

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. 14760

APPLICATION OF COG RESOURCES, INC.,
TO EXCLUDE THE LEONARD SHALE INTERVAL OF THE
BONE SPRING FORMATION FROM THE SPECIAL RULES
AND REGULATIONS FOR THE RED HILLS-BONE SPRING POOL,
LEA COUNTY, NEW MEXICO

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID K. BROOKS, Hearing Examiner
WILLIAM V. JONES, Legal Examiner

November 10, 2011

Santa Fe, New Mexico

This matter came on for hearing before the
New Mexico Oil Conservation Division, DAVID K. BROOKS,
Hearing Examiner on Thursday, November 11, 2011, at the
New Mexico Energy, Minerals and Natural Resources
Department, 1220 South St. Francis Drive, Room 102,
Santa Fe, New Mexico.

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For the Applicant:

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By: Michael Feldewert

For Concho Resources:

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1 EXAMINER BROOKS: We're going on the record
2 again in docket number 33-11. At this time I will call
3 case number 14760, Application of EOG Resources, Inc.,
4 to exclude the Leonard shale interval of the Bone Spring
5 formation from the special rules and regulations for the
6 Red Hills-Bone Spring Pool, Lea County, New Mexico.

7 Call for appearances.

8 MR. FELDEWERT: Michael Feldewert from the
9 law firm of Holland & Hart appearing on behalf of the
10 applicant.

11 MS. LEACH: I'm Carol Leach with Concho
12 Resources, and I'm here on behalf of Concho, EOG
13 Operating, LLC.

14 EXAMINER BROOKS: Okay. At this time we
15 will defer case number 14760 until the -- further
16 proceedings in case number 14760 will be deferred to
17 1:30 PM today at which time we will proceed to the
18 disposition of that case. Thank you.

19 MS. LEACH: Thank you very much.

20 [Case 14760 deferred until 1:30 PM.]

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1 EXAMINER BROOKS: Case number 14760 we've
2 already called and taken appearances. So at this point
3 in time we will go back on the record in case number
4 14760.

5 And do you have witnesses?

6 MR. FELDEWERT: Yes, Mr. Examiner. We have
7 three witnesses here.

8 EXAMINER BROOKS: Could you ask the
9 witnesses to stand and identify themselves to be sworn?

10 MR. HURLBUT: My name is Douglas W. Hurlbut.

11 MR. ROBERTSON: Steven Dennis Robertson.

12 MR. VILLALOBOS: Joe Villalobos.

13 [Whereupon the witnesses were duly sworn.]

14 MR. FELDEWERT: We call Mr. Hurlbut.

15 DOUGLAS W. HURLBUT

16 after having been first duly sworn under oath,
17 was questioned and testified as follows:

18 DIRECT EXAMINATION

19 BY MR. FELDEWERT:

20 Q. Would you let the Examiner know by -- state your
21 name and then identify by whom you are employed and in
22 what capacity.

23 A. My name is Douglas W. Hurlbut. I'm a petroleum
24 landman with EOG Resources in Midland, Texas.

25 Q. And have you previously testified before this

1 division?

2 A. Yes, I have.

3 Q. Were your credentials as a petroleum landman
4 accepted and made a matter of record?

5 A. Yes, they have been.

6 Q. Are you familiar with the application filed by
7 EOG in this case?

8 A. Yes, I am.

9 Q. And are you familiar with the status of the lands
10 in the area?

11 A. Yes, I am.

12 MR. FELDEWERT: Mr. Examiner, I would tender
13 Mr. Hurlbut as an expert witness in petroleum land
14 matters.

15 EXAMINER BROOKS: He is so qualified.

16 Q. (By Mr. Feldewert) Would you please identify for
17 the Examiner what EOG seeks with this application?

18 A. Well, we are wanting to get an order to exclude
19 the Leonard shale interval, the Bone Springs formation
20 from the special rules and regulations for the Red Hills
21 Bone Springs Pool.

22 Q. Now, is this particular formation an oil
23 producing zone?

24 A. Yes, it is.

25 Q. Would you turn to what has been marked as EOG

1 Exhibit Number 1. Is that a copy of the current special
2 pool rules for the Red Hills Bone Spring Pools?

3 A. Yes, it is.

4 MR. FELDEWERT: And you'll note,
5 Mr. Examiner, that this was entered under order number
6 R-10109 dated April 1994. There has also been some
7 amendments to this rule as late as 1995.

