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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 NOS. 14125 & 14126

APPLICATION OF APACHE CORPORATION  
FOR STATUTORY UNITIZATION,  
LEA COUNTY, NEW MEXICO

and

APPLICATION OF APACHE CORPORATION  
FOR APPROVAL OF A WATERFLOOD  
PROJECT AND TO QUALIFY THE PROJECT  
FOR THE RECOVERED OIL TAX RATE,  
LEA COUNTY, NEW MEXICO

COPY

REPORTER'S TRANSCRIPT OF PROCEEDING

EXAMINER HEARING

BEFORE: DAVID K. BROOKS, Legal Examiner  
TERRY G. WARNELL, Technical Examiner  
RICHARD EZEANYIM, Technical Examiner

May 15, 2008

Santa Fe, New Mexico

This matter came for hearing before the New Mexico Oil  
Conservation Division, DAVID K. BROOKS, Legal Examiner, TERRY  
G. WARNELL, Technical Examiner, and RICHARD EZEANYIM, Technical  
Examiner, on May 15, 2008, at the New Mexico Energy, Minerals  
and Natural Resources Department, 1220 South St. Francis Drive,  
Room 102, Santa Fe, New Mexico.

REPORTED BY: JOYCE D. CALVERT, P-03  
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Albuquerque, New Mexico 87102

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Examiner Hearing  
CASE NOS. 14125 & 14126

PAGE

APPLICANT'S WITNESSES:

MARIO MORENO, Senior Land Advisor  
DIRECT EXAMINATION BY MR. BRUCE  
EXAMINATION BY MR. EZEANYIM  
  
ROBERT E. CURTIS, Senior Staff Geologist  
DIRECT EXAMINATION BY MR. BRUCE  
EXAMINATION BY MR. WARNELL  
  
KEVIN MAYES, Senior Engineering Advisor  
DIRECT EXAMINATION BY MR. BRUCE  
EXAMINATION BY MR. EZEANYIM  
EXAMINATION BY MR. WARNELL

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APPLICANT'S EXHIBITS 1 - 17  
APPLICANT'S EXHIBITS 18 - 23  
APPLICANT'S EXHIBITS 24 - 33

REPORTER'S CERTIFICATE

APPEARANCES

FOR THE APPLICANT:

James G. Bruce, Esq.  
ATTORNEY AT LAW  
P.O. Box 1056  
Santa Fe, New Mexico 87504

1 MR. WARNELL: Okay. Let's go back on record.

2 Our next case is Case No. 14125, Application of  
3 Apache Corporation for Statutory Unitization, Lea County,  
4 New Mexico. And we're also going to consolidate the next case,  
5 Case No. 14126, Application for Apache Corporation for Approval  
6 of Waterflood Project and to Qualify the Project for the  
7 Recovered Oil Tax Rate, Lea County, New Mexico.

8 Mr. Bruce, call for appearances?

9 MR. BRUCE: Mr. Examiner, Jim Bruce, of Santa Fe,  
10 representing the applicant. I have three witnesses.

11 MR. WARNELL: Will the witnesses please rise and  
12 identify themselves?

13 MR. MORENO: Mario Moreno, with Apache Corporation,  
14 landman.

15 MR. CURTIS: Bob Curtis, geologist.

16 MR. MAYES: Kevin Mayes, petroleum engineer.

17 [Witnesses sworn.]

18 MR. BRUCE: Mr. Examiner, before I begin, especially  
19 on the land end, there's a lot of paperwork to go through, so  
20 if something -- if we go through it too fast and something  
21 strikes you and you want to ask a question, feel free to  
22 interject at that time rather than waiting until the end.

23 MARIO MORENO

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

DIRECT EXAMINATION

1

2 BY MR. BRUCE:

3

4

Q. Would you please state your name and city of residence for the record.

5

A. Mario Moreno. I live in Tulsa, Oklahoma.

6

Q. Who do you work for and in what capacity?

7

8

A. I work for Apache Corporation as a senior land advisor.

9

10

Q. Have you previously testified before the commission as a landman?

11

A. Yes, I have.

12

13

Q. And were your credentials as an expert petroleum landman accepted as a matter of record?

14

A. Yes, they were.

15

16

17

Q. And are you familiar with the -- does your area of responsibility at Apache cover this portion of Southeast New Mexico?

18

A. Yes, it does.

19

20

Q. And are you familiar with the land matters involved in this application?

21

A. Yes, I am.

22

23

MR. BRUCE: Mr. Examiner, I tender Mr. Moreno as an expert petroleum landman.

24

25

MR. WARNELL: We will accept Mr. Moreno as being so qualified.

1 Q. (By Mr. Bruce): First, Mr. Moreno, could you  
2 briefly summarize what Apache seeks in these cases?

3 A. In Case 14125, Apache seeks to statutorily  
4 unitize all interest in the Blinebry, Tubb, and the Drinkard  
5 formations underlying the 2480 acres of state, federal and fee  
6 lands for our proposed West Blinebry Drinkard Unit.

7 Also, in Case 14126, Apache is also seeking approval  
8 of the waterflood project and also certification of the project  
9 for the recovered oil tax rate.

10 Q. What is the proposed unitized interval?

11 A. The proposed unitized interval includes all  
12 depths between 8.75 feet above the stratographic Blinebry  
13 marker down to the top of the Abo Formation as found on the  
14 type log for the Hawk B-134 well, which is located 1040 feet  
15 from the south line and 1470 feet from the west line of  
16 Section 9, Township 21 South, Range 37 East.

17 Q. And that definition is in the unit agreement, is  
18 it not?

19 A. Yes, it is. And also the unitized formation will  
20 also include the subsurface points throughout the area,  
21 correlative to these depths.

22 MR. EZEANYIM: Could you state your vertical limits?  
23 Could you tell me about the vertical limits?

24 THE WITNESS: My what?

25 MR. EZEANYIM: Your vertical limits. Have you --

1 MR. BRUCE: Mr. Examiner, if we could, the easiest  
2 thing would be to wait for the next couple of exhibits, and  
3 then we could specify that for you.

4 MR. EZEANYIM: Okay.

5 Q. (By Mr. Bruce): Mr. Moreno, could you identify  
6 Exhibit 1, and describe its contents for the Examiner?

7 A. Okay. Exhibit 1 is a land plat which outlines  
8 the proposed unit area and identifies the separate tracts which  
9 comprise the unit area. Also attached to the Exhibit 1 is a  
10 legal description of all the tracts, or all the lands, in the  
11 entire unit area. This plat also describes 14 tracts in the  
12 unit. Apache operates 12. Campbell and Hendrick operates one,  
13 and Chevron operates another one.

14 Q. Okay. Let's move on to your Exhibit 2. Would  
15 you identify that for the Examiner?

16 A. Yes. Exhibit 2 is our Proposed Unit Agreement,  
17 and it is the standard form used by the State Land Office and  
18 the BLM, and it's similar to the agreements approved previously  
19 by the Division.

20 This unit agreement also describes the unit area and  
21 the unitized formation. And also the unitized substances  
22 include all the oil and gas produced from the unitized  
23 formation. This unit agreement also designates Apache  
24 Corporation as the unit operator.

25 Q. Let's stop for a minute and refer back to

1 Examiner Ezeanyim's question. Could you move on to Exhibit --  
2 excuse me -- Page 5 of Exhibit 2.

3 And does Subparagraph (v) define the unitized  
4 formation?

5 A. Okay.

6 Q. Does Exhibit -- Paragraph (v)?

7 A. Yes. It does define a unitized formation.

8 Q. And so you described that previously. And will  
9 the next witness, the geologist, have a portion of a type log  
10 which will show the unitized formation?

11 A. That's correct.

12 Q. What is Exhibit 3, Mr. Moreno?

13 A. Exhibit 3 is our Proposed Unit Operating  
14 Agreement, which basically sets forth the authorities and the  
15 duties of the unit operator, as well as the apportionment of  
16 the unit expenses between the working interest owners.

17 Q. And does the Unit Operating Agreement contain a  
18 provision for carrying working interest owners?

19 A. Yes, it does. It's in Article 11.

20 Q. Now, often these agreements provide for a penalty  
21 against nonconsenting working interest owners. Does this  
22 agreement contain such a provision?

23 A. No, it does not.

24 Q. And this will come up later. But Apache has  
25 other units in the immediate area, does it not?

1 A. Yes, it does.

2 Q. And those agreements do not contain penalty  
3 provisions, either?

4 A. No, they do not. Except, well --

5 Q. EBDU does, but not --

6 A. EBDU does, but not the NEDU, no.

7 Q. Let's discuss the ownership of tracts within the  
8 unit area --

9 A. Okay.

10 Q. -- and maybe I'll refer you back to Exhibit 2,  
11 the unit agreement, Mr. Moreno.

12 Would you describe how you determined the tracts and  
13 the names of the working and royalty interest owners in the  
14 unit area?

