

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. 13,003  
)  
APPLICATION OF EOG RESOURCES, INC., FOR )  
SIMULTANEOUS DEDICATION, EDDY COUNTY, )  
NEW MEXICO )  
\_\_\_\_\_ )

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

**RECEIVED**

BEFORE: DAVID R. CATANACH, Hearing Examiner

MAR 10 2003

Oil Conservation Division

February 20th, 2003  
Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, February 20th, 2003, 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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February 20th, 2003  
 Examiner Hearing  
 CASE NO. 13,003

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## A P P E A R A N C E S

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FOR MURCHISON OIL AND GAS, INCORPORATED; DEVON ENERGY  
PRODUCTION COMPANY, L.P.; and MEWBOURNE OIL COMPANY:

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\* \* \*

## ALSO PRESENT:

WILLIAM V. JONES, JR.  
Petroleum Engineer  
New Mexico Oil Conservation Division  
1220 South Saint Francis Drive  
Santa Fe, NM 87505

\* \* \*

1                   WHEREUPON, the following proceedings were had at  
2                   9:00 a.m.:

3  
4  
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6  
7                   EXAMINER CATANACH: All right, at this time we'll  
8                   call Case 13,003, which is the Application of EOG  
9                   Resources, Inc., for simultaneous dedication, Eddy County,  
10                  New Mexico.

11                  Call for appearances.

12                  MR. CARR: May it please the Examiner, my name is  
13                  William F. Carr with the Santa Fe office of Holland and  
14                  Hart, L.L.P.

15                  We represent EOG Resources, Inc., in this matter,  
16                  and I have two witnesses who need to be sworn.

17                  EXAMINER CATANACH: Additional appearances?

18                  MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe.  
19                  I am entering an appearance on behalf of Murchison Oil and  
20                  Gas, Incorporated; Devon Energy Production Company, L.P.;  
21                  and Mewbourne Oil Company.

22                  I do not have a witness to present.

23                  EXAMINER CATANACH: Okay, will the witnesses  
24                  please stand to be sworn in?

25                  (Thereupon, the witnesses were sworn.)

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PATRICK J. TOWER,

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

DIRECT EXAMINATION

BY MR. CARR:

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

A. Patrick J. Tower.

Q. Mr. Tower, where do you reside?

A. Midland, Texas.

Q. By whom are you employed?

A. EOG Resources, Inc.

Q. And what is your position with EOG?

A. Division land specialist.

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

A. Yes.

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

A. Yes, I am.

Q. Are you familiar with the proposal of EOG Resources to simultaneously dedicate two gas wells in the northwest quarter of Section 7, Township 17 South, Range 29 East?

A. Yes, I am.

1 MR. CARR: Are the witness's qualifications  
2 acceptable?

3 EXAMINER CATANACH: They are.

4 Q. (By Mr. Carr) Mr. Tower, would you briefly  
5 summarize what it is that EOG seeks with this Application?

6 A. Yes, EOG Resources, Inc., seeks simultaneous  
7 dedication of two wells, seeks an exception to Division  
8 Rule 104.C.(2).(b) to permit this simultaneous dedication  
9 for the existing 292.32-acre spacing and proration unit for  
10 the -- nonstandard spacing and proration unit for the  
11 Morrow formation in the South Empire-Morrow Gas Pool, to be  
12 dedicated to EOG Resources' current Warp Speed "7" Federal  
13 Com Number 1, which is located at a previously approved  
14 unorthodox gas well location, 2280 feet from the north line  
15 and 1930 feet from the west line of Section 7 of Township  
16 17 South, Range 29 East, and the other well, being the Warp  
17 Speed "7" Federal Com Number 2, which is located at a  
18 surface unorthodox location 1985 feet from the north line  
19 and 526 feet from the west line of said Section 7, and was  
20 drilled to a standard bottomhole location in the lower  
21 Morrow sand at a point 1980 feet from the north line and  
22 660 feet from the west line of Section 7.

23 Q. And the nonstandard unit and location were  
24 approved by Order Number 11,433; is that correct?

25 A. That is correct.

1 Q. That was in Case 12,454?

2 A. That is correct.

3 Q. The Number 1 well is a well that is completed in  
4 the middle and the lower Morrow; is that right?

5 A. That is correct.

6 Q. And then the Number 2 well was recently completed  
7 in the lower Morrow sand?

8 A. That is correct.

9 Q. And there will be a technical presentation  
10 showing that those wells are not in communication in the  
11 lower Morrow?

12 A. That is correct.

13 Q. We're talking about just the Morrow formation  
14 here today?

15 A. Yes.

16 Q. And the South Empire-Morrow Gas Pool, which is  
17 involved?

18 A. Yes.

19 Q. What rules govern that pool?

20 A. According to the standard statewide Rule 104.C  
21 which requires 320-acre spacing, the 660-foot setbacks and  
22 also allows for a pre-approved infill well in the opposite  
23 quarter section.

24 Q. And so we're seeking an exception to that last  
25 provision because you're asking for authority to have two

1 wells in one quarter section?

2 A. That is correct.

3 Q. Let's go to what's been marked Exhibit Number 1.  
4 Would you identify and review that for Mr. Catanach?

5 A. Exhibit Number 1 is a land plat, in red outlines  
6 the spacing unit for these two particular wells, and the  
7 two red dots depict the approximate locations of both the  
8 existing wells that we're talking about.

9 Q. Now, the Murchison interest, offsetting interest,  
10 is what?

11 A. Murchison is primarily to the west and northwest,  
12 and one of the key wells that the testimony will kind of  
13 highlight is their Murchison-operated Yogi Bear well in the  
14 north half of Section 12 of -- I believe that's 16 South,  
15 29 East.

16 Q. That's actually in the southeast of --

17 A. Or 17 South, excuse me, 28 East.

18 Q. And that Murchison well is in the southeast of  
19 the northeast of 12; is that right?

20 A. That's correct.

21 Q. Where is the Mewbourne offsetting interest?

22 A. Mewbourne's offsetting interest is in the south  
23 half of the current Section 7 that we're discussing, and  
24 they operate the two Morrow wells, the Empire 7 Number 1  
25 and Number 2.

1 Q. And where does Devon hold interest in the area?

2 A. Devon holds interest in -- undeveloped leasehold  
3 interest in Section 6 to the north, offsetting EOG.

4 Q. Does EOG operate any of the affected offsetting  
5 spacing units?

6 A. No.

7 Q. And Mr. Cate has conducted a -- been involved in  
8 discussions with both Mewbourne and Murchison; is that  
9 right?

10 A. Yes.

11 Q. And he will review those with the Examiner?

12 A. That is correct.

13 Q. Would you identify what has been marked as  
14 Exhibit Number 2?

15 A. Exhibit Number 2 is the notice affidavit to all  
16 the offset operators and also, where there was not an  
17 operator, all of the affected lessees, and there's a -- on  
18 the Exhibit A notice list will break down by offsetting  
19 tract all the particular parties that were notified.

20 Q. And EOG will be calling a technical witness to  
21 review the engineering and geologic reasons for this  
22 request; is that correct?

23 A. Yes, we will.

24 Q. Were Exhibits 1 and 2 prepared by you or compiled  
25 at your direction?

1 A. Yes, they were.

2 MR. CARR: Mr. Catanach, at this time we move the  
3 admission into evidence of EOG Exhibits 1 and 2.

4 EXAMINER CATANACH: Exhibits 1 and 2 will be  
5 admitted.

6 MR. CARR: And that concludes my direct  
7 examination of Mr. Tower.

8 EXAMINER CATANACH: Mr. Bruce?

9 MR. BRUCE: I don't have any questions of Mr.  
10 Tower.

11 EXAMINATION

12 BY EXAMINER CATANACH:

13 Q. Mr. Tower, as far as the notice for this case  
14 goes, did you essentially notify all offset 320-acre  
15 tracts? Is that what you did?

16 A. That is correct.

17 Q. All the way around your proposed unit?

18 A. Yeah, all the way -- in every direction around  
19 us. Whether that was required or not, we did notify  
20 everybody, both north, south, west and east.

21 Q. Other than the Murchison and the Mewbourne, are  
22 there other offsetting producing wells to your unit?

23 A. No. Mr. Cate will address all the wells, but the  
24 -- as far as immediate offset spacing producing wells, no.  
25 The two Mewbourne wells and the Murchison well are the only

1 producing Morrow wells next door.

2 Q. Has any offset operator contacted you with any  
3 concerns about your proposal?

4 A. Our next witness has had discussions. We have  
5 not, unless Mr. Bruce raises some additional concern. Our  
6 understanding, we have met with some of these parties as  
7 well. There have been no concerns or objections I'm aware  
8 of, other than -- more just trying to seek the information  
9 to understand what we're doing.