8 Q. Mr. Hurlbut, under these current rules what is
9 the spacing and well density?

10 A. Well, right now it's one well per 40-acre tract.

11 Q. And it's on 80-acre units?

12 A. Yeah, 80-acre units.

13 Q. And then they allow a well in each particular
14 40 acres?

15 A. Quarter quarter, right.

16 Q. Okay. At the time that these pool rules were
17 enacted in 1994 and 1995, was EOG or anyone else, to
18 your knowledge, drilling horizontal wells in the Leonard
19 shale interval in the Bone Springs formation?

20 A. No, they were not.

21 Q. Has EOG drilled a number of horizontal wells in
22 both the sand and shale intervals in the Bone Sprigs
23 formation?

24 A. Yes, they have.

25 Q. To your knowledge, where is the sand interval

1 located within the Bone Springs formation as it relates
2 to the shale interval?

3 A. Well, the sand is at about 12,000 feet and the
4 shale is about 9,000 feet.

5 Q. Is it your understanding that the shale intervals
6 of the Bone Springs formation have different geologic
7 and production characteristics in the sand intervals?

8 A. Yes.

9 Q. And does EOG intend to call a geologist and a
10 reservoir engineer to confirm these different
11 characteristics?

12 A. Yes, we do.

13 Q. Now, since you are seeking to exclude the shale
14 interval from the special pool rules, did you first
15 identify and provide notice of this hearing to the
16 division designated operators within the pool?

17 A. Yes, we did.

18 Q. And did you then also identify and provide notice
19 to the operators of wells in the Bone Springs formation
20 within one mile of this pool's current outer boundaries?

21 A. Yes, we did.

22 Q. If I turn to what's been marked as EOG
23 Exhibit Number 2, is this a depiction of both the
24 horizontal limits of the current pool as well as the
25 one-mile extension from those limits?

1 A. Yes, it is. The pink outline is the current
2 field of the Bone Springs Pool, and the yellow is a
3 one-mile outside boundary.

4 Q. So this was the area of your examination?

5 A. Yes, it was.

6 Q. Is EOG Exhibit Number 3, is that an affidavit
7 with the notice letter for this case?

8 A. Yes, it is.

9 Q. And does the third page of that exhibit identify
10 the operators within the pool and then within one mile
11 of the pool that you notified?

12 A. Yes, it is.

13 Q. And you'll see, does it not, Mr. Hurlbut, that it
14 reflects that everyone received notice of this
15 application?

16 A. Correct.

17 Q. Did you or anyone with your company have any
18 conversations with any of the other operators that have
19 been notified of this application?

20 A. Yeah. I had a phone call from Bob Doty with OXY,
21 and I talked to him about what we were doing out there.
22 And he seemed on board with that. I also had a call
23 from Pat Welch. He's with Concho EOG, and he was also
24 on board with what we were wanting to do here, the order
25 we wanted to seek. And then I think Joe Villalobos, our

1 geologist, also was contacted by Ray Pedania of Yates
2 Petroleum, and Ray Pedania said they were on board as
3 well.

4 Q. Is Exhibit Number 4 an affidavit that reflects a
5 publication in the Lovington Leader of the legal notice
6 for this hearing?

7 A. Yes, it is.

8 Q. And in your opinion, Mr. Hurlbut, would the
9 granting of EOG's application to exclude the shale
10 interval from the special pool rules be in the best
11 interest of conservation, prevention of waste, and the
12 protection of correlative rights?

13 A. Yes, it will be.

14 MR. FELDEWERT: Mr. Examiner, I would move
15 the admission of EOG Exhibits 1 through 4.

16 Q. (By Mr. Feldewert) Or let me ask a previous
17 question. Were Exhibits 1 through 4 compiled by you or
18 put together at your direction?

19 A. Yes, they were.

20 MR. FELDEWERT: I'd move the admission of
21 EOG Exhibits 1 through 4.

22 EXAMINER BROOKS: Exhibits 1 through 4 are
23 admitted.

24 [Exhibits 1 through 4 admitted.]

25 MR. FELDEWERT: And that concludes my

1 examination of this witness.

2 EXAMINER BROOKS: Okay. I don't believe I
3 have any questions. Your proposal would retain 80-acre
4 units?

5 MR. HURLBUT: Do what now?

6 EXAMINER BROOKS: Your proposal would retain
7 the 80-acre units; is that correct? You don't intend to
8 change the fact that this pool would be spaced on
9 80-acre units?

10 MR. HURLBUT: We want to change that to like
11 four wells on a 40 under statewide rules.

12 EXAMINER BROOKS: Oh, you want to change the
13 units to 40s as well as the density?

14 MR. HURLBUT: Right. Because we're going to
15 be drilling increased density wells.

16 MR. FELDEWERT: Mr. Examiner, if I may, the
17 application excludes the shale from special pool rules.
18 I think the end result of that would be the shale would
19 then fall under the general statewide rules.