15 A. Okay. The unit tracts are formed according to  
16 common mineral ownership. And if you'll go back to the unit  
17 agreement and look at Exhibit 2, which would be the -- would be  
18 Exhibit B-1 to the unit agreement.

19 Q. And that's a 27-page exhibit to the unit  
20 agreement?

21 A. That is correct. And this Exhibit B-1,  
22 basically, you'll find that it lists a tract by tract listing  
23 of all the interest owners. And these names and the interests  
24 were obtained from current Division orders and title opinions.

25 Q. Are all of the tracts within the proposed unit



1 area producing?

2 A. Yes, they were. And all of these tracts also  
3 have Division orders covering them.

4 Q. And so all of the data within the unit agreement  
5 should be current and correct?

6 A. Yes.

7 Q. Unless perhaps somebody has a changed address and  
8 hasn't notified Apache?

9 A. That is correct.

10 Q. How many interest owners are there in the  
11 proposed unit area?

12 A. We've got 10 working interest owners, 150  
13 royalty, 88 overriding royalty interest owners.

14 Q. Okay. Now, let's first talk about the working  
15 interest owners. Referring to Exhibit 4, who are they, and who  
16 do you seek to statutorily unitize?

17 A. If you'll look at Exhibit 4, Exhibit 4 lists all  
18 of the working interest owners, the then working interest  
19 owners that we currently have within the boundaries of our  
20 unit. Every one of our working interest owners have ratified  
21 the agreement except for Geodyne Nominee Corporation, John P.  
22 Searls, and Susan Searls Collier. And we are seeking to  
23 unitize these three working interest owners.

24 Q. What is the total percentage of working interest  
25 owners who have voluntarily ratified the unit?

1 A. 99.4 percent.

2 Q. Now, let's move on to the royalty and the  
3 overriding royalty owners. In Exhibits 5 and 6, what do those  
4 two exhibits reflect?

5 A. Well, if you'll note on Exhibit 5, this lists all  
6 of the royalty interest owners and gives you a breakdown of  
7 what their tract royalty interest is and their unit royalty  
8 interest would be.

9 Exhibit 6 lists all of the overriding royalty  
10 interest owners and also breaks down their unit, gross royalty  
11 and unit royalty interest.

12 Q. Now, in looking at Exhibits 5 and 6, they're  
13 framed in identical matters. And looking over to Column 3,  
14 Mr. Moreno, what does Column 3 of those exhibits indicate?

15 A. Column 3 indicates whether the royalty and/or  
16 overriding royalty interest owner on each one of the exhibits  
17 has ratified the unit agreement.

18 Q. And so by looking at these two exhibits, you  
19 would seek to statutorily unitize any royalty or overriding  
20 royalty interest owner who doesn't have an X in Column 3 across  
21 from his name?

22 A. That is correct.

23 Q. And rather than trying to identify them on those  
24 exhibits, does Exhibit 6A list all of the owners who have the  
25 private or fee owners who have not yet ratified?

1 A. That is correct.

2 Q. What is Exhibit 7A?

3 A. Exhibit 7A contains ratifications from all the  
4 overriding royalty and royalty interest owners who have  
5 ratified the unit to date.

6 Q. Okay. And what about Exhibit 7B?

7 A. 7B is a -- contains all the copies of the  
8 ratifications for the working interest owners who have ratified  
9 the unit and unit operating agreement to date.

10 Q. And you mentioned there's state and federal land  
11 in the unit. Has the Commission of Public Lands preliminarily  
12 approved unitization?

13 A. Yes, they have.

14 Q. And what is Exhibit 8?

15 A. Exhibit 8 is a letter from the State of  
16 New Mexico, Commissioner of Public Lands, which has given us  
17 preliminary approval to move forward with our proposed  
18 waterflood unit.

19 Q. Okay. They will not grant final approval until  
20 the Division's order is entered; is that correct?

21 A. That is correct.

22 Q. What is Exhibit 9?

BLM

23 A. Exhibit 9 is the letter from the Bureau of Land  
24 Management who has also given their preliminary approval to  
25 move forward with our waterflood project.

1 Q. What is the total percentage of royalty plus  
2 overriding royalty owners who have voluntarily ratified the  
3 unit?

4 A. To date, including the BLM and the State Land  
5 Office, we've received 92.8 percent of the royalty and  
6 overriding interest owners who have ratified the unit  
7 agreement.

8 Q. And so both looking at working interest owners  
9 and then the royalty owner group, the voluntary ratification  
10 exceeds the 5 percent required by statute?

11 A. Yes, it does.

12 Q. And if interest owners signed ratifications after  
13 the hearing, will they have been deemed to have ratified or  
14 consented to the unit?

15 A. Yes.

16 Q. There's so many owners. Do you continue to  
17 get -- do the ratifications continue to dribble in?

18 A. Yes, they do.

19 Q. Now, let's discuss your efforts to obtain the  
20 voluntary unitization of the parties to the unit. Would you  
21 please identify Exhibit 10A and 10B?

22 A. The Exhibit 10A, basically, is the copies of all  
23 the correspondence sent to the royalty and overriding royalty  
24 interest owners in the unit. Exhibit 10B is copies of all  
25 correspondence sent to the working interest owners proposing

1 the unit.

2 Q. Okay. Rather than just go through the documents,  
3 the correspondence letter by letter, could you, for the  
4 Examiner, outline Apache's contacts with the interest owners?

5 A. In October of 2005, we first began considering  
6 unitization, and we started having informal discussions with  
7 the working interest owners within our proposed 2480-acre  
8 boundary unit.

9 Our meetings -- primarily, we focused with Chevron  
10 and BP since they were the larger working interest owners.  
11 Then December 5th of 2005, we had our first informal meeting  
12 with BP and Chevron where we began -- where we started to begin  
13 collecting data to formulate our tract participation.

14 Subsequent to that date -- we had meetings three  
15 times after that in 2007, also with BP and Chevron. And then  
16 started having -- once we knew BP and Chevron were coming on  
17 board with us to form this unit, then we started having  
18 meetings at the end of December, 2007, with the smaller working  
19 interest owners, primarily being Campbell and Hendrick.

20 Then on February 18th -- which there's a letter in  
21 the correspondence that was Exhibit 10B, I believe -- that went  
22 out on the working interest owners where we sent our final unit  
23 and unit operating agreement forms, which basically identified  
24 the proposed boundary and also our proposed participation  
25 formula.

1           And subsequent to that date, on March 4th, 2008, we  
2   sent our first mail-out to all the royalty and overriding  
3   royalty interest owners along with ratifications in the unit  
4   agreement. Then on April 11th, we sent our last mail-out to  
5   the royalty and overriding royalty interest owners that had not  
6   ratified the unit from the first mail-out just to advise them  
7   that the hearing is coming up, and we'd like to get their  
8   ratifications in as soon as possible.

9           Q. Have you received any formal objections to the  
10   unitization?

11          A. No.

12          Q. Just people who haven't returned their  
13   ratifications?

14          A. That is correct.

15          Q. In your opinion, has Apache made a good faith  
16   effort to secure voluntary unitization?

17          A. Yes, we have.

18          Q. And was written notice of the unitization hearing  
19   given to all of the owners who did not voluntarily join in the  
20   unit?

21          A. Yes.

22          Q. And what is Exhibit 11?

23          A. Exhibit 11 is an Affidavit of Notice regarding a  
24   notice sent to the royalty and overriding royalty interest  
25   owners.

1 Q. Were any of the letters returned?

2 A. Yes. And those persons are listed on Exhibit 12.

3 Q. Okay. Exhibit 12 is a listing of people who  
4 either didn't pick up their certified mail, or it was returned  
5 as undeliverable, correct?

6 A. As undeliverable, that is correct.

7 Q. Except for Bishop Whipple Schools. Were you ever  
8 able to determine an address for that entity?

9 A. I believe we were able to find an address for  
10 them.

11 Q. But there was never any response?

12 A. No.

13 MR. BRUCE: Mr. Examiner, if you'll go toward the  
14 back of Exhibit 11, as I mentioned to you before the hearing,  
15 we will need to continue this matter for a couple of weeks.  
16 Although many of these certified mails were delivered, the post  
17 office hasn't seen fit to return the green cards to me. So I  
18 will probably need to continue both hearings to submit some  
19 additional green cards, et cetera, at the next hearing.

20 What you see on a lot of these is information from --  
21 you can get information from the postal service's website, but  
22 it's not the actual physical green card, so --

23 Q. (By Mr. Bruce): Now, you previously noted that  
24 the addresses are from the Division order files; is that  
25 correct?

1 A. Yes, that's correct. And so all of the addresses  
2 should have been current.

3 Q. Now, where you knew -- or when you did your  
4 mailings, some of the letters were returned, were they not?

5 A. Yes, they were. But there was still some of the  
6 ones that were returned that we attempted to try to find, but  
7 they were still unlocatable.

