

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:)
APPLICATION OF APOLLO ENERGY, L.P.,)
FOR APPROVAL OF A WATERFLOOD PROJECT,)
EDDY COUNTY, NEW MEXICO)

CASE NO. 13,935

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID K. BROOKS, Jr., Legal Examiner
RICHARD EZEANYIM, Technical Examiner

June 21st, 2007

Santa Fe, New Mexico

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This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID K. BROOKS, Jr., Legal Examiner, and RICHARD EZEANYIM, Technical Examiner, on Thursday, June 21st, 2007, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

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June 21st, 2007
 Examiner Hearing
 CASE NO. 13,935

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* * *

A P P E A R A N C E S

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* * *

1 WHEREUPON, the following proceedings were had at
2 9:06 a.m.:

3
4
5 EXAMINER BROOKS: Very good, at this time we'll
6 go back on the record and we'll call Case Number 13,935,
7 the Application of Apollo Energy, L.P., for approval of a
8 waterflood project, Eddy County, New Mexico.

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

11 EXAMINER BROOKS: You have how many witnesses?

12 MR. BRUCE: Two.

13 EXAMINER BROOKS: Are they present?

14 MR. BRUCE: Yes.

15 EXAMINER BROOKS: Witnesses should stand to be
16 sworn.

17 (Thereupon, the witnesses were sworn.)

18 EXAMINER BROOKS: Call your first witness.

19 MR. BRUCE: My first witness is Jerry Ebanks.

20 And Mr. Examiner, before I begin, placed in front
21 of you, Exhibit Number 1, what Apollo Energy seeks to do is
22 institute a waterflood on the Russell Federal Lease.

23 And if you'll look at Exhibits 1 and 2 together,
24 this waterflood is a lease waterflood. It is completely
25 within Federal Lease LC-050797, seeking to flood the

1 Russell (Yates) Pool. There was a waterflood on this lease
2 approved by Commission Order R-263, many, many, many years
3 ago. As our first witness will testify, the waterflood
4 ceased operation, in effect, and so Apollo Energy has
5 purchased this acreage and essentially seeks to reinstate
6 the waterflood.

7 If you look at Exhibit 1 you can see that that's
8 a pretty bare bones order when it comes to waterflooding,
9 and I'm just including Exhibit 1 for historical
10 information.

11 And the second page is simply the definition. If
12 you'll see in the lower right-hand corner the nomenclature
13 orders telling you what acreage is within that pool.

14 Exhibit 2 is part of a land plat showing a couple
15 of things. The dark outline is part of that federal lease.
16 That federal lease covers, among other acreage, the south
17 half, southeast, of Section 12, all of Section 13, less and
18 except the southeast quarter, southeast quarter, and the
19 northwest quarter, northeast quarter, and north half,
20 northwest quarter of Section 24.

21 All of the wells you see on this plat are
22 operated by Apollo except for the three wells highlighted.
23 One is an OXY well, one is operated by Thunderbolt
24 Petroleum, and one is operated by Nordstrand Energy. And
25 that is taken directly from the Division's ONGARD records,

1 and that is simply for notice purposes later.

2 And if you'll look, even though there are -- the
3 dividing lines, those dashed lines on Exhibit 2, have
4 nothing to do with the lease boundaries. That has to do
5 with some -- I think some deeper rights and how they are
6 split up.

7 But insofar as the Russell (Yates) Pool goes,
8 everything on this plat within that dark, heavy black line
9 is within that federal lease I mentioned and has common
10 ownership.

11 And with that I'd like to proceed with Mr. Ebanks
12 at this point.

13 EXAMINER BROOKS: Okay, I am a little bit
14 confused about the boundaries that we're dealing with here.
15 Perhaps the -- Is the witness going to explain that or --

16 MR. BRUCE: Well, what is your question, Mr.
17 Examiner?

18 EXAMINER BROOKS: Well, let's see, if -- It's
19 easier for me to look at the plat that is Attachment 1 to
20 your Exhibit 3 because it shows more lines, more section
21 lines.

22 And let's see, if I'm trying to plot what is the
23 land that is noticed here, it starts with the southwest
24 quarter -- the southwest quarter of the southeast quarter
25 of Section 12. Now Section 12 --

1 MR. BRUCE: And if you look at --

2 EXAMINER BROOKS: -- would be the section that
3 the -- of which only the bottom quarter, only the south
4 quarter is shown on this map that's Attachment A, right?