20 EXAMINER BROOKS: Okay. And this is the
21 same question that Mr. Jones raised this morning, and I
22 have to just check these rules every time because I
23 don't remember them. I guess it's my age.

24 Okay. If the application involves changing the
25 amount of acreage to be dedicated to a well the

1 applicant shall notify owners of interest in the mineral
2 state in existing spacing units with producing wells.

3 I think that probably means that you're going to
4 change the -- it makes sense that that would only mean
5 if you're going to change the amount of acreage
6 dedicated to the existing producing wells. However,
7 it's not perhaps as clear as one might wish. And I
8 assume there are no existing producing wells in the
9 shale; is that correct?

10 MR. HURLBUT: Run that question by me again?

11 EXAMINER BROOKS: Are there any existing
12 wells producing from the shale within this pool?

13 MR. HURLBUT: Not within the existing pool.

14 EXAMINER BROOKS: Okay. I think you're
15 probably okay.

16 EXAMINER JONES: Does that mean that --
17 wouldn't it be especially okay if you had a proposal to
18 actually reduce the -- decrease the vertical limits of
19 the existing Bone Spring pool to include only the sand,
20 in that way create a new pool. The geologists could
21 create a new pool for the -- just including the shale
22 and that pool would be automatically spaced on the --

23 MR. HURLBUT: Right. That would work.

24 EXAMINER BROOKS: It could be done that way.

25 MR. HURLBUT: Well, wait a minute here. Not

1 in the case where we were drilling wells within the
2 unit, within the Red Hills Bone Spring unit. How would
3 that be? That still would be a separate pool I guess
4 maybe as to that formation or that interval.

5 EXAMINER JONES: Is the unit specific to a
6 certain depth or is it all depths?

7 MR. HURLBUT: It's -- I think it's all --
8 well, let's see here. I know what has been drilled
9 there produces the third Bone Springs sand.

10 EXAMINER JONES: Which is 12,000 feet?

11 MR. HURLBUT: 12,000 feet.

12 EXAMINER BROOKS: The potential notice would
13 go away if you left the 80-acre units in place but just
14 increased the well density. And it probably would, in
15 the way you're saying it all -- if you read it the way
16 it's literally stated, if you take the pool out that is
17 not going to apply. And if there are no wells producing
18 from the shale. That's the factual question you need to
19 establish. There are no wells producing from the shale
20 within this pool, right?

21 MR. HURLBUT: Correct, at this time.

22 EXAMINER BROOKS: Okay. I think that
23 probably makes it okay.

24 MR. HURLBUT: Okay.

25 EXAMINER BROOKS: We'll give it some more

1 thought. I have no more questions.

2 MR. FELDEWERT: Call our next witness.

3 JOE VILLALOBOS

4 after having been first duly sworn under oath,

5 was questioned and testified as follows:

6 DIRECT EXAMINATION

7 BY MR. FELDEWERT:

8 Q. Would you please state your name and identify for
9 the Examiner by whom you're employed and in what
10 capacity.

11 A. My name is Joe Villalobos. I'm a petroleum
12 geologist working for EOG Resources in Midland.

13 Q. Have you previously testified before this
14 division, Mr. Villalobos?

15 A. Yes, sir, I have.

16 Q. Were your credentials as a petroleum geologist
17 accepted and made a matter of record?

18 A. Yes, sir, they were.

19 Q. Are you familiar with the application filed by
20 EOG in this case?

21 A. Yes, sir, I am.

22 Q. And have you conducted a study of the lands that
23 are the subject of this application?

24 A. Yes, sir, I have.

25 MR. FELDEWERT: I would tender

1 Mr. Villalobos as an expert witness in petroleum
2 geology.

3 EXAMINER BROOKS: He is so qualified.

4 Q. (By Mr. Feldewert) Before we begin there was a
5 reference to a conversation that you had with another
6 operator about this application.

7 A. Yes, sir.

8 Q. And do you recall who that was, and just relay
9 the nature of that conversation.

10 A. I've had two conversations with two different
11 geologists, Ray Pedania with Yates Petroleum and Pat
12 Welch with Concho. And basically they have activity in
13 this Red Hills area. And we've discussed the geology
14 and activity in that area before. And basically they
15 called and they said they were very supportive of our
16 application in this hearing because they felt it would
17 help everybody that has operations out there.

18 Q. Now, would you just identify for the Examiners
19 here the various producing intervals in the Bone Springs
20 formation that is the subject area.

