOR
3 maximize the opportunity to recover the remaining
4 hydrocarbons in this portion of the pool?

5 A. Yes, it will.

6 Q. Let's look specifically, then, at how each of
7 these wells has performed. You've used the same display
8 method, if you will, when we go from Exhibit 10 to 11,
9 you've formatted the display in the same fashion?

10 A. Yes, I have, with the exception -- I will have to
11 have you look at the gas-oil ratio scale. I've changed
12 slightly for the exhibits.

13 Q. All right, let's look at Exhibit 11, then. This
14 is the Number 6 well?

15 A. It is.

16 Q. What did you do to this well to increase its
17 productivity?

18 A. If you look at the vertical bar again, that's the
19 date of the order increasing the GOR from 2000 to 6000.

20 In December, after we received the order on the
21 Number 6, we went in, we reperf'd zone C, Paddock zone C,
22 and then we added perforations at Paddock zone B.

23 That well responded very nicely. The well is now
24 flowing on an open choke between 50 to 200 pounds of
25 pressure. Oil production is 95 barrels of oil per day with

1 462 MCF per day. The producing GOR is 4800.

2 Q. The procedures conducted on each of these wells
3 is shown at the bottom of the display as we look at each
4 display?

5 A. That's correct.

6 Q. Summarize what happened. You increased your
7 productivity, and there's a net gain of what?

8 A. Our net gain is 71 barrels of oil per day and 378
9 MCF per day gas. Our producing GOR is basically the same
10 as what it was back in 1992.

11 Q. All right, sir. Let's go to the next display,
12 Exhibit 12.

13 A. Exhibit 12 is the same format. This is for the
14 Number 7. The 7 is a west offset to the Number 6. Again,
15 we're on that top row of wells in the Lockhart A-27 lease.
16 Number 7 is in unit C.

17 Number 7 responded very nicely to our work.
18 Prior to the order, Order 10,026, Number 7 was a very
19 difficult well to produce. We had to pinch this well back
20 to keep gas below 200 MCF a day. As a result, we were
21 producing only one to two barrels of oil per day with a
22 190,000 GOR.

23 What we did to the Number 7, we re-perf'd Paddock
24 zone C and we opened Paddock A and B. As a result, we had
25 a net gain of 53 barrels of oil per day, 384 MCF per day.

1 The producing GOR came down from over 100,000, down to a
2 current rate of 10,600.

3 Q. The ability to achieve this net gain is directly
4 attributable to what, Mr. McClelland?

5 A. Our Order 10,026, increasing the limiting GOR
6 from 2000 to 6000.

7 Q. All right, sir. If you'll turn to Exhibit Number
8 13, let's discuss the performance of this well.

9 A. This is the Number 14. Again, we're in the top
10 row of wells. This time we're in Unit A. We're on the
11 extreme eastern edge of the Paddock reservoir.

12 We drilled this well in November, came on line in
13 December of last year. This well is in zones B and C of
14 the Paddock interval.

15 We're seeing a pretty rapid drop in oil
16 production here. We anticipated that with this well; it is
17 on the edge of the reservoir, downstructure to the Number
18 6. We're producing 21 barrels of oil per day, 208 MCF per
19 day, for a 9900 GOR.

20 This well is fairly typical of the rest of the
21 wells that we'll be looking at in our lease.

22 Q. All right, sir, let's look at 14.

23 A. Exhibit 14 is the Lockhart A-27 Number 2. Now,
24 on -- We've now jumped to the southern row of wells in our
25 Lockhart A-27 lease. The Number 2 is in unit F.

1 Q. When we look at the southern row of wells in the
2 lease, these wells have not exhibited the level of net gain
3 that the northern row of wells did?

4 A. That's correct.

5 Q. Is there a reservoir explanation why they have
6 not achieved a level of success as the northern row of
7 wells?

8 A. It seems to be tied primarily to structure. The
9 better wells are on the structural high. As you drop off
10 that structure, we seem to lose permeability fairly
11 quickly.

