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BEFORE THE OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF COLORADO

IN THE MATTER OF ALLOW A THIRD WELL) CAUSE NO. 232
TO BE DRILLED FOR PRODUCTION OF GAS) WATTENBERG GAS
AND ASSOCIATED HYDROCARBONS FROM THE) SPACED AREA
J SAND ON A 320 ACRE SPACED UNIT)

The above-entitled matter came duly on for
hearing in Room 110, 1313 Sherman Street, Denver, Colorado
80203, on Monday, July 20, 1987, commencing at the hour
of 9:00 a.m.

BEFORE:

Commissioner John Haun, ~~Acting~~ Chairman
~~Commissioner Jeff Walker~~
Commissioner Gretchen Vander Werf
Commissioner Rogers Johnson
Commissioner Max Krey
Commissioner Truman Anderson

William Smith, Director of Commission
Frank Piro, Deputy Director-Secretary

I N D E X

MR. SULLIVAN'S WITNESSES

EXAMINATION

GARY JERMAN

BY MR. SULLIVAN

3

JACK McCARTNEY

BY MR. SULLIVAN

5

BY MR. LUND

21

BY MR. KEEFE

30

MR. LUND'S WITNESSES

BILL HAWKINS

BY MR. LUND

36

BY MR. SULLIVAN

43

BY MR. SMITH

44

1 CHAIRMAN HAUN: All right. The next item is
2 Cause No. 232, Wattenberg Gas Spaced Area. The applicant
3 is Cimarron Oil. They want a third well on a 320-acre
4 spacing unit and there are several objectors: Amoco,
5 Union Pacific Resources.

6 Who is representing the applicant?

7 COMMISSIONER WELBORN: I am going to have to
8 disqualify myself from this one.

9 CHAIRMAN HAUN: All right.

10 MR. SULLIVAN: Steve Sullivan representing
11 Cimarron.

12 CHAIRMAN HAUN: Are you ready to make your
13 presentation?

14 MR. SULLIVAN: Yes, sir.

15 CHAIRMAN HAUN: All right. Then the representa-
16 tives of the objectors?

17 MR. LUND: Kenneth Lund for Amoco, Mr. Chairman.
18 We have a witness.

19 CHAIRMAN HAUN: And for U.P.?

20 MR. KEEFE: William Keefe for Union Pacific
21 Resources Company, Mr. Chairman, and we have a statement and
22 may introduce evidence.

23 CHAIRMAN HAUN: All right. You may proceed
24 with your presentation.

25 MR. SULLIVAN: Cimarron's requesting that the

1 Oil and Gas Commission modify the field rules governing
2 operations in the Wattenberg Gas Field with respect to this
3 spacing unit, to allow the drilling of an infill well to
4 produce from the J sand formation on the 320 acre spacing
5 in the south half of Section 4, Township 1 South, Range 6
6 Southwest. Cimarron has previously drilled the well in the
7 southwest quarter of southwest quarter of Section 4 which
8 is capable of producing gas from the J sand formation. It
9 now hopes to drill another well in the northeast quarter
10 of the southwest quarter of Section 4, 1980 feet from the
11 west line, 1980 feet from the south line. The location
12 was chosen primarily as to test the D sand formation, which
13 is the primary target, but in order to recover some of the
14 costs of drilling the D sand test in the event significant
15 production is not obtained from the D sand, Cimarron is
16 requesting it be allowed the opportunity to produce from
17 the J sand formation. Cimarron has obtained the consents
18 from the operator and the working interest owners to the
19 north, Karen Oil Company and Byrd's Exploration Company,
20 which is the spacing unit towards which the well would be
21 drilled, and is the only spacing unit less than 980 feet
22 from the drill site location. There are two known objectors:
23 Amoco and Union Pacific Resources. Our testimony will show
24 in this area the J sand wells most probably will not drain
25 more than 80 acres and that drilling in this location will

1 not damage the correlative rights of any of the adjoining
2 lease owners.

3 As my first witness, I'd like to call Gary
4 Jerman, a land man.

5 EXAMINATION

6 BY MR. SULLIVAN:

7 Q Would you please state your name and address and
8 company for whom you work?

9 A My name is Gary Jerman. My office is 1645
10 Court Place, Suite 300, it's Denver 80202, and my company
11 is Jerman Consulting Group.

12 Q Would you please, briefly, state your background
13 and experience as a land man?

14 A I've been an independent land man for 11 years.
15 I am a certified petroleum land man and my certificate
16 number is 3337.

17 Q With respect to the south half of Section 4
18 and the adjacent 320 acre spacing unit, have you examined
19 title to these lands for Cimarron?

20 A Yes, I have.

21 Q Based upon your examination, does this map
22 correctly show the operators of those spacing units?

23 A Yes, it does.

24 MR. SULLIVAN: I'd like to offer the map
25 into evidence.

1 CHAIRMAN HAUN: It is accepted into evidence.

2 MR. SULLIVAN: And that's all. Does the
3 Commission have any questions of the witness?

4 CHAIRMAN HAUN: I guess not.

5 MR. SULLIVAN: Okay. Thank you, Gary.

6 As my next witness, I would like to call Jack
7 McCartney.

8 EXAMINATION

9 BY MR. SULLIVAN:

10 Q Would you please state your name and address
11 and the company with whom you work?

12 A Jack McCartney and my residence is in Lakewood,
13 Colorado and I work for McCartney Engineering, Inc.

14 Q Would you briefly state your experience as a
15 petroleum engineer?

16 A I've got degrees from the Colorado School of
17 Mines in Petroleum Engineering and I have worked in the
18 industry approximately 20 years.

19 Q Have you ever testified before the Commission
20 before?

21 A Yes, I have.

22 Q Were you accepted as an expert witness?

23 A Yes.

24 MR. SULLIVAN: Cimarron would like to offer
25 Mr. McCartney as an expert witness, expert petroleum engineer.

1 CHAIRMAN HAUN: Do you want to have him sworn?

2 MR. SULLIVAN: Yes.

3 JACK McCARTNEY

4 was duly sworn by Chairman Haun and testified as follows:

5 CHAIRMAN HAUN: His credentials are accepted
6 as an expert witness.

7 Q Mr. McCartney, would you please explain
8 Cimarron's reasoning for drilling the well at the proposed
9 location?

10 A Cimarron Oil Company is fixing to, or would
11 like to and has permitted to drill a D sand test in the
12 northeast of the southwest of Section 4 of Township 1
13 South, Range 65 West, in Adams County. The basis for the
14 test is looking for a channel deposit as described in
15 Exhibit No. 1. There are two excellent D sand channel
16 wells located in Section 34 of Township 1 North, Range 65
17 West and a channel is also exhibited in the Sikiat well,
18 which is the southwest southwest of Section 32 and in the
19 Champlin 38 D No. 1 well, which is located in the northeast
20 quarter of Section 5. It is Cimarron's expectation, hope,
21 desire, wish, whatever that this channel may be connected
22 and may transverse through the northern part of the south
23 half of Section 4. The basis of the well is really a D
24 sand test and the desire to potentially produce a J at
25 this location is basically a bail out zone in case the D is

1 nonproductive or very marginally productive. It is an
2 attempt on Cimarron's behalf to have a little bit of
3 insurance in drilling this well that they may have an
4 opportunity to produce a little bit of J sand gas to help
5 offset the risk and cost of this well.

6 In reviewing the wells in the immediate vicinity
7 of this, the Champlin 38 D No. 1 well in the northeast
8 quarter of Section 5 first produced in June of 1979, has
9 produced approximately eight years. Through March of 1987
10 it had accumulated 139,699 MCF of gas and 9,410 barrels of
11 oil from the J sand formation. This is a relatively
12 marginal well in today's standards. Another well was
13 recently drilled, actually drilled about a year ago in
14 the northwest quarter of Section 4. Byrd's Exploration
15 took over this well upon completion and attempted a
16 completion in the J sand, produced a J sand for approxi-
17 mately nine months, seven months, and I understand recently
18 plugged the well after cumulative production of 1,749 MCF
19 of gas and 77 barrels of oil, so, basically, that is about
20 as close as you can come to a dry hole. The well located
21 in the southwest southwest of Section 3 was drilled by Rocky
22 Mountain Production. It was completed as a D sand well,
23 and as far as I know no attempt has been made to complete
24 in the J sand. The D sand at that location has produced
25 about 40,000 MCF and 3,000 barrels of oil. It's fairly