21 A. There is two main intervals that are productive
22 in the Red Hills area. At the top of the Bone Spring
23 interval is a Leonard shale, which is roughly about
24 500 feet thick, and that's the new zone that we have
25 recently started developing, exploiting. And there is

1 the older zone at the base of the Bone Spring formation,
2 which is referred to as a third Bone Spring sand.

3 Q. Now, is this Leonard shale also known by some as
4 the Avalon shale?

5 A. Yes, sir, the Leonard shale is also referred by
6 other operators as the Avalon shale.

7 Q. Would you turn to what has been marked as EOC
8 Exhibit Number 5. I ask that it be pulled out of the
9 the exhibit notebook.

10 A. Okay.

11 Q. And we'll probably leave that out as we continue
12 our examination here.

13 A. Okay. The exhibit --

14 Q. But you would just identify that for the
15 Examiners, please? And why don't you give them a minute
16 to get it out of their notebook. Okay. Why don't you
17 identify for the Examiners EOG Exhibit 5.

18 A. Exhibit Number 5 is a structure map on top of the
19 Bone Spring formation, Bone Spring lime. It is a very
20 easy marker that most operators use to map in this area.
21 And it is of the Red Hills area located in Southeast Lea
22 County, New Mexico. The bold red outline at the center
23 of the exhibit is the Red Hills Unit, which is operated
24 by EOG Resources. The reddish brown dots are the
25 productive Third Bone Spring producers of the Red Hills

1 Unit. That is typically found at about 12,000 to about
2 12,300, somewhere in there.

3 The exhibit also shows the type log that is
4 designated there in section 26 of township 25 south,
5 33 east, which is where EOG has drilled five horizontal
6 wells and one monitor science well, if you will, where
7 we have conducted the bulk of our research in this unit.
8 And those wells there in section 26 are horizontal
9 Leonard shale producers.

10 Q. Is that known as the Lomas Rojas Study Area?

11 A. Yes, sir. This is the Lomas Rojas 26, a study
12 area. The exhibit also shows a three-well cross section
13 in dark blue. That is designated by the three triangles
14 that are part of Exhibit Number 6, which I'll go into
15 later.

16 Q. So you have a type log that corresponds to what
17 is shown down in the left corner of the exhibit in
18 section 26 that we're going to go through as an exhibit,
19 correct?

20 A. Yes, sir.

21 Q. And you have a cross section map that corresponds
22 with the blue lines?

23 A. Yes, sir.

24 Q. Anything else about this structure map?

25 A. No, sir. It's a very common interval that's

1 mapped by all the operators out here, and it basically
2 shows dip to the southeast just to give an idea of what
3 the structure looks like in this area.

4 Q. So with respect to the area at issue here, is the
5 geology of the Bone Springs formation consistent
6 throughout this area?

7 A. Yes, sir. The geology of the Bone Spring
8 formation is laterally continuous throughout this area,
9 a very gentle dip of about 1 degree, just laterally
10 continuous.

11 Q. Okay. If we keep this map out on the table and
12 we turn to what has been marked as EOG Exhibit Number 6.
13 Is this the cross section that corresponds to your -- or
14 the type of cross section that corresponds to the blue
15 line on Exhibit Number 5?

16 A. Yes, sir, it is.

17 Q. Why don't you walk the Examiners through that
18 exhibit, please.

19 A. This cross section that's Exhibit Number 6 is a
20 southwest to northeast cross section starting from the
21 left-hand side, which is the southwest going to the
22 right-hand side, which is the northeast. And basically
23 what I have attempted to do here is to show the
24 productive intervals of the Leonard shale which is found
25 up there. It's shaded in green, and we denote it as a

1 Leonard target zone, Leonard shale.

2 And then about 2800, 3,000 feet below that in
3 orange we have noted the Third Bone Spring sands, which
4 is productive in the EOG Resources North Red Hills Unit.
5 And what we have attempted to show here is basically
6 show the productive intervals as well as the
7 stratigraphic separation of roughly 26 to 2800 feet
8 between the Leonard shale at the top of the Bone Spring
9 formation and the third Bone Spring sand at the base of
10 the Bone Spring formation.

11 Q. Now, do you also have a type log that is
12 associated with the well that is shown in section 26 on
13 Exhibit Number 5?

14 A. Yes, sir. Exhibit 7 is the type log that we are
15 using to designate the Leonard shale productive interval
16 in this area. The reason we selected this log is
17 because we had a lot of science here. It was our
18 science well. And the Leonard shale is very distinct,
19 very, very easy to find in this log, in this type log.
20 Basically what I'm showing is that the Leonard shale
21 begins at the base of the Bone Spring lime roughly at
22 9250. And the base of the Leonard shale is at 9548
23 right above that massive carbonate, which is also part
24 of the Bone Spring formation.

