

NEW MEXICO OIL CONSERVATION DIVISION

EXAMINER HEARINGSANTA FE, NEW MEXICO

Hearing Date

MAY 3, 2001

Time 8:15 A.M.

NAME	REPRESENTING	LOCATION
Michael Felder	Holland + Hart and Carrell + Carr	Santa Fe
William J. Tower	Holland + Hart	Santa Fe
PATRICK J. TOWER	EOG Resources, Inc	MIDLAND
D JAY SIEMENS JR	EOGR	MIDLAND
RANDALL CATE	"	"
Joe Tietjen	Tom Tietjen Gary Tietjen Edna Tietjen Jerry Tietjen	Bosque farms New Mexico
James Black	CHK	SF
Linda Townsend		OKC
DONNIE MICHAEL	CHESAPEAKE	MIDLAND

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

IN THE MATTER OF THE HEARING CALLED BY)
THE OIL CONSERVATION DIVISION FOR THE)
PURPOSE OF CONSIDERING:)

CASE NO. 12,649

APPLICATION OF EOG RESOURCES, INC.,)
FOR POOL CREATION, SPECIAL POOL RULES)
AND A DISCOVERY ALLOWABLE, EDDY COUNTY,)
NEW MEXICO)

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

May 3rd, 2001

Santa Fe, New Mexico

01 MAY 18 PM 1:37

OIL CONSERVATION DIV.

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, May 5th, 2001, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

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Examiner Hearing
CASE NO. 12,649

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* * *

A P P E A R A N C E S

FOR THE APPLICANT:

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 By: WILLIAM F. CARR

FOR DEVON ENERGY PRODUCTION COMPANY, L.P.,
 and DEVON SFS OPERATING, INC.:

JAMES G. BRUCE, Attorney at Law
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 Santa Fe, New Mexico 87501
 P.O. Box 1056
 Santa Fe, New Mexico 87504

* * *

1 WHEREUPON, the following proceedings were had at
2 8:30 a.m.:

3 EXAMINER CATANACH: Okay, at this time I'll call
4 Case 12,649, which is the Application of EOG Resources,
5 Inc., for pool creation, special pool rules and a discovery
6 allowable, Eddy County, New Mexico.

7 Call for appearances in this case.

8 MR. CARR: May it please the Examiner, my name is
9 William F. Carr with the Santa Fe office of the law firm
10 Holland and Hart, L.L.P. We represent EOG Resources, Inc.,
11 and I have three witnesses.

12 EXAMINER CATANACH: Additional appearances?

13 MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe,
14 representing Devon Energy Production Company, L.P., and
15 Devon SFS Operating, Inc. I have no witnesses.

16 EXAMINER CATANACH: Any additional appearances?

17 Okay, will the three witnesses please stand to be
18 sworn in?

19 (Thereupon, the witnesses were sworn.)

20 PATRICK J. TOWER,
21 the witness herein, after having been first duly sworn upon
22 his oath, was examined and testified as follows:

23 DIRECT EXAMINATION

24 BY MR. CARR:

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

1 A. Patrick J. Tower.

2 Q. Mr. Tower, by whom are you employed?

3 A. EOG Resources, Incorporated.

4 Q. And what is your position with EOG?

5 A. Project landman.

6 Q. Have you previously testified before this
7 Division and had your credentials as an expert in petroleum
8 land matters accepted and made a matter of record?

9 A. Yes.

10 Q. Are you familiar with the Application filed in
11 this case on behalf of EOG?

12 A. Yes.

13 Q. And are you familiar with the status of the lands
14 in the area which is the subject of this Application?

15 A. Yes, I am.

16 MR. CARR: Are the witness's qualifications
17 acceptable?

18 EXAMINER CATANACH: They are.

19 Q. (By Mr. Carr) Mr. Tower, would you briefly state
20 what it is that EOG Resources, Inc., seeks with this
21 Application?

22 A. EOG Resources is seeking the creation of a new
23 pool in the Strawn formation as a result of the discovery
24 of the Oak Lake "25" Federal Number 1 well, located 850
25 feet from the north line and 750 feet from the west line of

1 Section 25, Township 17 South, Range 30 East, in Eddy
2 County, New Mexico.

3 Q. In what formation is this well completed?

4 A. This is in the Strawn.

5 Q. And what are you seeking?

6 A. We are seeking the adoption of special pool rules
7 and regulations which would include for 160-acre oil well
8 spacing as gas-oil ratio of 4000 cubic feet of gas for each
9 barrel of oil produced, and the standard for 160-acre
10 spacing, 660-foot setbacks from the outer boundaries.

11 We're also seeking a special depth bracket
12 allowable of 1120 barrels of oil per day and the discovery
13 allowable associated with this, and we're also seeking that
14 this request be made retroactive to the date of first
15 production, which is March 11th of this year.

16 Q. Initially, could you just tell us, what is the
17 status of the Oak Lake "25" Federal Well Number 1?

18 A. EOG has drilled this well in March and it has
19 been completed, as mentioned, in the Strawn formation and
20 is currently producing from the Strawn.

21 Q. Will EOG call geophysical and engineering
22 witnesses to review the technical aspects of this case and
23 also the current status of the well?

24 A. Yes.

25 Q. Let's go to what has been marked Exhibit Number

1 1. Would you identify that and review it for Mr. Catanach?

2 A. Yes, this is a base map or land map. The red dot
3 shows the subject well, the location. In yellow is the
4 outline of the applied-for spacing unit of 160, being the
5 northwest quarter of said Section 25.

6 It also depicts all the wells in the immediate
7 area. Most of these are shallow. Later witnesses will
8 have a little better map that will show -- an uncluttered
9 version, showing just the deep wells.