1 marginal D sand producer. To the south, in Section 9,
2 the Calcitrant No. 2 well, located in the northeast quarter,
3 was completed in October of '82. Actually it was completed
4 first in D sand in February of '82, and was produced as a
5 single zone D sand well until October of 1982, at which
6 time a request was made and granted that the well be
7 comingled with the J sand, so since October of '82 it has
8 produced from both the D and the J sand. Since it was
9 comingled in '82, it's produced 158,001 MCF and 6,404
10 barrels of oil. In Section No. 8, there are four wells
11 in there operated by Mason John Oil, Inc. The closest
12 to our area of interest is the Bergeman No. 1. It was
13 completed in September of 1979 and has produced 296,763 MCF
14 of gas, 12,884 barrels of oil, and, as shown, it's quite
15 a bit the most prolific well in the immediate vicinity of
16 Section 4. There is a couple wells up in Section 2 that
17 are now no longer producing in the J. One, the Sikiat well,
18 was plugged and abandoned after cumulative production of
19 a little over 18 CF of gas and the Kilker No. 1 produced
20 a little over 1 BCF of gas out of the J and upon completion
21 of the J it was recompleted in the Niabrara and I believe
22 produced only minimal amounts of oil and gas from the
23 Niabrara. The exhibit No. 1 shows two cross-sections of
24 that well, in Exhibits 2 and 3, the first is to describe
25 this channel deposit which is the basis for the well and the

1 second will be to show the development of the J sand in
2 the area immediately surrounding this request for exception
3 location. The D sand production in the area of Section 34,
4 which is the basis for this, two wells up there, the 34-7,
5 located in the southwest of the northeast of 34, has pro-
6 duced in 13 months about 10,000 barrels of oil and 200,000
7 MCF of gas. It was completed in February 1986. The 34-3
8 in this same section produced 28,000 barrels of oil and
9 98,000 MCF of gas, so it's evident that the most prolific
10 production potential for Section 4 is going to be from the
11 D sand rather than the J sand.

12 The Exhibit No. 2 is a cross-section depicting
13 the D sand channel development. From left to right, the
14 two wells on the left, the Sikiata No. 1 and the
15 Champlin 78, Amoco D No. 1 wells have low perocity develop-
16 ment and probably are not productive, but they do indicate
17 some channel deposition and this channel is further evident
18 up to the northwest. The section 34 wells that are producing
19 from the D sand are also shown on this cross-section and
20 this is the type of log that we'd like to see at the proposed
21 Penrod No. 2 location. Also shown on this cross-section
22 are the various zones of the J sand that we're calling the
23 J-1, J-2, and J-3 sand developments. The J-2 sand is
24 ordinarily thought to be the most productive of the three
25 sand benches. The reason for the discussion on the D sand

1 is to illustrate that this really is a D sand test and not
2 an excuse for drilling another J sand well on the quarter
3 section. Exhibit No. 3 shows three of the wells drilled
4 in Section 4 on this. I wanted to present these perocity
5 logs to show the magnitude or lack of magnitude of the
6 perocity development on the J sand in this area. Two of
7 the three wells, the Penrod No. 1 by Amoco and the Rock
8 Oil Penrock well were completed as dry holes with no cores
9 or tests. The first well was drilled by Karen Oil Company
10 and then Byrd's exploration took that over and completed
11 the well and were not successful in achieving hardly any
12 production from that well. Limited perocity development,
13 basically not an ideal place to drill a prolific J sand
14 well as far as we can tell from the geology. The Exhibit
15 No. 4--there seems to be two wells in the southwest quarter
16 of Section 4. CHAIRMAN HAUN: There seems to be two wells in
17 the southwest quarter of Section 4.

18 A Yes, one well. The Cimarron Penrod No. 1 was
19 just drilled about a week ago, so there is, it was a twin
20 well hundred feet to the north of the other. They had a
21 lease deadline problem and they had to get in there and
22 drill and since they were a little apprehensive about whether
23 or not they'd be able to produce a J sand from the D sand
24 test, and it was necessary to drill a well they thought
25 they could produce in paying quantities to hold the lease

1 that well was twinned and it was just recently drilled.

2 CHAIRMAN HAUN: What happened; does it produce
3 from the D?

4 A Well, it's not completed yet. Completion is
5 pending the drilling of the second well on that 160, so
6 they can use first the scale, and try to minimize cost
7 in the completions operation for both wells in basically
8 the same time.

9 MR. SMITH: Did they get any D sand in that
10 first well?

11 A They got about six foot of micro log separation,
12 looks like about four foot of perocity development in the E.
13 It's pretty tight but it might make a little D well.

14 Q What about the J?

15 A The J looks just about like the twin there, which
16 is on this cross-section. Actually, if you look hard
17 enough, you can come up with about 10 or 12 feet of perocity,
18 greater than eight percent, depending on which one of the
19 repeat sections you look at on the log and it would indicate
20 from that well that there may be in the order of 600 or
21 700,000 MCF of gas in place per 160. It's obviously, I guess
22 it may not be obvious, but since it was drilled in very close
23 proximity to the other well, that the wells look similar
24 and there was no real surprises as far as any better develop-
25 ment. The D actually looked a little bit better. We would

1 like to think that it's going in the right direction. I
2 guess the basis for thinking that we should be able to
3 produce a J sand from this exception location is based on
4 the performance of the J sand wells in this immediate
5 area. We are not trying to set a precedent and say that
6 the Wattenberg field should be downspaced. We're not saying
7 that all the offset operators ought to be compelled to drill
8 three wells on each 120 acre tract. We are saying that
9 these are, economically, these are tough times. We need
10 all the help we can get to even get a well drilled these
11 days. The geologist's worked hard. He's missed on one
12 occasion, the Berrige well in the northwest of Section 4
13 was his idea. Looking for that same channel, it's not there
14 and so he's got authority to drill another well looking
15 for that channel, but in all reality they're going to need
16 all the help they can get to recover some of the expenses
17 of this exploration program. The J sand is not anticipated
18 to be a real world beater here. One of those wells might
19 produce a quarter of a BCF, so in the event that they need
20 a little help on this well and in the event there may be a
21 few feet of perocity development in the J, it's only
22 reasonable and it's only logical and it's only right that
23 they should be able to try to recover those hydrocarbons at
24 that location. If it were to be shown that they were potentially
25 draining offset operators or that they got a very prolific

1 well in the J and something happens that I really don't
2 anticipate happening and it makes a good J well because of
3 its location and because there potentially may be two wells
4 completed in the J in that quarter section, it would be
5 reasonable to assume that upon application offset operators
6 could come back and have the Commission take a look at the
7 potential for drainage there. We're not for certain a twin
8 well would make a commercial well. We know that it was
9 drilled in an attempt to make a commercial well, but having
10 not been completed yet, we don't even know for sure whether
11 it will make a commercial well. There is going to be little
12 chance that one well is going to effectively drain the
13 reserves on 160 acres in this particular section. There has
14 already been four wells drilled, three of them in the south
15 half of Section 4, which is the spacing unit in question,
16 two dry holes and one well yet to be completed. So a valid
17 attempt has been made to try to extract hydrocarbons from
18 this half section with so far nothing to show for it.

19 CHAIRMAN HAUN: Wouldn't it have been better to
20 wait and see what this twin well would do prior to making
21 this request. It seems that the timing is a little off
22 here, isn't it?

23 A We would have liked to have done that, sure,
24 but we potentially can save a set-up charge on the fire
25 trucks, use the same work, use the same personnel, and just

1 that amount of expenditures savings justifies doing them
2 both at the same time. You know, if they've got that well
3 and then they're going to drill a second well, well, you'd
4 be better off to do them both at the same time. There
5 had been some, you know, looking for excuses for the well.
6 I said, well, if we're drilling in older part of Wattenberg
7 Field where we've got a well that's produced for 10 or 15
8 years, we come in and we drill an 80-acre offset, we drill
9 it and they want to see if there is completion on the 160.
10 We want to do what Amoco is doing in Spindle. We want to
11 drill some 20-acre, auote, downspaced wells, to see what's
12 there. Unfortunately here, we would have to, it's not a
13 good place to drill like an observation well, a test well,
14 because the rock is so tight it's going to take years to
15 even, see any interference from offset well. So if the
16 time is right to drill the D sand test, which I understand
17 from my client, they desire to do, then we don't have the
18 option as far as timing. The deficiency is such that we
19 would like to complete them both at the same time. Actually,
20 well, I won't go into the--I was going to say that the cost
21 of having me show up at the hearing just about puts that
22 potential J sand in the hole.