25 Q. This type up here, is this for the well that's

1 actually referenced in the application to define the
2 shale interval that you seek to exclude from the special
3 pools?

4 A. Yes, sir, it is.

5 Q. Now, in your opinion is there communication
6 between the Bone Springs sand interval, producing
7 interval, and the Bone Springs Leonard shale interval?

8 A. No, sir, in my opinion there is no communication
9 between the Leonard shale and the Third Bone Spring
10 sand.

11 Q. Are there different geologic and production
12 characteristics between the Bone Spring sand and the
13 Bone Springs Leonard shale intervals?

14 A. Yes, sir, there is. The Third Bone Spring sand
15 at 12,000 feet is what we refer to as a conventional
16 reservoir, good porosity, good permeability values. We
17 are typically developing this reservoir with vertical
18 wells.

19 And the Leonard shale is what we would refer to
20 as an unconventional reservoir. It is a shale
21 reservoir, very low permeability, low porosities. And
22 we are exploiting this shale with horizontal wells as
23 well as -- you know, frac stimulation is required to
24 make these wells economic.

25 Q. So as a geologist, do you look at the shale

1 interval differently from the sand interval from a
2 development standpoint?

3 A. Yes, sir, I do.

4 Q. And as a geologist would you consider them to be
5 separate sources of supply?

6 A. Yes, sir, I do.

7 Q. Is EOG presenting a reservoir engineer to discuss
8 the results of the drilling program in the Leonard shale
9 down in the Lomas Rojas study area?

10 A. Yes, sir, we are.

11 Q. Which is shown on EOG Exhibit Number 5, correct?

12 A. Yes, sir.

13 Q. My question to you is if we look at section 26 in
14 EOG Exhibit Number 5 down in the left-hand corner. In
15 your opinion as a geologist, are the results from that
16 Lomas Rojas study area equally applicable across the
17 area that currently comprises the Red Hills Bone Springs
18 pool?

19 A. Yes, sir, they are.

20 Q. In your opinion will the granting of EOG's
21 application be in the best interest of conservation, the
22 prevention of waste, and the protection of correlative
23 rights?

24 A. Yes, sir, it will be.

25 Q. Were EOG Exhibits 5 through 7 prepared by you or

1 compiled under your direction or supervision?

2 A. Yes, sir, they were.

3 MR. FELDEWERT: Mr. Examiner, I would move
4 into evidence EOG Exhibits 5 through 7.

5 EXAMINER BROOKS: Exhibits 5 through 7 are
6 admitted.

7 [Exhibits 5 through 7 admitted.]

8 MR. FELDEWERT: And that concludes my
9 examination of this witness.

10 EXAMINER BROOKS: Okay. I don't think I
11 have any questions at the moment. I'll pass it to
12 Mr. Jones.

13 EXAMINER JONES: This cross section, did you
14 hang it on top of the Bone Spring?

15 MR. HURLBUT: It's a structure. It's a
16 structure cross section.

17 EXAMINER JONES: Okay. So it is on top of
18 Bone Spring. So is the Bone Spring that easy to pick?
19 Based on this type log you can see it pretty good, I
20 guess, from the Brushy Canyon down into the Bone Spring.
21 But is it always that easy to pick?

22 MR. HURLBUT: The Bone Spring lime, which we
23 use to map on, is thin in some places considerably, and
24 makes it a little difficult. But if you look at the
25 resistivity you will see that that really shows a very

1 tight formation, and that helps a lot. But in most of
2 Lea County and Eddy County it's a pretty good marker.
3 There is some stratographic difficulties in certain
4 areas. But for the most part if you look at it real
5 closely you should be able to designate the Bone Spring
6 lime or where it should be. Sometimes it's only 10 feet
7 thick.

8 EXAMINER JONES: Because I know there's a
9 place called Nash Straw, Avalon, Delaware, and it's kind
10 of like where the Avalon seems to -- it's kind of a
11 decision whether it's really up in the Brushy or the
12 down in the Bone Spring.

13 MR. HURLBUT: That upper part of the Bone
14 Spring formation is a little complicated, and that's the
15 reason why we've been mapping and using the Bone Spring
16 lime as our marker because that's a little bit more
17 diagnostic. As you go above it there is a considerable
18 stratographic change. And some people refer to it, as
19 you say, as lower Brushy. Other people will still
20 consider it part of the Bone Spring.

21 EXAMINER JONES: But does our geologist
22 agree with you on this interpretation, Paul Kouts? He's
23 in Lea County, right?

24 MR. HURLBUT: I am not sure, Mr. Jones. I
25 know that this is a GDS top, that they consistently

1 pick -- the mapping services typically pick this top,
2 and that's why we picked it because it's a very common
3 marker for the industry.

