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1 MR. UTZ: Case 4510.

2 MR. HATCH: Application of Amerada Hess Corporation
3 for amendment of special pool rules, Lea County, New Mexico.

4 MR. KELLAHIN: If the Examiner please, Jason
5 Kellahin, Kellahin and Fox, Santa Fe, appearing for the
6 Applicant. We have one witness I would like to have sworn.

7 (Witness sworn.)

8 (Whereupon, Applicant's Exhibits 1 through 7 were marked
9 for identification.)

10 MR. UTZ: Are there other appearances?

11 MR. KELLAHIN: If the Examiner please, Case 4510 is
12 the application of Amerada Hess Corporation for an amendment
13 to the special pool rules for the Bronco Siluro-Devonian Pool,
14 Lea County, New Mexico.

15 As the Examiner knows, the pool is presently prorated
16 on the basis of a joint hearing which was held between the Oil
17 Conservation Commission of New Mexico and the Texas Railroad
18 Commission; not exactly a joint hearing, but representatives of
19 the Texas Railroad Commission did come to Santa Fe and partici-
20 pate in the hearing on the New Mexico portion of the pool and
21 likewise, representatives of the New Mexico Commission attended
22 the Texas Railroad Commission's hearings in Austin.

23 As result of that, an order was entered to prorate
24 this pool which lies in Lea County, New Mexico, and Yoakum
25 County, Texas, and the present allowable under these pool rules

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1 is 227 barrels of oil per day. Now, the Applicant in this
2 case proposes and feels that at this time the pool is being
3 discriminated against under our statewide proration orders
4 and we seek to put this pool under the statewide proration
5 orders which would give an allowable with a proportional
6 factor of 5.67.

7 The present allowable, as I said, was 227 barrels of
8 oil per day; the increase on the basis of the present allowable
9 that has been assigned to other pools in the state would be 454
10 barrels per day. Now, representatives of Amerada Hess Corpo-
11 ration have consulted with the Texas Railroad Commission. They
12 express no objection to any change.

13 They have applied to the Texas Railroad Commission
14 for a similar hearing to be held contingent upon approval of
15 this application by the State of New Mexico. In other words,
16 in effect, they have said or at least their staff has recom-
17 mended that Texas go along with whatever decision has been
18 made by the New Mexico Commission.

19 I think that rather sums up the position of the
20 Applicant in this case. Of course, we have the further pro-
21 posal that bottom hole pressure tests no longer be required and
22 I think our evidence will amply support that as well.

23 RICHARD FRAZIER,

24 having been first duly sworn, testified as follows:
25

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Richard Frazier.

Q By whom are you employed and in what position, Mr. Frazier?

A Employed by Amerada Hess Corporation.

Q Is that spelled F-r-a-z-i-e-r?

A That's right.

Q What is your position with Amerada Hess Corporation?

A I am a petroleum engineer in the technical service section in Midland. I handle proration matters for the Midland region and for the Seminole-Hobbs region.

Q Does that area you handle proration matters for include the Bronco Siluro-Devonian?

A Yes, it does.

Q Have you ever testified before the Oil Conservation Commission or one of its examiners?

A No, I have not.

Q For the benefit of the Examiner, would you briefly outline your education and experience as a petroleum engineer?

A I graduated from the University of Tulsa in May of 1970 with a Bachelor of Science Degree in petroleum engineering. I have been employed by Amerada Hess Corporation for three years.

Prior to graduation, I was employed as a junior

1 petroleum engineer in the reservoir engineering section
2 in Tulsa. Since graduation, my position has been that of
3 petroleum engineer in the technical service section in
4 Midland.

5 MR. KELLAHIN: Are the witness' qualifications
6 acceptable?

7 MR. UTZ: Yes, sir, they are.

8 Q (By Mr. Kellahin) Mr. Frazier, you heard the statement
9 I made in regard to the application in this case. Do you
10 have anything to add to that or modify it?

11 A No, sir.

12 Q Now, referring to what has been marked as the Applicant's
13 Exhibit Number 1, would you identify that exhibit, please?

14 A Exhibit Number 1 is a map showing the location and owner-
15 ship of the wells in the Bronco Pool. The map also points
16 out that the pool is divided into two nearly equal parts
17 by the New Mexico-Texas border.

18 Q Is the number of wells in the two states substantially
19 the same?

20 A Yes. There are currently nine producing wells in New
21 Mexico and eleven in Texas.

22 Q I see. Now, referring to what has been marked as the
23 Applicant's Exhibit Number 2, would you identify that
24 exhibit?