23 CHAIRMAN HAUN: That's what I thought.

24 A I'm not expecting it to be a very prolific well,
25 as you can tell. On Exhibit No. 4, we have done some log

1 calculations of all the wells in the nine-section area,
2 looked at the cumulative production, made an estimate of a
3 remaining production to try to estimate what the average
4 recovery of wells in this area are. We've got a couple good
5 wells. The first two on the list, the Kilker No. 1 and
6 the Sack-Hiett wells produced over a BCF of gas. It looks
7 like the Sack-Hiett got more than its share but, you know,
8 that happens and it was two wells drilled on the 640 tract.
9 The available 160-acre locations were never drilled in that
10 section and then the next five wells shown on Exhibit No. 4
11 really don't indicate that because of low resistivity and
12 marginal perocity they really didn't calculate as if they
13 had any pay under the criteria that we used in this analysis,
14 and we can see the cumulative production has been very
15 marginal, so those wells were very marginal J sand producers.
16 One of them was located to the north in Section 33 and the
17 other four are in Section 34. The two important wells: One
18 is in the northwest of Section 4, shown on the exhibit as
19 the first No. 4-3. That well name has been changed, I
20 understand, to the Penrod No. 4-3. When Birch took over
21 the operation, they changed the well, named it Penrod,
22 very, very marginal production. We anticipate its recovery
23 of gas in place is only 1.5 percent, so it, in essence, has
24 achieved no drainage of any potential gas in place.

25 Looking at the log as shown in Exhibit No. 3, it's

1 hard to find any perocity development in that log.

2 MR. SMITH: That well has been plugged, hasn't
3 it?

4 A Yes, and it was plugged here within the last
5 six months. I think it's so designated on that plat.

6 MR. SMITH: It is.

7 A Then the other, I believe the next closest well
8 is a Champlin 78D No. 1 well in the northeast quarter of
9 Section 5. That's not a very good well either, frankly,
10 and based on volumetrics we calculate for it we indicate
11 that it's going to drain about 28 percent of the gas in place
12 on 160's, or if we would double that we would be at 55
13 percent of the gas in place on 80-acre drilling patterns, so
14 it is not efficiently draining the reserves under its own
15 160. Again, we point out that in Section 5 it is a sole
16 well drilled in Section 5 and the operators not chosen to
17 develop that section, so they evidently are not afraid of
18 at this time of drainage to the south, whether offset by
19 two Mesa Mashawn wells and the other wells shown there just
20 happen to be other wells on the map. There is some fairly
21 good production in the area. In general, we're not efficiently
22 draining 160 acres. Two footnotes. One is the Calson
23 32-9 No. 2 is the comingled DJ sand well and I have allo-
24 cated 70 percent of the production from that well to the J
25 and 30 percent to the D, and in calculating its recovery, and

1 on the Wagner 41-10 well there was no reduction or electrical
2 log survey, so the water saturation calculation was estimated
3 from other wells in the area. The rest of the exhibits are
4 performance curves of all the wells in the area. Where
5 there is an extrapolation shown by either a dash line or a
6 line connected with dots, such as in Exhibit No. 8, that is
7 a basis for estimate of remaining primary reserves. We've
8 done that on all the wells that exhibit, in our opinion,
9 any economic production. Some of these estimates are, you
10 know, it's based on judgment, experience, et cetera, et
11 cetera, particularly wells like the Burgmund in Exhibit
12 No. 15 or the temporary well in No. 17. These wells have
13 been curtailed in their production for some time so we don't
14 have a nice performance curve to go on and this well's cur-
15 tailment started, it appears, in about the first of 1983,
16 so our projections, based on more of a typical well performance,
17 since we have three years of what we think is good history
18 on the well from 1980 through 1982 and after that it's cur-
19 tailed, but the well does have additional capacity. It's
20 really not trailing off like the curve might indicate, so
21 we've given it credit, which we think is justified as far
22 as calculating remaining reserves which, of course, affects
23 the recovery factor that we have used. I guess, in summary,
24 based on the data, based on the wells in the area, the logs,
25 the performance history, what's happened in the area, the

1 request to produce the J sand at this exception location,
2 assuming that we're talking about the one that's 1980 from
3 the west line and 1980 from the south line of Section 4, this
4 request is reasonable, it's logical, it potentially is
5 economic to go ahead and complete the J sand. That decision
6 will, of course, wait until the well is drilled and logs are
7 run, will not damage correlative rights, will not cause
8 drainage of adjacent tracts, and is not a concern to the
9 operators directly to the north of what should be most
10 concerned is Byrd's Exploration, Carey Oil Company have not
11 filed protests in this matter, in fact I think Burge is
12 supporting the application is beneficial to the development
13 of the area to have the well drilled, particularly for the
14 exploration of the D sand and should be granted. In the
15 event that extra ordinary production is seen at this
16 location or even from the two wells on this quarter section,
17 then it would be appropriate for the Commission to take
18 action and say, hey, let's take a look at this because
19 production is higher than you'd estimated, potential damage
20 could occur, and to this end we'd recommend that a reasonable
21 amount of gas be allowed to be produced and if the cumulative
22 gas production from the J sand in this quarter section
23 exceeds a reasonable amount, say, half of BCF, 500,000 MCF,
24 which would calculate to be about a 75 percent recovery of
25 the gas in place, if we were to exceed that amount, well, then

1 upon application adjacent operators could come back to the
2 Commission and take appropriate action, if necessary. It's
3 not been demonstrated that any potential damage will occur
4 and to my best judgment I don't anticipate any damage will
5 occur from production of J sand at this location.

6 CHAIRMAN HAUN: Are there any questions?

7 MR. SMITH: Yes. Mr. Chairman, the Penrod
8 No. 1 well in Section 3, Jack; is that out of a different
9 formation?

10 A It's a D sand well.

11 MR. SMITH: Thank you.

12 A They to date have not chose to produce the J
13 sand or attempted completion of the J sand.

14 MR. SMITH: That's the only question I have,
15 Mr. Chairman.

16 CHAIRMAN HAUN: Does that complete his
17 testimony?

18 MR. SULLIVAN: One other question.

19 Q In your opinion, why would it be better to
20 drill the D sand test at the proposed location rather than
21 the permanent location in the southeast quarter?

22 A Well, the D sand is really keyed off of the
23 channel coming down this way through these wells and
24 extending up further to the northwest. It is the obvious
25 desire to balance a few things. Number one, it is D sand

1 test which we want to get as close to our control points,
2 which in this case is the Champlin No. 1 well, and that's
3 why we're drilling it in the southwest quarter. The reason
4 it's a diagonal 80-acre offset rather than sitting over
5 here in the corner, say, the northwest or southwest, is
6 that they may potentially also need to produce J sand at
7 that location and it would do a better job of potential
8 recovery of the J sand underlying this quarter section if
9 it had a reasonable amount of separation from the existing
10 well, so it's a compromise, but based primarily on geology.
11 As far as drilling in the permitted location in the south-
12 east quarter, geologically, that is getting very risky
13 and it was decided that the D sand outweighs the J sand
14 potential by so much that they'd better drill the best D
15 sand location.

16 CHAIRMAN HAUN: It seems obvious why Burge would
17 not object because that would prove up a D sand well for
18 them if it turned out to be a producer.

19 A Sure, and, you know, it doesn't hurt Amoco
20 coming up through here. I think they have interest over
21 here some place, so lot of advantages in getting that well
22 drilled. All we're trying to do is give them a little bit
23 of help in the J sand in case and, frankly, they're going
24 to need all the help they can get.

25 CHAIRMAN HAUN: Are there questions of this witness?

1 (There were no questions of this witness).

2 MR. SULLIVAN: Mr. Chairman, we would like
3 to offer this report into evidence.

4 CHAIRMAN HAUN: This report is accepted into
5 evidence. Do the objectors have questions of this witness?

6 MR. LUND: Mr. Chairman, my name is Kent Lund
7 with Amoco. Let me see if I just understand what you're
8 saying here. Your primary goal is to do a D sand test.

9 A Yes.

10 Q And your J sand intent is a fall back?

11 A Yes.

12 Q Let me see if I can understand some of the
13 parameters of your gas in place calculations and I believe
14 it is Exhibit 4. You didn't do a material balance calcu-
15 lation, did you?

16 A No. There are, as far as I know, there are no
17 bottom hole surveys available on 99 percent of Wattenberg wells.

18 Q Right. You'd need some more production history
19 that you just don't have?

20 A We need pressure history which we don't have.

21 Q Some of the parameters in your gas in place
22 calculation would include temperature, pressure, gas
23 compressibility, water saturation; is that right?

24 A Yes.

25 Q With respect to water saturation. Isn't it a little

1 difficult to gauge the effect of water saturation in this
2 area?

3 A We used standard tumble equation in establishing
4 the water, estimating the water saturation. Yes, it's
5 difficult. If you, for instance, would take into account
6 clay content, the water saturation calculation would look
7 lower. The water saturations we've got are either higher.
8 The method used established water saturations probably may be
9 too high, if anything. Clay content would have a tendency
10 to lower the calculated water saturation. It would also
11 lower the perocity, which the two basically would cancel
12 each other.