8 Q. Okay. So you examined pertinent records, whether  
9 county records or telephone records, to update the addresses  
10 when the correspondence was returned?

11 A. Yes, that is correct.

12 Q. Now, with respect to the bad addresses or  
13 unlocatable owners, was notice published as to them?

14 A. Yes, it was. And those notices are marked as  
15 Exhibit 13.

16 MR. BRUCE: Mr. Examiner, there was one or two other  
17 names that I forgot off of this, and I published notice of this  
18 hearing, but I haven't gotten the Affidavit of Publication  
19 back. I'll be submitting that at the next hearing also.

20 Q. Were all of the unsigned working interest owners  
21 notified of the hearing?

22 A. Yes, they were. Copies of the notice and the  
23 certified receipts are attached to the Affidavit of Notice  
24 submitted as Exhibit 14.

25 Q. And all of the working interest owners were



1 locatable, were they not?

2 A. Yes, they were.

3 Q. Now, the next witnesses will discuss the  
4 waterflood project. And for the waterflood, Apache had to  
5 notify offsets and surface interest owners; is that correct?

6 A. That is correct.

7 Q. What does Exhibit 15 reflect?

8 A. Exhibit 15 is a plat showing the offset operators  
9 and the lessees in the Blinebry, Tubb, and Drinkard Formations  
10 within one-half mile of our proposed injection wells to the  
11 unit.

12 Q. And in the upper left-hand corner of this  
13 exhibit, is there a color scheme to show who the operators are?

14 A. Yes, sir, there is.

15 Q. And what is Exhibit 16?

16 A. Exhibit 16 identifies the surface owners in the  
17 unit area.

18 Q. And for purposes of the injection, does notice  
19 have to be given to the surface owners where the injection  
20 wells are located?

21 A. That is correct.

22 Q. And up there in the upper left-hand side, the  
23 surface owners are designated by a color scheme?

24 A. By color scheme, that is correct.

25 Q. Now, you have all surface owners, but as to

1 Robert McCassland and Charlie Bettis, there are no injection  
2 wells at this point on their --

3 A. That is correct.

4 Q. And so they did not need to be given notice?

5 A. That is correct.

6 Q. And what is Exhibit 17?

7 A. Exhibit 17 is an Affidavit of Notice regarding a  
8 letter sent to the surface owners and offset operators  
9 pertaining to Apache's application to institute a waterflood  
10 project. And this letter also contains the certified copies  
11 and returned receipts.

12 Q. Mr. Moreno, in your opinion, will the granting of  
13 these two applications be in the interest of conservation and  
14 the prevention of waste?

15 A. Yes.

16 Q. And were Exhibits 1 through 17 prepared by you or  
17 under your direction or compiled from company business records?

18 A. Yes, they were.

19 MR. BRUCE: Mr. Examiner, I move the admission of  
20 Apache Exhibits 1 through 17.

21 MR. WARNELL: Exhibits 1 through 17 are so admitted.

22 MR. BRUCE: I have no further questions of the  
23 witness.

24 MR. WARNELL: Questions?

25 MR. BROOKS: No questions.

## EXAMINATION

1

2 BY MR. EZEANYIM:

3

Q. Mr. Moreno?

4

A. Yes, sir.

5

Q. Is that correct?

6

A. Yes, sir.

7

8 Q. You said you only have three working interest  
owners or royalty interest or --

9

10 A. We have three working interest owners left that  
have not ratified the unit, and we seek to get them unitized.

11

12 Q. Very good. Okay. Do you know why -- have you  
contacted them? And just considering whether to --

13

14 A. Yes. I have talked with them numerous times.  
15 Two of the owners that we seek to unitize are kind of in a  
16 family squabble, or squabbling over the interest. So one of  
17 those family members has ratified because she was content with  
18 the interest we indicated on our unit agreement, because we  
took it off of the title opinion.

19

20 However, her sister does not agree with it, so  
21 there's a lot of discussions going back and forth with those  
three family members.

22

23 Q. So in your opinion, it's not because of the unit  
operating agreement that they don't agree.

24

25 A. No. As a matter of fact, one of the owners I've  
been communicating with has indicated that they are in. They

1 will ratify this agreement. However, they got to get this  
2 issue with the family owner interest issue resolved, which they  
3 may or they may not.

4 Q. Okay. I'm trying to get at something, and that  
5 is, you know, you need to come to an agreement. You need an  
6 operating agreement, but other than that, you have to have your  
7 allocation of costs and production and the initial credits and  
8 charges to make sure they are fair, reasonable, and equitable.

9 So after that, nobody has objected to this  
10 unitization because of those.

11 A. No, they have not.

12 Q. Okay. The BLM and the State Land Office has  
13 given permission --

14 A. Yes.

15 Q. -- for both the unit and the --

16 A. Yes, sir. Yes, sir.

17 Q. And did you say you're not seeking for  
18 nonparticipation penalties?

19 A. That is correct. We're not seeking for a  
20 penalty.

21 Q. Very good.

22 A. Well, we're not seeking for a penalty under our  
23 unit operating agreement. However, I believe the Commission  
24 allows for cost plus 200 for unitization; is that correct?

25 MR. BRUCE: Yeah. But we're not seeking that.

1 Q. (By Mr. Ezeanyim): Yeah. Okay. That's fine.

2 And the participation is formalized in the unit operating  
3 agreement?

4 A. It is in the unit agreement.

5 Q. Units agreement.

6 A. Right.

7 MR. BRUCE: One of our witnesses will discuss that  
8 more, Mr. Ezeanyim.

9 MR. EZEANYIM: Okay. You may be excused. Thank you.

10 MR. WARNELL: Will the witness please step down if  
11 there are no more questions?

12 Thank you, Mr. Bruce.

13 ROBERT E. CURTIS

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

16 DIRECT EXAMINATION

17 BY MR. BRUCE:

18 Q. Will you please state your name.

19 A. Robert E. Curtis.

20 Q. Where do you reside?

21 A. Tulsa, Oklahoma.

22 Q. Who do you work for?

23 A. I work for Apache Corporation as a senior staff  
24 geologist.

25 Q. Have you previously testified before the

1 Division?

2 A. Yes.

3 Q. And were your credentials as an expert geologist  
4 accepted as a matter of record?

5 A. Yes.

6 Q. And are you familiar with the geology involved in  
7 this application?

8 A. Yes.

9 Q. And this area, this township is your  
10 responsibility at Apache; is it not?

11 A. Yes, it is.

12 MR. BRUCE: Mr. Examiner, I tender Mr. Curtis as an  
13 expert petroleum geologist.

14 MR. WARNELL: So be it.

15 Q. (By Mr. Bruce): Mr. Curtis, could you identify  
16 Exhibit 18 for the Examiner, and discuss the zone Apache seeks  
17 to unitize in this case.

18 A. Exhibit 18 is a west/east-oriented structural  
19 cross section that goes through the approximate north/south  
20 middle of our proposed unit, which we will see on a later  
21 exhibit.

22 There are seven wells shown. Each is identified with  
23 the operator, the lease name, well number, and then its  
24 location information. The type log that Mr. Moreno mentioned  
25 that we used in the unit agreement is the Hawk B-1 #34. It is

API 30 025 36344

1 identified as the type log.

2 The units we are seeking to unitize is the entire  
3 Blinebry, Tubb, and Drinkard reservoirs. As described in the  
4 agreement, that reservoir extends from a 75 feet above the  
5 Blinebry marker, which we have identified as the Blinebry --  
6 BLBY OCD -- top marker, and this well is at a drill depth of  
7 5584 feet down through the Drinkard Formation, the base of  
8 which is in the top subadjacent Abo, being in this well at 6690  
9 feet.

10 Q. Insofar as the Blinebry, you've got Blinebry  
11 marker and Blinebry OCD. Those depths have been previously  
12 identified by the Oil Conservation Division, have they not?

13 A. Yes, yes.

14 Q. So there's something -- those are depths -- those  
15 are markers that can be found in the Division's records?

16 A. Yes. When the Blinebry pool was created, the  
17 Division defined the Blinebry reservoir interval as extending  
18 75 feet above the described Blinebry markers.

19 Q. Now, in looking, you've got these color codes  
20 again, but what does the green indicate?

21 A. For purposes of waterflooding, we will inject  
22 water into the two darker green bands. The uppermost is what  
23 we have -- what we call the Blinebry oil lag. The lower  
24 interval is the Drinkard. We've inherited some rather -- as it  
25 turns out, some unfortunate terminology from Shell who did the

1 initial unitizations and pool definitions in the area. The  
2 red-dashed line, which is labeled Blinebry Gas Oil, is at a  
3 subsea depth of 2255 feet. In '87, when they formed the units  
4 North Blinebry Drinkard pool, they said this was a gas cap.