12 Q. However, the wells on this lower southern row
13 have still achieved some benefit from increasing the gas-
14 oil ratio?

15 A. They have.

16 Q. Do you see any adverse consequences in the
17 reservoir?

18 A. No, I do not.

19 Q. Is there any kind of water influx or water
20 problem with increasing the gas-oil ratio?

21 A. No. There is some water production, but it's
22 limited and it's not keeping the bottomhole pressure up.
23 As we saw earlier, it is a solution gas oil drive
24 reservoir.

25 Q. All right, and it appears to perform like a

1 conventional, typical solution gas drive reservoir?

2 A. That's correct.

3 Q. Let's look at Exhibit 15, then, have you
4 summarize that for us.

5 A. Number 15 is the Number 10 well. This well,
6 again, is in the bottom row of wells, unit G. 10 is perf'd
7 in everything, Glorieta, Paddock A, B and C.

8 This well has not responded to our workovers.
9 Evidently, we've just -- we've lost our reservoir quality
10 coming off the structural high. We did work this well
11 over, but netwise we're basically the same production as
12 what we were before the order.

13 Q. All right, sir. Let's look, then at the last
14 exhibit, Exhibit 16.

15 A. The final exhibit is our Lockhart A-27 Number 13,
16 located in Unit E. This well is on the westernmost edge of
17 our lease.

18 This well we have done no work on. We are in
19 Paddock zone A and B here.

20 It continues to operate much like the wells on
21 the structural contour: 15 barrels a day, 150-160 MCF per
22 day, with a GOR somewhere between 10,000 to 15,000.

23 Q. Does increasing the gas-oil ratio in the pool
24 have an adverse consequence between the higher-production
25 wells and the lower-production wells so that there is, if

1 you well, net uncompensated drainage occurring between
2 spacing units?

3 A. No, as we've demonstrated in our lease, we're
4 actually seeing a benefit in increasing the GOR. We're
5 producing more oil at a lower GOR.

6 Q. Summarize for us your conclusions, then, Mr.
7 McClelland.

8 A. Speaking for Conoco, the Order 10,026 has allowed
9 us to increase oil production by 157 barrels of oil per day
10 from the Paddock Pool at a decreased GOR. We are being
11 more efficient in recovering oil.

12 MR. KELLAHIN: That concludes my examination of
13 Mr. McClelland.

14 We move the introduction of his Exhibits 1
15 through 16.

16 EXAMINER STOGNER: Are there any objections to
17 the exhibits?

18 Exhibits 1 through 16 will be admitted into
19 evidence at this time. Thank you, Mr. Kellahin.

20 Mr. Bruce?

21 MR. BRUCE: No questions.

22 EXAMINER STOGNER: No questions of this witness?

23 EXAMINATION

24 BY EXAMINER STOGNER:

25 Q. Mr. McClelland, referring -- I'm just looking at

1 Exhibit Number 3 --

2 A. Uh-huh.

3 Q. -- which, as I understand, the blue stippled --
4 or, I'm sorry, the purple mark, that is the productive
5 outline of this pool; is that correct?

6 A. It's the outline of the better-producing wells
7 that -- There are wells that are productive outside of this
8 blue stippled area, but you notice a rapid drop in the
9 productivity of these wells once you get outside that blue
10 stippled area.

11 The 1680 is what I'm referring to as the blue
12 stippled area.

13 Q. Now, are the reservoir characteristics that
14 you're experiencing up there in the Lockhart A-27 lease, is
15 that the same solution drive reservoir down in the south
16 part of the pool? Is that the same characteristics?

17 A. We feel it is, if the one -- The exhibit where I
18 showed the producing GORs, if you notice, the wells high on
19 structure, they have similar GORs to what we're seeing on
20 our lease.

21 Q. That's Exhibit Number 9 you're referring to?

22 A. Exhibit Number 7. It's the yellow and orange
23 right there on top.

24 Q. Oh, okay, here it is.

25 A. Based on the GORs, how they produce with the

1 structure, I feel like the reservoirs are very similar.
2 They are solution gas oil drive reservoirs.