13 Q Now, with respect to the permeability that you
14 have calculated, that's difficult to calculate in this par-
15 ticular area, isn't it?

16 A We've made no attempt to calculate permeability.

17 Q All right. And the permeability calculations
18 would have an effect on the H part of your calculation,
19 wouldn't it?

20 A Well, we have made no attempt to calculate
21 permeability nor have we testified so.

22 Q All right. Your gas in place calculations do
23 not account for permeability?

24 A It accounts for pay thickness but permeability
25 is independent, it's a rock characteristic independent of the

1 gas in place.

2 Q Now, maybe I missed this, but what was your
3 acreage calculations?

4 A Plus or minus 320 acres in this south half of
5 Section 4.

6 Q But you were using 160's for your original?

7 A Yes. The drainage calculations percent of
8 recovery were based, I am sorry, on 160 acre drilling tract.

9 Q I didn't ask that clear, that's my fault.

10 Q Now, you know that this particular reservoir,
11 that the sand's permeability varies throughout the reservoir,
12 doesn't it?

13 A I am sure it does, much more prolific production
14 up here couple miles away.

15 Q If you get up to the northwest that's better?

16 A Yes.

17 Q Would you consider this to be a tight gas
18 reservoir?

19 A Yes.

20 Q And did that make that a little bit more diffi-
21 cult to evaluate pressure information?

22 A Well, we could assess that if there were
23 pressure information to evaluate, which I have not seen any.

24 Q And you would like to see pressure information
25 to draw some definitive conclusions, wouldn't you?

1 A Not necessarily. Performance in the Wattenberg
2 field has been so well established for so long that we feel
3 very comfortable in estimating remaining reserves from
4 performance primarily.

5 Q But I thought you just indicated that the
6 permeability in the sand characteristics change as you go
7 from the northwest down to this particular area?

8 A They change but the performance of individual
9 wells takes into account, of course, the permeability,
10 success of the stimulation job, other factors.

11 Q You don't have a continuous sand area in this
12 area, do you?

13 A No. Well, it's continuous in the, fairly
14 continuous in that you could map the J-1 interval, J-2
15 interval, and J-3 interval throughout the area. These
16 intervals thicken and thin and porosity goes and comes, but
17 as a general trend the J sand is a continuous deposition
18 as far as environment.

19 Q And in this particular area that is the subject
20 in your application, it's a heterogeneous area, is it not?

21 A Well, you could, you know, all wells are not
22 going to be identical, as witnessed from an area up here,
23 the spaced City, for instance, field, which is developed on
24 80's, not on this map, but it's adjacent, is in Section 31.
25 It's evidently quite a bit more prolific than the average

1 J sand in the area, excellent wells.

2 Q In a typical production curve in this area,
3 how would you illustrate that per well in this area?

4 A Well, there's a half a book full of wells in
5 this area.

6 Q Initial high production and then leveling off
7 and continuing for a long well life; is that fair to say?

8 A In this instance, as far as the wells we're
9 looking at in Section 4, I would not characterize by initial
10 high production rate.

11 Q That's correct.

12 A Well, it's difficult to find a typical well,
13 but exhibit 13 is fairly typical with Cahmplin sending
14 Amoco D No. 1 well from Section 5 is typical in about its
15 first three years' performance, and then the curtailment
16 cause some deviation from typical performance and that's
17 gas marketing problems.

18 Q On Exhibit 13, what was your approach on the
19 bottom line, the bottom line decline?

20 A The performance was estimated from an
21 expedential decline of 10 percent a year based on the
22 historic trends, but primarily the trend's up until the
23 end of 1981 and we more or less overlaid a typical performance
24 curve on this and then kind of washed out or averaged in,
25 you might say, the curtailed production that's occurred for

1 the last four years. The extrapolation shown are shown
2 just so we get a feel for how we estimate the ultimate
3 recovery. We're not making an attempt in this curve to
4 estimate how much gas is going to be sold next year or the
5 next year or the next year. It's only an attempt in trying
6 to find out what the ultimate recovery is. How they get
7 there may be a lot different than what this curve says
8 because of market conditions and curtailment.

9 Q And you're aware of some curtailment in gas
10 sales in this area, aren't you?

11 A Yes, and some of the operators are good name
12 names on gas pipelines, but some are more restricted than
13 others, yes.

14 Q What about the effect of completion techniques
15 on the quality of wells in this area?

16 A They have an effect.

17 Q How would you complete a well in this area?

18 A I'd give it as big a crack job as I economically
19 could justify.

20 Q And that would be based on your reading of the
21 logs, primarily?

22 A Again, experience of other wells, what's worked
23 in the area with other wells, yes.

24 Q Now, let's see. I think you discussed in
25 northeast in Section b; is this the Burgmund well No. 1?

1 A Yes.

2 Q I believe you testified that that well is
3 draining 160's, in your opinion?

4 A Well, it's achieving a drainage based on the
5 log calculations and the performance calculations. I
6 believe that well is shown in Exhibit No. 15. We've used
7 some liberty, you might say, in extrapolating the remaining
8 gas reserves for that well, in that it is a field that is
9 severely curtailed in the last few years.

10 Q Because of the curtailment, you can't really
11 tell what the well would do if it were in full production,
12 right?

13 A It's more difficult to tell. All right, if it
14 can achieve that performance that we've indicated, it then
15 should recover about 55 percent of the gas in place on
16 160's, which if efficient drainage is 75 or 80 percent of
17 the gas in place, then potentially we're draining 110 acres
18 or 120 acres efficiently. It's above-average well for
19 the area.

20 Q I'm sorry. I think I missed this before. You
21 said that the Byrd wells and the Penrod well in the southwest
22 quarter of Section 4 is not yet completed?

23 A That is true.

24 Q What's the stage of development in that well?

25 A They logged that well about a week ago and

1 possibly ten days ago, something in that order. The rig
2 moved off to drill another well. They are going to have
3 that rig moved back in to drill this exception location.
4 That's the current plan but currently it's just sitting
5 there waiting for completion.

6 MR. SMITH: Did you have pipe?

7 A Pipe was run, yes.

8 BY MR. LUND: (Continuing):

9 Q Tell me again why that Mirrow well was drilled
10 next to that dry hole?

11 A The lease had an expiration date as of five days
12 ago and they had to get a well drilled and they thought
13 that that was the best shot at achieving a commercial
14 producing well in that half section.

15 Q Um hum. In your Exhibit 3 you've got a log from
16 the Amoco-Penrod well No. 1 in the southwest quarter of
17 Section 4?

18 A Yes.

19 Q Would you take a look at that, please?

20 A Yes.

21 Q And I guess the D interval would be above the
22 dark line that you have plotted in there?

23 A The D sand, as shown in there at about 7,865 feet
24 but it is 60, 70 feet above the J sand line.

25 Q You wouldn't complete a D sand in that well bore,

1 would you?

2 A Well, not initially, maybe as a--I might before
3 I abandon the well.

4 Q And I guess the last question and when you're
5 summing up your testimony and forgive me if I heard this
6 wrong, but we were talking about I think your proposed
7 location being potentially economic. Did you use that
8 phrase?

9 A Well, there could be absolutely no J sand develop-
10 ment at all. If it looks--If that location looks like the
11 Burge well up here in the northwest quarter, we would
12 anticipate the same results and be hard pressed to complete
13 it economically, but I think we're looking at 100 feet or
14 more of pipe. Okay, assume they run pipe on the D, hundred
15 feet or more pipe, \$5.00 a foot. There is \$500.00,
16 \$30,000 crack job, \$5,000 for work on the unit, so at
17 \$35,500 for a potential shot at producing some J sand gas
18 so that's where it becomes economic. I would be hard
19 pressed to say it's economic to drill a J sand well if
20 that's your only objective at that location.

21 Q Okay. So your testimony is that it looks
22 economic to try a D test but it probably is not for a J test?

23 A The sand is exploratory test. Whether it's
24 economics, it's going to make them quite a bit of money or
25 lose them quite a bit of money, so, you know, I can't judge

1 a D sand because it's speculative and it's, you know,
2 based on hypothesis of this channel coming through,
3 et cetera, et cetera. All I am saying is it's not terribly
4 expensive to get some gas from the J once you are there.

5 Q In your opinion, what is an efficient recovery
6 percentage of gas in a tight gas reservoir like we're talking
7 about here?

8 A I would like to see producer be able to recover
9 75 percent of his gas reserves.

10 MR. SMITH: You mean 75 percent of gas in place?

11 A Yes.

12 MR. LUND: Nothing further, Mr. Chairman.

13 CHAIRMAN HAUN: Mr. Keefe?

14 MR. KEEFE: Yes, Mr. Chairman

15 EXAMINATION

16 BY MR. KEEFE:

17 Q I guess I need a little education here. The
18 objective of your application is to ask for three J sand
19 wells in the south half of Section 4, is it not?