5 In 1990, when they re-approached or re -- had to come  
6 back to the OCD to make the pool rules effective and permanent,  
7 they had determined at that time the gas cap had been  
8 eliminated and was no longer extant, at least as far as the  
9 northeast Drinkard unit goes, which is adjacent to our east.

10 Additionally, in the last four years, Apache has  
11 drilled and completed over 40 Blinebry, Tubb, and Drinkard  
12 wells in this unit, recommended unit area. None of which have  
13 been completed as gas wells. So we strongly suspect there is  
14 no longer a gas cap, but to be conservative and prevent  
15 potential problems, we will not be injecting water into that.

16 Q. Now, let me ask you one thing: Normally,  
17 Southeast New Mexico, the Blinebry, Tubb, and Drinkard form  
18 separate pools, do they not?

19 A. Yes, they are carried as separate pools.

20 Q. But what about the acreage within the boundary of  
21 the proposed unit? Are they separate pools?

22 A. Not anymore. In April of 2006, Apache approached  
23 the OCD to have the units north of Blinebry, Tubb, Drinkard  
24 pool extended, both to the east to cover our East Blinebry  
25 Drinkard pool, which was in the process of being unitized, and



1 also to the west to cover the area that is -- that we are now  
2 seeking to have formed as the West Blinebry Drinkard pool.

3 Q. So according to the Division, this entire  
4 unitized interval is one single pool?

5 A. Is one single pool.

6 Q. Okay. Now, let's discuss the production in the  
7 zone to be unitized. What is Exhibit 19?

8 A. Exhibit 19 is a well data and lease data exhibit.  
9 The lease names are so identified in rather bold font, although  
10 in some cases they're covered up by other materials. State  
11 leases are shown in the various shades of red. Federal leases  
12 are shown in various shades of blue, and fee leases are shown  
13 in various shades of yellow.

14 Each well is identified by its operator, lease name,  
15 and well number. The colored attributes or donuts, if you  
16 will, around each well bore indicate which formation or  
17 formations have been perforated -- yellow being Blinebry; red  
18 being Tubb; blue being Drinkard. There's only two wells on the  
19 map that I am aware of that have perforated any of those three  
20 formations and not produced them, one of which would be -- and  
21 there is a database error or change.

22 In Section 5, the well identified as the Gruy  
23 Petroleum Management Curry No. 1, at some point in time,  
24 Cimarex Operating bought that well, so it should be called  
25 Cimarex. We have made that correction in some other exhibits.

1 Although they perforated the Blinebry, they did not produce it.  
2 And it is now producing in the Eumont Yates-Seven Rivers pool.

3 Also down in the unit D of Section 17, Chevron  
4 drilled its Mittie Weatherly No. 7 down through the Drinkard.  
5 However, it did not perforate nor test the Blinebry, the Tubb,  
6 nor the Drinkard, and it is currently a Grayburg, Penrose Kelly  
7 Grayburg well.

8 Q. Okay. What is Exhibit 20?

9 A. Exhibit 20 is a structure map on the top of the  
10 Tubb Formation. The Tubb is the most reliable, or has been the  
11 most reliable marker within the unit, especially considering  
12 the number of old electric logs we have to use. It has the  
13 same perforation attributes. The contour interval is 20 feet,  
14 ranging from the highest contour lines being in the warm red  
15 and yellow colors down to the lowest being the cooler blues and  
16 purples.

17 Q. Now, when you're looking at defining why you  
18 decided on the unit boundaries, could you go into, from a  
19 geological standpoint and maybe actually a little bit of a land  
20 standpoint, why you decided on these boundaries?

21 A. Well, as far as the structure goes, the effective  
22 porosity and permeability decreases as one goes down dip. At a  
23 depth of minus 2740 to minus 2760, wells have had their  
24 productive potential severely curtailed by diagenesis, plugging  
25 of porosity, permeability. And as I mentioned, the Curry No. 1

1 in the southern part of the Section 5 in the northwest corner  
2 of the map did perforate the Blinebry but was not found to be  
3 productive. The western boundary we'll discuss with the  
4 porosity maps.

5 Q. Okay. And what is on the eastern boundary?

6 A. We're bounded adjacent to the east by our -- by  
7 the Apache-operated Northeast Drinkard Unit.

8 Q. Okay. Let's move on to the isopachs, the first  
9 one. What is Exhibit 21?

10 A. The first one, Exhibit 21, is a net pay isopach  
11 of the Blinebry Oil leg, which, if you remember from  
12 Exhibit 18, the cross section is the bright green band up at  
13 the top. Once again, I've colored-coded the isopach contour  
14 interval values to make it easier to see.

15 The large number to the left of the various well  
16 bores is the number of feet of pay I've calculated. To do this  
17 map, I used only modern gamma ray and neutron density logs from  
18 which I could calculate cross plot porosity. We found that  
19 using some of the old vintage logs, the porosity values just  
20 bounce all over the place, and one ends up creating a map that  
21 looks like an isopach of random variables.

22 Looking at the gray-shaded area, which the zero line  
23 would be on the outside edge of that on the west side of the  
24 map, approximately along the west unit boundary, the Blinebry  
25 Pay is severely reduced. In fact, one sees it going fairly far

1 eastward over into Section 17. So we set the western unit  
2 boundary along the Apache lease lines over there.

3 And Chevron has, of course, been involved in  
4 ratifying the unit and discussing various parameters of the  
5 unit, and they have had no objection to this proposed unit  
6 boundary line, nor have they asked for any of their acreage  
7 over there to be included.

8 Q. Same thing with Campbell and Hendrick?

9 A. Same thing with Campbell and Hendrick to the  
10 south. Also, I probably should add that there's a lot of older  
11 wells that do not have modern electric logs in them. I  
12 extended the contours over those areas by form lining my pay  
13 values of the Blinebry cumulative production map. This is a  
14 technique we have been using for four to five years, and we've  
15 been very pleased with our well performance from new wells  
16 drilled based upon this method.

17 Q. Okay. What does Exhibit 22 reflect?

18 A. Exhibit 22 is a similar net pay map on the  
19 Drinkard. This will be the lower of the two bright green  
20 bands. Pay criteria are the same as they were in the Blinebry.  
21 It's a little bit better than one sees in the Blinebry. But  
22 again, over on the western side of the boundary, net pay values  
23 are decreased as also were accumulative production values. So  
24 once again, the western boundary was set along the Apache lease  
25 lines and also based upon the net pay isopach and also the

1 accumulative production values.

2 Q. Okay. Now, your last two maps showed a reservoir  
3 to the south on the Stephens and Johnson piece. Why weren't  
4 they included in there?

5 A. Mr. Stephens and Johnson, they declined  
6 participation.

7 Q. They asked to be left out?

8 A. They asked to be left out, so we did, in fact,  
9 leave them out to conform to their wishes.

10 Q. From a geologic standpoint, has this reservoir  
11 been reasonably defined by development?

12 A. Yes.

13 Q. And is the Blinebry, Tubb, and Drinkard Reservoir  
14 continuous across the unit area?

15 A. It's continuous across the unit area. In fact,  
16 it's continuous across the entire central basin platform in the  
17 southern and eastern part of Lea County.

18 Q. Referring to Exhibit 23, geologically, is this  
19 reservoir a good candidate for waterflooding?

20 A. Yes, it is a good candidate. In fact, the  
21 immediate areas we see on Exhibit 23, it will be the fourth  
22 unit in waterflood involving all or parts of the Blinebry,  
23 Tubb, and Drinkard Formations.

24 Q. And the fourth or fifth?

25 A. If I said fourth, it was a misstatement. It

1 should be fifth.

2 Q. Fifth. Are there -- is there a freshwater zone  
3 in this area, Mr. Curtis?

4 A. Yes. We spoke to Ken Fresquez with the State  
5 Engineer's Office in Roswell. The Ogallala Aquifer, according  
6 to their records, should extend to a depth of about 130 feet.  
7 There is some debate about the Santa Rosa Formation whose top  
8 is at 950 feet. And in parts of the county, it can be a  
9 freshwater source. However, in the 21 South, 37 West area, it  
10 appears to be highly mineralized and is, therefore, not  
11 freshwater.

12 Regardless what depth, however, the freshwater  
13 extends to, every well within the proposed unit boundary has at  
14 least two strings of casing set through both intervals, one of  
15 which has cement cemented back to the surface. So groundwater  
16 should be adequately protected.

17 Q. Are there any faults in this area which would  
18 connect the injection zone to a freshwater zone?

19 A. No.

20 Q. Were Exhibits 18 through 23 prepared by you or  
21 under your direction?

22 A. Yes.

23 Q. And in your opinion, is the granting of this  
24 application in the interests of conservation and prevention of  
25 waste?