5 MR. BRUCE: That's correct. If you had looked at
6 Exhibit 2, that I have handed you, that would be --

7 EXAMINER BROOKS: Exhibit 2?

8 MR. BRUCE: -- if you look at the northern end,
9 the southwest --

10 EXAMINER BROOKS: Yeah.

11 MR. BRUCE: -- quarter of the southeast quarter,
12 it would include those Russell USA Numbers 1, 2 and 3
13 wells.

14 EXAMINER BROOKS: Okay. And you have here the
15 south of the -- The green line includes the entire south
16 half of the southeast quarter, right? Looking at
17 Attachment 1 here.

18 MR. BRUCE: The --

19 EXAMINER BROOKS: But the unit only -- the
20 proposed unit only includes the southwest quarter of the
21 southeast quarter?

22 MR. BRUCE: That's the only place where wells are
23 located at this time, Mr. Examiner.

24 EXAMINER BROOKS: Okay, and that's all you're
25 asking us to include in the unit?

1 MR. BRUCE: At this point, yes.

2 EXAMINER BROOKS: Okay. And then it includes the
3 north half -- we're going into 13 now -- it includes the
4 north half, the southwest quarter, and the north half of
5 the southeast quarter, and the southwest quarter of the
6 southeast quarter. So in 13 it includes everything within
7 the green dashed lines?

8 MR. BRUCE: That's correct.

9 EXAMINER BROOKS: And then in 14 -- now 14 --
10 let's see, we're -- 13 -- 14 is going over to the left side
11 of the map, it includes the --

12 EXAMINER EZEANYIM: -- southeast --

13 EXAMINER BROOKS: -- southeast quarter of the
14 southeast quarter of 14.

15 EXAMINER EZEANYIM: Uh-huh.

16 EXAMINER BROOKS: So it does not include
17 everything within the green lines in 14, it includes only
18 this quarter section down at the very bottom.

19 MR. BRUCE: That is correct, Mr. Examiner.

20 EXAMINER BROOKS: Okay. So if you're going to
21 outline the unit on this map you would go down the line
22 between 13 and 14 to the dotted line that separates the
23 north half of -- the northeast quarter of the southeast
24 quarter from the southeast of the southeast, and only the
25 southeast is included in what you now ask --

1 MR. BRUCE: At this point --

2 EXAMINER BROOKS: -- to be unitized?

3 MR. BRUCE: -- yeah. It is all owned by Apollo
4 regardless --

5 EXAMINER BROOKS: Okay --

6 MR. BRUCE: -- but that's -- but that would --

7 EXAMINER BROOKS: -- and similarly, the acreage
8 in Section 24 is not included?

9 MR. BRUCE: There are no wells down there.

10 EXAMINER BROOKS: Okay, so I think I have this
11 correctly outlined. You start -- If you start at the
12 northwest -- northeast corner of Section 13, then proceed
13 east to the dividing line between the southeast southeast
14 of 12 and the southeast southwest of 12, you go north,
15 include the -- around the southwest southeast. That's the
16 only part of 12 that's included?

17 MR. BRUCE: That's correct.

18 EXAMINER BROOKS: And -- well, just to make it
19 simple, rather than trying to go around the perimeter, all
20 of 13 is included except the southeast southeast?

21 MR. BRUCE: That's correct.

22 EXAMINER BROOKS: And then in 12 it's only the
23 southwest southeast?

24 MR. BRUCE: At this point, yes.

25 EXAMINER BROOKS: And in 14 it's only the

1 southeast southeast?

2 EXAMINER EZEANYIM: Southeast.

3 MR. BRUCE: That's correct.

4 EXAMINER BROOKS: Okay, I think I've got it
5 figured out now. Thank you.

6 MR. BRUCE: And that was done simply because that
7 is where the wells are.

8 EXAMINER BROOKS: Okay.

9 MR. BRUCE: That is the extent of the productive
10 reservoir which Mr. Ebanks can talk about.

11 EXAMINER BROOKS: Okay, you may proceed --

12 EXAMINER EZEANYIM: Is that the lease --

13 EXAMINER BROOKS: -- sorry.

14 EXAMINER EZEANYIM: Is that the lease that the --
15 the acreage that is outlined, does that cover the lease,
16 single lease?