3 Q. Did I hear you mention right that one of your
4 Lockhart A wells that you drilled last year experienced
5 virgin pressures?

6 A. Well, the Number 6, the first well that we
7 started producing from on this lease, experienced virgin
8 pressure. That was the Number 6 in 1991. We measured a
9 bottomhole pressure there that was significantly higher
10 than what we estimated the Paddock reservoir to be. And
11 that's shown on that first production plot, Exhibit Number
12 9.

13 Q. That would lead me to think there was no
14 indication that even though this pool had been producing
15 since 1945, any drawdown in that particular area?

16 A. That's what it appears on that structural high.
17 We appear to be isolated from the drainage of the rest of
18 the Paddock Pool.

19 Q. During this test period, have you had any
20 indication of drawdown due to the higher GOR in any other
21 wells neighboring the wells that have gotten higher
22 production, specifically those up in the north?

23 A. We -- I don't have access to production from the
24 offset wells, I have not -- I talked to the offset
25 operators and did not hear any comments concerning what

1 they noticed as drainage from this test period. There are
2 no active wells directly north of us, though, on the
3 Section 22.

4 Q. Those wells have all been shut in?

5 A. Shell made a few attempts to produce up there,
6 and they encountered water.

7 I'll correct that. In Section 22, back to that
8 current production exhibit, Exhibit Number 8, Shell does
9 have one well, the Turner 4. That's in Unit M of Section
10 22, four barrels a day, 14 MCF per day. They are producing
11 quite a bit of water on this well. It's located
12 downstructure, again, to our lease.

13 Again, it all ties to the fact that we feel like
14 we have a small structural high and rapidly lose
15 productivity as we come off that structural high.

16 EXAMINER STOGNER: No other questions of this
17 witness at this time. He may be excused.

18 Mr. Bruce?

19 WILLIAM T. DUNCAN, JR.,

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. BRUCE:

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

25 A. William Thomas Duncan, Jr.

1 Q. And where do you reside?

2 A. I reside in Midland, Texas.

3 Q. Who do you work for and in what capacity?

4 A. Exxon Corporation, as a reservoir engineer in our
5 regulatory compliance group.

6 Q. Have you previously testified before the Division
7 as an engineer?

8 A. Yes, I have.

9 Q. And were your credentials accepted as a matter of
10 record?

11 A. Yes, they were.

12 Q. And are you familiar with the engineering matters
13 pertaining to the Paddock Pool?

14 A. Yes, I am.

15 MR. BRUCE: Mr. Examiner, I tender Mr. Duncan as
16 an expert engineer.

17 EXAMINER STOGNER: Are there any objections?

18 MR. KELLAHIN: No objection.

19 EXAMINER STOGNER: Mr. Duncan is so qualified.

20 Q. (By Mr. Bruce) Mr. Duncan, is Exxon appearing
21 today in support of making the GOR permanent for the pool?

22 A. Yes, we are.

23 Q. And in your opinion, is the high GOR a poolwide
24 problem?

25 A. It is, and it's not localized. We've experienced

1 it on our lease, and I'll present evidence in today's
2 hearing to show that it does extend over the pool.

3 Q. Would you please refer to your Exhibit 1 and
4 identify it for the Examiner?

5 A. Exhibit Number 1 is a tabulation showing the
6 December, 1993, production for wells in the Paddock Pool.
7 It's listed by -- with the operator in the left-hand
8 column, the location of the well, Section, Township and
9 Range, and then the actual production during that month,
10 barrels of oil and MCF of gas, and the gas-oil ratio that
11 resulted from that production. The operators are listed
12 alphabetically.

13 The purpose of this exhibit is just to show the
14 most recent production information that we have for the
15 entire pool, and I'll use it on later exhibits.

16 Q. Okay, could you move on to your Exhibit 2 and
17 explain what that shows to the Examiner?

18 A. Exhibit Number 2 plots the December, 1993,
19 reported gas-oil ratios for the wells in the Paddock Pool.
20 I've included only the wells which are active Paddock Pool
21 wells, as I did on the first exhibit.