10 EXAMINER CATANACH: Okay, I have nothing further.

11 MR. CARR: Mr. Catanach, at this time we would  
12 call Randy Cate.

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

16 DIRECT EXAMINATION

17 BY MR. CARR:

18 Q. Would you state your full name for the record?

19 A. Randall Cate.

20 Q. And where do you reside?

21 A. Midland, Texas.

22 Q. By whom are you employed?

23 A. EOG Resources.

24 Q. Mr. Cate, what is your current position with EOG  
25 Resources?

1 A. I am project reservoir engineer.

2 Q. Have you previously testified before this  
3 Division?

4 A. Yes, I have.

5 Q. At the time of that testimony, were your  
6 credentials as an expert in petroleum and reservoir  
7 engineering accepted and made a matter of record?

8 A. Yes.

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

11 A. Yes.

12 Q. And are you familiar with EOG's proposal to  
13 simultaneously dedicate two Morrow gas wells to this  
14 previously approved 292-acre spacing unit in the north half  
15 of Section 7?

16 A. Yes.

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

19 EXAMINER CATANACH: They are.

20 Q. (By Mr. Carr) Would you summarize the purposes  
21 of your technical presentation here today?

22 A. We want to prove that the two wells that are on  
23 the 160 -- The northwest 160 acres, we have two wells: the  
24 Warp Speed "7" Federal Number 1 and the Warp Speed "7"  
25 Federal Number 2.

1 I'll present data that proves that they are not  
2 in the same reservoir with each other but that the lower  
3 Morrow is in communication with a Murchison well called the  
4 Yogi Bear which is less than half a mile to the northwest,  
5 and the lower Morrow reservoir in the Warp Speed Number 1  
6 is just a separate and distinct -- not in communication  
7 with any offset wells, and that the middle Morrow in the  
8 Warp Speed Number 1 did see some drainage effect from the  
9 Green "B", which is less than half a mile south, which was  
10 originally a Phillips well that had produced about half a  
11 BCF of gas.

12 Mewbourne now has that south half of the section  
13 and are represented by Mr. Bruce.

14 Q. We have two wells in the northwest quarter?

15 A. Yes, we do.

16 Q. Only one of those wells is currently producing?

17 A. That's right, yes.

18 Q. And you're seeking permission to put the Number 1  
19 well back on, that's really what we're here for; isn't that  
20 correct?

21 A. I guess that's right, yes. We're asking for  
22 simultaneous dedication that we can produce both wells out  
23 of the Morrow on the same 160.

24 Q. The Number 1 well was an existing well when the  
25 Murchison well was completed to the west?

1           A.    That's correct.

2           Q.    And you drilled the Number 2 well to offset that  
3 production?

4           A.    That's right.

5           Q.    And you shut in the Number 1?

6           A.    That's right.  The rules right now, we are only  
7 allowed one well, and we are currently producing the Warp  
8 Speed Number 2.  It is the one that's being drained  
9 severely by the Yogi Bear well to the northwest.

10          Q.    You have discussed your proposal with offset  
11 operators?

12          A.    Yes, I have.

13          Q.    Would you summarize those discussions?

14          A.    Okay, we have had -- I have had discussions with  
15 Mike Daugherty of Mewbourne, who is seated next to -- I'm  
16 sorry, of Murchison, who is seated next to Jim Bruce.  I've  
17 also had discussions with Bruce Insalaco and Larry  
18 Cunningham.  They are the Midland managers of Mewbourne Oil  
19 and Gas.  I received a call from Tim Harrington of Phillips  
20 Petroleum.

21                 In all the discussions -- Phillips said just send  
22 a copy of the data, after I showed them what we were going  
23 to do.

24                 Mewbourne was satisfied.  We met at lunch one day  
25 and showed the data, and they were satisfied.

1           And then I've had discussions with Murchison, and  
2 Mr. Daugherty did explain that he would be here to ask some  
3 questions.

4           Q.    Did you supply the exhibits to Murchison  
5 yesterday that you're planning here to present to Mr.  
6 Catanach today?

7           A.    Yes, yes, we gave them a set of the exhibits that  
8 are presented today.

9           Q.    I think at this time, Mr. Cate, it would be  
10 helpful if we'd look at the geological data on this  
11 reservoir, and I'd ask you to refer to what's been marked  
12 as Exhibit 3, an isopach of the lower Morrow Yogi sand.  
13 Would you, in reviewing that, explain the general history  
14 of your efforts to develop the north half of Section 7?

15          A.    Exhibit 3 is an isopach and contoured prediction  
16 of the sand extent for what we call the Yogi sand. The  
17 Yogi sand -- and I'll show you in a minute in the cross-  
18 section -- has produced almost a BCF, probably over a BCF.  
19 As of February, about .9 of a BCF. Currently I believe the  
20 well is 5.5 million cubic feet a day from the lower Morrow  
21 sand.

22                   I used a 7-percent cutoff on -- crossplot  
23 porosity cutoff, to predict the size of these reservoirs.  
24 I worked with Barry Zinz, our geologist, and we used  
25 volumetrics and pressure data and -- with that 7-percent

1 cutoff to predict what the sands might look like in their  
2 areal extent.

3 This well, the Yogi Bear, was completed for  
4 almost 7 million cubic feet a day -- and I will show a  
5 pressure plot of this later -- approximately July of 2002.

6 They, interestingly enough, came in at original  
7 pressure, above 4900 pounds. That's original pressure. So  
8 they found a discrete new reservoir.

9 Our Warp Speed Number 1 -- which would be Unit  
10 what, E, F? Unit F in the north half of Section 7 -- was  
11 drilled two years ago, and it had encountered original  
12 pressure in the lower Morrow and had produced, you know,  
13 for two years commingled with the middle Morrow, and I'll  
14 show some evidence about how I arrived at the breakout of  
15 production. But at the time, our lower Morrow is only  
16 producing approximately 600 MCF a day, when the Yogi Bear  
17 well comes in.

18 Based on those pressure differentials, we knew  
19 that we needed to drill another well to capture the  
20 reserves under the acreage that would be in the Yogi Bear  
21 reservoir.

22 Then we did proceed with the Warp Speed Number 2.  
23 We re-entered a well that the surface was slightly  
24 unorthodox and kicked it back or sidetracked it back to a  
25 standard location. This was three months ago, December of

1 2002. We did encounter the lower Morrow reservoir, and a  
2 pressure buildup test was run and showed that the reservoir  
3 had already been depleted to approximately 2800 to 2900  
4 pounds. And I'll show you that the derivative plot on the  
5 radial -- or the log log plot, shows it's in communication  
6 with the Yogi Bear well.

7 Q. I think before we go to all the other isopachs we  
8 probably should move to the cross-section.

9 A. Yes, the cross-section --

10 Q. There's a trace for this cross-section on Exhibit  
11 Number 3. The cross-section is Exhibit Number 4, and I'd  
12 ask you to go to that and review it for Mr. Catanach.

13 A. Yes, we included a cross-section of four wells  
14 that are somewhat critical to the Application.

15 From the left, the Yogi Bear well, which is the  
16 well that caused us to drill our Warp Speed "7" Number 2.

17 The next one, the second from the left, is the  
18 Warp Speed "7" Number 2.

19 The third one from the left is the Warp Speed "7"  
20 Number 1, the original well.

21 And then we've included the -- it was General  
22 American, which was Phillips, it became Phillips Green "B"  
23 11. By the way, that well has ceased to produce. It's  
24 been shut in or abandoned by Mewbourne at this time.

25 Back to the Yogi well, again we used a crossplot

1 porosity cutoff of 7 percent, that's a good cutoff for the  
2 Morrow to predict volumetrics by and come up with a net  
3 producing pay, and that will be the essence of the maps  
4 that you'll see. I also used the pressure data that we've  
5 run on all wells to do P/Z work and help us determine the  
6 size of these reservoirs.

7           Starting on the Yogi well to the left, they have  
8 only completed in the lower Morrow interval, what we call  
9 the Yogi sand, and it's designated in yellow. You can see  
10 a six-foot or so porosity interval. That, we believe, is  
11 where their gas is being produced from. They have not  
12 perforated or tested the middle Morrow, which is up at  
13 approximately 10,370 or -80 feet. Frankly, they don't  
14 really have any net sand that we see. I mean, there's no  
15 crossover. So it looks like this well should probably just  
16 remain a lower Morrow producer.