1 A. Yes.

2 MR. BRUCE: Mr. Examiner, I tender the admission of  
3 Exhibits 18 through 23.

4 MR. WARNELL: We accept Exhibits 18 through 23.

5 MR. BRUCE: I have no further questions of the  
6 witness.

7 MR. WARNELL: Any questions, Mr. Brooks?

8 MR. BROOKS: No questions. Thank you.

9 MR. EZEANYIM: Let me reserve my questions until we  
10 have the engineer.

11 MR. BRUCE: Okay.

12 EXAMINATION

13 BY MR. WARNELL:

14 Q. All right, sir. I had two questions here. If we  
15 could go back to Exhibit 18.

16 A. Yes, sir.

17 Q. Mr. Curtis, explain the two shades of green to me  
18 again, please.

19 A. Well, the two brighter shades are the reservoirs  
20 into which we will be injecting water. In the Blinebry,  
21 there's two different colors because the lower, paler green  
22 with the hatcher tends to have less reservoir and especially  
23 less good reservoir in it than the upper. We will perforate  
24 and produce reservoir intervals therein, but as far as  
25 injecting water into it, we do not feel that that would be a

1 paying proposition.

2 Q. And that's all oil in there?

3 A. It is all oil.

4 Q. Okay. Thank you. One quick question -- and you  
5 probably don't have to go to Exhibit 21 -- but you had  
6 mentioned your cross plot porosity.

7 A. Yes.

8 Q. What are you cross plotting? Is that neutron --

9 A. It's neutron density.

10 Q. You use a dual water model or --

11 A. Actually, for these, we have not used any type of  
12 water saturation cutoff. We have yet to test a wet well. Some  
13 of the wells drilled by Apache before the current staff and the  
14 current office took it over, we did not -- or those engineers,  
15 in general, in addition to other companies, didn't run  
16 resistivity logs, so without the resistivity log, I cannot  
17 calculate water saturation. So that severely reduces my  
18 database for mapping. So I'm trying to use as much data as I  
19 can.

20 MR. WARNELL: Okay. Thank you. I believe that's all  
21 our questions, Mr. Curtis. At this time, the witness may step  
22 down.

23 KEVIN MAYES

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



DIRECT EXAMINATION

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BY MR. BRUCE:

Q. Would you please state your name and city of residence.

A. My name is Kevin Mayes. I reside in Tulsa, Oklahoma.

Q. And who do you work for and in what capacity?

A. I'm a senior engineering advisor for Apache Corporation.

Q. Have you previously testified before the Division?

A. Yes, I have.

Q. And were your credential as an expert petroleum engineer accepted as a matter of record?

A. Yes, they were.

Q. Is this portion of Southeast New Mexico under your responsibility at Apache?

A. Yes, it is.

Q. And are you familiar with the engineering matters related to these applications?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Mayes as an expert petroleum engineer.

MR. WARNELL: We certainly accept that.

Q. (By Mr. Bruce): As part of your job, Mr. Mayes,

1 with respect to these applications, have you made calculations  
2 regarding secondary recovery and the economics of the  
3 waterflood project?

4 A. Yes, I have.

5 Q. Let's start with Mr. Curtis' last exhibit,  
6 Exhibit 12. In looking at that, could you describe briefly the  
7 history of the pool, at least with respect to the proposed West  
8 Blinebry Drinkard Unit?

9 A. Now, I'll concentrate on the yellow-colored  
10 application that we had today, the West Blinebry Drinkard Unit.  
11 It is the Blinebry Drinkard Reservoir. It started producing  
12 back in the 1940s, so a lot of these wells are of vintage age.  
13 There have been 111 Blinebry, Tubb, and Drinkard wells drilled  
14 in this portion of the pool.

15 All these wells with the exception of one junked and  
16 abandoned well were productive. There were no dry holes  
17 drilled in the Blinebry, Tubb, and Drinkard. And currently,  
18 there are 91 active wells in the Blinebry, Tubb, and Drinkard  
19 in this portion of the field.

20 Q. Would you identify Exhibit 24, and describe  
21 production from wells in this area of the pool?

22 A. Exhibit 24 is a production graph. The red is gas  
23 production. The green is oil production. The blue is water  
24 production. And then there's a black curve that goes through  
25 there. That's actually a well count curve. I did want to

1 bring up from 2005 to the present on the well count curve it  
2 takes a significant drop. That's not actually a drop in well  
3 bores. That's actually one -- we consolidated the pools. We  
4 went from multiple completions being reported in the public  
5 data to true wells being produced. You can see it drop down to  
6 about 80 wells producing in 2006. We've drilled a few more  
7 wells. And again, we have the current active wells in the  
8 proposed unit at 91 wells.

9 Up in the upper right-hand corner, the graph, you can  
10 see the cumulative oil, water, and gas that's been produced out  
11 of this proportion of the pool. And then some notes that I  
12 have made on the graph, citing production in August of 2007  
13 reached a recent peak of 13 million cubic feet of gas a day,  
14 812 barrels of oil a day.

15 And then you can see a decline analysis I've done  
16 citing that the total remaining reserves from this pool under  
17 its current condition would be 2,135,000 barrels of oil.  
18 That's a significant number because that's the number where we  
19 will convert from phase one participation to phase two  
20 participation, which we will discuss in a minute.

21 Q. Okay. Is the waterflood project proposed a  
22 method of extending the life of this reservoir?

23 A. Yes, it is.

24 Q. What is the drive mechanism for the pool?

25 A. It's primary depletion solution gas drive at this

1 point.

2 Q. Now, before we discuss the recoveries, let's  
3 discuss the tract allocation formula. What is Exhibit 25?

4 A. Exhibit 25 is -- we're at Section 13 out of the  
5 unit agreement. It does define the tract participation  
6 throughout the life of the waterflood.

7 Of particular importance, again, is in Paragraph 2,  
8 the next to last sentence. You see where we again cite the  
9 2,135,000 barrels of oil where we will convert from phase one  
10 to phase two participation. And then it goes on to define  
11 tract participation.

12 Phase one is 100 percent A over B. What this is is  
13 current rate. We made phase one based on the current rate  
14 coming out from each tract. It's defined as the production  
15 brought off of each tract in August of 2007. It is based on an  
16 oil equivalent basis. So we did take gas production into  
17 account also, and we ratioed the gas down to a barrel of oil  
18 equivalent based on a ratio of 6 to 1. So 6 MCF per day  
19 equated to one barrel of oil equivalent a day.

20 Then we'll move on. Phase two is defined as C and D  
21 down there. It is 100 percent C over D. It is based on  
22 cumulative oil produced off of each tract from inception  
23 through April 30th of 2007. What else you got attached here,  
24 Mr. Bruce?

25 Also attached to this exhibit is Exhibit B-2 out of

1 the unit agreement again. It just goes through each tract and  
2 defines each parties' interest in the tract and their  
3 participation, both phase one and phase two. So you can go  
4 through there and see how the tracts broke down.

5 Q. Would you describe for the Examiner the reasons  
6 for selecting these participation parameters as opposed to any  
7 other.

8 A. Yes. All the parties felt like a two-phase  
9 formula was appropriate. Some of the tracts have had a lot of  
10 work done on them, and production significantly increased.

11 Thus, the cash flow to those particular participants -- it  
12 didn't seem fair to cut those cash flows just because we were  
13 forming a unit.

14 And then a cumulative oil for a phase two basis,  
15 everybody uses a secondary to primary ratio to look at how  
16 waterfloods -- how much secondary reserves should be assigned  
17 to a tract. As a result, cumulative oil seemed like a fair and  
18 reasonable participation to use in phase two.

19 Q. And in your opinion, does this formula allocate  
20 produced and saved hydrocarbons to each tract on a fair,  
21 reasonable, and equitable basis?

22 A. Yes, they do.

23 Q. Now, moving on to the next two Exhibits, 26 and  
24 27, could you describe the data you used to determine the tract  
25 participation?

1           A. Yes. Exhibit 26 is -- I reviewed the offset  
2 mature waterfloods already in place in this area and in this  
3 reservoir. And I went through and looked at -- you can look at  
4 the left column, and go down the parameters that I felt were  
5 appropriate to review to determine how our flood would perform.

6           Those parameters included the oil production rate  
7 going into the flood; initial response period; a secondary  
8 response period; and then peak rate, the years to the peak  
9 rate. The GOR characteristics: Does the GOR collapse during  
10 the course of the waterfloods? Water production: Was there  
11 any early water breakthrough? How the water production  
12 increased with waterflood operations.

13           Looked at the initial injection rate to see how their  
14 injectors performed compared to how ours should perform. I  
15 looked at that S&P ratio as a secondary reserve as opposed to  
16 primary reserves ratio. So we looked at that on the three  
17 offset mature floods.

18           And then just working the spreadsheet from left to  
19 right, you can see I looked at those parameters for the Central  
20 Drinkard Unit, the CDU, Warren Unit, and then the Northeast  
21 Drinkard Unit, identified there as NEDU. And then I averaged  
22 how those offset floods performed, and I used that to determine  
23 how I felt our waterflood would perform.