10 The two wells that I will point you to -- and
11 again, they will get into more details on the technical
12 merits of this -- are the Anadarko Power Fed Com Number 2
13 well, located in the southeast quarter, southeast quarter
14 of Section 26, to the southeast of our well, and the Yates
15 Petroleum Laguna Cedro "AOM" Federal Number 1 well, located
16 in the southeast quarter of Section 25, are two deep wells.
17 The majority of the balance, other than wells that are not
18 currently producing, are primarily shallow.

19 Q. The proposed new pool immediately offsets the
20 North Cedar Lake-Strawn Pool, does it not?

21 A. That is correct.

22 Q. And what are the boundaries of that pool?

23 A. Okay, the north Cedar Lake-Strawn Pool, the
24 boundaries are the south half of Section 25 and the east
25 half of Section 26.

1 Q. And we will present geological and geophysical
2 data showing that what we are seeking in terms of a new
3 Strawn pool is a separate source of supply from what is
4 located within the existing pool?

5 A. That is correct.

6 Q. Would you identify what has been marked as EOG
7 Exhibit Number 2?

8 A. Exhibit Number 2 is the notice affidavit sent out
9 with the Exhibit A listing all those parties that have been
10 notified in the area.

11 Q. To whom was notice provided?

12 A. Notice was provided, one, to the Division-
13 designated operators within a mile of the proposed new
14 pool, also to the owners of the mineral estate within the
15 proposed new pool, and also as a precaution just to all
16 lessees within a mile of the proposed new pool, which
17 they're numerous since there are not a lot of deep wells.

18 Q. Mr. Tower, prior to this hearing, an entry of
19 appearance was filed on behalf of a Mr. Knox?

20 A. Yes.

21 Q. Have you determined where Mr. Knox's interest is
22 located?

23 A. Yes, I have. The Knox interest is -- I believe
24 it was Jack Knox that entered an appear- -- or entry, pre-
25 hearing statement -- is located in the north half of the

1 northwest quarter of Section 26 to the west, offsetting
2 Section. So several locations away. I believe Mr. Knox
3 owns approximately 25 percent interest in the zones in
4 question.

5 Q. Will EOG call geological and geophysical as well
6 as engineering witnesses to review the technical portions
7 of this case?

8 A. Yes.

9 Q. Were Exhibits 1 and 2 prepared by you or compiled
10 under your direction?

11 A. Yes, they were.

12 MR. CARR: At this time, Mr. Catanach, we would
13 move the admission into evidence of EOG Exhibits 1 and 2.

14 EXAMINER CATANACH: Exhibits 1 and 2 will be
15 admitted as evidence.

16 MR. CARR: And that concludes my direct
17 examination of Mr. Tower.

18 MR. BRUCE: No questions, Mr. Examiner.

19 EXAMINATION

20 BY EXAMINER CATANACH:

21 Q. Mr. Tower, do you know what the nature of the
22 objection from Mr. Knox was?

23 A. I have -- No, I don't. My guess is more of a
24 fact-finding, but that's speculation.

25 Q. Okay. So you guys gave notice to all the mineral

1 interests within the 160?

2 A. Yes, sir.

3 Q. All of the operators within one mile of the well
4 or proration unit?

5 A. One mile of the spacing unit or proration unit
6 we're applying for.

7 Q. Okay.

8 A. In other words, in essence the nine-section block
9 outside that section.

10 Q. Okay, and there was some acreage in that nine-
11 section area that was not operated by someone; is that what
12 you were -- ?

13 A. Yes, there -- As I mentioned earlier, primarily
14 in this area you can see the multitude of wells, and there
15 may be three different depth ownerships. Generally you
16 have cutoffs at either the Grayburg-San Andres and/or
17 approximately the Abo formation.

18 So the majority of our notice dealt with the
19 zones below the Grayburg-Jackson and/or Abo, concentrating
20 on the lands that would be affected, in essence, Strawn
21 formation. So all of the lessees -- There are not that
22 many operators, as you'll see, so we notified all lessees
23 in this area, in the absence of a Division-designated
24 operator.

25 Q. Okay. Have you been in contact with any of these

1 parties, or have any of them expressed any objection to
2 your Application?

3 A. We have talked to Anadarko, who is primarily the
4 offset operator, on two different occasions, and to the
5 best of our understanding, we're not going to send to
6 anybody that had no problems with what we're doing.

7 We've also had discussions with the District OCD
8 to provide them information and ensure that they understood
9 what we were applying for and provide them data.

10 Q. To your knowledge, they didn't express any
11 opposition or concern?

12 A. No, sir.

13 EXAMINER CATANACH: Okay, that's all I have of
14 this witness.

15 MR. CARR: Mr. Catanach, at this time we'll call
16 Mr. Siebens.

17 J. SIEBENS,
18 the witness herein, after having been first duly sworn upon
19 his oath, was examined and testified as follows:

20 DIRECT EXAMINATION

21 BY MR. CARR:

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

23 A. J. Siebens.

24 Q. And spell "Siebens" for the Examiner and the
25 reporter.

1 A. S-i-e-b-e-n-s.

2 Q. By whom are you employed?

3 A. EOG Resources.

4 Q. And what is your position with EOG?

5 A. I'm a project geophysicist.

6 Q. Have you previously testified before this
7 Division and had your credentials as an expert in
8 geophysical sciences accepted and made a matter of record?

9 A. Yes, I have.

10 Q. Are you familiar with the Application filed in
11 this case on behalf of EOG?

12 A. Yes, I am.

13 Q. Have you made a geophysical and geological study
14 of the area which is the subject of this Application?

15 A. Yes, I have.

16 Q. And are you prepared to share the results of that
17 work with Mr. Catanach?

18 A. Yes, sir.

19 MR. CARR: Are the witness's qualifications
20 acceptable?

21 EXAMINER CATANACH: They are.

22 Q. (By Mr. Carr) Let's go to what has been marked
23 as EOG Exhibit Number 3, and I'd ask you to first identify
24 it and then review the information on this exhibit for the
25 Examiner.