20 A That's how the application was worded, I do
21 believe. I've got it here.

22 Q That's the objective, that's the reason you're
23 here today; is that correct?

24 A Yes. We're talking about the opportunity to
25 produce the J sand, yes.

1 Q Now, what I would like to do I would like to
2 figure out what those three wells are. Could we start
3 with the northeast of the southwest. As I understand, you
4 originally drilled a well there, that's this so-called twin
5 well, it's not yet been completed, but it is intended to be
6 completed as a J sand producer; is that correct?

7 A No. The twin well is located in the southwest
8 of the southwest in close proximity to the Old Amoco
9 Penrod No. 1.

10 Q That's the one?

11 A That is the one that is currently drilled. It's
12 hard to see on that exhibit but that's where it is. I think
13 it's referred to as the Cimarron Penrod No. 1.

14 Q All right. How many existing J sand producers
15 are there in the south half of Section 4 and where are they?

16 A There are no J sand producers in the south half
17 of Section 4.

18 Q What is the well that is intended to be drilled
19 first into the J sand?

20 A Well, it already has been drilled and that is
21 the--Well, to back up, there has been three J sand tests
22 drilled. One, as shown as Rock Oil No. 34-4 in the
23 southeast quarter. One was the Amoco--Let me back up, take
24 them chronologically. The Amoco well was drilled first some
25 number of years ago, in the southwest quarter before, no core,



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1 no test, plugged and abandoned. Rock Oil came in and
2 drilled tests in the southeast quarter. No pores, no tests,
3 plugged and abandoned. Cimarron came back in earlier in
4 this month. Twin, the old Amoco Penrod No. 1, in the
5 southwest quarter and that well is currently pending com-
6 pletion in the J sand.

7 Q Pending completion in the J Sand. Okay. What's
8 confusing me, then, is you obviously, by this application,
9 you intend to drill two more J sand completions. One is
10 obviously the well that you also intend to drill in the D
11 sand. Where is the third well?

12 A Well, it was asked in the application that a
13 third well be drilled in the statutory drilling window in
14 the southeast quarter, Section 4. Whether or not that well
15 will be drilled is not known to me.

16 Q Okay. The reason that I ask that question is
17 because your testimony would indicate that really all you're
18 asking for is an exception location so that you can drill
19 your D location and if it comes in also as a J to complete
20 it in a J. However, your application doesn't ask for that.
21 It doesn't ask that it be asked for as an exception location.
22 It asks that you be allowed to drill three J locations within
23 the south half of Section 320, correct?

24 A I believe it's specific with respect to the
25 location of those wells also.

1 Q Okay. My problem is why didn't you come in for
2 an exception location instead of asking for three wells and
3 a J?

4 A Well, maybe I should revise my testimony and
5 talk about three wells in the J, but I made the assumption
6 on my behalf, not with respect to the application,
7 unfortunately maybe, but my assumption was that there would
8 be no problem in drilling two wells in the south half if
9 they were 990 whatever it is feet from the lease line. The
10 problem and the exception to the norm is trying to get
11 authority to go ahead and produce 7-J gas from this third
12 location, which I have called an exception location, in
13 that it's an exception to the normal Wattenberg rules.

14 Q It is an exception to the normal Wattenberg
15 rules, I don't disagree with that, but wouldn't you agree
16 that asking for an exception location might be a lot easier
17 to drill a D sand in this instance than trying to set a
18 precedent by drilling three wells in the 320 and setting
19 a precedent for the three J sand wells in the 320 and
20 setting a precedent for the entire Wattenberg field?

21 A Well, our intent is certainly not to set a
22 precedent for the entire Wattenberg field or we would have
23 possibly applied to respace the entire Wattenberg field.

24 MR. KEEFE: I have no further questions.

25 CHAIRMAN HAUN: Can I follow up on that just a

1 minute, gentlemen. Where is the third location? I see the
2 first one is the twin. The second one is your request where
3 you are going to drill the D. Where is the third well?

4 A The third one was asked for which is a statutory
5 well on the southeast quarter that is within the field
6 rules already established for the Wattenberg field, being
7 990 feet, I believe, from the lease line.

8 CHAIRMAN HAUN: That would be approximately
9 the Rock Oil dry hole, wouldn't it?

10 A I am not informed, I guess I should say, as to
11 whether that is a pending location and I am not informed as
12 to whether a location has even been staked in the southeast
13 quarter at this time.

14 CHAIRMAN HAUN: Okay. Are there other questions
15 of this witness?

16 Any redirect?

17 MR. SULLIVAN: Just a concluding statement.

18 Cimarron's intent in this application is to drill
19 at an exception location for the J sand in the northeast
20 southwest of Section 4. The primary target is the D sand
21 formation based upon Cimarron's interpretation of the geology
22 in the area. It's economic to drill and complete both of
23 these wells at the same time, whereas if you were going to
24 wait 1, 2, or 3 years, in addition to perhaps not having a
25 leasehold coverage, it would increase the economics such that

1 it would actually, I think under the statutory interpretation,
2 could be defined as waste. It's more economic to drill two
3 simultaneously. The completion of the J sand, if the D
4 sand is not proved to be productive, would only add small
5 incremental costs to the cost of this well, and for that
6 reason Cimarron is requesting the opportunity or the option
7 to go to the J in case the D is not spaced. In order to
8 avoid drilling a second J sand well in that area, they would
9 like to complete the J from the D requested location so that
10 they would only have to drill an extra 100 feet rather than
11 drill the entire 8,000 feet, which would be required if the
12 second well had to be in the southeast quarter. The pro-
13 duction history of the surrounding wells indicate that the
14 drilling and production of the J sand at the requested
15 location will not injure any of the correlative rights of
16 adjacent land owners. The lease owner in the Section, 320
17 acre half section spacing unit to the north, has consented
18 to this location to the drilling of this well by Cimarron.
19 Cimarron requested three wells in the three potential J sand
20 wells in the south half of Section 4 because based upon the
21 results of the first two wells and the geologic interpre-
22 tations that could be inferred from that that they may want
23 to drill a well at a legal J sand location in the southeast
24 quarter.

25 For those reasons, we request that the Commission

1 grant the application of Cimarron Oil.

2 CHAIRMAN HAUN: All right. Thank you.

3 Now, Mr. Lund, you wished to present a witness?

4 MR. LUND: Mr. Chairman, we would just like to,
5 briefly, put on a witness.

6 CHAIRMAN HAUN: Okay. At this time we'll take
7 a ten-minute break and we will be back here at 10:50.

8 (The Commission took a short break and con-
9 tinued after break as follows):

10 CHAIRMAN HAUN: Mr. Lund, are you ready to proceed?

11 MR. LUND: I think we've got a deal. We just
12 don't want the record to be one sided.

13 CHAIRMAN HAUN: All right. Do it, gentlemen.

14 MR. LUND: Mr. Chairman, Kent Lund with Amoco
15 Production Company. We will call Bill Hawkins as a witness.

16 EXAMINATION

17 BY MR. LUND:

18 Q Would you please state your name and business
19 address?

20 A Bill Hawkins, 1640 Broadway, Denver, Colorado.

21 Q By whom are you employed and in what capacity?

22 A Amoco Production Company. I am a senior
23 petroleum associate assigned to proration duties in our
24 region.

25 Q Have you ever testified as an expert witness

1 before the Commission before?

2 A No, I have not.

3 Q Okay. Would you briefly state your educational
4 background from college on?

5 A I received a Bachelor of Science degree in
6 Petroleum Engineering from Texas Tech University in 1972,
7 received a Master of Engineering degree from Texas Tech
8 University in 1974.

9 Q And will you just briefly state your employment
10 history upon graduation from Texas Tech?

11 A Starting work with Amoco Production Company
12 full time in 1974, have been employed by them since as an
13 engineer. I have served in both staff and supervisory
14 capacity, supervising reservoir engineering and production
15 operation groups, both in Southern Louisiana, off-shore
16 Gulf of Mexico, North Sea, West Africa out of the London
17 office, and here in Denver in our northern division, which
18 includes Wyoming, parts of Colorado, North Dakota, South
19 Dakota.

20 Q I'll ask Mr. Smith's favorite question. Are you
21 a registered professional engineer in any State?

22 A Yes. I am a registered professional engineer
23 in the State of Louisiana.

24 Q Did you conduct a study of this area that's
25 affected by the application for purposes of this hearing?

1 A Yes, I did.

2 MR. LUND: We would offer Mr. Hawkins as an
3 expert in Petroleum Engineering.

4 CHAIRMAN HAUN: Do you want to have him sworn?

5 A Please.

6 (Chairman Haun swore the witness).