4 EXAMINER JONES: Oh, sure. And this shale
5 that you're targeting looks like 300 feet thick or so;
6 is that right?

7 MR. HURLBUT: Yes, sir, roughly about
8 300 feet thick.

9 EXAMINER JONES: And you're going to go
10 right in the middle of it? You're going to have another
11 witness to talk about that, I guess. But for
12 geology-wise, how do you pick your target?

13 MR. HURLBUT: We tried to -- we select the
14 sweetest spot within that shale based on porosity and
15 resistivity values.

16 EXAMINER JONES: But not mud log?

17 MR. HURLBUT: Mud log through the whole
18 interval, through the whole 300 feet you see a nice
19 increase of gas, and that's what kind of led us to the
20 plate.

21 EXAMINER JONES: So it's a gas plate?

22 MR. HURLBUT: It's oil.

23 EXAMINER JONES: It's oil?

24 MR. HURLBUT: On the mud log you'll see a
25 gas increase in the zone, yes, sir.

1 EXAMINER JONES: And there are some other
2 shales here on top of these other sands, but they're not
3 as good as this one?

4 MR. HURLBUT: We're still evaluating some of
5 those.

6 EXAMINER JONES: Did you work this area
7 before with your other employer or employers?

8 MR. HURLBUT: No, sir. I mainly work the
9 Midland basin, central basin platform. This area here,
10 I've worked it since I started with EOG in 2004.

11 EXAMINER JONES: Did you work the Cotton
12 Draw Unit?

13 MR. HURLBUT: I did a little bit of work on
14 it.

15 EXAMINER JONES: I have no further
16 questions.

17 EXAMINER BROOKS: No further questions.

18 MR. FELDEWERT: We then call our third and
19 final witness.

20 STEVE ROBERTSON
21 after having been first duly sworn under oath,
22 was questioned and testified as follows:

23 DIRECT EXAMINATION

24 BY MR. FELDEWERT:

25 Q. Would you state your name for the record and

1 identify for the Examiners by whom you are employed and
2 in what capacity.

3 A. Steven D. Robertson, EOG Resources, and I'm a
4 reservoir engineer.

5 Q. Have you previously testified before this
6 division?

7 A. Yes, I have.

8 Q. And were your credentials as a petroleum
9 reservoir engineer accepted and made a matter of public
10 record?

11 A. Yes, they were.

12 Q. Are you familiar with the application filed by
13 EOG in this case?

14 A. Yes, I am.

15 Q. And have you conducted a study of the area that
16 is the subject of this application?

17 A. Yes, I have.

18 MR. FELDEWERT: I tender Mr. Robertson as an
19 expert witness in petroleum reservoir engineering.

20 EXAMINER BROOKS: So qualified.

21 Q. (By Mr. Feldewert) Mr. Robertson, I'd like you
22 to turn to what has been marked as EOG Exhibit Number 8.
23 Is this a depiction of the development plan that you put
24 together for this area?

25 A. Yes, it is.

1 Q. In fact, Mr. Robertson, wasn't this particular
2 development plan the subject of a case before these same
3 Examiners the last time you were up there?

4 A. Yes, it is.

5 MR. FELDEWERT: And for the record,
6 Mr. Examiners, that was case numbers 14738 and 14739,
7 which was heard on September 29th.

8 EXAMINER BROOKS: Okay.

9 Q. (By Mr. Feldewert) Mr. Robertson, what was the
10 basis for putting together this development plan for the
11 Leonard shale in this particular area?

12 A. The basis was a spacing test that we conducted in
13 section 26 called the Lomas Rojas area.

14 Q. And that's the area that we've been referencing
15 on Exhibit Number 5, which is down in the left bottom
16 corner of the exhibit in section 26, EOG Exhibit
17 Number 5?

18 A. Yes, it is.

19 Q. Before we get to that study, was that particular
20 study area approved by the division?

21 A. Yes, it was in a meeting between EOG personnel
22 and OCD personnel.

23 Q. Why did you conclude that this Lomas Rojas area
24 provided a good study ground for the Leonard shale
25 component for the Bone Springs formation in this

1 particular area?

2 A. It has the formations that are typical of the
3 Leonard shale and the Third Bone Springs throughout the
4 Red Hills area. And the zones are laterally continuous
5 and fairly uniform within that section.

6 Q. And I'd like you to turn to what has been marked
7 as EOG Exhibit 9. Would you identify that for the
8 Examiner and explain what you did in this Lomas Rojas
9 study area?