25 A Exhibit Number 2 is a structure map contoured on the top

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1 of the Devonian Formation. The map shows that the Pool
2 consists of the series of three anticlinal traps which
3 are separated by common water table.

4 Q It has been developed then in those anticlinal traps
5 and the outlines of the pool has been defined, is that
6 correct?

7 A Yes.

8 Q In both states?

9 A Yes.

10 Q No further development would be anticipated?

11 A No, that's correct.

12 Q Now, referring to what has been marked as Exhibit Number
13 3, would you identify that exhibit?

14 A Exhibit Number 3 is a general data sheet for the Bronco
15 Pool. Some of the more important items we have listed
16 are average porosity, 5.8 percent, average permeability,
17 148 millidarcies, gas-oil ratio, 138 cubic feet per
18 barrel, producing mechanism is an active water drive,
19 reservoir is approximately seventy-four percent depleted
20 and the overall recovery efficiency is expected to be
21 around 51 percent.

22 Q Is that typical of an active water drive pool?

23 A This is above average recovery for a water drive reservoir
24 such as this.

25 Q Now, referring to what has been marked as Exhibit Number

1 4, would you identify that exhibit?

2 A Exhibit Number 4 is a performance graph for the total pool.

3 The oil production curve shows a gradual decline of ap-
4 proximately 5 percent per year. Oil production reached
5 a peak in 1958, when an average of 156,000 barrels per
6 month were produced.

7 The current producing rate is approximately 60,000
8 barrels per month. Water curve shows a fairly steady
9 increase over the life of the pool. From 1964 through
10 1966, the water production declined due to plug back
11 treatments on five Amerada Hess Wells. The decline for
12 1970 in water production is due to the abandonment of two
13 high water cut wells.

14 Currently, water production amounts to approximately
15 86 percent of the total flood production.

16 Q Do you have any more wells in the pool that could be
17 plugged back to cut off the water?

18 A This is a possibility. We haven't made a complete study
19 of this, but it is a possibility.

20 Q Would you comment on the information shown on the bottom-
21 hole pressures?

22 A Bottom-hole pressure curve shows that the original
23 pressure was 4789 PSI. Pressure declined approximately 500
24 PSI from 1952 to 1961. During this time the pool pro-
25 duced twelve and a half million barrels of oil. From

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1 1961 to 1967 the pool produced nine million barrels of
2 oil but the reservoir pressure remained essentially
3 constant.

4 Pressure deviated less than one percent from a value
5 of 4270 PSI. This indicates that at a reservoir pressure
6 of approximately 4270 PSI, the pressure differential
7 between the oil zone and the aquifer was sufficient to
8 allow water influx to keep pace with oil withdrawals and
9 maintain constant pressure.

10 Q Would continued bottom-hole pressure surveys serve any
11 purpose in this pool in your opinion?

12 A In my opinion they would not. These surveys were dis-
13 continued in 1968 because at that time the reservoir was
14 approximately 70 percent depleted and a very good fifteen-
15 year pressure history had been obtained and the reservoir
16 pressure had shown no indication of declining.

17 Q In the event the Commission were to approve this appli-
18 cation, which would result in an increased allowable, in
19 your opinion would that affect your bottom-hole pressure
20 any materially?

21 A No, it would not.

22 Q You feel the water encroachment would still keep pace
23 and maintain the pressures substantially as they are?

24 A Yes, that's correct.

25 Q Do you have anything else to add in connection with this

1 exhibit?

2 A Yes. This slow decline in oil production and the increas-
3 ing water production, the maintenance of reservoir pressure,
4 all indicate the reservoir has an efficient water drive
5 mechanism.

6 Q Now, turning to what has been marked as the Applicant's
7 Exhibit Number 5, would you identify that exhibit?

8 A Exhibit Number 5 is a tabulation of the production and
9 pressure data which was plotted on Exhibit 4.

10 Q That is the basis, then, of your Exhibit Number 4?

11 A Yes.

12 Q Referring to Exhibit Number 6, would you identify that
13 exhibit?

14 A Exhibit Number 6 is a tabulation of the latest well test
15 data for the wells in the New Mexico portion of the pool.
16 Also shown are the current allowable for the wells and
17 the anticipated production increase if the top unit
18 allowable were calculated by the statewide methods.