7 MR. LUND: Hopefully, that swearing is retro-
8 active through his previous answers. We don't want to take
9 a lot of the Commission's time, but we just have some brief
10 objections.

11 CHAIRMAN HAUN: He is accepted as an expert.

12 MR. LUND: Thank you. We don't want to take
13 much of your time, Mr. Chairman.

14 CHAIRMAN HAUN: We certainly appreciate that.

15 MR. LUND: We have some technical disagreements
16 and I would just ask Mr. Hawkins to address a few of those.

17 Q Why don't you discuss briefly the possibility
18 of J sand wells in this area draining 160's?

19 A Well, we believe that the wells that are,
20 especially in this area of the J sand, several of which
21 will exhibit or have exhibited production, performance
22 which indicate they can drain 160 acres. Most specifically,
23 I would cite the wells that were in Section 32, the Kilker
24 and the Sack-Hiett wells that each recovered in excess of
25 BCF of gas. Secondly, I think there are some wells to the

1 southeast of this or, excuse me, southwest of this Section
2 4 that have been under production curtailment for the last
3 several years, but they do indicate that they are capable
4 of producing significant quantities of gas and we believe
5 they will drain 160 acres. Several things that go into
6 the estimate of drainage calculations, first of which I
7 would like to address would be the original gas in place.

8 I think we can see from the Exhibit No. 4 on
9 the applicant's report that net pay calculations in J sand
10 are difficult. We've got four wells, or five wells that
11 indicate no net pay, yet they have produced out of the J
12 sand. An error in calculation of net pay by 50 percent
13 would have the result of changing your original gas in place
14 by factor of two and potentially, you know, increasing your
15 percent of recovery by factor of two.

16 The reason that net pay is so difficult to
17 calculate here is because this is a tight gas sand which
18 has very low permeability that affects the amount of the
19 rock that is going to contribute to production. You can
20 calculate from a log an estimate of porosity and water
21 saturation, which are only estimates, and they're not
22 necessarily accurate without some additional physical
23 studies to help define those, but if you have mineralogy
24 effects that would tend to close the pore throat, such as
25 that gas cannot be movable throughout the reservoir, then

1 your calculation of net pay should include some impact
2 from that rock minerology or that calculation of permeability.

3 The second thing I'd like to address on drainage
4 calculations would be the estimate of remaining production.

5 The applicant has used and stated that he used
6 an expedential decline that has been exhibited by the well
7 in its early life, most of the time three or four years of
8 production history, and then shifted that to fit the pro-
9 duction performance and made an extrapolation. What we found
10 in tight gas sand is that the wells produce under a hyper-
11 volumetric decline which is steeply dipping or steeply
12 declining in the early lives but flattens out significantly
13 in the later life and a well can continue to produce at
14 some lower rate than the initial production rate for a
15 number of years, as many, depending on what's economic,
16 obviously, but say 30 plus years. And so I think to use
17 a conventional expedential decline estimate on performance
18 of a well is conservative in your estimate of what that
19 well might ultimately produce.

20 CHAIRMAN HAUN: What would be the effect of
21 using your proposed method, would it increase the ultimate
22 recovery considerably or a little or what?

23 A Well, having not made the calculation, I
24 couldn't compare with exactly the numbers he's got but I
25 can tell you that if you use a hyperbolic decline over a 30

1 plus year period you would significantly improve the ultimate
2 recovery from what is shown on Exhibit 4.

3 The last thing I would like to address on
4 drainage is the percent recovery that is efficient in a
5 tight gas sand. Afigan has stated that he would like to
6 see 75 percent recovery in these sands and I think we
7 would all like to see 75 percent, but that is more of a
8 conventional approach to gas recovery in a conventional
9 type reservoir, and it's dictated primarily by your scales
10 condition. In a tight gas formation, recovery percentages
11 are generally lower than in a conventional gas reservoir,
12 the reason being the lower permeability and the ability of
13 the gas from a long distance away from the well bore or the
14 crack to reach that cracking and be produced through the
15 well bore. We believe that an efficient gas recovery on
16 the order of 60 percent is more reasonable in a tight formation
17 gas reservoir.

18 CHAIRMAN HAUN: You're not extremely concerned
19 about this sort of thing, though, are you?

20 A I'm not sure if I understand your point.

21 CHAIRMAN HAUN: Well, if you really wanted to
22 know, it seems to me you would get some pressure information?

23 A This is another question that we're going to
24 address and that is what do we think would be required to
25 help us determine should a third well be drilled and specific--

1 CHAIRMAN HAUN: But you, in general, have not
2 taken very many drill stem tests, maybe a drill stem test is
3 not efficient in this case, but it seems to me you ought to
4 try to establish pressure relationships so that when a new
5 well is drilled you could tell whether it has in fact been
6 affected by previous production or not.

7 A I agree, but we would like to see, ideally,
8 several pieces of information to help us determine should
9 a second well be drilled within 160 area or is one well
10 sufficient. Primarily, you're going to look for sections
11 or spacing units where you have past performance production
12 history that you can run some pressure build-up analysis,
13 pressure transient analysis to determine what's the effective
14 drainage radius, what is the expected reservoir pressure
15 at the extremes of the drainage radius, what's the average
16 pressure within the drainage area. Ideally, then you could
17 drill a second well to see has the reservoir been depleted
18 in that area, does production from the second well interfere
19 with the original well's performance, both of which would
20 indicate that that area is being drained by the one well,
21 and I think our major concern in this area is that there
22 has been no production history from this spacing unit.

23 MR. LUND: I don't believe I have anything
24 further, Mr. Chairman.

25 CHAIRMAN HAUN: Are there questions of this

1 witness by Mr. Sullivan?

2 MR. SULLIVAN: Yes, Mr. Commissioner.

3 EXAMINATION

4 BY MR. SULLIVAN:

5 Q Is there any evidence that you can show us,
6 calculations that you performed, that a well producing
7 from the J sand at the proposed location would either
8 drain off the spacing units or damage the correlative rights
9 of any of the adjacent units, the northeast of the southwest?

10 A I have not formed any calculations to determine
11 if a well drilled there would drain across the section line.

12 Q Do you have any reserve estimates about wells
13 that were drilled that aren't producing in Section 5 of
14 these wells?

15 A No, I have not performed an estimate of ultimate
16 recovery. I have simply stated the approach that I would take.

17 Q If you're worried about the bottom hole pressure
18 and worried about drainage in the top of two wells for 160,
19 for instance, and you own acreage in this area, has Amoco
20 done any bottom hole tests of any wells in this area, used
21 the method that you are proposing?

22 A I couldn't state conclusively that we have. I
23 know that it was probably the approach that should be taken.
24 I can't cite specifically any examples.

25 MR. SULLIVAN: That's all.

1 CHAIRMAN HAUN: All right. Are there questions
2 of this witness by member of the Commission?

3 (There were no questions).

4 CHAIRMAN HAUN: Mr. Smith?

5 MR. SMITH: Just a couple questions, if I may,
6 Mr. Chairman.

7 EXAMINATION

8 BY MR. SMITH:

9 Q Mr. Hawkins, I would like to refer you to
10 Exhibit 13, 15, and 16, and particularly the first, the
11 declines exhibited in the early life of these wells, par-
12 ticularly in Exhibit 16. Seeing that kind of initial
13 decline and then where he commences his decline in 1987,
14 wouldn't your gut feeling, looking at this kind of a situation,
15 wouldn't you feel that his estimate of reserves are probably
16 over-estimated?

17 A Well, I would say that it's not necessarily an
18 over estimate. The reason I would say that that is the
19 latter since 1983 I would postulate that this well has
20 been under some kind of production restriction and that at
21 several times during the reservoir or the well's production
22 life, you could see that the production rate has back up
23 around, I don't know if the scale's quite right on this two
24 million a day or 200,000 a day, but you can see the peak
25 rates that occur generally once a year and if you look at

1 that peak rate in 1987, the little spike up, and compare
2 that with the peak rate or let's say, yeah, the peak rate
3 in 1983, the early part of 1983, you'd say that those wells,
4 that is nearly constant, nearly a flat except for the times
5 when the well's probably been curtailed and this is why I
6 probably, knowing what I know about a tight gas sand drawn
7 in a production decline, that would have flattened much
8 more severely than the expedential or straight line type
9 decline that he has used on this Cimarron paper.