17           The second well from the left, the Warp Speed  
18 Federal Com Number 2, all we did was perforate the lower  
19 Morrow. It turned out, based on the pressure data, all  
20 this well is capable of is 600 MCF a day. I'll show you  
21 the pressure data that shows that it's in the same  
22 reservoir as the Yogi Bear. We have not tested the middle  
23 Morrow at this point.

24           The third well from the left is the original Warp  
25 Speed "7" Number 1. The lower Morrow we are showing here

1 as two separate sands from the yellow sand that was in the  
2 Yogi reservoir, and again based on pressure data. And you  
3 can see in this sequence you've got sand-shale-sand-shale.  
4 They're very narrow channels, they're very thin sands. We  
5 think it's kind of a bifurcating system, that the sands  
6 generally are running from a northwest to a southeast  
7 direction, and that's the way that I mapped those. Again,  
8 this well came in, original pressure in the lower Morrow.

9 We then went up and tested the middle Morrow. As  
10 you can see, it's almost 40 foot of crossplot porosity in  
11 that sand. It has produced very poorly, and so far I've  
12 given it less than .2 of a BCF. The Warp Speed Number 1  
13 has produced just under .6 of a BCF. So approximately .4  
14 of a BCF I'm allocating to the lower Morrow and just under  
15 .2 to the middle Morrow, and I'll show you why. We run  
16 production logs that show why we did that allocation.

17 So again, our original pressure was found in the  
18 lower Morrow two years ago. We had -- If you go to the  
19 fourth well or the one on the far right, the Phillips Green  
20 "B" 11, at the time we drilled our Warp Speed and completed  
21 the Number 1 in the lower sand and received original  
22 pressure, the Green "B" had produced approximately 1.5 BCF  
23 out of the lower Morrow. We confirmed with Mewbourne that  
24 the middle Morrow in this well is approximately half a BCF,  
25 and the lower Morrow had produced 1.5 BCF. But again, our

1 Warp Speed Number 1 had original pressure and therefore  
2 cannot be in the same reservoir.

3 So the green sand was what we designated for the  
4 Green well, and again it will show you on the maps it's  
5 separate and discrete from both the Yogi and the Warp sand.

6 Q. This exhibit basically shows the discontinuous  
7 nature of the Morrow throughout the area --

8 A. It certainly does.

9 Q. -- in the basic intervals which we're going to be  
10 talking about?

11 A. That's right.

12 Q. Now, Exhibit 3 was an isopach of the lower Morrow  
13 Yogi sand.

14 A. That's right.

15 Q. I'd ask you now to go to Exhibit Number 5, which  
16 is an isopach on what we call the lower Morrow Warp sand.

17 A. Exhibit Number 5 is the zone we call the Warp on  
18 the cross-section. It is the blue sand, separate and  
19 distinct from pressure data. We saw no communication or  
20 evidence that it exists in any of the other wells in this  
21 plat, so it is mapped.

22 It's going to make 800 million cubic feet. It  
23 had four feet, is all in that well, and that's  
24 approximately 180 acres, based on six feet of average pay.  
25 So we just interpreted that and mapped in approximately 180

1 acres. I'll show that on my volumetrics later.

2 Q. Let's now go to Exhibit Number 6, which is the  
3 third lower Morrow sand, the Green sand, and review your  
4 isopach of this Morrow development.

5 A. Yes, this is the Green sand, again, 7-percent  
6 crossplot porosity cutoff. The Green sand only produced,  
7 from what we can tell, in the Green "B" 11. It had  
8 produced 1.5 BCF. It's currently been abandoned by  
9 Mewbourne, so the ultimate recovery is 2 BCF, 1.5 from the  
10 lower Morrow. It encountered 12 feet of sand. They had  
11 not perforated that interval in the Empire 7 well, which is  
12 in the southwest quarter of Section 7. So it appears that  
13 this Green "B" sand is a one-well sand also.

14 Q. All right. Let's now move to the middle Morrow,  
15 the isopach of the middle Morrow being Exhibit Number 7.

16 A. Again, for this a crossplot porosity, again, with  
17 a cutoff of 7 percent. We had a very thick sand in our  
18 Warp Speed Number 1, 36 feet that made the cutoff, and it's  
19 shown there on the cross-section. It was fracture-treated.  
20 The initial pressure, it built to around 3600 pounds, which  
21 is under the 4300-pound original pressure for the middle  
22 Morrow, so we thought that we were seeing a little bit of  
23 depletion from the Green "B" 11 that's less than half a  
24 mile away from the south. There were no other middle  
25 Morrow producers in the area at the time.

1           It tends to support a northwest-to-southeast-  
2 trending sand also, or a directional perm in that way. But  
3 frankly, the middle Morrow -- it underproduces. It's very  
4 efficient, 20-foot sands like the Green "B" to the south,  
5 22 feet, and it's only going to make half a BCF also.

6           So the point, really, of the middle Morrow is,  
7 it's not even producing the reserves that are probably in  
8 place on this. We've got to figure out how to get those  
9 eventually. But I'll show you some volumetrics.

10           We have not shot it again in the Warp Speed  
11 Number 2. We certainly want to continue to produce it in  
12 the Warp Speed Number 1. It's going to require a  
13 compressor, and I do have a little bit of data to show  
14 later that we did a vent test on it to see what it would do  
15 separately after it was shut in and isolated from the lower  
16 Morrow.

17           Q. Mr. Cate, what conclusions can you reach from  
18 EOG's geologic information on the Morrow formation in this  
19 area?

20           A. Well, we use not just mapping but also  
21 volumetrics based on the P/Z data from the pressure data  
22 that I'll show you, to arrive at the sizes of the  
23 reservoirs. You can see that it's in a -- the lower  
24 Morrow, especially, is in a sand-shale-sand-shale sequence  
25 that lends itself to being very lenticular and discrete

1 reservoirs within the lower Morrow section.

2 The middle Morrow, on the other hand, is thicker  
3 and very tight, and it doesn't seem to produce up to what  
4 its volumetrics would indicate the gas in place to be.

5 Q. Let's go to the engineering portion of your  
6 presentation, and I'd ask you to refer to the -- We have,  
7 basically, Mr. Examiner -- the next three exhibits are  
8 packets of information that address three individual wells.  
9 And so I'd like to refer first to what has been marked  
10 Exhibit Number 8, the information on the Warp Speed Federal  
11 Com Number 1, and I'd ask you to review that for Mr.  
12 Catanach.

13 A. All right. Exhibit Number 8 is the packet of  
14 data for the Warp Speed "7" Federal Com Number 1, and I'll  
15 just walk through each page.

16 The top page is a production plot. It shows that  
17 the well has cum'd approximately .6 of a BCF to date.  
18 During this time period -- By the way, this is a daily  
19 production plot, so to the left over there you can see that  
20 the well IP'd at approximately 3000 MCF a day. It was  
21 commingled at the time between the middle and the lower  
22 Morrow.

23 But we ran production surveys, two surveys so  
24 far, but the initial one showed 80 percent of the  
25 production to the middle Morrow, 20 percent to the lower

1 Morrow. Frankly, when we drilled the Warp Speed Number 2,  
2 we thought that that was going to hold for the remaining  
3 production. And then we ran another production log after  
4 drilling the "7" 2 and found out it's the Morrow. You  
5 can't always be right on the Morrow. And it turned out  
6 that the middle was almost not producing at all. Five  
7 percent from the middle Morrow, 95 percent from the lower  
8 Morrow.

9           So I've allocated most of the production to the  
10 lower Morrow. It appears that the initial rapid decline  
11 after the well first came on was probably the middle Morrow  
12 declining rapidly after the fracture treatment, which is  
13 coincident with when we ran. We ran it just -- the  
14 production log, a few days after frac'ing the middle Morrow  
15 and putting the well on line.

16           So it appeared to me that what's reasonable is  
17 that the middle Morrow really fell off rapidly, and then  
18 you see a nice stable pattern for the last year that I  
19 believe indicates was mostly lower Morrow production. So  
20 I've used that as the basis of my production allocation of  
21 .8 of a BCF and approximately .4 of a BCF to the middle  
22 Morrow, for the EUR.

23           The next page is a wellbore schematic. As the  
24 well sits now it is shut in, pending a simultaneous  
25 dedication outcome. There's a packer between the middle

1     Morrow perms and the lower Morrow perms. We ran bombs to  
2     analyze the lower Morrow, and at the time we did that we  
3     blew down the back side, and the bomb indicated no  
4     communication so we knew that we had a good -- verified we  
5     had a good test on the lower Morrow to present pressure  
6     data.

7             The next page, these are going to be the summary  
8     printouts of the Baker Hughes production surveys that were  
9     on the first page, from the test on September 15th, 2001.