24           Q. Okay. And then what does Exhibit 27 reflect?

25           A. Moving onto Exhibit 27, Exhibit 27 is a

1 volumetric sheet of how much oil is in place, how much oil we  
2 think we're going to recover with these waterflood operations.

3           The first set of calculations basically get that the  
4 original oil in place was 120 million barrels of oil. That is  
5 the two bright green areas of the reservoir that Mr. Curtis  
6 identified in his cross section. There is more oil in the  
7 lower Blinbry. But again, we don't know how much it's going  
8 to contribute to the waterflood.

9           Working our way on down Exhibit 27, the next group of  
10 calculations deals with accumulative recovery, remaining  
11 primary reserves, and ultimate primary recovery. There's two  
12 sets of calculations for each of those parameters. And what  
13 has happened is, I looked at it just on the initial 40-acre  
14 wells that develop this part of the field. And then there's  
15 been, as Mr. Curtis referred to, 40 20-acre infill wells  
16 already drilled, mostly in the north half of this field. So I  
17 looked at their performance also. Bottom line, doing nothing  
18 to this part of the field, the ultimate primary recovery would  
19 be 15.4 million barrels of oil or a 13 percent recovery factor.

20           And then the next two groups of calculations goes  
21 through the free gas saturations that is built up in the  
22 reservoir and how long fill-up time would take to collapse that  
23 gas back into the oil bands. And that calculates out as 9.6  
24 years.

25           And then the last group of calculations deals with

1 the incremental reserves we think that this waterflood will  
2 recover. I did it in two parts also. If we would have  
3 waterflooded this with the wells just on 40 acres, and then if  
4 we would have done this with the field, completely drilled down  
5 to 20-acre well spacings, and then I subtracted out the  
6 reserves that are not currently -- the parts of the field that  
7 are not currently drilled down to 20 acres.

8 And bottom line, I came up with 6.1 million barrels  
9 that this waterflood ought to recovery, incrementally, which is  
10 an increment of 5 percent recovery factor.

11 Q. What does Exhibit 28 reflect?

12 A. Exhibit 28 goes through the 27 wells that we plan  
13 to convert from current production into water injection wells.  
14 And the bottom line there is we will look at losing 97.8 -- and  
15 these numbers are down at the bottom of the spreadsheet in  
16 bold. 97.8 barrels of oil a day, 413 barrels of water a day,  
17 and 1.7 million a day of gas production will be lost when we  
18 convert these wells from production to water injection.

19 Q. And what type of recovery are you predicting for  
20 the project? What type of ratio?

21 A. It's .4 secondary barrels to every one barrel of  
22 primary oil. Again, 6.1 million barrels of oil incremental to  
23 this project.

24 Q. What is the estimated life of this project?

25 A. I would refer the Examiners to Exhibit 29. It's



1 a production plot of how we feel this waterflood will perform.  
2 You can, of course -- the red is gas production; the green is  
3 oil production. You can see the 97-barrel a day drop in oil  
4 production when we convert these wells from production to  
5 injection. We pretty much plan on oil production being flat  
6 for a year and then starting to respond in accordance with the  
7 three offset analogous waterfloods that I looked at, again, 6.1  
8 million barrels of incremental oil over a 44-year life.

9 Q. What type of injection pattern will you have?  
10 And I refer to Exhibit 30.

11 A. Exhibit 30 represents both our injection system  
12 on our production system that will be in existence during the  
13 operation of this waterflood. The red box in the middle of the  
14 field will be a central facility that we will build both to  
15 handle and process our produced fluids and to be in position  
16 for our source water and high pressure pumps for our water  
17 injection.

18 We will have two water source wells. They are in the  
19 blue hexagons there. One will be a re-entry to the San Andres  
20 Formation, and one will be a new drill to the San Andres  
21 Formation. And then you can see the yellow hexagons are our  
22 location of our injection wells.

23 Again, the north side of the field has been drilled  
24 down to 20-acre wells and, for the most part, will be 40-acre  
25 five-spot pattern on the injection. And the ~~south-half-of-the~~

1 ~~field is still pretty much on an 80-acre-five-spot-pattern.~~

2 Q. Would you discuss briefly the economics for the  
3 project? And I refer you to Exhibit 31.

4 A. Exhibit 31 is just a summary sheet of the  
5 economics to all parties. It's going to take \$10.6 million to  
6 install this project. I cite the incremental reserves as 5.9  
7 million barrels of oil versus the 6.1 I've talked about.  
8 Whenever we ran it through our economic models, they cut off a  
9 little bit of the reserves. We'll actually cite 5.9 after  
10 economic modeling.

11 You can see the project is very attractive to all  
12 parties, the working interest owners, the mineral owners, and  
13 the State of New Mexico through increased tax revenues. The  
14 working interest owners should realize a benefit of after-tax  
15 present value discounted at 10 percent of \$77 million, so a  
16 67 percent rate of return on their investment. Mineral owner,  
17 the same present value is calculated at \$18 million dollars,  
18 and the State of New Mexico is \$8 million of present value in  
19 increased tax revenue. So it's an attractive project to  
20 everybody.

21 Q. So the project will be economic?

22 A. Yes, it will.

23 Q. Is the portion of the pool being unitized  
24 suitable for waterflooding?

25 A. Yes, it is.

1 Q. Is the project area so depleted that it's prudent  
2 to apply an enhanced recovery program at this time?

3 A. Yes, it is.

4 Q. In your opinion, is the waterflood project  
5 technically and economically feasible at this time?

6 A. Yes, it is.

7 Q. Will the value of the oil and gas recovered by  
8 unit operations exceed the unit costs plus a reasonable profit?

9 A. Yes, it will.

10 Q. Will waterflood operations result in the recovery  
11 of substantially more hydrocarbons from the pool than will  
12 otherwise be recovered?

13 A. Yes.

14 Q. Will unitization and secondary recovery benefit  
15 working interests and royalty owners in the unit?

16 A. Yes, it will.

17 Q. And is unitized management an operation of this  
18 portion of the reservoir reasonably necessary to effectively  
19 carry out waterflood operations?

20 A. Yes, it is.

21 Q. Because of this estimated additional production,  
22 do the wells in the proposed unit qualify for the recovered oil  
23 tax rate?

24 A. Yes, it does.

25 Q. Depending on the price of oil? One thing you did

1 mention, Mr. Mayes, that there were 91 active wells, and the  
2 total current production is what? About 812 barrels a day?

3 A. That's correct.

4 Q. So even though you mentioned development, the  
5 wells are small producers at this time?

6 A. That's correct.

7 Q. Now, let's move on to the injection application.  
8 What is Exhibit 32?

9 A. Exhibit 32 is the New Mexico Oil Conservation  
10 Division form C-108, Application for Authorization to Inject.

11 MR. BRUCE: And, Mr. Examiner, for ease of reference,  
12 in the lower right-hand corner, the pages have been numbered in  
13 case Mr. Mayes needs to refer to anything.

14 Q. (By Mr. Bruce): Mr. Mayes, let's start off with  
15 the injection wells. How will they be completed? And if you  
16 could refer to the pages for the Examiner to look at.

17 A. Yeah, for all 27 wells we plan to convert from  
18 production to injection we have drawn up a schematic and posted  
19 all the pertinent information required in the C-108  
20 application. Those schematics run from Page 3 to Page 29.

21 Q. Could you discuss a typical completion?

22 A. Yeah. The most important thing is the top of  
23 cement, and basically we found top of cement on all strings of  
24 casing from four sources. One either -- in the records, it's  
25 denoted that cement was circulated to the surface while

1 installing that casing. That is designated by the initials  
2 CIRC. Where appropriate, a second item was -- if the top of  
3 cement was determined by a temperature log, then that's denoted  
4 by the initials TS on the schematic.

5 The third way of determining it is a cement bond log,  
6 and that is designated by the initial CBL where that is  
7 pertinent. And then the fourth way is to calculate the top of  
8 cement. And where we calculated top of cement, we utilize the  
9 appropriate size of bore hole, the appropriate size of casing.  
10 We used a 1.41 cubic feet per sack for the yield on the cement,  
11 which is pretty standard in this area. And we used a  
12 25 percent excess to the size of the bore hole to allow for  
13 washouts and other issues.

14 ~~All the injectors do appear to be in good mechanical~~  
15 ~~shape with the exception of~~ (four) that I would like to discuss  
16 with the Examiner. The first one to discuss would be the  
17 ~~Lockhart A-17-#04~~ well on Page 18. This is a well that has  
18 actually been re-completed out of the Blinebry, Tubb, and  
19 Drinkard Formation and into a shallower Penrose Formation. It  
20 is currently producing in economic quantities out of the  
21 Penrose.