19 Only three of the nine wells would be affected by
20 the change in top allowable. At the current normal unit
21 allowable, if the change is granted, all of the New Mexico
22 wells would be classified marginal.

23 Q None of them would be able to make the allowable that
24 would be assigned on the basis of the present statewide
25 allowable, is that correct --

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- 1 A That is correct.
- 2 Q -- with the depth factor?
- 3 A Right.
- 4 Q Is there a market for the increase in oil that would
5 result from this change?
- 6 A Yes. If we could refer to Exhibit Number 7 on this
7 question, it's a letter from Phillips Petroleum Company
8 stating that they would purchase the additional oil and
9 that they have sufficient pipe line capacity to process
10 the crude.
- 11 Q Now, approval of this application would result in an
12 increase in production of water as well, would it not?
- 13 A Yes.
- 14 Q Would you have any problem in disposing of the increased
15 water?
- 16 A No. The water will be disposed of by the Bronco salt
17 water disposal system which is operated by Amerada Hess.
18 The system currently has excess disposal capacity of at
19 least 3,000 barrels per day.
- 20 Q Any other operators using this system?
- 21 A Yes, Atlantic Richfield and Sohio use this system.
- 22 Q Would you be able to handle the increased water production
23 from their wells, too?
- 24 A There will be no change in the production from their wells.
- 25 Q They are producing at capacity now, is that correct?

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- 1 A Yes.
- 2 Q What about other operators in the New Mexico side of the
3 pool? Do you know what they are doing with their water?
- 4 A They dispose of it themselves. Texaco is the only other
5 producer that --
- 6 Q And they have their own disposal system?
- 7 A Yes, they do.
- 8 Q As far as you know, it would handle any increase in
9 production, would it?
- 10 A Yes, but their well, as far as I know, would not be
11 affected by this increased allowable.
- 12 Q Now, what did you say the GOR in this pool is?
- 13 A It was 138.
- 14 Q There would be some slight increase in gas production,
15 then, is that correct?
- 16 A Yes.
- 17 Q What disposition would be made of that gas?
- 18 A Well, at the present time Amerada Hess uses all of its
19 produced gas to operate lease equipment. In addition to
20 the produced gas, we are also having to buy supplemental
21 gas for fuel. Even with the predicted increase in gas
22 production it will still be necessary to supplement our
23 gas for fuel.
- 24 Q Now, Mr. Frazier, in your opinion, would any waste occur
25 if the production from this pool is increased at this

1 stage?

2 A No. For fourteen years of the pool's eighteen-year life
3 the total oil withdrawal rate has been higher than that --
4 than the rate anticipated if the top allowable is in-
5 creased. Reservoir performance to date has been excellent.

6 Reservoir pressure has been maintained at approxi-
7 mately 90 percent of the original value and the recovery
8 efficiency is calculated to be 51 percent, which is about
9 7 percent higher than the average for a water drive
10 carbonate reservoir.

11 Q Have any individual wells in the pool been produced at
12 the rates that would result from approval of this appli-
13 cation?

14 A Yes. For short periods of time the wells have been
15 produced for well test purposes and to make up production
16 due to down time.

17 Q On the basis of those tests was there any increase in the
18 percentage of water produced?

19 A No, the water percentages remained constant.

20 Q Now, in your opinion, will there be any increase in the
21 rate of water encroachment relative to oil production as
22 a result of the increase in allowable which we are seek-
23 ing?

24 A No.

25 Q In other words, you say that this pool is capable of

1 producing at statewide allowable rates?
 2 A Yes, that's right.
 3 Q And no waste would occur?
 4 A Correct.
 5 Q On that basis, would you say that this pool is presently
 6 being discriminated against in the assignment of allow-
 7 ables?

8 A In my opinion, it is.
 9 Q Were Exhibits 1 through 7 prepared by you or under your
 10 supervision?
 11 A Yes, they were.

12 MR. KELLAHIN: At this time I would like to offer
 13 in evidence Exhibits 1 through 7.

14 MR. UTZ: Without objection, Exhibits 1 through 7 will
 15 be entered into the record of this case.

16 MR. KELLAHIN: That completes the direct examination
 17 of the witness.

18 CROSS EXAMINATION

19 BY MR. UTZ:

20 Q Mr. Frazier, this is a Devonian Pool, right?
 21 A Yes, it is.
 22 Q How many other Devonian Pools are in New Mexico, approxi-
 23 mately, and if so, are they water drive also?
 24 A All Devonian Pools in New Mexico are water drive, yes,
 25 sir.