10            The next page was December 16th, 2002. Just in  
11     the box with the contributions, and you can see what the  
12     results in the top and then in a graphical form down below  
13     showing the allocations that I talked about on the  
14     production plot.

15            Q.     Okay, the next page, the Test Overview?

16            A.     Yes, next page is the first test when the well  
17     was initially completed. It ran back in July of 2001 for  
18     the lower Morrow only. We ran a 100-hour test while we  
19     were waiting on our pipeline, and it shows that the  
20     pressure stabilized very quickly, just under 4900 pounds.

21            The next plot is a radial flow plot of that test.  
22     It indicates permeability of almost 30 millidarcies. And  
23     we did get into radial flow, and that's the extrapolated  
24     pressure of 4824 pounds. Again, that is original pressure  
25     out here for the lower Morrow.

1           The next plot is the log log plot. It shows on a  
2 derivative -- when you see the derivative tail up at the  
3 very end -- Are you all familiar with which curve is the  
4 derivative curve on this log, or -- Okay, the derivative  
5 curve is the one that, over to the far right it drops and  
6 it goes into this flattening area which is radial flow, and  
7 then you'll see it tail up at the very end. That's  
8 indicative of a boundary. That's called boundary effect,  
9 seeing an extent to the reservoir.

10           That is also support for these being discrete  
11 reservoirs when you -- pressure buildups are able to see --  
12 that can be created by faults or just the sand pinches out.

13           Another point to see, we took this test prior to  
14 frac-treating our lower Morrow, and it showed a very high  
15 skin factor.

16           The next two pages were -- these are a summary of  
17 our field reports from -- I had indicated that at the time  
18 this well had been shut in, while the Number 2 was  
19 producing, in February here we ran our bottomhole buildup  
20 that I just showed you, and we flowed down on the back side  
21 the middle Morrow, just to verify that there was no  
22 communication and that the test was a good test, and this  
23 simply just shows that.

24           The next page is a test overview of the lower  
25 Morrow bottomhole pressure analysis that was run February

1 this year, February, 2002, while this well has been shut  
2 in. A 46-hour test, builds up to just under 1800 pounds.

3 We did get into radial flow on the next page, and  
4 it shows an extrapolated bottomhole pressure of 1788  
5 pounds. I used that to calculate the EUR of 800 million  
6 cubic feet for the lower Morrow.

7 Interesting thing on this one is that our  
8 permeability is very much reduced after we've produced this  
9 well. If you'll remember, the original was almost 30  
10 millidarcy. We are now seeing approximately 3 millidarcy.  
11 One of the things that can be going on is damage as you  
12 produce. This well does produce some fluids. If we do  
13 leave it shut in that is one of our concerns, that the  
14 fluids can sit on the sands and basically change the  
15 relative perm of the sands and possibly cause damage that  
16 may or may not be treatable or removable.

17 And then the next plot is the log log plot on  
18 this most recent analysis. Now, it was not shut in the  
19 hundred hours like the first analysis was. The well got  
20 into the radial flow but did not actually see that boundary  
21 again, and it's because we just didn't have it shut in as  
22 long as the first test. But we did get radial flow, which  
23 allowed us to extrapolate the pressure.

24 And the finally, we did a vent test here just  
25 recently to see what the middle Morrow by itself is capable

1 of. And again, the line pressure out there that we had  
2 been producing the well into is approximately 400 to 500  
3 pounds, and it looks like if we can get this thing down to  
4 around 30 pounds on compressor -- obviously the pressure is  
5 falling. I don't know how long it will last, but we would  
6 like to go ahead and put that on compression and get the  
7 remaining .2 of a B that are derived from the bottomhole  
8 pressure datas that we have here.

9           The bottomhole original pressure and this  
10 pressure that I've got right now are calculated from these  
11 shut-in tubing pressures here and on the original  
12 completion, for the middle Morrow. The others -- the lower  
13 Morrow, of course, is calculated off these two transient  
14 analyses you just saw.

15           Q. Now, Mr. Cate, these individual well exhibits are  
16 organized in the order the wells were drilled; isn't that  
17 right?

18           A. That's right.

19           Q. All right, so let's go now to Exhibit Number 9,  
20 the information you have on the Yogi Bear well.

21           A. That's right, the next well is the Yogi Bear.  
22 They drilled it in July, basically, and brought it on in  
23 September, 2002.

24           As you can see, it's an outstanding well. It  
25 came on at approximately 7 million cubic feet a day. It's

1 produced over a BCF and is still doing 5.5 million a day.

2           There is -- I've got an extrapolated decline here  
3 of approximately 2.5 BCF. This was agreed to or seemed  
4 reasonable by Murchison's estimations also. They believe  
5 that another well has been drilled to the north called the  
6 Kodiak Bear -- or, I'm sorry, the Grizzly Bear, I think,  
7 that is, I think, in the same reservoir, and have given it  
8 approximately 1 BCF. We don't have much data on it right  
9 at this point.

10           But the critical thing is, this was an  
11 outstanding well. We knew that our Number 1 was not in the  
12 same reservoir, the lower Morrow reservoir, and we wanted  
13 to make sure that we protected our correlative rights so we  
14 drilled the Number 2. And as was seen by the pressure data  
15 that I'll show you, it's in that reservoir. So another BCF  
16 and a half. Our Number 2 well is only capable of 600 MCF a  
17 day, versus almost 6 million a day. So there's no way that  
18 our Number 2 well is going to compete and get its fair  
19 share of the reserves, but there's really nothing else we  
20 can do.

21           The second page is their original bottomhole  
22 pressure. I went ahead and increased it slightly down to  
23 the datum of the perfs, this bottomhole pressure here at  
24 10,336 of 4940, and I think I added 11 or 13 pounds just to  
25 get down to the middle Morrow sand, they were -- took the

1 pressure above it. Main point is, it was original  
2 pressure, its own discrete reservoir also.

3 Q. Let's now go to Exhibit Number 10, the  
4 engineering information on the Warp Speed Number 2.

5 A. Warp Speed Number 2, we drilled to try to get  
6 into the Yogi Bear reservoir. We did get the sand, we  
7 fracture-treated it. It just isn't the quality of pay that  
8 the Yogi Bear is. It came on at around a million a day,  
9 but it's already fallen to 600 MCF a day.

10 I've done some drainage calculation that shows  
11 we'll get about 30 acres of drainage off our lease is all,  
12 and I'll show you that in a minute.

13 The next page is a wellbore schematic indicating  
14 that we had re-entered an old Exxon well that was drilled  
15 to approximately 9000 feet. And it was just slightly  
16 unorthodox, so we kicked it over to a standard location in  
17 the lower Morrow sand. That bottomhole location for the  
18 sand that I've got is 703 feet from the west and 1935 from  
19 the north line, just based on our directional survey. It  
20 is a single completion in the lower Morrow at this time.

21 The next page is the bottomhole pressure analysis  
22 for the lower Morrow that was run in January, right after  
23 completion. The well was shut in for 66 hours almost and  
24 built up to approximately 2800 pounds on the test overview.

25 We did get into radial flow, on the next page.

1 You can see the interesting thing happening here with the  
2 radial flow curve is turning over. That's because of the  
3 communication with the Yogi Bear well. Remember, at this  
4 time our Number 1 well was shut in, and there is no other  
5 -- the Green "B" had been abandoned, so there is no other  
6 lower Morrow that it could be, in my opinion.

7           The third and final page there of the analysis  
8 shows the log log plot. And again, the derivative this  
9 time is falling. Now, that is indicative of a  
10 communication with a producing well, as opposed to the  
11 derivative on the other tests that I've showed you where it  
12 goes up: That's a boundary, a no-flow boundary.

13           So this data is, in my opinion, very convincing  
14 that we were in the Yogi Bear reservoir. If you take the  
15 2800 pounds -- or actually it's 2986 pounds, extrapolated,  
16 and apply that to a P/Z of the Yogi Bear reservoir, it's a  
17 3.5-BCF P/Z, which really fits what the 2.5-BCF, the Yogi,  
18 should produce, 1 in the Grizzly according to Murchison,  
19 and then maybe .3 that our new well might get.

20           Q. Let's go now to your summary sheet, EOG Exhibit  
21 Number 11.

22           A. This is a summary of the pressure data, the dates  
23 that these wells were completed and what zones they were  
24 completed in. I've already gone over everything, just so  
25 you'll know that I didn't catch some of the -- Under PSI

1 I've got "\$M". I must have money on the brain or  
2 something, but anyway -- so please disregard that.

3 But again, the main point is, I've got cumulative  
4 production, I've got EURs based on solid transient  
5 analyses. We know that the Yogi had original pressure in  
6 its lower Morrow, we know that the Warp Speed Number 1 had  
7 original pressure in its lower Morrow, and then it was  
8 depleted on down. They cannot be the same reservoir.