10 A. Yeah, this the section 26 and 25 south, 33 east.
11 And in this section we have five horizontal wells and
12 one observation well. And we are doing a pattern
13 spacing test whereby horizontal well number 2H is at a
14 1320-foot spacing, typical 160-acre spacing for a
15 horizontal. And it's confined by two wells, one on
16 either side.

17 The number 4H well is a confined well at 880 feet
18 spacing, which would be about 107-acre drainage area.
19 And that well is also confined. And so we're comparing
20 the EURs of those wells to see if reducing the spacing
21 would reduce the reserves or not.

22 Q. Does this exhibit also depict your net pay?

23 A. Yeah, the contours on there are net pay
24 thickness. And you can see there is a slight thinning
25 of the net pay as we go from east to west. And so in

1 order to compare these wells on an equal basis we have
2 done normalization of the EURs, the Estimated Ultimate
3 Recoveries, so that we can compare them on an equal
4 basis. And we've normalized them by pay thickness, oil
5 in place, oil content, and lateral length.

6 Q. And let's go to the results, which as I
7 understand, is marked on EOG Exhibit Number 10?

8 A. Yes, it is.

9 Q. And why don't you explain this exhibit to the
10 Examiners, please.

11 A. This shows the normalized EURs for the wells in
12 the Lomas Rojas area. And, in particular, we want to
13 look at the EURs for well number 4H and well number 2H.
14 And we can see that despite the change in average
15 distance between wells, the calculated EURs for those
16 two wells are basically the same, about 165 MBOs. And
17 so our conclusion from that is that we can go to the
18 880-foot spacing without hurting our estimated ultimate
19 recoveries.

20 Q. And that would result, as I understand it, in
21 roughly six horizontal wells per section?

22 A. Yes, it would.

23 Q. And that's actually the plan that's reflected on
24 EOG Exhibit Number 8, correct?

25 A. That's correct.

1 Q. And those wells are spaced 880 feet apart?

2 A. Yes, they are.

3 Q. And that's the development plan that you would
4 like to implement throughout this area?

5 A. Yes, it is.

6 Q. Are you concerned about waste if this particular
7 development of pattern is not followed for the Leonard
8 shale interval in the Bone Springs formation?

9 A. Yes, I am. Yeah. If we were to drill four wells
10 per section then basically we would be leaving out two
11 wells that could recover 165 MBO each. So we would be
12 basically missing out on 330 MBOs per section.

13 Q. And the problem you face as a company, as I
14 understand it, is that the current special pool rules
15 would not allow development under this pattern, correct?

16 A. That's correct.

17 Q. Now, from the production reservoir engineering
18 standpoint are the production characteristics in the
19 sand intervals of the Bone Springs formation different
20 from the shell or a shale interval?

21 A. Yes, they are.

22 Q. What are those differences and how do they relate
23 to --

24 A. The Leonard shale is a much lower permeability,
25 probably a factor of two orders of magnitude, a factor

1 of 100, and so it takes much more stimulation through
2 the horizontal wells with transverse fracs in order to
3 drain that formation. And so the main difference is the
4 difference in permeability between the two zones.

5 Q. So as a reservoir engineer do you consider them
6 to be separate sources of the supply requiring different
7 development plans?

8 A. Yes, I do.

9 Q. We noted that special pool rules were enacted in
10 1994 and 1995. Was anyone drilling in the Leonard shale
11 interval at the time that those pool rules were enacted?

12 A. No, they were not.

13 Q. Did you have an opportunity to examine the record
14 from the hearings that resulted in the adoption of the
15 special pool rules or Red Hills Bone Springs pool as
16 they exist today?

17 A. Yes, I did.

18 Q. And what did you observe from your review of that
19 record?

20 A. Those were put in place for the Third Bone
21 Springs sand but were not -- the calculations that led
22 to that spacing do not apply to the Leonard shale.

23 Q. Well, the density that's allowed under the
24 current statewide rules, in other words, if this was
25 excluded from the special pool rules, will the current

1 statewide rules allow EOG to develop this area using the
2 880-acre spacing pattern that we see in EOG Exhibit
3 Number 8?

4 A. Yes, they do. They allow four wells per
5 40 acres, and we're asking for six wells per section.
6 So that would be allowed under the statewide rules.

7 Q. And, again, in your opinion, do you think waste
8 will occur if EOG is not allowed to develop the shale
9 interval in this area under the current statewide rules?

10 A. Yes, I do.

11 Q. In your opinion will the granting of this
12 application be in the best interest of conservation, the
13 prevention of waste, and the protection of correlative
14 rights?