17 MR. BRUCE: It is one single federal lease, with
18 common ownership in the Russell (Yates) Pool.

19 EXAMINER BROOKS: Is that the green dashed
20 outline?

21 MR. BRUCE: That is the green dashed outline.

22 EXAMINER BROOKS: Okay.

23 MR. BRUCE: It also includes some additional
24 acreage over to the west, which isn't important here. That
25 federal lease.

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JERRY EBANKS,

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

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. My name is Jerry Ebanks.

Q. And where do you reside?

A. I live in Dallas, Texas.

Q. What is your occupation?

A. I'm a geologist.

Q. Who do you work for?

A. I'm a senior geologist with Forrest A. Garb and Associates. We're a geological and engineering consulting firm.

Q. And what is the relationship of Forrest A. Garb and Associates to Apollo in this matter?

A. We are consultants to them, helping them to decipher the engineering and geological aspects of this project.

Q. Have you previously testified before the Division?

A. No, I have not.

Q. Would you please summarize your educational and employment background for the Examiner?

1 A. I have a bachelor of science in geology from
2 Lamar University in Beaumont, Texas, and a master of arts
3 degree in geology at University of Texas in Austin.

4 Q. And when were your degrees acquired?

5 A. The bachelor's degree was in 1963, and the
6 master's degree in 1965.

7 Q. And who have you worked for in the business, if
8 you could just very briefly go through that?

9 A. I've worked for Mobil Oil Corporation, I've
10 worked for Ray Hollofield and Associates in Dallas, I have
11 worked with PXI, Incorporated, a geological prospect and
12 consulting firm, and I've also worked for Forrest Garb and
13 Associates.

14 Q. How long have you been with Garb and Associates?

15 A. Ten years.

16 Q. And as part of your duties with respect to Apollo
17 Energy, have you studied geology and the reservoir of the
18 Russell (Yates) Pool in this area?

19 A. Yes, I have.

20 Q. And as a result, has Forrest A. Garb Associates
21 and have you prepared exhibits for presentation today?

22 A. I have, in fact.

23 MR. BRUCE: Mr. Examiner, I'd tender Mr. Ebanks
24 as an expert petroleum geologist.

25 EXAMINER EZEANYIM: Before the Examiner answers,

1 let me ask a question. Are you a -- Do you happen to be a
2 registered petroleum geologist?

3 THE WITNESS: No, I'm not a registered petroleum
4 geologist. To conduct work like this in the oil and gas
5 business in Texas, you do not have to be a registered -- a
6 state registered petroleum geologist. I do have a position
7 as a certified petroleum geologist by the AAPG, the
8 American Association of Petroleum Geologists, and I will
9 tell you that that's strictly, basically, an experience-
10 based and peer-review-based certification. It's not
11 statutory.

12 EXAMINER BROOKS: Proceed.

13 Q. (By Mr. Bruce) Mr. Ebanks, could you first
14 identify Exhibit 3 for the Examiner and briefly go through
15 the history of this pool?

16 A. Exhibit 3 is the discussion portion of a report
17 we turned out in studying and reviewing the Russell Pool.
18 Doré Energy, of whom Apollo Energy is a subsidiary, came to
19 us late last winter and asked us to review this. They saw
20 the opportunity perhaps to acquire this field and wanted to
21 know what we thought about it. Would we give a reasonably
22 quick review of the geology and engineering aspects of the
23 field and provide them some recommendations, which we did,
24 and the pages of Exhibit 3 are the discussion portion of
25 the report that we presented to Doré Energy.

1 In that, Doré had gathered from New Mexico
2 government sources various items and bodies of information
3 that had been retained -- or gathered and retained by the
4 New Mexico Conservation Division, Oil Conservation
5 Division, regarding the Russell field.

6 Among those things were copies of the drillers'
7 logs and all the wells that had been drilled in the field.
8 Or as far as I know, it was all of them. And by drillers'
9 logs, I mean these are text descriptions created by the
10 people drilling the wells at the time, descriptions of the
11 sand units and the various lithologies that they drilled
12 through in drilling these wells.

13 Now these are reasonably -- I hate to say
14 inaccurate, but they're the type of information that is
15 very difficult to use in a quantitative sense, a very
16 detailed quantitative sense, in comparison to the degree of
17 detail into which we could go if we had modern open-hole
18 logs of all these wells. The field was discovered in 1942,
19 and that's pretty much the way things were done back then.