9 Then the Warp Speed Number 2 in its lower Morrow  
10 indicates that it is in the same reservoir with the Yogi  
11 Bear, but there is no way that, based on its capabilities  
12 and -- of almost 6 million a day and our capability of only  
13 600 a day, that we cannot effectively compete, you know, in  
14 this reservoir. It's going to be a short-lived reservoir  
15 at these producing rates.

16 At the very bottom I went ahead and went through  
17 some volumetric calculations to show again the middle  
18 Morrow in the Warp Speed 1. It's a very thick sand out  
19 here and underproduces. We're not sure why, except it's  
20 just a tight, tight rock. The lower Morrow in the Warp  
21 Speed Number 1 I had indicated was approximately 180 acres,  
22 separate reservoir, looks like it's almost entirely on our  
23 lease, and it's not seeing any communication with any other  
24 offset wells.

25 And then the Warp Speed Number 2, again we're

1 just going to be outcompeted by the Yogi Bear in that  
2 reservoir, and I believe we need to be allowed to produce  
3 whatever we can to protect our correlative rights from that  
4 well.

5 Q. Mr. Cate, if your Application is denied and EOG  
6 is allowed to only have one well in the northwest quarter  
7 of Section 7, would EOG produce the Number 2 well?

8 A. Yes, we will produce the well that is being  
9 drained, that we're being drained by.

10 Q. So if the Application is denied, the impact on  
11 Murchison to the west would be the same?

12 A. Yes.

13 Q. If the Application is denied you would not, then,  
14 be able to produce the Number 1 well?

15 A. That's correct.

16 Q. You wouldn't produce the lower Morrow in the  
17 Number 1, at least not at this time?

18 A. That's right.

19 Q. And the middle Morrow you would not be able to  
20 produce now, and it would be subject to drainage?

21 A. That's right. And I also believe there's a  
22 potential for damage, as the lower permeabilities on these  
23 transient tests show.

24 Q. Will approval of this Application afford EOG  
25 Resource the opportunity to produce without waste its just

1 and fair share of the reserves under the north half of  
2 Section 7?

3 A. Yes, and possibly not even what gas is under our  
4 lease.

5 Q. In your opinion, will approval of this  
6 Application otherwise be in the best interest of  
7 conservation, the prevention of waste and the protection of  
8 correlative rights?

9 A. Yes.

10 Q. Were Exhibits 3 through 11 either prepared by you  
11 or compiled under your direction and supervision?

12 A. Yes, they were.

13 Q. Can you testify as to their accuracy?

14 A. Yes.

15 MR. CARR: Mr. Catanach, at this time we'd move  
16 the admission into evidence of EOG Exhibits 3 through 11.

17 EXAMINER CATANACH: Exhibits 3 through 11 will be  
18 admitted.

19 MR. CARR: That concludes my direct examination  
20 of Mr. Cate.

21 EXAMINER CATANACH: Okay, Mr. Bruce?

22 EXAMINATION

23 BY MR. BRUCE:

24 Q. Mr. Cate, maybe let's go through your exhibits in  
25 more or less the order you went through them. So starting

1 with your Exhibit 3, which is your lower Morrow Yogi  
2 sand --

3 A. Yes.

4 Q. -- first of all, what is the approximate distance  
5 between the Yogi Bear well and the bottomhole location of  
6 the Number 2 well?

7 A. Judging on this, approximately a quarter mile,  
8 maybe 1300 to 1500 feet.

9 Q. You don't have an exact number?

10 A. No, I did not calculate that.

11 Q. Okay. The Yogi Bear well is not at an unorthodox  
12 location, is it?

13 A. No.

14 Q. Okay. And as to your Number 2 well, was a  
15 bottomhole survey --

16 A. Yes.

17 Q. -- done?

18 A. Yeah, a directional survey throughout the entire  
19 well.

20 Q. Okay. In looking at your Exhibit 4, the cross-  
21 section, now, you've testified that the lower Morrow is  
22 discontinuous. What about the middle Morrow?

23 A. The middle Morrow, if you do volumetrics, it  
24 tells you it's not draining very many acres at all for the  
25 entire package. We believe we saw approximately 800 pounds

1 or so of drawdown or drainage effect from the Green "B" 11,  
2 so it would tend to be slightly more, I guess, continuous.

3 But it still -- for the volumetric calculations,  
4 it still shows that they are not able to produce the gas  
5 that is in place. I believe that it's also showing it's  
6 probably a directional perm to the north, kind of  
7 northwest-southeast -- that's how I chose to map it -- and  
8 that the middle Morrow in another well may or may not see  
9 drainage, even though the sands do correlate very well in  
10 the middle Morrow.

11 Q. Now, you said in the Yogi Bear well you would not  
12 anticipate the middle Morrow being productive; is that your  
13 estimation?

14 A. Yes, I would not, based on our cutoffs and the  
15 lack of crossplot porosity that's seen.

16 Q. What about in your Number 2 well?

17 A. Yes, I believe it will be productive.

18 Q. Does EOG have any plans to complete in the middle  
19 Morrow, in the Number 2 well?

20 A. We would like to, of course, produce that. Right  
21 now we would simply -- we're going to stay with the lower  
22 zone and get all we can get out of the lower zone since it  
23 is in communication with the Yogi Bear. When you add  
24 another zone, one plus one never equal two, and a lot of  
25 times that's because there's just more backpressure down

1 the hole. And that could cause us -- like the production  
2 survey showed us on the Number 1 well, we could actually be  
3 producing the middle and not the lower and not get the  
4 reserves that we should get out of the lower first.

5 Q. If you only produce the Yogi sand in the Number 2  
6 well, about how long do you think that would be productive  
7 before you'd want to come uphole to the middle Morrow?

8 A. Well, at these rates I think there's a, you know,  
9 one- or two-year life to get the majority of the reserves  
10 before we're down to, you know, a hundred MCF a day or so.  
11 I would say probably in a year --

12 Q. Okay.

13 A. -- we would anticipate adding that, after we're  
14 convinced that we've depleted the lower Morrow.

15 Q. So your Application here today would require  
16 approval to go uphole and complete in the middle Morrow at  
17 such time that you've made that determination?

18 A. Yeah, I don't think we're distinguishing between  
19 -- We're not asking to distinguish between middle and lower  
20 -- it's --

21 Q. It's all one --

22 A. -- as far as the Commission --

23 Q. -- formation?

24 A. Yeah. Well, as far as the Commission is  
25 concerned, it --

1 Q. Yeah.

2 A. -- is the Morrow.

3 Q. Okay. So when you do come uphole, then at that  
4 point you would be producing from the middle Morrow in both  
5 the Number 1 and Number 2 wells?

6 A. Possibly. If -- We would put the Number 1 middle  
7 Morrow back on, on compression. The P/Z and decline curves  
8 show that it probably has less than .2 of a BCF, which is  
9 possible that we might deplete that in the next year. I  
10 can say that in all likelihood it will be very marginal, at  
11 best maybe 50 to 100 MCF a day at that point.

12 Again, I think the Number 2 middle, we would  
13 anticipate what we've seen in the other wells out here,  
14 maybe .3 to a half a BCF, which in my calculations would  
15 not even drain the sands under our acreage.

16 Q. In the --

17 A. In the middle.

18 Q. In the middle?

19 A. Yes, we're talking in the middle.

20 Q. Okay. In looking at your maps, is there any  
21 immediate offset production in the middle Morrow?

22 A. Are you saying immediately offset? No, not that  
23 I'm -- The TNT well to the north, I looked in the PI data  
24 and could not see that it was producing.

25 Q. Who's the operator of --

1           A.    I thought that was Devon.  And we thought they  
2 tested it, but frankly I don't have the information.  But I  
3 looked in the PI, and there was no production.  So I'm  
4 assuming it was NER or noneconomic reserves.

5                        In the middle in the south, Mewbourne has  
6 abandoned the Green "B" 11, but they brought on the Empire  
7 "7" Federal Number 2 in the middle.  That's the well --

8           Q.    About when, do you know?

9           A.    It's a new completion.  Two months.  And that is  
10 a middle sand, from what I've been told.  I don't have much  
11 data on it.  But it's not a direct offset, it's, I guess --

12          Q.    Half a mile away or more?

13          A.    Yeah.  Yeah, I mean, I don't know what  
14 definition --

15          Q.    At this point have you noticed -- I mean, I know  
16 it's a new well, but have you noticed any effect from  
17 Mewbourne's Number 2 well on your Warp Speed Number 1 well?