1 A. Exhibit Number 3 is a lower Strawn production map
2 in the area of question. The red outlined box in Section
3 25 is the proration unit area that we are discussing today.
4 These are all the wells -- on this map, are all of the
5 wells greater than 9000 feet in this map area. Hence,
6 these are the only wells that are capable and have, in
7 fact, penetrated the Strawn. So this is all Strawn
8 penetrations.

9 The green outlines or shaded areas are areas of
10 Strawn production that have been classified oil, and we are
11 requesting an oil classification, and that will be
12 presented in a little while, as far as our Oak Lake.

13 And to the north, the red-shaded area is an area
14 where the Strawn production is classified as gas.

15 Q. There's also a trace on this exhibit for a
16 subsequent cross-section.

17 A. That is correct.

18 Q. Are you ready to go to that cross-section?

19 A. Yes, I am.

20 Q. Let's go to what has been marked as EOG Exhibit
21 Number 4, and I'd like you to take that out and then review
22 the line of cross-section and the information on the
23 various wells.

24 A. This line of profile runs from north to south, as
25 identified on the previous plat, the production map.

1 To the far north is the Oak Lake 11, an EOG well
2 that was a dry hole attempting to target the Strawn; the
3 Oak Lake 14, which is Loco Hills Strawn, an EOG Resource
4 well; then the Oak Lake "25", which is the well in question
5 that we are submitting for oil and et cetera.

6 The next well is the Loco 25 from Texaco, and
7 we'll start to talk about the details of that well.

8 The Laguna Cedro, also in Section 25, which is
9 one of the Cedar Lake-Strawn North Pool wells.

10 Over to the Anadarko Power Fed Com Number 2,
11 which is another Cedar Lake-Strawn North well.

12 And then to the Hondo Oil and Gas State CE, which
13 is a Cedar Lake Strawn well to the south in Section 2,
14 these representing, in the north end of the section, all of
15 the productive wells, and then the CE well, being a
16 representative well of Cedar Lake Strawn to the south.

17 This cross-section is hung stratigraphically on
18 what is referred to as the strat datum, a lower Strawn
19 marker, Atoka being down below, hung on that lower Strawn
20 marker. And the lower Strawn, as annotated between wells 6
21 and 7, if you will, and wells 2 and 3, that is the surface
22 upon which subsequent maps -- and we will typically be
23 referring to as the top of the lower Strawn. The long and
24 short of -- And also, excuse me, the red bars are perf'd
25 intervals, as understood by EOG Resources, in these

1 respective wells.

2 The long and short is that the production coming
3 from Cedar Lake Strawn to the south in the Hondo well, the
4 production from Cedar Lake Strawn north in the Yates and
5 Anadarko wells, is shown in that lower darker blue and the
6 associated red-bar perf intervals. And the production from
7 our Oak Lake "25" well is from a rather unusual/unique to
8 any wells that you see in this profile, 200-plus-foot
9 carbonate section stratigraphically higher than those
10 productive wells.

11 Interpretivewise, we're just looking at a lower
12 original carbonate and an in-place carbonate buildup, to
13 which our well is located and the other wells are not.

14 Q. There's also a fault depicted on this exhibit, is
15 there not?

16 A. That is correct, and that fault will be
17 identified on a seismic time map forthcoming --

18 Q. Are you ready to go to that seismic map? Why
19 don't you do that? That's Exhibit Number 5. Will you
20 first identify it, and review the information on that
21 exhibit for the Examiner?

22 A. Exhibit Number 5 is a lower Strawn time structure
23 map based on 3-D seismic, and the yellow line that you see
24 going through there is a profile that shows where these
25 wells on this cross-section happen to be on this windowed-

1 in area. Basically we're looking at Section 25 and 26,
2 yellow colors being structurally high, going down through
3 the greens, blues, into the purples into the kind of hot
4 purply fuchsia color, if you will.

5 The Oak Lake "25" Fed Number 1 in the northwest
6 corner is at a subsea value of 6523. And I apologize for
7 this display, but the Texaco -- my companies backwards --
8 the Texaco Loco 25 in Section 25 south of the fault is at a
9 subsea of minus 6713. That did not display very well. As
10 well as the Power Well Number 2 in Section 26. It is also
11 in that purple color shade. That is also a minus 6713.
12 And I think the rest of them are readable for the most
13 part.

14 Seismically, we see a fault separating as well
15 the Oak Lake "25" from the wells to the south in the Cedar
16 Lake-Strawn North field.

17 Structurally, we have 190 feet of relief between
18 the Oak Lake and the two -- off the two northern wells, the
19 Texaco Loco and the Anadarko Power wells, 270, almost, feet
20 to the Yates Laguna Cedro well.

21 And so not only stratigraphically, do we believe
22 it's a separate pool, but also from a structural standpoint
23 there is fault separation.

24 Q. Summarize the conclusions you have reached from
25 your geological and geophysical work in this area.

1 A. The overall conclusion of this is that this is
2 geologically, stratigraphically unique to production in the
3 existing pools. It is structurally distinct from the
4 existing pools. It covers about 110 acres, it is unique in
5 the sense that it's 110 acres and on the order of 250 feet
6 tall in thickness, versus in the area the typified well is
7 30 feet.

8 Q. Were EOG Exhibits 3 through 5 prepared by you or
9 compiled under your direction and supervision?

10 A. Yes, and with conjunction with my colleague Barry
11 Zinz.

12 Q. And do you work with Mr. Zinz on this and other
13 projects?

14 A. Very intimately.

15 Q. And can you testify as to the accuracy of these
16 exhibits?

17 A. Yes.

18 MR. CARR: Mr. Catanach, at this time we'd move
19 the admission of EOG Exhibits 3 through 5.

20 EXAMINER CATANACH: Exhibits 3 through 5 will be
21 admitted as evidence.

22 MR. CARR: And that concludes my direct
23 examination.

24 EXAMINER CATANACH: Mr. Bruce?

25 MR. BRUCE: Just one question, Mr. Siebens.

EXAMINATION

BY MR. BRUCE:

Q. Is the -- Under Exhibit 3, the well on the north end, the Oak Lake 14 Federal well, is that a gas well?

A. Yes.

MR. BRUCE: That's all I have.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Siebens, is your structure in the northwest quarter of Section 25, is that isolated from the production to the north?