22 In order to be on the first exhibit, the well had
23 to have production attributed to it during the month of
24 December, either gas or oil. And in order to make the plot
25 on Exhibit Number 2, that well had to have both gas and oil

1 production so that a GOR could be calculated.

2 What's shown on this exhibit is that -- I have it
3 arranged so that the plot moves consecutively, each well,
4 as the GOR goes up from left to right on the plot.

5 And what this shows is that the 2000 standard
6 cubic feet per barrel gas-oil ratio line that I've drawn on
7 this map has about, oh, a quarter of the pool wells below
8 that line and approximately three-quarters of the pool
9 wells above that line.

10 The 6000 GOR line that I've drawn on this exhibit
11 shows that it's about halfway between the distribution of
12 wells, about -- a more equal portion above and below the
13 line.

14 Obviously, the wells in this pool produce at
15 relatively high gas-oil ratios, some of them.

16 Q. Okay, how about Exhibit 3?

17 A. Exhibit Number 3 is the same information that was
18 plotted on Exhibit Number 2, but instead of being ranked in
19 order from lowest GOR up to the highest, it's plotted in
20 the same order as in the tabulation on Exhibit Number 1.

21 And what that does is, it groups the operators in
22 the pool together, so that you see that Chevron has wells
23 that vary from low GORs to relatively high GORs, Conoco
24 also, Exxon has quite a variation, Headington, Hendrix,
25 Marathon, Mobil, Parker and Parson, and Texaco.

1 Q. Now, you don't have any names on this exhibit,
2 but the first -- say the -- Take the three biggest
3 groupings of wells. Who are those operators?

4 A. For instance, you'll see Chevron is a trend that
5 starts at a gas-oil ratio shown in the plot of 156, or on
6 the table of 156, and increases. So you can kind of tell
7 where those groupings are. The Chevron grouping is the
8 first large grouping, Conoco, Exxon, Headington, Hendrix,
9 Marathon -- You can see how it progresses.

10 The purpose of this exhibit is to show that
11 it's -- the variation in GORs. And in fact, the GORs,
12 actual producing GORs being above 6000, occurs to all the
13 operators in the pool, or many of the operators in the
14 pool. It's a relatively poolwide situation.

15 Q. So for instance, Conoco, Exxon and Mobil all have
16 a large number of wells, and they all show the same,
17 similar trend?

18 A. That's correct.

19 Q. Finally, Mr. Duncan, what is Exhibit 4 and what
20 are you trying to show there?

21 A. Exhibit Number 4 is the same information, but in
22 this case it's plotted with the vertical axis being the
23 gas-oil ratio for each well and the horizontal axis being
24 the December oil production from that well.

25 And the purpose of that is to show that there is

1 a significant amount of oil production coming from both
2 high- and low-gas-oil-ratio wells.

3 Now intuitively, we might start this process,
4 assuming that the higher the gas-oil ratio -- the higher
5 gas-oil ratio wells are going to produce very little oil.
6 But in fact, there are significant oil producers above the
7 2000-to-1 gas-oil ratio, as there are below.

8 Q. So except for a few wells that produce virtually
9 no oil, or produced virtually no oil in December of 1993,
10 there's really no discernible trend?

11 A. That's correct.

12 Q. In your opinion, Mr. Duncan, will the making
13 permanent of the 6000-to-1 GOR for this pool be in the
14 interest of conservation and the prevention of waste?