22 Our intent is to ~~drill a twin well to the Penrose~~ to  
23 capture the reserves and re-enter this well and squeeze off the  
24 Penrose and make it into a Blinebry and Drinkard injector.  
25 This is a well that is not on the -- that is not going to come

1 into the unit as inventory. We're going to leave it outside of  
2 the unit for the time being. We will -- it's going to be our  
3 last conversion, so it will probably happen in January of next  
4 year. But we did want to go ahead and get the permission to  
5 inject into the Blinebry and Drinkard at this time, so that's  
6 why -- that's one I wanted to discuss with you.

7 The next one would be the Southland Royalty #4, which  
8 is on Page 21. Again, similar situation. The Blinebry, Tubb,  
9 and Drinkard had been abandoned, and this well has been  
10 re-completed up in the Grayburg. It is uneconomic in the  
11 Grayburg at this time. So our intent is to inventory it into  
12 the unit, squeeze the Grayburg and make an injector out of it  
13 in the very near future upon receiving approval for this unit.

14 The third well would be the ~~Southland Royalty #077~~,  
15 which is on Page 24. Same situation, the Blinebry, Tubb, and  
16 Drinkard Formations have been abandoned. This well has been  
17 re-completed in a shallow Grayburg zone again. Again, the  
18 Grayburg is uneconomic in this well, so we will be inventorying  
19 it into the unit. We will be squeezing the Grayburg and making  
20 a Blinebry and Drinkard injector out of it as well.

21 MR. WARNELL: That's the Grayburg there? 38, 20, 63?

22 THE WITNESS: That's correct. Yes, sir.

23 A. And then the last well is the ~~State C Tract 12 #3~~  
24 well, which is on Page 26. Same scenario, and this well is  
25 actually completed in the Penrose and is at this time T and A'd

1 with a cast-iron bridge plus and a cement up hole. Again,  
2 we'll clean that all out, squeeze the Penrose, inventory this  
3 well into the unit and make an injector out of the Blinebry and  
4 Drinkard out of this well. All the other injectors appears to  
5 be in good mechanical shape to be used as injectors.

6 Q. (By Mr. Bruce): And so you wanted to point out  
7 the wells that are currently completed in another zone rather  
8 than the BTD zones in this reservoir?

9 A. That's correct.

10 Q. How many wells are there in the area of review?

11 A. There were -- and I'll refer the Examiners to  
12 Page 31, which is our map, again, of all of the -- the  
13 half-mile radius around all the proposed injectors. Within  
14 ~~that area of review, there were~~ 170 wells that we reviewed the  
15 mechanical integrity of. We posted that information on a  
16 spreadsheet which runs from Page 32 to 36.

17 For the Examiner's convenience, we did organize this  
18 with the first page, Page 32 being the proposed injection  
19 wells. And then the next two pages, Pages 33 and 34 are the  
20 producing wells coming into the unit. And then the next two  
21 pages, Pages 35 and 36 are the wells outside of the unit.

22 We can certainly send this spreadsheet to the  
23 Examiners in an electronic form so that you can sort it any way  
24 you would like to make it easier for you to look at all  
25 these -- the mechanical integrity of all these well bores.

1 Q. Are any of the wells in the area of review  
2 plugged and abandoned?

3 A. Yes. We did find six plugged and abandoned  
4 wells. They all appeared to be plugged according to the OCD  
5 requirements. We did provide schematics and, where  
6 appropriate, detailed reports of these wells, and that runs  
7 from Page 37 to Page 49.

8 Q. And are the wells in the area of review properly  
9 completed or plugged and abandoned so as to prevent movements  
10 of fluids between zones?

11 A. I believe so, yes.

12 Q. Would you summarize the proposed injection  
13 operations? And I refer you to Pages 50 through 52.

14 A. Yes. Item No. 7 on Form C-108 deals with  
15 injection volumes and injection pressures. Based on the  
16 analogous offset floods, we think we'll average 490 barrels of  
17 water a day per injector. We don't see any single injector  
18 going over 1000 barrels of water a day injection. The  
19 injection pressure, the shallowest top perforation we have in  
20 any proposed injector is at 5602 feet. So per the OCD  
21 requirements of .2 psi per foot per surface injection pressure,  
22 we would be asking for a maximum surface injection pressure of  
23 1120 pounds at this time. Of course, we will subsequently run  
24 step rate tests and see if we can justify an increase in that  
25 pressure.



1 Q. Is there a proposed stimulation program for the  
2 injection wells?

3 A. All the wells will be acidized in the Blinebry  
4 and the Drinkard upon conversion from production.

5 Q. And are there any water wells within this area?

6 A. Yes. And I've attached, again, in accordance  
7 with the State Engineer's Office, a list of all water wells of  
8 record in the area of review. Those are attached on Pages 53  
9 and 54. The deepest of those wells is 163 feet.

10 And again, to confirm what Mr. Curtis said, to that  
11 depth we will have at least two strings. All the wells in the  
12 area of review will have at least two strings of casing  
13 cemented back to surface covering down to that depth.

14 Q. What is the source of your injection water?

15 A. Of course, we'll be bringing produced water back  
16 into the central facility. We will use it for the reinjection.  
17 We will have makeup water from the San Andres Formation from  
18 the two source wells that we discussed earlier.

19 Q. Is there any problem between the San Andres water  
20 and Blinebry or Drinkard water?

21 A. No, there isn't. The San Andres has been the  
22 source water for the three offset mature floods that they've  
23 been using since the mid 1970s. No major problems between the  
24 San Andres water and the Blinebry and Drinkard waters.

25 Q. So you don't anticipate any compatibility

1 problems between those two sources of water?

2 A. No, we do not.

3 Q. And what is Exhibit 33?

4 A. 33 is the start of the plan of operation that  
5 we'll submit to the BLM and the State of New Mexico upon  
6 statutory unitization. What Exhibit 33 is is a list of all the  
7 wells that will be coming into the unit inventory with their  
8 old lease name and lease well number and their new proposed  
9 unit number in the right-hand column.

10 Q. And this identifies the injectors also?

11 A. That's correct.

12 Q. In your opinion, is the granting of this  
13 application in the interest of conservation and the prevention  
14 of waste?

15 A. Yes, it is.

16 Q. And were Exhibits 24 through 33 prepared by you  
17 or under your supervision?

18 A. Yes, they were.

19 MR. BRUCE: Mr. Examiner, I move the admission of  
20 Exhibits 24 through 33.

21 MR. WARNELL: Exhibits 24 through 33 are so admitted.

22 MR. BRUCE: I have no further questions of the  
23 witness.

24 MR. BROOKS: No questions.

25 MR. WARNELL: Richard?

1

EXAMINATION

2 BY MR. EZEANYIM:

3 Q. Your name, again? I forgot.

4 A. Kevin Mayes.

5 Q. Mr. Mayes. Thank you for testifying. First of  
6 all, I don't see very well. But this spreadsheet on the area  
7 of review wells is very tiny.

8 A. Yes, sir.

9 Q. Is there any way we can blow it up so I can read  
10 it? I tried to read it, but I couldn't.

11 MR. BRUCE: He can e-mail it to you.

12 Q. (By Mr. Ezeanyim): Yes, I would appreciate that.  
13 It is very important to have that information. Because I would  
14 like to run through it.

15 A. Yes, sir.

16 MR. WARNELL: The same, Mr. Mayes, with some of the  
17 spreadsheets.

18 THE WITNESS: Absolutely.

19 Q. (By Mr. Ezeanyim): Okay. I think it was a good  
20 presentation, but I still have a couple of questions to clarify  
21 what you have said here.

22 From your testimony, I think this is a really good  
23 project. If you can make almost 7 percent return, that's  
24 excellent. So I'm not even going to go to the cost to ask if  
25 your project is economic or not.

1 Are you in the Blinebry, the Tubb and the Drinkard,  
2 right?

3 A. That's right.

4 Q. What would be your perforation intervals where  
5 you start injecting? Is that going to be just the Tubb and  
6 Blinebry or the Drinkard -- or I mean, the Drinkard or what?  
7 All three formations?

8 A. No. It'll be -- to start out with, it will be  
9 the Blinebry and the Drinkard. Those are ~~the two known gas~~  
10 ~~reservoirs~~ -- I'm sorry -- known oil reservoirs, and that is  
11 what is waterflooded in the offset waterfloods. The Tubb is an  
12 interesting animal. As you go down structure, it can get to an  
13 oil saturation that may justify water flooding. As a result,  
14 we want to unitize that and have that option available to us.

15 Q. But you want to target this in case you see  
16 something there?

17 A. Yes, sir.

18 Q. But I guess it's the Blinebry and the Drinkard?

19 A. Those are proven, yes, sir.

20 Q. And then the injection intervals is all in this  
21 C-108?

22 A. Yes, it is.

23 Q. On the wells, you're going to use about 27  
24 injection wells that are currently producing, right?

25 A. Yes, sir.

1 Q. You're going to convert them. And you don't have  
2 the schematics for -- what will they look like? Where are you  
3 converting them -- do you?