10 Q I think I would agree, but looking at the latter
11 part of 1982, first part of 1983, that flattening would
12 have started, okay, I think I have what I want to know on
13 that. The second question I had, you indicate and I
14 certainly understand tight gas generally estimate about 60
15 percent recovery as a more reasonable. Wouldn't that tend
16 to decrease, assuming for a minute the original oil in
17 place and I understand your problem there, that his reserves
18 were too low; I didn't understand for sure whether his
19 reserves were from the curves or from the oil in place or
20 vs. cumulative production, but if they are from cumulative
21 production oil in place, then his percent in recovery is
22 probably under estimated.

23 A Well, I believe, at least in my opinion, what
24 I thought he did was to take cumulative production to a
25 certain period of time near the current date, make some

1 extrapolations from the performance curve for the remaining
2 production, some notes, too, and divide it by the original
3 gas in place for percentage and that's--

4 Q Final question. Can you explain to the Commission
5 why Amoco has only drilled one well in Section 5?

6 A I cannot explain.

7 MR. SMITH: That's all I have, Mr. Chairman.

8 CHAIRMAN HAUN: Are there any other questions
9 of this witness?

10 COMMISSIONER KREY: Mr. Chairman, how come
11 we haven't had more pressure tests out in this area?

12 CHAIRMAN HAUN: Well, I guess--You want me to
13 answer that question?

14 COMMISSIONER KREY: Amoco or somebody.

15 CHAIRMAN HAUN: Well, since the tight sand, the
16 DST is not a very effective mechanism for doing this and
17 you could, conceivably, shut the well in for a period of
18 time and pull it for a period of time and so on and get
19 information and, I don't know, I guess if I was Amoco I
20 would have done that. You know, I think it should have been
21 done.

22 COMMISSIONER KREY: I think it was a regulation
23 that was done annually.

24 MR. SMITH: No. I think one of the things, too,
25 they have a lot of pressure information that doesn't come out.

1 Where they have it is that these shut-in periods of time
2 your tubing pressure is pretty good, reflecting your bottom
3 hole pressure. For the most part, many of these wells, if
4 you notice, don't produce any oil at all, so you could take
5 a shut-in pressure, say, after a week's shut-in and extrapolate
6 what the bottom hole pressure was. I would think the
7 engineers would be playing with it, if nothing else, but
8 tight gas sands are hard to do--

9 A I'd say you're probably exactly right, that there
10 is some pressure data, tubing pressures during shut-in
11 period that is available. Again, you have to recognize
12 that's not necessarily the most accurate data that you can
13 get nor does it give you the type of information that the
14 build-up pressure tests would give you during the period of
15 build-up, and to run that test would take a considerable
16 amount of time and expense, and I can't state for certain
17 that Amoco has not run some bottom hole pressure build-ups
18 in some areas of the Wattenberg fields. I just don't know.

19 CHAIRMAN HAUN: Okay. Mr. Keefe, do you have
20 a witness?

21 MR. KEEFE: Mr. Chairman, we're not going to
22 introduce any evidence, but we would like to make a closing
23 statement at the appropriate time.

24 CHAIRMAN HAUN: You're through?

25 MR. LUND: Yes.

1 CHAIRMAN HAUN: All right. Go ahead. This
2 is the appropriate time.

3 MR. KEEFE: Thank you, Mr. Chairman.

4 First of all, let me say that Union Pacific
5 Resources Company has no objection if only two wells are
6 drilled into the J sand on this 320 acre drilling and
7 spacing unit. This application is for three and that's
8 where our objection lies. If the applicant were to want
9 to change the application so that they're merely asking
10 for an exception location, which in thinking about it, seems
11 to me would be appropriate if they desired to do that,
12 because I think their notice would still be good. I have
13 been trying to think about that and I think it would still
14 be good, then I don't see anything wrong with granting them
15 the application on that. In the event that they still
16 want three wells on that 320-acre drilling and spacing unit,
17 we do object and the reason we object is because we think
18 it's precedent setting. I think you said it all, Mr.
19 Chairman, at the very beginning. This is a complicated
20 matter, anytime you want three wells on 320's, and I would
21 suggest to you that it is very complicated.

22 Union Pacific Resources, in fact, has tried to
23 put together some diagrams to see what it would look like
24 if just on this nine spot area, that is this Section 1
25 surrounding eight sections you were to use this same drilling

1 and spacing pattern that they have suggested in their
2 application today and apply it to all the stand-up and
3 lay-down 320's and also, of course, there's one section
4 in there that's not been drilled and has neither lay-down
5 nor stand-ups in it yet. Anyway, we tried to look at
6 those diagrams and see how you would come out on it and
7 there is a lot of little spaces when you apply this kind
8 of spacing, and I guess what I am suggesting to you is
9 that if you grant this well location pattern for 320's
10 today, you are setting a precedent that may have a far-
11 reaching results and I don't think you should take it
12 lightly. I think if you're going to grant this kind of
13 thing, it should only be done after much study. I don't
14 think you have to do it today if the applicant is willing
15 to simply change its application and ask for an exception
16 location so that they may drill the one well that they
17 want to drill into the D sand and give up their opportunity
18 to drill a third well in the J.

19 That's all I have, Mr. Chairman.

20 CHAIRMAN HAUN: Anybody else have any contri-
21 bution to make?

22 MR. SULLIVAN: Mr. Chairman, final comment.

23 It doesn't appear to me, anyway, that there's
24 been any evidence that drilling and completing the J sand
25 at the proposed location would result in waste or damage to

1 correlative rights. We're requesting that only the south
2 half of Section 4, based upon our interpretation of the
3 geology and our estimates of the reserves in place, if it
4 does, if production histories from these, assuming that
5 both of them can be completed in the J and production
6 histories from these two wells shows that there is drainage
7 or damage to correlative rights to the adjacent lease
8 owners, then Cimarron would be very open to reopening
9 this entire matter and taking some action at that time to
10 restrict production or otherwise protect the correlative
11 rights of the adjacent lease owners. The D sand is the
12 target here. The J sand does not have great potential.
13 The location was chosen for the D and because of well
14 economics, the wildcat shot at the D does not work, Cimarron
15 would like to be able to recover some of its costs by
16 completing a marginal well in the J sand, which is what
17 they anticipate the J sand to be in this area. For that
18 reason, we would wish you to grant Cimarron's request.

19 MR. LUND: Mr. Chairman, I think that that puts
20 the cart before the horse. I mean, he is stating that we
21 complete it and if we don't produce over a certain limi-
22 tation, then we're high and then the offset owners have to
23 have the burden to come in to object to that kind of pro-
24 duction. I don't think that's appropriate under the
25 statutes and under the rules here. There's got to be

1 justification for economic and efficient drilling within a
2 drilling and spacing unit and I just don't think we have
3 it here. We have no objection to a D test, but we severely
4 object to three wells.

5 CHAIRMAN HAUN: All right. I think we've
6 heard those arguments several times now.

7 Do you have any comments, Mr. Smith?

8 MR. SMITH: Yes, I do, Mr. Chairman.

9 It lends itself to the Wattenberg spaced area
10 is a tremendously large area. It is primarily a tight gas
11 sand reservoir and you have heard many times about
12 idiosyncrasies of the tight gas sand development, but it
13 is obvious to me and we've had it come up before that
14 within this large spaced area there are going to be areas
15 that, first of all, they thought the 320, one well would
16 drain 320, and then it was found that is not so.

17 CHAIRMAN HAUN: There must have been some
18 reservations in some people's minds as to whether that
19 was true.

20 MR. SMITH: That's right, but now it seems to be
21 that the precedent thing is now that it still should be 320
22 acre spacing because of the problems legally by downspacing,
23 but, anyway, most people have accepted the concept you need
24 an infill well, and one well can be justified on 160-acre
25 spacing. In this large of an area and I think this is an

1 outstanding example here that it appears that this well
2 will not drain 160 acres in some instances and although I
3 suppose the lawyers could argue the application and the
4 presentation of testimony, but what I heard was in Section
5 4 one well will not drain 160 acres and, therefore, on that
6 kind of a basis, I think the request is legitimate and I
7 think it's backed up by opportunities to restrict, if
8 necessary, but the precedence, as I see it in the Wattenberg
9 field, should be to stick to 160's unless the engineers
10 offer geological information shows one well will not drain
11 160. We've already had three wells in this particular
12 section so, obviously, three times they didn't think it
13 would even be justified to complete the wells if they
14 couldn't have a 160, so I think the application should be
15 approved, not as a precedent setting, not as an exception
16 to spacing the Wattenberg, but as a showing in the evidence
17 that one well will not drain 160 acres in the south half
18 of Section 4.

19 CHAIRMAN HAUN: I disagree with your analysis,
20 but any other?

21 COMMISSIONER VANDER WERF: Why shouldn't it be
22 treated as an application for an exception location rather
23 than committing ourselves to the drilling of a third well?