A. Yes, it is.

Q. And by what? What is that isolated --

A. By virtue of interpreting the seismic.

If you refer back to the cross-section, Exhibit 4, stratigraphically it is depicted on this cross-section when looking at the lower Strawn interval, Mr. Zinz shows from the Oak Lake 14 that colored blue interval of the lower Strawn, the productive perf'd interval. He shows, if you will, a facies shazam line that is isolated about the 14 well in that cross-section. And then he has the annotation of lower Strawn, implying we're back into inter-reefal, if you will, deposition. And then we come back to the Oak Lake "25" where that facies grows again.

And so seismic confirms that its areal extent is

1 equivalent to -- not only like it depicts in the 25, but it
2 depicts it virtually identically for the Oak Lake 14.

3 Q. So if you drilled a well in between yours and the
4 well in Section 14, what would you expect to encounter?

5 A. My expectation, you would encounter something
6 akin to the Oak Lake 11, to something akin to a Laguna or
7 maybe a Power. You will not encounter this 250 feet of
8 clean gamma, to which is what we're production.

9 Q. Okay. And your well is not being produced in the
10 same interval as is being produced to the south; is that
11 correct?

12 A. Correct, the 25 is stratigraphically higher than
13 the fields to the south.

14 Q. The wells in the south half of Section 25, I
15 guess they're Texaco wells?

16 A. Yes.

17 Q. That's producing, right?

18 A. The Texaco well was tight --

19 Q. Okay.

20 A. -- nonproductive.

21 Q. So the one, the Laguna Cedro well --

22 A. Right, that is the only productive well.

23 Q. Okay. Well, isn't that same interval that's
24 being produced in that well, isn't that present in your
25 well?

1 A. Yes, it is. But you chose it not to produce it,
2 or is there a reason for that?

3 A. Yes, the column, the productive interval is
4 associated with what we've perf'd, and I would defer any
5 specific details to the engineer, if you want follow-up on
6 that question.

7 Q. That is potentially productive?

8 A. I better let him answer.

9 Q. Okay. How do you get these huge buildups like
10 this in the Strawn in this area?

11 A. Well, that's a very good question, because we're
12 wanting to find many more of these. We've looked at, I
13 guess, many, many, many miles of seismic looking at it, and
14 unfortunately we have not found any other, other than these
15 two.

16 Stratigraphically, you have Lusk field to the
17 south, oh, ten miles-ish, where you start getting into this
18 more, huger, massive, if you will, carbonate buildup. I
19 think in a reasonable standpoint people believe that to be
20 at a shelf break divergence where you have capacity and
21 accommodation space for this little critter, concentration
22 and carbonate growth.

23 And typically, we are in an updip position
24 shelfal, relative to that in this area. This fault, in
25 this particular case, we believe, provided a seep point in

1 a shallow marine environment for carbonate growth to
2 develop and made this area specifically unique to the
3 carbonate factor persisting here, as opposed to being, you
4 know, more regionally pervasive.

5 Q. Does your data indicate that this structure that
6 you're identified here -- is it isolated on all sides from
7 anything else?

8 A. Yes.

9 Q. Do you know if there's going to be any more wells
10 drilled?

11 A. Not in this immediate area.

12 Q. Not into this structure, though?

13 A. Not into this structure, absolutely not.

14 Q. So essentially, this will be the only well in
15 this pool, because this pool -- chances are, this pool is
16 not going to be expanded at any time?

17 A. That is correct. This is 160 -- I mean, the
18 proration unit request is 160. This feature itself,
19 referring to Exhibit Number 5, and if you take, if you
20 will, the kind of a yellowish color contour on there, 110
21 acres.

22 Q. That's within the yellow section?

23 A. Let's see, as you look at your -- If you start in
24 the corner of the northwest corner of Section 25 and pick
25 that color right there -- I guess I can draw on one of

1 these -- to highlight this area.

2 Q. Okay, that area being the area in red --

3 A. Basically -- fundamentally red, slightly into
4 this alleged yellow. That is 110 acres, you know, from
5 planimeter work. So that is its physical areal size.

6 And again, its uniqueness is the 250 feet of
7 carbonate.

8 EXAMINER CATANACH: Okay, I think that's all I
9 have, Mr. Carr.

10 MR. CARR: At this time, Mr. Catanach, we call
11 Randy Cate.

12 RANDALL CATE,
13 the witness herein, after having been first duly sworn upon
14 his oath, was examined and testified as follows:

15 DIRECT EXAMINATION

16 BY MR. CARR:

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

18 A. It's Randall Cate.

19 Q. By whom are you employed?

20 A. EOG Resources.

21 Q. What is your position with EOG?

22 A. I'm project reservoir engineer.

23 Q. Have you previously testified before this
24 Division?

25 A. Yes, I have.

1 Q. At the time of that testimony, were your
2 qualifications as an expert in reservoir engineering
3 accepted and made a matter of record?

4 A. Yes, they were.

5 Q. Are you familiar with the Application filed in
6 this case on behalf of EOG?

7 A. Yes.

8 Q. Have you prepared an engineering study of the
9 area which is the subject of this Case?

10 A. Yes, I have.

11 Q. And are you prepared to share the results of that
12 work with Mr. Catanach?

13 A. Yes.

14 MR. CARR: Are the witness's qualifications
15 acceptable?

16 EXAMINER CATANACH: Yes, they are.

17 Q. (By Mr. Carr) Mr. Cate, let's go to what has
18 been marked as EOG Exhibit Number 6, and I'd like to work
19 through the pages in this exhibit with you. Let's go to
20 the first page, and I think it would be helpful if
21 initially you would explain to Mr. Catanach what this
22 exhibit shows, what's it intended to show?