15 A. Yes, it would.

16 Q. And were Exhibits 1 through 4 prepared by you?

17 A. Yes, they were.

18 MR. BRUCE: Mr. Examiner, I move the admission of
19 Exhibits 1 through 4.

20 EXAMINER STOGNER: Are there any objections?

21 MR. KELLAHIN: No objection.

22 EXAMINER STOGNER: Exhibits 1 through 4 will be
23 admitted into evidence.

24 Thank you, Mr. Bruce.

25 Mr. Kellahin, your witness.

1 MR. KELLAHIN: I have no questions of Mr. Duncan.

2 EXAMINATION

3 BY EXAMINER STOGNER:

4 Q. Let me make sure I get this straight. On Exhibit
5 Number 3 you said that first grouping of wells represents
6 who?

7 A. The -- Actually, I was trying to sort that out
8 again just a few moments ago.

9 The first major grouping, it's easily
10 identifiable to find that well that has a 154 GOR, 156 gas-
11 oil ratio.

12 Q. Uh-huh, yes.

13 A. Do you see it? That grouping extends up into the
14 right and terminates just below 10,000. That is a Chevron
15 grouping.

16 The next grouping is a Conoco grouping.

17 The next one is Exxon.

18 The next two-well grouping is Headington.

19 The following groping, right after Headington, is
20 Hendrix.

21 The next grouping is Marathon.

22 And the next very large grouping is Mobil.

23 The next two-well grouping is P and P.

24 And the final grouping shown on the plot is
25 Texaco.

1 Q. During that testing period that was allowed, with
2 the temporary GOR increase, has -- did Exxon do any testing
3 of their particular wells or --

4 A. Well, Exxon has actually already done this type
5 of work on wells on its leases, and we've found much the
6 same results that Conoco did.

7 We also were concerned about the gas-oil ratios,
8 but the wells were within the Paddock waterflood unit, and
9 the waterflood allowable allowed them to produce at higher
10 gas rates.

11 Our basic conclusion from that work was that the
12 reservoir, as we found out in our attempts to waterflood
13 the reservoir, is very stratified, the pay is significantly
14 discontinuous, and this type of work, this type of
15 production optimization, is really necessary in order to
16 deplete the reserves since there's not sufficient
17 continuity to waterflood the reservoir.

18 Q. Does Exxon operate the lease right directly below
19 that Lockhart A-27, Hardison?

20 A. The Hardison B lease?

21 Q. Yeah, southeast corner of 27.

22 A. Yes, we do.

23 Q. Is there any noticeable effects in either one of
24 your wells during this test period?

25 A. I'm looking at the well test for the Hardison B

1 Number 6 well, which is the northernmost well on that
2 lease, and comparing those tests since about this time in
3 1993, the well appears to have -- it has decreased in oil
4 production somewhat, along with the decreased gas
5 production. But again that's coming off of work that was
6 done to increase production from the well.

7 The gas-oil ratio has stayed relatively constant
8 over the period, except for one test which I consider to be
9 probably bad. But of the other four tests during the
10 period, it looks like the gas-oil ratio has stayed
11 relatively constant.

12 EXAMINER STOGNER: I don't have any other
13 questions of Mr. Duncan at this time.

14 Any other questions?

15 He may be excused.

16 Mr. Kellahin, do you have anything further?

17 MR. KELLAHIN: No, sir.

18 EXAMINER STOGNER: Mr. Bruce?

19 MR. BRUCE: No, sir.

20 EXAMINER STOGNER: With that, then, this case
21 will be taken under advisement.

22 (Thereupon, these proceedings were concluded at
23 9:09 a.m.)

24 * * *

25

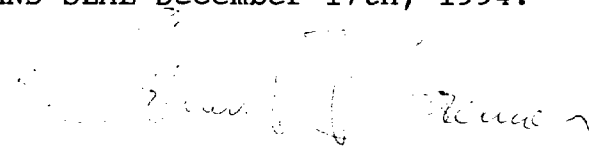
CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
 COUNTY OF SANTA FE)

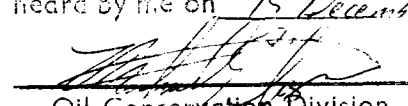
I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

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 December 17th, 1994.


 STEVEN T. BRENNER
 CCR No. 7

My commission expires: October 14, 1998

I do hereby certify that the foregoing is a correct record of the proceedings in the examination hearing of James M. Keppner (Case 10830) heard by me on 15 December 1994.

 _____, Examiner
 Oil Conservation Division

STEVEN T. BRENNER, CCR
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