15 A. Yes, I do.

16 Q. Were Exhibits 8 through 10 prepared by you or
17 compiled under your direction or supervision?

18 A. Yes, they were.

19 MR. FELDEWERT: I would move the admission
20 of evidence of Exhibits 8 through 10.

21 EXAMINER BROOKS: 8 through 10 are admitted.
22 [Exhibits 8 through 10 admitted.]

23 MR. FELDEWERT: And that concludes my
24 examination of this witness.

25 EXAMINER BROOKS: How many wells are you

1 saying it takes to develop a section? You said six
2 horizontals?

3 MR. ROBERTSON: Six horizontals per section
4 is what we currently view as prudent.

5 EXAMINER BROOKS: Okay. It looks like these
6 were mile and a half long horizontals that you did here.

7 MR. ROBERTSON: In that example they were,
8 yes.

9 EXAMINER BROOKS: And what do you consider
10 to be the optimal length?

11 MR. ROBERTSON: A mile and a half is what
12 we're currently planning for where land allows it.

13 EXAMINER BROOKS: I guess that's all I have.
14 I'll pass it to Mr. Jones.

15 EXAMINER JONES: That pool that we're
16 working on here, you probably somewhat already answered
17 that probably. Is it just within the Red Hills Unit or
18 is it down to the southeast of that unit? I guess
19 you've got an exhibit that shows that.

20 MR. FELDEWERT: Mr. Examiner, I think it's
21 Exhibit 2. And it would identified in the pink on
22 Exhibit 2. And there is a slight difference between the
23 Red Hills Unit and the current designation of the Red
24 Hills Bone Springs pool area.

25 EXAMINER JONES: So you chose to work on the

1 pool here on this application and not limit it to the
2 unit itself. And with six wells per section that would
3 mean creating project areas that -- would you create one
4 big project area for a whole section and then drill six
5 wells just to get your wells optimally spaced?

6 MR. ROBERTSON: Yeah, if that was possible
7 under mineral ownership and that type of thing we would
8 do that. It's conceivable you could have a project area
9 be a 320, you know, or half a section wide and then have
10 three wells optimally spaced within that half section.
11 But that's the ideal way to do it. And one of those
12 wells will be on that quarter section line, so you'd
13 have to have some kind of project area designation
14 allowing that.

15 EXAMINER JONES: Yeah. We do have
16 compulsory pooling, and your land guy can work on
17 optimizing what you --

18 MR. ROBERTSON: Right, what I've come up
19 with.

20 EXAMINER JONES: What you and Joe look at to
21 come up with.

22 MR. ROBERTSON: Right. Yeah.

23 EXAMINER JONES: I'm sure he wouldn't mind.
24 I didn't ask Mr. Villalobos, but is this really a shale?
25 I mean, as a reservoir engineer you look at this as a

1 shale or silt stone.

2 MR. ROBERTSON: Yeah, we call it a silt
3 stone, mud stone. Yeah, the term shale is kind of
4 ambiguous. Some people think of shale as being very
5 clay rich and this is not clay rich.

6 EXAMINER JONES: It's real hot on the
7 gamma ray, isn't it?

8 MR. ROBERTSON: Yeah, right. It does have a
9 lot of --

10 EXAMINER JONES: Is that uranium or --

11 MR. ROBERTSON: No. I think it's due to the
12 illite in there, which is thorium, I believe. I'm not
13 sure.

14 EXAMINER JONES: But as far as these
15 ultimate recoveries you came up with, you probably just
16 said what you based it on. Was it declined curves or
17 was it volumetrics or what?

18 MR. ROBERTSON: Mainly it would be decline
19 curves, yeah. Yeah. I mean, we do have simulation
20 models as well. But it's pretty difficult to simulate,
21 so we really believe in the decline curves.

22 EXAMINER JONES: You do have a simulator
23 warmed up and going on this?

24 MR. ROBERTSON: Oh, yeah. Oh, yeah.

25 EXAMINER JONES: Okay. And I don't

1 understand how you can pay for a horizontal well that
2 deep and that long for 180,000 barrels. But I guess at
3 these prices maybe you can.

4 MR. ROBERTSON: It can be borderline
5 sometimes. You have to do everything as cheap as
6 possible.

7 EXAMINER JONES: I don't have any more
8 questions. The gravity of the oil?

9 MR. ROBERTSON: 40 feet.

10 EXAMINER JONES: 40 feet. Thanks.

11 EXAMINER BROOKS: I have nothing further.

12 MR. FELDEWERT: That concludes our
13 presentation.

14 EXAMINER BROOKS: Very good. Case number
15 14760 will be taken under advisement.

16 [Case 14760 taken under advisement.]

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I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. 14760
heard by me on Nov 10, 2011
David K. Brooks Examiner
Oil Conservation Division

REPORTER'S CERTIFICATE

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2
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