4 A. No. But I can provide those to you.

5 Q. That's really what we're looking at.

6 A. Okay.

7 Q. Because if you provide the schematics on what  
8 they would look like, then that would reduce the amount of  
9 remedial work you may be required to do. You are talking about  
10 squeezing the Grayburg and other wells. If you provide -- if  
11 you squeeze it off and provide a schematic -- so you have the  
12 engineer evaluate what more work is necessary to be done, maybe  
13 there will be no work if you provide that information on the  
14 injection wells, the ~~27-injection-wells-you-are-going-to~~  
15 ~~convert?~~

16 A. I can do that.

17 Q. We would like to have those schematics, where  
18 they are cemented, those wells, and then the stops and -- but  
19 some of them are circulated on those wells.

20 A. Well, our priority was if we could find a record  
21 that said it circulated, we honored that first. And then if we  
22 could find a temperature log in the records, we honored that  
23 second. And then if we could honor a cement bond log in the  
24 records, third, we honored that. And then calculating it was  
25 our last resort.

1 Q. I do have a problem with calculating the cement  
2 tops because sometimes it doesn't give you an accurate cement  
3 top. And then if we -- it's up to our judgement that it might  
4 need something. But if you don't have any others, that's all  
5 you have to do, but we need to see the calculation that you  
6 have for the cement tops.

7 A. Okay.

8 MR. WARNELL: Would it be possible to go into some of  
9 those wells and run ~~CPO?~~ *CBL*

10 THE WITNESS: Well, I mean, it's difficult. You're  
11 taking a well offline, and you're losing production. It's not  
12 desirable.

13 Q. (By Mr. Ezeanyim): It's not desirable, but can  
14 you do it? If we tell you you have to do that, can you do it?

15 A. I mean, it's possible, yes.

16 Q. It's possible. Okay. And you say you are going  
17 to use two types of spots, 40-acre to 20-acre five-spots,  
18 right?

19 A. I'm sorry?

20 Q. 40-acre five-spots? What portion are you going  
21 to use for the waterflood?

22 A. The way the field is developed at this time, it  
23 lends itself to putting in a 40-acre five-spot on the north  
24 half of the field and a 20-acre five-spot on the south end of  
25 the field.

1 Q. Does that mean that those that would most -- give  
2 you the most value?

3 A. Yes. And the intent is to go ahead and get the  
4 waterflood started up, start pressuring up the reservoir, and  
5 then we'll develop the south part of the field.

6 Q. Okay. Is your well now currently water  
7 producing, just the well? Do you have any idea?

8 A. On average oil production?

9 Q. Yes.

10 A. Actually, it's on one of my exhibits.

11 Q. Yeah, it is, but --

12 A. 8.9 barrels of oil a day is the average.

13 Q. Per well?

14 A. Per well.

15 Q. 8.9. Okay.

16 A. Yes, sir.

17 Q. I don't know. Are you -- did we talk about the  
18 freshwater zone in this area?

19 A. Okay.

20 Q. So we have the water analysis?

21 A. We did not get a water analysis. We can get  
22 that. We talked to Ken Fresquez at the New Mexico State  
23 Engineer's Office. He's the keeper of the freshwater. And we  
24 had an extensive conversation with him about what depth  
25 freshwater existed to, and he basically cited 130 feet as the

1 base of freshwater. And then I cited in my testimony that the  
2 deepest water well in the area is 163 feet, and cited that all  
3 the wells we reviewed cover that up substantially.

4 Q. That may be no issue, but we need to get a  
5 freshwater for our records to see what is happening there.

6 A. Got it.

7 Q. If you go to area of review, how many wells do we  
8 have in the area of review? Did you say 170?

9 A. 170, yes, sir.

10 Q. ~~170,~~ and they are all contained here. Out of  
11 those 170, how many have been ~~plugged and abandoned?~~

12 A. ~~Six.~~

13 Q. Six have been plugged and abandoned. With the  
14 rest of the wells, what are they doing now?

15 A. They're producing. 111 -- or I'm sorry -- ~~91 of~~  
16 ~~them are currently producing in~~ the -- well, I take that back  
17 because there are some wells outside the unit that are still  
18 within the area of review. They are producing wells.

19 Q. Okay. That's it for this one. So out of the  
20 170, six are plugged and abandoned, the rest of 164 are  
21 producing?

22 A. Yes, sir.

23 Q. Okay. And the information is contained in here  
24 whether they are plugged and abandoned or currently active?

25 A. Right. All the mechanical details on all 170



1 wells is on that spreadsheet.

2 Q. Okay. Very good. So what we need of those  
3 injectors -- I mean, those wells that are you going to  
4 convert --

5 A. Absolutely.

6 Q. -- tell what you are going to do. Are you going  
7 to squeeze off? Because those are the primary actions we look  
8 for the injectors. That's where you -- I know you're not going  
9 to do it on there. You're going to pressurize it, and you're  
10 going to do 2 psi a foot?

11 A. Correct.

12 Q. Okay. So if we could get the spreadsheets of  
13 those wells so I can read about it. I don't mean to -- what  
14 else do I need here?

15 A. Freshwater.

16 Q. Yeah. Freshwater. We need that. Are you asking  
17 for saturation for the oil tax rate?

18 MR. BRUCE: Even though it may not be useful at this  
19 time, we are still requesting it.

20 MR. EZEANYIM: Yeah. I don't know whether you would  
21 get that in 100 years. I don't know when the price will come  
22 back from 130 to 28.

23 This is a good project. I have no more questions.

24 MR. BROOKS: I do have one question. What oil price  
25 do you use in your economic?

1 THE WITNESS: On that summary sheet? It was a  
2 10-year strip price a couple of months ago. I believe it was  
3 ~~\$86=a barrel~~. I could double check that for you if you'd like.  
4 It's changed a little.

5 MR. BROOKS: Yeah. It's changing very rapidly these  
6 days.

7 MR. EZEANYIM: What is it today? Is it \$126? But  
8 you used \$86. That's okay. Then trying to do your analysis,  
9 why did you use 10 percent to estimate that?

10 THE WITNESS: It's a corporate rate.

11 MR. EZEANYIM: Corporate, okay. And that is  
12 internal?

13 THE WITNESS: Internal to us, yes. Internal to  
14 Apache.

15 MR. BROOKS: That's all I had.

16 EXAMINATION

17 BY MR. WARNELL:

18 Q. Okay. Mr. Mayes, very impressive set of exhibits  
19 from all of you gentlemen.

20 I do, however, have a question on Exhibit No. 26. If  
21 you could help me out there a little bit. On your first line  
22 item, oil, IP, that far right-hand column, how does that  
23 average to 8.9 barrels per day?

24 A. What does it average out to be, sir?

25 Q. It just kind of caught my eye that -- and are you

1 averaging --

2 A. Oh, oh. That is not an average number from the  
3 three offset floods. That is actually the oil rate that  
4 existed when the waterflood was installed. I'm sorry.

5 Q. And you've got it right there. I just wanted you  
6 to know I was paying attention.

7 A. I apologize for that.

8 MR. EZEANYIM: Does CDU have the 20 units? What does  
9 CDU mean?

10 THE WITNESS: CDU stands for Central Drinkard Unit,  
11 which is on that plat we gave you, the five offset units,  
12 that's the southern one. The Warren Unit is a Blinebry, Tubb,  
13 Drinkard waterflood. It's north of us. And the NEDU is the  
14 Northeast Drinkard Unit, which is directly to the east.

15 MR. WARNELL: Okay. That's all I really have.  
16 Mr. Bruce?

17 MR. BRUCE: I have nothing further in this matter,  
18 Mr. Examiner.

19 MR. WARNELL: The witness may step down.

20 MR. BRUCE: I would simply ask that both cases be  
21 continued for two weeks so I can submit the additional notice  
22 material.

23 MR. WARNELL: So be it. We'll continue both of the  
24 cases until June 12th.

25 MR. BRUCE: May 29th.

1 MR. WARNELL: May 29th. Cases No. 14125 and 14126  
 2 will be continued to May 29th.

3 [Hearing concluded.]

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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. \_\_\_\_\_,  
 heard by me on \_\_\_\_\_.

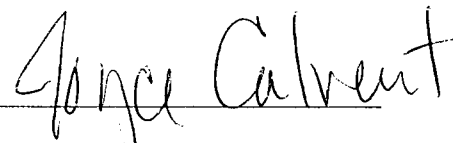
\_\_\_\_\_, Examiner  
 Oil Conservation Division

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I FURTHER CERTIFY that I am neither employed by nor related to any of the parties or attorneys in this case and that I have no interest in the final disposition of this proceeding.



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9 stenographic notes. On the date I reported these proceedings,  
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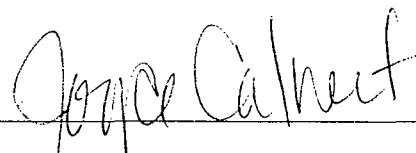
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