23 A. Yes, my engineering study had three parts to it.
24 One was did I also find data that proved separation,
25 supporting the new discovery of the Oak Lake "25" in the

1 Strawn?

2 Also, we were asking for 160 acres spacing unit,
3 and so I needed to support that volumetrically.

4 And also, since we're asking for a special depth
5 bracket allowable, I've generated supporting data that
6 proves that there would be no damage if producing at a
7 higher rate.

8 So this first page -- This whole packet is the
9 one exhibit. And this first page, I compared our Oak Lake
10 "25" to nearby Strawn Pool data, and this is the top
11 portion. I compared it to the Cedar Lake Field, the Cedar
12 Lake North, the Loco Hills and the Lusk. Now, all four of
13 the top fields there are listed on our exhibit or shown on
14 the Exhibit Number 3. The Lusk field is approximately 15
15 miles southeast of here.

16 And I compared the initial bottomhole pressures,
17 oil gravities, the specific gas gravities, and then
18 compared to the existing pool rules that these other fields
19 have.

20 And I found that the Cedar Lake North, which is
21 the Anadarko well in Section 26, which is the closest
22 Strawn producer to us -- it differs in bottomhole pressure,
23 it's very similar in oil gravity to ours, but then the gas
24 gravity of their analysis and ours is very much different
25 on the gases. And I will also show more information on

1 that in the next couple of pages.

2 The Cedar Lake-Strawn Pool is the pool about one
3 and a half miles south. It's got four wells in it. It
4 currently has spacing rules of 160 acres and a 4000 GOR.
5 And for your information, the Lusk-Strawn Pool also has
6 160-acre spacing and 4000 GOR.

7 It appeared to us -- We could not find special
8 pool rules on the Cedar Lake North. Originally the
9 Anadarko well was completed as a gas well down in a stray
10 sand interval. It produced only about 30 million cubic
11 feet, and they came on up to this oil pool, and it was
12 redesignated. But as far as we could tell, it's on
13 statewide rules. 40 -- You know, 40 acres with the 2000.

14 It's not a very good well. It's only cum'd
15 around 20,000 barrels after five or six years, I think.

16 So the main thing I wanted to compare is the
17 separation of our discovery with the Cedar Lake North
18 Anadarko well specifically. And we do have information on
19 that well because we have a small interest in it.

20 Now, the pressure data that you'll notice for the
21 Cedar Lake North oil, they had run an initial bottomhole
22 pressure test, and the well was so tight it only built to
23 2860 pounds after three days and the comment was, it was
24 still building. It looked like you wouldn't be able to
25 analyze it, it was so tight. And the production of the

1 well also represents a tight reservoir.

2 But if you compare the bottomhole pressures of
3 the Cedar Lake reservoir to the south, that one was
4 measured out at 4200 pounds. And then our Loco Hills
5 reservoir to the north, which is a gas zone, it produces
6 condensate at a 54.6 gravity, but its bottomhole pressure
7 measure was 4485.

8 So I think the bottomhole pressure data
9 definitely supports that we're in a unique and separate
10 reservoir.

11 Going to the bottom part of the page, the
12 volumetric calculations, what I did, I compared the Cedar
13 Lake and the Lusk field, because they are the current
14 fields in the area that have 160-acre spacing and the 4000
15 GOR. And on the Cedar Lake, those pay attributes,
16 porosity, SW's, I calculated from logs on those four logs.

17 The Lusk, I -- it's a large pool, it has 65 wells
18 in it, and I used the public PI information that was
19 available to find the bottomhole pressure. But also I used
20 an average pay of 40 feet based on the perforated intervals
21 in those wells. It was an eyeball thing, but I did look
22 through each well to get what appeared to be an average
23 perforated pay interval. And then I used the same porosity
24 and SW's.

25 Formation volume factors I calculated out of a

1 program that's based on GOR and initial bottomhole
2 pressures and oil gravities. It used correlation, Lassiter
3 standing and Glasco correlations. Calculated the original
4 oil in place on those and arrived at a recovery factor, for
5 the Cedar Lake field it was 29.7 percent. The "c" just
6 means that's what I calculated. The recovery factor for
7 the Lusk on an average well would be 29.4 percent of the
8 oil in place.

9 I then applied a 29-percent recovery factor to
10 our projected ultimate recovery of 350,000 barrels and
11 arrived at the 126 acres, 126.3.

12 I performed a program called -- it's an HDS --
13 Hydrocarbon Data Systems log analysis program. I used a
14 pay cutoff of 2-percent porosity and 40 percent SW. All
15 the SW's were under the 40 percent, but that's the pay
16 cutoff we use. You can look at the log and see that
17 there's not that much -- Out of the 200 feet of carbonate,
18 we arrived at 64 feet that would meet our cutoff of 2-
19 percent porosity.

20 I then applied our recovery factor to the EUR,
21 and that's how I arrived at what the wells should be
22 capable of draining. It's very close to what Mr. Siebens
23 has described as the areal size of our -- I'm going to
24 refer to it as a pinnacle, but as our accumulation based on
25 the seismic.

1 I then went and looked at an approximate 400,000-
2 barrel EUR, because the decline rate that we used to get
3 350,000 barrels is almost 60 percent. It's much steeper
4 than your typical wells, so I just wanted to show a
5 sensitivity to EUR. 400,000 barrels would drain 144 acres.

6 Q. What does the second page in this exhibit show?

7 A. Okay, this is the support that I was referring
8 to, the gas analyses. The first is gas analysis on the Oak
9 Lake "25" well. The second is the gas analysis on the
10 Power Fed Number 2, the Anadarko well which is in the Cedar
11 Lake North oil.

12 And the gases are quite different. If you look
13 at the methane, the Power Fed 2 is 68 percent versus 76.1
14 percent on the Oak Lake "25".