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1 Q Now, looking at Exhibit 6, do you have a column there for
2 the present allowable?

3 A Yes, I do.

4 Q Which one is it?

5 A Current allowable in barrels per day.

6 Q That would be for the Federal B Number 1, 227 and for the
7 Ward's 1 and 2, 250 and 250?

8 A Right. This has been increased due to additional acreage
9 which has been assigned to these wells. We have an
10 acreage factor of 1.1.

11 Q Now, the change in allowable would be the second column
12 to the right of that --

13 A The next column.

14 Q -- increased production if allowable calculated by state-
15 wide method? No, this is water.

16 A Yes. The oil production is right next to -- this would
17 be the increase. The allowable would be the wells' capacity
18 in all these cases.

19 Q That would be what, 268 in the first case, 297 and 337, is
20 that it?

21 A Yes, that's correct.

22 Q So, the figures in the third column from the left, oil
23 barrels per day, 41, 47 and 87, that is the increase,
24 then?

25 A Yes, that's the difference between the current allowable

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- 1 and the test capacity.
- 2 Q It's your testimony, then, that this increase would not
- 3 detrimentally affect the producing capacity of these wells
- 4 even though it is an active water drive?
- 5 A That's correct.
- 6 Q Your basis for that is what, again?
- 7 A Basically due to past performance of the reservoir. The
- 8 total withdrawals from the reservoir have been in excess
- 9 of what we anticipate and no harmful affects have been
- 10 noticed. The reservoir pressure will continue to be more
- 11 than adequate to keep the pressure above bubble point
- 12 pressure which would be the minimum pressure we could
- 13 stand without damaging the reservoir.
- 14 Q There would be no danger of coning the water into these
- 15 well bores?
- 16 A To our knowledge, no. If this occurred, of course, we
- 17 would have to slow the rates down.
- 18 Q Be a little late, then, wouldn't it?
- 19 A Well --
- 20 Q Judging from the percentage of water you are producing
- 21 now, I think it would be a little late at that point,
- 22 86 percent, isn't it?
- 23 A Yes, that's a field-wise basis. Our best wells' water
- 24 percentage is much less than that. The Ward Number 2
- 25 currently produces no water.

- 1 Q Federal B Number 1 produces quite a bit, doesn't it?
- 2 A Yes, it does.
- 3 Q 215 to 268, that's almost half water, isn't it?
- 4 A I'm sorry.
- 5 Q I say, 215 water you anticipate it will produce a day and
- 6 268 oil?
- 7 A Yes. Well, actually, it will be 268 barrels of oil and
- 8 1424 barrels of water. This would be the increased water.
- 9 Q Oh, I see. Sure.
- 10 A This was taken off.
- 11 Q It will be hard to tell whether that one is coning or not,
- 12 won't it?
- 13 A I think it will.
- 14 MR. UTZ: Are there other questions of the witness?
- 15 MR. HATCH: In this column, the 175 barrels would be
- 16 the additional oil and that's from the New Mexico side?
- 17 THE WITNESS: New Mexico side only.
- 18 MR. HATCH: The 450 would be the --
- 19 THE WITNESS: This was an approximate figure. There
- 20 is one well in the Texas side which is currently top allowable.
- 21 It would produce approximately an additional 227 barrels per
- 22 day, so I think 402 barrels per day would be the increase we
- 23 would expect.
- 24 MR. UTZ: Are there other questions?
- 25 MR. HATCH: Yes, one other. You said you do plan to

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1 appear before the Texas Railroad Commission if this was approved?

2 THE WITNESS: Right.

3 MR. HATCH: But you don't have any date or any hearing
4 set?

5 THE WITNESS: No. It will be contingent upon the
6 approval here.

7 MR. HATCH: And if you appeared there and they refused,
8 then, would you anticipate coming back here for reduction in this
9 or would you anticipate letting it ride?

10 MR. KELLAHIN: Actually, with a slight increase in
11 oil production in New Mexico, I don't think it will be material
12 any way. Wouldn't be worthwhile to come back to change it.

13 MR. HATCH: That's all.

14 MR. UTZ: Other questions? The witness may be
15 excused.

16 (Witness excused.)

17 MR. UTZ: Statements? The case will be taken under
18 advisement. We will adjourn until 1:30.

19 (Whereupon, the hearing was adjourned until 1:30 the
20 same day.)

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I N D E X

WITNESS

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RICHARD FRAZIER

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E X H I B I T S

Nos. 1 through 7

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