18          A.    We've been shut in, so --

19          Q.    Okay.  Have you been monitoring pressure in the  
20 Number 1 while it's been shut in?

21          A.    Yes, and that was one of the -- the last page in  
22 that Number 1 packet, and we've had about a 1300-pound  
23 surface shut-in on the tubing and on the casing side.

24          Q.    Okay, but have you noticed any difference in the  
25 last two months while that Mewbourne well came on?

1           A.    No.  I mean, really in the middle, from what I've  
2    seen, and the small drainage areas, I would not anticipate  
3    there would be any.

4           Q.    A couple other questions on this.  If you get  
5    approval for what you're requesting today, does EOG have  
6    any plans to drill in the northeast quarter of Section 7?

7           A.    We do not have plans at this time.  Eventually, I  
8    believe every 160 in the Morrow is going to get drilled.  
9    And if we're required to wait until we're only producing  
10   two wells in the 320, so be it.  I believe the data is  
11   showing with all these lenticular reservoirs, that there is  
12   a chance of getting new reserves in the northeast quarter,  
13   but I think we are willing to wait until we deplete the  
14   reserves in one or both of the wells in this simultaneous  
15   Application in the northwest quarter.

16          Q.    So in looking at your cross-section, is the only  
17   place that EOG is being drained in the Yogi sand?

18          A.    No, I believe the middle Morrow in the Number 1  
19   well -- see, it saw -- it did not come in at original  
20   pressure, so --

21          Q.    That was from an old well, though, right?

22          A.    Yes, yes.

23          Q.    It's not facing any immediate drainage from any  
24   well?

25          A.    Well, just because it's not producing doesn't

1 mean there's not a pressure sink that could still be  
2 pulling reserves. You know, if that Green "B" was  
3 abandoned at a lower pressure than the pressure we're  
4 forced to be shut-in at, the gas will move that direction.

5 Q. Now, the maps you've shown me here today, I mean,  
6 the Morrow in this area, it's typical of the Morrow  
7 anywhere in Eddy County, isn't it?

8 A. Well, I don't know that there's typical Morrow.  
9 I mean, we -- I really couldn't say that.

10 Q. Is there anything unique about this Morrow  
11 reservoir as opposed to, say, in the next township to the  
12 north or to the east or to the south?

13 A. No, nothing unique. I mean, we've got a lot of  
14 Morrow production in the Sand Tank area, and there are more  
15 sandbar, 40-foot sand packages, still have high  
16 permeabilities. But you don't see a lot of the sand-shale  
17 sequences like you do up here to the north.

18 But as far as predictive tools for, you know,  
19 volumetrics and all, it's the same, it is the same from  
20 that aspect.

21 Q. Now, on the Number 1 well, I know that's a  
22 vertical well, but was there a directional survey done on  
23 that well?

24 A. I don't believe so. I mean, I know that we  
25 drilled it, you know, within the deviation requirements,

1 but I don't believe so. I don't think we went outside the  
2 five degrees for 500 feet, but I don't believe there was  
3 one run on that.

4 Q. And if I'm reading your maps right, the distance  
5 between the Warp Speed Number 1 -- "7" Number 1 and "7"  
6 Number 2, is it approximately the same as the distance  
7 between the Warp Speed Number 2 and the Yogi Bear well?

8 A. Yes. Now, I looked at that, I thought it was  
9 around 1290 feet or so. It was just under the 1320-foot-  
10 between-well requirement, but -- almost 1320 feet.

11 Q. Looking at your Exhibit 8, Mr. Cate, I just have  
12 a couple of brief questions. At least on the copies that  
13 we received yesterday, you don't have a legend. What is  
14 the green and what is the black --

15 A. Oh, okay.

16 Q. -- at the bottom?

17 A. Yes, that's a good point. The green is the oil  
18 or -- well, condensate production -- it's a gas well -- and  
19 it's pretty minimal, really.

20 Q. Ten barrels a day or less right now?

21 A. Yes, ten or less right now. There are some blue  
22 dots showing some scattered water production, but it seems  
23 to be very little, you know, a barrel or two here and  
24 there.

25 The black curve is the flowing tubing pressure.

1 And as you can see, when we shut the well in, the flowing  
2 tubing pressure went up and stabilized. So that's what the  
3 black one is.

4 Q. Now, the most recent -- Of course, this is on the  
5 Number 1, so this is shut in?

6 A. Yes, it's shut in.

7 Q. Shut in. And so the flowing tubing pressure you  
8 have is flat or even inclining at this point, is it not?

9 A. Well, very minimally, I would say, it has that  
10 appearance. This is a log log plot, and that -- you know,  
11 I wouldn't -- I think I've got data, if I may --

12 Q. Yes.

13 A. -- this last page. It shows the actual tubing  
14 pressure for 2-13 through 2-17, so very recently. And I  
15 think -- It built, well, 25 pounds, but the last two days  
16 were stable at 1320. So it's very minimal. I think maybe  
17 the log log kind of exaggerates the visual effect there.

18 Q. But the first page, this is a semi-log plot,  
19 isn't it?

20 A. Oh, I'm sorry, yeah, it's semi-log. I just meant  
21 the -- yeah, the log scale is in the vertical, though.

22 Q. But if it's flat, would that indicate that the  
23 Number 1 isn't being drained by any other well?

24 A. In a very tight reservoir the transients can be  
25 very slow. I would say that you need a lot more time to

1 see before I'd make that conclusion.

2 Q. How much time would you need to determine that?

3 A. You know, I mean it could be months. I don't  
4 really know that.

5 Q. And on that same -- just a point of  
6 clarification, I just want to make sure that when you did  
7 your first production survey you had 80 percent in the  
8 middle Morrow, right?

9 A. Correct.

10 Q. And the latest one, a few months ago, was five  
11 percent in the middle Morrow. Why do you attribute the big  
12 flip-flop in production?

13 A. Okay, yeah, I thought I had addressed that. The  
14 initial production survey was run very shortly after we  
15 completed the middle Morrow. We fracture-treated it,  
16 brought both zones on, and as you can see it was a pretty  
17 rapid decline from that point. I believe that that's the  
18 middle Morrow --

19 Q. Okay.

20 A. -- depleting.

21 Q. Mine weren't stapled together, so I hope I'm on  
22 the right date. I think the second page of that exhibit,  
23 which is the well --

24 A. For the Number 1? Yeah.

25 Q. Yeah, the well schematic. I just want to

1 clarify. A couple of times on some of these exhibits, like  
2 over on the right side on the well history, under the  
3 September 10th, '01, it says frac upper Morrow interval.  
4 What we're talking about is the middle Morrow, isn't it?

5 A. Correct, yes, it is.

6 Q. Okay. There is no upper Morrow zone that's  
7 productive in these wells?

8 A. No, that's right.

9 Q. Okay. And on your first pressure buildup, you  
10 did have that shut in about 100 hours; is that correct?

11 A. Yes, I believe that's right.

12 Q. Okay.

13 A. It shows on the test overview. Yes, over a  
14 hundred hours while we were waiting on pipeline.

15 Q. Okay. Now again, your main concern is  
16 production, offsetting production from the Yogi sand; is  
17 that correct?

18 A. Well, that is the concern that caused us to drill  
19 the Number 2 well, yes.

20 Q. Now, EOG does have an interest in that Yogi Bear  
21 well, does it not?

22 A. Yes.

23 Q. Do you recall what that interest is?

24 A. I believe it's 50 percent. Mr. Tower is saying  
25 it is 50 percent.

1 Q. Now, are you suggesting that Murchison should  
2 restrict production in the Yogi Bear well?

3 A. No.

4 Q. Just a couple of final questions, Mr. Cate.  
5 Maybe if you have your Exhibits 3 and 7 in front of you,  
6 and that's the Yogi sand and the middle Morrow. EOG wants  
7 to produce so that its acreage in Section 7 can compete  
8 with the offsetting acreage in Section 12 in the Yogi sand,  
9 but looking at Exhibit, by the same token couldn't, say,  
10 Murchison make that same argument about getting another  
11 well in the northeast quarter of Section 12 to compete with  
12 your current and potential production in the middle Morrow?

13 A. I would say yes. Each well has to stand on its  
14 merits. I think we were prepared, if we're turned down, to  
15 have to be shut in. That's a kind of an economic question  
16 that each company has to make. But you have to have data  
17 to support the request, and it has to rise to the  
18 obligations that the Commission, you know, prevent waste  
19 and protect correlative rights. So I would say yes only if  
20 after getting that data it proves that it rises to those  
21 obligations.