15 The other thing that I noticed was the BTU of the
16 gases are quite different. Almost 1400 dry on the Power
17 Fed 2 versus 1205 on the Oak Lake "25".

18 Also the specific gravities of the gas are quite
19 different. The Power Fed 2 has approximately .83 specific
20 gravity versus .72 for the Oak Lake "25".

21 Q. All right, let's go to the decline curve, which
22 is the fourth page in the engineering data.

23 A. This was support for the EURs that I used in my
24 volumetrics on the first page. Again, you can -- We've
25 only got about six weeks of production, but you can see at

1 the higher rates that you might imply a decline, and that
2 arrives at 350,000 barrels. But again, if you'll notice on
3 the lower right-hand side of the page, it gives you the De,
4 which is the exponential decline rate. It's 57 percent,
5 which is very -- it's atypical, it's very high for oil
6 wells. And I will show in the subsequent pages here that a
7 higher EUR might actually result. And of course the higher
8 the EUR, the higher the drainageability.

9 Q. All right, let's go to the next graph --

10 A. Okay.

11 Q. -- the compilation of the MER tests --

12 A. Okay.

13 Q. -- and ask you to review that for Mr. Catanach.

14 A. Yes, we -- When we first brought the well on, it
15 had an initial GOR of approximately 3250, and this is a
16 graphical representation of how we flow-tested the well.

17 Early on, we didn't have all of our gas -- we
18 would flow into frac tanks and facilities, we didn't have
19 all of our gas-metering equipment in place.

20 At the time that -- approximately March 28th, we
21 put vapor-recovery system in place on the tanks, and so we
22 were able to meter and sell all the gas volume. And at
23 that time we also opened the well up and began our MER test
24 at an approximate rate of -- the green is the oil on a per-
25 day basis -- at approximately 800 to 900 barrels a day. We

1 did have it as high a 1020 barrels per day. And we
2 monitored the GOR for approximately two and a half to three
3 weeks, and it was remarkably steady.

4 Then on April 21st or 22nd, we reduced the rate
5 again back down to the 400- to 500-barrel-per-day range and
6 monitored the GOR, and again it stayed right at this
7 average 3250. And then after one week we decided to come
8 back to the -- open the well back and do one confirmation
9 on the higher rates again and let it try to stabilize then
10 around 800 to 900 barrels a day after it did produce over
11 1000, and the GOR stayed right there.

12 So this proves to us that the well is not rate-
13 sensitive, that producing the well at over 1000 barrels per
14 day has not caused the GOR to increase.

15 But we went one step further. We also ran a
16 bottomhole flowing pressure at the time that we increased
17 the rate from the approximate 500 barrels a day up to the
18 1000 barrels a day on April 27th and 28th. The increase in
19 productivity, approximately 500 barrels a day, only
20 resulted in a reduction in the bottomhole flowing pressure
21 of 134 pounds.

22 This well, based on that productivity, could
23 produce 6000, 7000, 8000 barrels a day if we wanted to gut
24 the thing. That is not our intent. It just -- It
25 demonstrates that the ability of this well to produce is

1 quite unique, and it does also match the -- not only the
2 net pay that's about four times what you see in the typical
3 wells in this area, but the gross pay being over 200 feet.
4 It does match what we see on the logs geologically.

5 Q. Mr. Cate, is the next page, page 6, the
6 production history of the well in a tabular form?

7 A. Yes, that is simply in tabular form. It has
8 chokes, the only additional information is that it has
9 choke sizes and some remarks as to our testing and when we
10 were able to build facilities and sell the flash gas.

11 Q. When did the well first produce?

12 A. Well, I start here at 3-15. These are one day
13 behind it. We actually were flowing back after our acid
14 frac, I believe on the 11th, on March 11th.

15 Q. You produced the well at unrestricted rates for
16 30 days during the initial testing period, correct?

17 A. Yes.

18 Q. And you've continued to produce the well at
19 virtually unrestricted rates; is that correct?

20 A. At unrestricted rates?

21 Q. You have been allowed by the OCD to continue to
22 produce the well, have you not, pending this hearing?

23 A. Oh, yes. Oh, yes. We have been in contact with
24 the District the whole time and let them know what we were
25 doing and that we were in an MER phase. Specifically we

1 were talking with Bryan Arrant.

2 Q. And you have agreed, have you not, that once an
3 order is entered in this case, that you will bring the well
4 in compliance with that order and the rules of the
5 Division?

6 A. Yes, we certainly will.

7 Q. All right, let's go to the next page, which is
8 again a graph, and this one is on the Cedar Lake North
9 Pool. What does this show?

10 A. Yes, the next three graphs are the Cedar Lake
11 North Pool, the Lusk-Strawn and also the Cedar Lake-Strawn.
12 They are the historic production of those pools. And I've
13 plotted out the oil and gas production histories with their
14 cumulative.

15 But at the bottom -- The bottom curve is the GOR,
16 and I've done this to show that all these fields typically
17 start producing at a GOR of approximately 4000 or so, and
18 over time the GORs will increase to, you know, 8000 or so.

19 And this first plot, the Cedar Lake North, it
20 shows that as the GOR has increased, the oil production has
21 not dramatically fallen. It has maintained a consistent
22 15- to 20-percent decline rate. There's no evidence that
23 an escalating GOR has hurt the reservoir at all. This is
24 just how the reservoir will produce.

25 The next page is the Lusk field. Now, my public

1 information didn't pick it up from the beginning. It
2 actually -- First production was in 1961, I believe. But
3 by the time the public information picked it up, its GOR
4 was up at approximately 16,000 or so, and it's in the
5 depletion phase of the reservoir. The GOR is actually
6 going down over time. But the oil production has been
7 remarkably steady also in a probably 15- to 20-percent
8 decline, or even less there also. And the average EUR on
9 those wells is going to be 350,000 barrels or so.