24 MR. SMITH: I guess that would be all right, but
25 the thing is if there was an exception location on the basis

1 that these two wells will not drain 160 acres, there certainly
2 is not then drainage going to occur in the south half of
3 the southeast of Section 4, so, no, from the evidence it
4 does not appear there would be any drainage of the gas of
5 southeast quarter of Section 4. The operators would certainly
6 have an opportunity to drain that.

7 CHAIRMAN HAUN: I am mystified by the economics
8 of drilling twins for these two dry holes.

9 MR. SMITH: Yes. You want to look at the log?

10 CHAIRMAN HAUN: What I have in mind would be to
11 grant them their request to drill this exception location,
12 the northeast of the southwest of 4 and in the event that
13 they're twin wells to the southwest of southwest of 4 with
14 a J producer, that that be the end of drilling in the south
15 half of four and that they would not be permitted to drill
16 a twin to the dry hole in the southeast quarter. In other
17 words, they would have two wells on this 320, which is we've
18 got all over the basin, because I am concerned about this
19 precedence of drilling three wells on a half a section
20 when there are some sections that still only have one well
21 in them.

22 MR. SMITH: But they only have one well because
23 economically it does not justify, they are not draining a
24 sufficiently large area to justify another well. Economically,
25 it is not justified in the south half of 4. We haven't

1 heard any evidence to that effect.

2 MR. SMITH: Mr. Chairman, I support your
3 recommendation. I think that might be the way to go
4 but I don't think you should shut them out from coming
5 back in if in fact they show they have not drained the
6 southeast and chose to do so.

7 CHAIRMAN HAUN: If this twin well in the
8 southwest is completed as a dry hole, C and A, and if
9 their D sand well that goes to the J shows that the J is
10 not productive there, then we won't have any production in
11 the south half of 4. They certainly could come over here
12 and drill the regular location at that time. I mean,
13 that's a sequential thing. We don't have to answer all
14 those questions today it seems to me.

15 How does everybody else feel?

16 COMMISSIONER VANDER WERF: I am worried about
17 the precedent of committing ourselves to the three wells on
18 the 320, so I agree with Dr. Haun.

19 COMMISSIONER ANDERSON: It seems to me the only
20 precedent we are setting is paying careful attention to
21 the facts as best we can determine them in specific area.
22 Now, I don't see why permitting the possibility of three
23 wells in this 320 necessarily extends anywhere.

24 COMMISSIONER VANDER WERF: All I am saying is
25 I don't want to commit ourselves now 'til we see what happens

1 with these two wells, the one that's been drilled and not
2 completed and now the other one that's proposed.

3 MR. SMITH: I think you have enough engineering
4 and geology testimony to make that determination. I might
5 refer you to, I think it was either last month or month
6 before where there was a specific spacing pattern and on a
7 particular tract you allowed another well and the reason you
8 did is because there was evidence presented that showed
9 that the wells were there and were not draining the physical
10 part of that. I think Dr. Haun's recommendation with my
11 comment that they be allowed to come back in for the other
12 well, say, both of these are completed as producers and
13 that the one that is a D well is only justified economically
14 because of the J and they come back in and show that they
15 have not drained the southeast quarter of Section 4, that
16 they would be allowed to go ahead with a third. Precedence
17 doesn't do much for me. You know, I look at the facts and
18 if the facts justify a certain action as an exception, you
19 got to realize that this area is so large there has to be
20 areas that one well will efficiently drain 320 and there
21 has to be areas where one well will only drain 160 and
22 I am sure there will be areas where one well will not
23 drain 160's. Now, whether I put up the money for closer
24 drilling than that is beside the point, but the point is
25 engineering and geological information will indicate that

1 those two wells are not draining. Good example is the
2 subject where Amoco came in and been produced on 40 acres
3 for a long time. Now, they said to the Commission, look,
4 the facts show that the wells are not draining or we
5 think not and they ask for five exceptions. The Commission
6 looked at the facts and gave it to me and I think that is
7 ultimately going to happen in this J sand. Unfortunately,
8 the gas market, being what it is, there is enough restrictions
9 so a lot of people aren't going to jump in and get their
10 feet wet.

11 CHAIRMAN HAUN: I think ultimately what we
12 ought to do is have a hearing on this whole spaced area
13 and then there be presented evidence that in the following
14 16 areas that it appears that this ought to work, therefore
15 we would like a blanket change in the spacing for the whole
16 field and we're, in effect, here to grant a request for
17 three wells. We're changing the--We are in fact setting
18 a precedent; whether you agree with that or not, it seems
19 to me we are.

20 MR. SMITH: I think you are and I think it
21 probably should apply to Section 32, Section 33, Section 5,
22 and Section 3.

23 COMMISSIONER ANDERSON: It seems to me the only
24 precedent we're setting is the Commission is willing to pay
25 attention to specific variations in the area and necessarily

1 going to be bound by a rule which makes sense in some
2 instances and not in others. The argument for this sets
3 a precedent. I just don't agree to the extent that it
4 does such a bad fact. The only precedent we're setting
5 is the paying attention to the realities of being a very
6 local areas in a very large pool.

7 CHAIRMAN HAUN: Okay. Gretchen, are you willing
8 to propose a motion?

9 COMMISSIONER VANDER WERF: Well, I would
10 propose a motion along the lines of your suggestions, but
11 I don't know if I can state everything that we've been
12 discussing. It grants the request for the well in the
13 northeast quarter of the southwest quarter.

14 CHAIRMAN HAUN: Okay. And in the event this
15 well is completed as a J sand gas well and in the event
16 that the twin well to the southwest southwest quarter well
17 is also completed as a J sand well, then the request for
18 the location in the southeast quarter of Section 4 is
19 denied.

20 MR. SMITH: Okay. I've got it. May I word it
21 a little bit clearer. I think I cut down a little bit.
22 What I say is granted the wells proposed to be drilled in
23 northeast quarter of southwest quarter will be an exception
24 to the approved location to the southeast quarter in
25 Section 4 and that the well proposed in the southeast

1 quarter be denied. That's what you said, but I just cut
2 out some words.

3 CHAIRMAN HAUN: Read it again.

4 MR. SMITH: That the well proposed to be drilled
5 in the northeast quarter of southwest quarter be an exception
6 to the approved location for the well in the southeast
7 quarter section and the specific well requested in southeast
8 quarter of section be denied.

9 CHAIRMAN HAUN: Okay.

10 COMMISSIONER VANDER WERF: It depends on
11 what happens to the well that is going to be drilled.

12 MR. SMITH: And then also if either well is
13 not completed in J sand, the southeast location may be
14 approved.

15 CHAIRMAN HAUN: Yes, that was the thought.
16 All right. That motion is made by Gretchen.
17 Does anybody second it?

18 COMMISSIONER JOHNSON: I'll second it.

19 CHAIRMAN HAUN: The motion has been made and
20 seconded. Now, is there discussion of that motion?

21 COMMISSIONER KREY: Yes, Mr. Chairman. If
22 they've got two good J wells in the southwest quarter of
23 the section, you think you would deny them the right to go
24 ahead and twin the present well or the old dry hole in the
25 southeast quarter? I do not think anybody could deny them

1 the right if they got something that looked economically
2 feasible in the southwest; I would assume they could come
3 back in and ask for another exception.

4 CHAIRMAN HAUN: I suppose they could. Your
5 suggestion is so remote.

6 COMMISSIONER KREY: You don't think they're
7 going to be that good, do you, be that economically prudent.

8 CHAIRMAN HAUN: Roger?

9 COMMISSIONER JOHNSON: Seconded. In effect,
10 we're not denying the southeast, we're not granting it;
11 isn't that it?

12 CHAIRMAN HAUN: Right.

13 COMMISSIONER JOHNSON: In other words, it is not
14 stated the southeast is not hereby granted. Is there a
15 distinction there which would allow for them to come back
16 in in the future, depending on what happens?

17 MR. SMITH: But if we frame it the way that
18 John suggested, Rogers, where if either well is not com-
19 pleted J sand producer, then we can handle it.

20 COMMISSIONER JOHNSON: Just semantics. I was
21 saying it is not hereby granted as opposed to denied.

22 CHAIRMAN HAUN: In effect, that's what it says.

23 MR. SMITH: Right, good point.

24 CHAIRMAN HAUN: Any other comments?

25 Are you ready for the question?

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All in favor of that motion say aye?


Opposed, no?

COMMISSIONER ANDERSON: No.

CHAIRMAN HAUN: With one objector the motion
is carried.

REPORTER'S CERTIFICATE

I, Vernon D. Thomason, Certified Shorthand
Reporter, state that the above and foregoing is a true and
correct transcript of my Stenotype notes thereof.


VERNON D. THOMASON
C.S.R./Notary