22 Q. So are there some general guidelines you could  
23 give me when that should be allowed? I mean, are you  
24 talking separate reservoirs, economics? Could you give me  
25 some --



1 sand. Starting with Warp Speed Number 2, I anticipate 300  
2 million out of it, 2500 million or 2.5 BCF out of the Yogi.  
3 And then the Grizzly Bear, which I admit I don't have that  
4 much information, but in discussions with Mike Daugherty of  
5 Murchison he indicated they thought it would be around a  
6 BCF.

7 So a total reservoir size of approximately 3.8  
8 BCF, and that fits the P/Z for a 5000-pound reservoir  
9 producing approximately 1.4 BCF to date. Our well  
10 encounters the 2900 pounds. It's very close to about 3.7  
11 or 3.8 BCF.

12 Q. Okay. Now, the Murchison well is also producing  
13 from some sands lower than the Yogi sand; is that correct?

14 A. Well, I don't -- I really can't say that they're  
15 producing. The cutoff, I know we gave it, I think, two  
16 feet. I know there's one little spike. I don't see that  
17 contributing in this production data. It's possible that  
18 it's adding a little bit of pay, but -- or a little bit of  
19 production out of the Green. The Green sand has a small  
20 spike of porosity.

21 Q. Okay, so you're attributing most of that to the  
22 Yogi sand in the Murchison well?

23 A. The Murchison well, yes.

24 Q. Why is it that -- Your Well Number 2, why is it  
25 that you think the rates are so drastically different?

1           A.    It's just the Morrow.  If you look at the gamma-  
2 ray comparisons on the Yogi to what we found, the gamma-ray  
3 is much higher in our well, almost 80 units, if I've got my  
4 scale right.

5                        So I would anticipate that we know this lower  
6 Morrow is a very shaly sequence.  Maybe there's just a lot  
7 more shale in this well.  It just acts much tighter, and  
8 that can typically be attributable to a higher shale  
9 content.

10           Q.    Okay.  Now, this well is producing at 600 MCF a  
11 day?

12           A.    Yes, after fracture treatment.

13           Q.    And that's currently producing?

14           A.    It is currently producing.

15           Q.    Okay, the Number 1 well is currently shut in?

16           A.    Yes.

17           Q.    What's the producing rate of that well currently?

18           A.    Zero.  I mean --

19           Q.    If it's --

20           A.    You mean its capacity?

21           Q.    Before it was shut in?

22           A.    Let's see.  We were producing the lower Morrow at  
23 about a 400- to 500-pound line pressure.  We were producing  
24 what I believe is -- well, what the production survey  
25 showed is mostly lower Morrow, 600 MCF a day.  We vent-

1 tested the middle Morrow.

2           If we put this well on compression I'd anticipate  
3 possibly a million, a million and a half for a short period  
4 of time on compression, and then probably fall very  
5 rapidly. It doesn't have that much remaining reserves,  
6 based on the pressure data.

7           Q.    Okay. Is there a reason why you need to produce  
8 the middle Morrow in both the Number 1 and Number 2 well?

9           A.    Well, I think it's more the timing issue. I  
10 believe that the middle Morrow -- we are not able to drain,  
11 effectively drain our acreage in the Number 1 well. The  
12 volumetric calculation for this very thick sand only shows  
13 eight acres. I mean, it's obviously very inefficient.

14                    So I do not believe that having two relatively  
15 poor completions in the middle is a harm to anybody. I  
16 think it just allows us to drain the gas under our lease.

17           Q.    Did you give a drainage area for the Number 1 in  
18 the middle Morrow?

19           A.    Yes, it was on my summary sheet of volumetric  
20 calculations, which is Exhibit 11, and it's at the bottom,  
21 eight acres.

22           Q.    You're saying eight acres?

23           A.    It's -- the middle --

24           Q.    So --

25           A.    I'm sorry.

1 Q. So essentially what you're saying is, it's  
2 necessary to produce that interval in the Number 2 well,  
3 just to drain your acreage?

4 A. Yes.

5 Q. But you don't want to do that right away? Is  
6 that what you testified to?

7 A. Our current plan is to go ahead and produce the  
8 lower Morrow until such a point we believe we've, you know,  
9 protected our acreage or achieved as much of the reserves  
10 as we're going to, and then we would add the middle Morrow  
11 sand.

12 Q. Now, the Green "B" Number 11, you said that had  
13 been abandoned. The whole wellbore has been abandoned?

14 A. Yes, it's no longer a Morrow producer. It was  
15 just recently -- I think it was only making like 20 MCF a  
16 day out of the Morrow interval, and several months ago  
17 Mewbourne went ahead and abandoned it so that they could  
18 drill their Empire 7 Federal Number 2. That's my  
19 understanding.

20 Apparently there's a shallow operator now that's  
21 recompleting that into a shallower zone.

22 Q. Now, the Yogi sand in the Number 1 well is  
23 entirely -- it's just not present, or is it very thin or --

24 A. Would you say again?

25 Q. The Yogi sand in your well Number 1 is just not

1 present at all?

2 A. Yes, we believe it's not present, just the way  
3 that we correlate the shales. And then incorporating the  
4 pressure data, knowing that we had original pressure and  
5 produced ours, the Yogi well comes in original pressure,  
6 and then the subsequent pressure data from the Number 2,  
7 we're convinced they're not the same reservoir. And I  
8 don't see any real indication of the Yogi Number 1 sand.

9 Q. Okay, but you've got two sands, one above and one  
10 below what would be the Yogi sand in the Number 1 well that  
11 you're producing in that well?

12 A. Yes, the Warp -- the Blue sand, what we call the  
13 Warp sand. The Green sand -- you know, frankly, we do  
14 correlate it over to the Green, but something caused  
15 separation from its lower Morrow. It had produced 1.5 BCF,  
16 and our lower Morrow came in at original pressure, so the  
17 Green sand I don't believe is effectively producing in our  
18 Number 1 well.

19 And really, the porosity that shows up in the  
20 Green sand is -- if you see, the gamma-ray across from it  
21 is very high. It's possible that that reading is really --  
22 it's a shale or a sandy shale, and it's just really not  
23 contributing.

24 Q. Was the green sand, was that the prolific sand in  
25 the offset Green "B" Number 11?

1 A. Yes.

2 Q. Okay, and what the Warp sand and what you're  
3 calling the Green sand, they're not present at all in your  
4 Number 2 well?

5 A. That's correct.

6 EXAMINER CATANACH: Okay.

7 EXAMINATION

8 BY MR. JONES:

9 Q. Mr. Cate, does EOG have an interest in the Yogi  
10 Bear State Com Number 1?

11 A. Yes, EOG has an interest in that well.

12 Q. So that's how you got the pressure data on the  
13 well? I noticed you had the pressure --

14 A. Yes, yes, they had sent it to us.

15 Q. On Exhibit 8 showing the Warp Speed Number 1  
16 well, the flowing tubing pressure is 500 pounds; is that  
17 right? Am I reading that right on the --

18 A. Yeah, the line pressure that we were producing at  
19 was between 400 and 500 pounds.

20 Q. What about the Yogi Bear well? What line  
21 pressure is it producing at?

22 A. Its line pressure, I'm not certain. Murchison  
23 has produced this well -- If you look at Exhibit 9, there  
24 is a flowing tubing pressure plot, and they've kept the  
25 well pinched back. I think they like to produce them that

1 way, not to damage them.

2 I remember early on the well had some freezing  
3 problems and all, and -- So I know that Murchison is  
4 producing it -- it's such a good well they're producing it  
5 -- cautiously, I think is the right word.

6 And so the flowing tubing pressure started at  
7 3000 pounds, and we're showing currently around 1500 or so.  
8 I think that's accurate. And --

9 Q. Okay --

10 A. -- so it's lost maybe half its flowing tubing  
11 pressure.

12 Q. Yeah, it looks like it. The Baker surveys, they  
13 use a spinner and a capacitance tool? Is that what they  
14 use --

15 A. Yes, and I just -- I mean, obviously there's a  
16 lot of report, and I didn't put the entire -- I put the  
17 summary of the report in.

18 But they do, they run a capacitance tool to break  
19 out the fluids, gas from water, and then of course a  
20 spinner survey to determine the volumes as they go above  
21 and below sets of perms. And I think they also had a  
22 temperature survey, which correlates to where the gas is  
23 entering the wellbore, when you get the temperature  
24 deflection.