10 Q. And the last page in the exhibit?

11 A. The last page is the Cedar Lake-Strawn, which --
12 Again, four wells, the field started at approximately 3000
13 GOR, very similar to ours, to the Oak Lake "25", and over
14 time it's increased up to 6000 to 7000. And again, the oil
15 in a decline that would be expected. No damage to the
16 reservoir with the increasing GORs.

17 Q. Is Exhibit Number 9 [sic] a copy of our
18 Application for discovery allowable and pool creation?

19 A. Yes, it is.

20 Q. I'd like to go through each of the things we're
21 requesting in this case and ask you to summarize the
22 reasons -- or the supporting information for each element
23 in your request.

24 First, we're seeking 160-acre spacing. Why is
25 that?

1 A. The well is -- I think the data clearly shows
2 that the well will be capable of draining efficiently and
3 effectively the Strawn reservoir that we have encountered
4 at approximately 120 acres or so, is the size that we see,
5 and I think that that would -- the data shows that it will
6 effectively drain that.

7 Q. Are you also seeking 660-foot setbacks from the
8 outer boundary of a dedicated spacing unit?

9 A. Yes, we are. That's standard with the 160-acre
10 spacing, from what we've seen.

11 Q. You're also seeking a special depth bracket
12 allowable of 1120 barrels; is that correct?

13 A. That's correct.

14 Q. And what is the basis for that request?

15 A. The basis is that the well is capable of
16 producing at much higher rates than that, even. I suppose
17 we could have asked for something much more, but we thought
18 that twice the standard depth bracket allowable was being
19 conservative, would allow us to produce the well at
20 efficient rates, not cause harm, as the data has proven --
21 as we have produced at over 1000 barrels a day, and that
22 based on the uniqueness of this reservoir and the fact that
23 it appears to be entirely within our spacing unit, the 160
24 acres that we're requesting, that the best thing would be
25 to allow us to produce at the 1120 barrels per day.

1 Q. That's twice the depth bracket allowable for 160-
2 acre spacing at this depth?

3 A. That's correct.

4 Q. Are you also seeking to increase the gas-oil
5 ratio, or double the gas-oil ratio?

6 A. From a standard, yes. But again, all these
7 Strawn fields, as we have seen, basically they start at a
8 3000 GOR. So without increasing the GOR limit, the well
9 would in effect have to be restricted. These reservoirs,
10 that's how they start, that's their initial GORs. And as
11 they produce, they actually have very high recovery factors
12 calculated out at almost 30 percent. So -- and typically
13 that's a very high recovery factor.

14 So the evidence pretty well shows that even at
15 4000-GOR limit, we're producing these fields very
16 efficiently.

17 Q. In your opinion, if the Application is approved,
18 can you produce the subject well at these higher rates
19 without causing waste of hydrocarbons?

20 A. Oh, yes, I think the data has definitely shown
21 that.

22 Q. Will approval of the Application and the approval
23 of the higher producing rates impair the correlative rights
24 of any operator?

25 A. No, it will not.

1 Q. You've also asked that the allowable be set
2 retroactively to the date of first production.

3 A. Yes.

4 Q. Why is that?

5 A. Well, during the MER testing period we have
6 encountered overproduction, and based on 40 acres and 320-
7 barrel-per-day allowable, we'd basically have to shut the
8 well in for an entire month or five weeks. We would
9 just -- We see no positive thing that could come of
10 shutting in this well.

11 Q. Would shutting the well in prevent waste?

12 A. No.

13 Q. Would it protect correlative rights?

14 A. No.

15 Q. Will any other interest owner be affected by
16 establishing the allowable retroactively to the first
17 production in early March of this year?

18 A. No.

19 Q. Mr. Catanach had questions of our geophysical
20 witness concerning an additional zone present in what we
21 are now seeking to be declared a new pool. You were
22 present for that testimony?

23 A. Yes.

24 Q. Can you respond to that question for the
25 Examiner?

1 A. Yes, I can. On the Oak Lake "25" Number 1 we had
2 a team of Barry Zinz, myself and Hal Crabbe, who's the
3 completion engineer, and we looked over the shows and the
4 log parameters and decided not to produce the zone that you
5 mentioned, Mr. Examiner, at approximately 10,640 or so, -30
6 to -40. The log has no crossover, the neutron is all above
7 the density. And when I performed calculations with a two-
8 percent cutoff it didn't actually make our porosity cutoff,
9 probably because of that, we tried to stay with the
10 indicated porosity. It was such a large zone, and we put
11 our perforations only in the areas that we saw crossover.

12 But because we were trying to complete in an over
13 200-foot interval with 20,000 gallons, we had to be very
14 selective with out perforations to ensure that the acid
15 treatment went in each perforation. So at the time there
16 was no thought process about staying out of that; it just
17 did not appear that it was the quality of pay that we
18 wanted to stimulate.

19 Q. Mr. Cate, were Exhibits 6 and 7 prepared by you
20 or compiled at your direction?

21 A. Yes.

22 Q. Can you testify as to their accuracy?

23 A. Yes, I can.

24 Q. And they are accurate?

25 A. Yes.

1 MR. CARR: At this time we would move the
2 admission into evidence of Exhibits 6 and 7.

3 EXAMINER CATANACH: Exhibits 6 and 7 will be
4 admitted as evidence.

5 MR. CARR: And that concludes my direct
6 examination of Mr. Cate.

7 EXAMINER CATANACH: Mr. Bruce?

8 MR. BRUCE: No questions.

9 EXAMINER CATANACH: No questions?

10 EXAMINATION

11 BY EXAMINER CATANACH:

12 Q. Mr. Cate, on your Exhibit Number 6 do you by any
13 chance have any current bottomhole pressures for any of
14 these offset Strawn pools?

15 A. No, I don't. We only have a small interest in
16 the Anadarko well, and I went through their file a few days
17 ago and did not see anything recent. We don't have an
18 interest in any of those other pools besides our Loco
19 Hills, the gas, but we have not run anything on it lately.

20 Q. But several of these pools have produced for a
21 number of years, so you would expect their bottomhole
22 pressure to be considerably lower?

23 A. Oh, yes. Yes, sir. I would anticipate -- Well,
24 for instance on the Cedar Lake Pool, it's already produced
25 318,000 barrels. I've got a projected EUR of 479,000

1 barrels. So it should be at maybe 1500 to 2000 pounds. I
2 would say that's correct.

3 And the same, actually the same with the wells in
4 the Cedar Lake North. They appear to have produced at
5 least half their reserves.

6 So yeah, I would anticipate those reservoir
7 pressures to be in the range of 1500 pounds, maybe.

8 Q. I guess if you were comparing your structure to
9 these other Strawn pools, would it most closely resemble
10 the Lusk?

11 A. Yes, I believe it would. Yes, the Lusk Pool had
12 several wells in it that have perforated intervals of 100,
13 120 feet. The average appeared to me of around 40 feet,
14 but it does appear that they did encounter some large
15 pinnacle-type accumulations, very similar to what we
16 encountered.

17 Q. Okay. I was a little confused on your bottom
18 portion, your volumetric calculation. You did use -- Was
19 it 6-percent porosity in the Cedar Lake and the Lusk --

20 A. Yes.

21 Q. -- to determine the net pay?

22 A. Yes, I did.

23 Q. But you said something -- And you used 4.8
24 percent?

25 A. On our Oak Lake "25" well, yes, because I

1 actually got a log analysis on this well. I did not use
2 the hydrocarbon -- the HDS log analysis on the Lusk field
3 wells.

4 I did use just a standard -- I did do a log
5 analysis using a crossplot porosity off the log for the
6 Cedar Lake wells, and then applied that same porosity to
7 the Lusk and the same SW. I did do SW calculations on the
8 Cedar Lake Pool, and their average was approximately 80
9 percent. I'm sorry, that should be S_{gas} . It should be gas
10 saturation, not water. Water saturation is approximately
11 20 percent.

12 Q. In your field, in your well?

13 A. No, in the Cedar Lake and the Lusk. I missed the
14 title in the yellow --

15 Q. Yeah.

16 A. -- the .8 should be the gas satur-- -- or, sorry,
17 the water saturation should be 20 percent, not .8. It
18 should be .2 for both the Lusk and the Cedar Lake.

19 And then our log analysis program on the Oak Lake
20 25 actually gives us closer to 70 -- 25 percent, I'm sorry,
21 .25, for the water saturation.

22 Q. Okay. But you mentioned something about using 2-
23 percent porosity in the Oak Lake.

24 A. That's the cutoff. That was our porosity cutoff
25 for what would be considered pay.

1 Q. Okay, so you've got 64 feet of pay in your well,
2 with porosity at least 4.8 percent; is that right?

3 A. Porosity at least 2 percent.

4 Q. At least 2 percent.

5 A. Right. And then the average of that --

6 Q. -- would be 4.8?

7 A. -- would be 4.8 percent, yes.

8 Q. Now, did you say that this well is on a decline
9 that's much steeper than the other fields?

10 A. Well, we don't have enough data. I said that to
11 arrive at 350,000 barrels -- we only had, really, about
12 three weeks of data that -- and I tried to eyeball a
13 decline rate, and in doing that, I arrived at 350,000
14 barrels.

15 My point was that that is a -- the decline rate
16 to achieve 350,000 barrels was almost 60 percent, and that
17 is an untypically high decline rate for all these Strawn
18 producers. And while I don't have the data, I believe that
19 we'll probably actually see the well decline at a lesser
20 rate than that, which would result in a higher EUR and a
21 higher drainage area.

22 Q. Now, did you actually take the well up to 1120
23 barrels a day, or the depth bracket allowable that you're
24 proposing?

25 A. No, we didn't actually. I think the highest that

1 we went to on this test was 1036. Let's see here. I'm
2 sorry, 1052, which was achieved on -- it would be April
3 8th. And then again 4-29, we achieved that 1036 barrels
4 per day.

5 We're really asking for the 1120 barrels a day.
6 It was simply twice what the depth bracket allowable on
7 160s would be. It would be easily achievable, but just --
8 We would have that allowable, and I would say we're
9 probably going to produce -- We would like to be able to
10 produce the well really where it's at, around this 1000
11 barrels a day. The little bit of extra would just give us
12 some push and not to overproduce, probably.

13 Again, I really believe the well, based on the
14 productivity, could really do 8000 barrels a day if we
15 wanted to.

16 Q. Hm.

17 A. It's quite unique.

18 Q. This will be the only well drilled to the
19 structure, as far as you can tell at this point?

20 A. Yes, yes. We will not drill another well on our
21 160, I can say that.

22 Q. And your data, your current data, demonstrates
23 that this well will drain the entire structure?

24 A. Yes, it sure does.

25 Q. So your 350,000 barrels, that's kind of a

1 conservative estimate on the EUR for the well?

2 A. I believe it is, but again it does match very
3 well the 126 acres that would be predicted on a 350,000
4 EUR, it matches very well what Mr. Siebens sees as the size
5 of the feature on the seismic.

6 EXAMINER CATANACH: Okay, that's all the
7 questions I have.

8 MR. CARR: Mr. Catanach, that concludes our
9 presentation.

10 EXAMINER CATANACH: Okay. Anything further,
11 gentlemen?

12 MR. BRUCE: No, sir.

13 EXAMINER CATANACH: Okay, there being nothing
14 further in this case, Case 12,649 will be taken under
15 advisement.

16 (Thereupon, these proceedings were concluded at
17 9:35 a.m.)

18 * * *

19
20
21 I hereby certify that
22 a complete record of the
23 the Examiner's hearing of
24 heard by me on 5/31/85
25 David R. Catanach
Oil Conservation Division
12649
2001

CERTIFICATE OF REPORTER

[illegible]

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

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL May 4th, 2001.

Allen P. Brown

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 2002