25 Q. Okay, on your first pressure test, on the 1

1 Number 1 --

2 A. Uh-huh.

3 Q. -- that was done after a flow period ended, a  
4 certain flow period, you shut it in after the flow period  
5 was --

6 A. Yes, yes.

7 Q. The flow period, is that shown anywhere, or is  
8 that on your decline curve?

9 A. No, this was -- On the first test?

10 Q. Yes.

11 A. This was done before, we were waiting on  
12 pipeline.

13 Q. Basically you just tested it awhile and --

14 A. Yeah, I think it was like a two-day flow, or  
15 possibly just 24-hour flow and then shut in. I've got that  
16 data, I didn't bring it. It was a short period, and it was  
17 prior to producing on the pipeline, so it was only to get  
18 enough drawdown to get a good test.

19 Q. So it was pretty stable, the flow rate was --

20 A. Yes.

21 Q. -- stable --

22 A. Yes, and this -- Yes, it was only approximately  
23 800 MCF a day, and it was before the fracture treatment.  
24 And so it blew down to -- I want to say around maybe 400  
25 pounds, and we let it produce for a day or two and then

1 shut it in.

2 Q. For 102 hours or so?

3 A. Yes, while we were waiting on the pipeline.

4 Q. Did -- this analysis on -- shows classic wellbore  
5 storage. That's what you analyzed, the wellbore storage  
6 portion, or you analyzed the radial flow portion?

7 A. Well, yeah, I mean on the log log plot I always  
8 just go -- and the unit slope is the wellbore storage, and  
9 when you set that portion of it on the curve, that tells  
10 the equation what -- wellbore storage factor, that's the C,  
11 the Cs --

12 Q. Yeah.

13 A. -- so when you set that, it sets, then, the  
14 wellbore storage factor in the model.

15 Q. Okay. And so that's why it came up -- it was  
16 before your frac job, so that's why it showed so much skin?

17 A. Yes, and a lot of that skin -- you know, skin can  
18 include turbulent flow. A lot of things make up skin, poor  
19 perforating or it didn't just, you know, penetrate  
20 completely. All of those kind of comprise that skin.

21 Q. Yeah. On the derivative it shows two dips there.

22 A. Yeah, I don't --

23 Q. I've forgotten why the -- Why do they show two  
24 dips?

25 A. You know, I don't know that. It could be, you

1 know, the boundary effects or something. But it shouldn't  
2 be like a fluid desegregation; that typically will be more  
3 in the wellbore storage time period. So I'm really not  
4 sure what those signify.

5 Q. Okay. But it did trend up at the end, so you  
6 interpret that to be a boundary, and that would be the  
7 boundary you -- As far as where the boundary was, you  
8 couldn't hardly tell which direction it was; it was just a  
9 boundary?

10 A. Right. No, there's really no way of knowing the  
11 direction. You know, you can go into the geologic model,  
12 none of which is a unique solution, but you can play with  
13 100 feet boundary and get good matches.

14 You know, typically we use this infinite  
15 homogeneous and try to see the radial flow, and that gives  
16 you your perm, your skins, your extrapolated pressures.

17 Q. Okay. And then you frac'd the well, produced it  
18 awhile, and then shut it in and ran a -- you ran the  
19 pressure test, so the pressure gauge -- and produced it a  
20 while and then shut it in, the final -- it's been shut in  
21 ever since, right?

22 A. Yes.

23 Q. That segment has, I guess, is what I'm trying to  
24 say.

25 A. Yes. Yeah, early on, we completed the lower

1 Morrow, ran the buildup, frac'd the lower Morrow, added the  
2 middle Morrow, frac'd it, ran the production survey,  
3 produced for two years, and then we had to shut in in order  
4 to produce the Warp Speed Number 2.

5 Just prior to shut in, though, we did run the  
6 second production survey, shut the well in and ran the  
7 bomb.

8 Q. At the same time, or you ran the bomb before you  
9 shut it in?

10 A. No, I think -- No, I think actually we were shut  
11 in and ran the bomb and just again flowed it back to that  
12 600 a day.

13 I think we were actually shut in for over a month  
14 at the time we went with the second bomb.

15 Q. Shut it in and ran the pressure sensor and then  
16 flowed it for a few days and then shut it in again?

17 A. Yes, yes.

18 Q. Okay.

19 A. And I think all that is listed in the two-page --

20 Q. Okay.

21 A. There was two pages on February 5th in there  
22 where we were -- we flowed to the test tank for six hours,  
23 flowing tubing pressure 100 pounds at the 1.2 rate, and  
24 then shut the lower Morrow in and ran the bottomhole gauge.

25 So we did vent it for, what, about ten hours to

1 get it drawn down and then run or test. And then the lower  
2 has been shut in ever since.

3 Q. Okay. So this second test included both zones?

4 A. No, just the lower.

5 Q. Just the lower, okay. And it showed a  
6 considerable difference in the -- well, obviously negative  
7 skin, which is --

8 A. Yes, it had been fracture-stimulated, so now you  
9 would expect a negative skin, although I really didn't see  
10 a bilinear -- like a slope of 2 or 4 that shows you the  
11 linear flow, it really didn't show up here, you know.

12 So it's a pretty ineffective frac, and that's --  
13 You know, over time I think those fracs heal, you know, and  
14 maybe some damage occurs as you flow and shut in, so --

15 Q. What is this binary foam? What do you mean by  
16 binary?

17 A. Binary foam is to protect the reservoir from --  
18 It's a non-water -- sometimes it's a mixture of like a  
19 methanol, almost like an alka-foam frac. Maybe you've  
20 heard that term.

21 But it's -- I mean, it will have some KCl in it,  
22 but it's also got a lot of the methanol, and the purpose on  
23 those Morrow is that they're sensitive to damage, and they  
24 want to use a friendly fluid on it.

25 Q. So you did everything right, it just is expensive

1 with -- No telling what else you can do on that one.

2 A. Nothing.

3 MR. JONES: Okay, thanks.

4 FURTHER EXAMINATION

5 BY EXAMINER CATANACH:

6 Q. Okay, just one more, Mr. Cate. Have you  
7 estimated what you might recover out of the middle Morrow  
8 in the Number 2 well?

9 A. I've got -- I can apply the same volumetrics.  
10 We've got -- just look at my map, I think it was 12 --  
11 middle Morrow map here -- 14 feet. I can tell you that the  
12 resistivity curve shows almost no separation, and a lot of  
13 these don't out here, indicating low permeability. And I  
14 believe we're looking at .2 or .3 of a B is all.

15 If you proportion the 14 to the 36 feet in our  
16 Number 1, that's only going to make .3; it could be as low  
17 as .1 of a BCF.

18 So I believe that it's going to be what we would  
19 call marginal. Maybe .3 of a BCF would be expected.

20 Q. Okay. And in that well you anticipate 300  
21 million remaining in the lower; is that right?

22 A. That's the EUR. We've actually produced around  
23 30 million or so to date.

24 Q. So about 270 remaining?

25 A. Yes, and that is based on proportioning to the

1 Yogi's 6 million-a-day rate versus our 600. We're going to  
2 get about a tenth of the reservoir, is all, or less,  
3 depending on what the Grizzly produces.

4 Q. Okay, what's remaining in the Number 1 well in  
5 the lower and middle?

6 A. The lower remaining -- I think I listed that on  
7 the summary, Exhibit 11. 400 million is remaining out of  
8 the lower Morrow, and approximately just 100 million in the  
9 middle Morrow.

10 And those are derived using the P/Z from these  
11 pressures that they've got here.

12 EXAMINER CATANACH: Okay, I have nothing further  
13 of this witness.

14 Any further questions of this witness?

15 MR. CARR: That concludes our presentation in  
16 this case.

17 EXAMINER CATANACH: Okay. Would you like to make  
18 any statements at this time?

19 MR. BRUCE: No, sir.

20 EXAMINER CATANACH: No statements. Is  
21 Murchison's position --

22 MR. BRUCE: Mr. Examiner, we're here, number one,  
23 for information and, number two, we're just interested in  
24 seeing what the Division does in cases like this.

25 Obviously there have been many -- There's been one or two,

1 I think, and obviously everything depends on the facts of  
2 the case, and we're just very interested.

3 EXAMINER CATANACH: Okay, there being nothing  
4 further, Case 13,003 will be taken under advisement.

5 (Thereupon, these proceedings were concluded at  
6 10:37 a.m.)

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I do hereby certify that the foregoing is  
a complete and true account of the proceedings in  
the Examiner hearing of Case No. 13003,  
heard by me on February 20 19 2003.

David Catanach, Examiner  
Oil Conservation Division

## CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL February 22nd, 2003.



STEVEN T. BRENNER  
 CCR No. 7

My commission expires: October 16th, 2006