20 Subsequent to our review of those data,
21 subsequent to the discovery of the field and it being put
22 on production in 19-- -- let's see, I believe it was 19-- --
23 if you'll go to page 2 of that discussion, 1948, an
24 engineering firm, Cable and Stine, who I believe are
25 located in Wichita Falls, Texas, were commissioned to do a

1 study for gas repressurization of the Russell field.

2 The Russell field is a -- it produces from the
3 Yates sand, and the top of the Yates sand varies but it's
4 roughly 800 feet deep in that area and on the order of 100
5 feet or less in thickness. And it's a fairly -- it's a
6 collection of alternating sands and shales with perhaps
7 some limy streaks and some anhydritic streaks, and many of
8 these sands in there are silty and shaly, so that they're a
9 relatively poor reservoir quality. However from the
10 performance of some of these wells it seems like certainly
11 some of these sand lenses and sand laminate probably do
12 have some pretty attractive properties.

13 However, the production in the field began to
14 decline because it had a limited amount of reservoir
15 energy, because it appears to be a -- pretty much a closed
16 body.

17 According to data retrieved from the New Mexico
18 government, the structure map which is the -- I guess
19 Exhibit Number 6, the one that you were looking at earlier
20 that's labeled Attachment 1 at the bottom, there's no
21 appreciable closed structure on there. It is basically
22 just a monoclinial dip to the east, a rather featureless
23 thing.

24 But if you -- The next exhibit, which is labeled
25 Attachment 2 at the bottom -- I think it's your Exhibit

1 Number 7 -- is a map of the net sand thickness, isopach map
2 of the net sand thickness of the Yates sand. These two
3 maps were created in the 1948 study by Cable and Stine.
4 And these two maps also were used in the other successive
5 studies of the field by engineering companies. And based
6 on the limited data we have they seem to be reasonable
7 documents, and so we accepted them as they were. We do not
8 have the specific data values that were used in contouring
9 these maps. But everything seemed to fit well, so we took
10 them pretty much as gospel and used them in our study.

11 Subsequent to Cable and Stine's study, there were
12 some detailed core analyses made in the mid- to late '50s
13 and the early '60s, and the results of those core analyses
14 corroborated opinions that Cable and Stine had formed
15 regarding some of the reservoir properties, primarily
16 saturations and porosity. And so again we felt comfortable
17 in having made the decision to use these existing maps.

18 And then in 1964 there was an evaluation
19 contracted out to Stephens Engineering, which I believe to
20 be a successor company to Cable and Stine. Stephens
21 Engineering, I know, is located in Wichita Falls, Texas,
22 and the documents in these various reports, the company
23 stamp on the pages of the documents looked identical to the
24 one used by Cable and Stine, so that's another reason that
25 I think that they are -- that Stephens is a successor

1 company to them.

2 And anyway, they were contracted to evaluate the
3 portions of the field that were under the Wills lease and
4 to also look at the possibility of waterflood.

5 All of the various generations of publications
6 that we looked at all seemed to come up with the same basic
7 conclusions, and that is that the reservoir had probably on
8 the order of 12-percent -- I mean 16-percent average
9 porosity, the original water saturations were probably on
10 the order of 35 percent, and the -- I'm looking for the
11 data we had on original oil in place. The original oil in
12 place, a shade under 6 million barrels.

13 If you look at your Exhibit Number 4, that's a
14 tabulation of the data that we were able to obtain, anyway,
15 the cumulative oil and water production from all the wells
16 in the field, and then in the fourth column toward the
17 right it has a cumulative oil-water ratio.

18 And as you see at the very bottom on the second
19 page of that attachment, that exhibit, that at the end of
20 2006 the field had produced a shade under 2.4 million
21 barrels of oil and almost 8 1/2 million barrels of water.
22 Now some of that water was formation water and some of it
23 was water that was used in a waterflood that was initiated,
24 to which Mr. Bruce alluded earlier.

25 Your Exhibit Number 5 is simply a copy of some

1 tabulated data we got from New Mexico that has essentially
2 completion information for all of the wells. It lists the
3 well number and the lease name, the completion date, the
4 stimulation that was performed at the time of initial
5 completion. And you'll notice under that it says "quarts",
6 and to the best of our knowledge every one of those
7 stimulation jobs was done with so many quarts of
8 nitroglycerine, nitroglycerine shot in the wellbore
9 opposite the producing formation.

10 Then it lists the initial potential rates of the
11 wells in barrels of oil per day and barrels of water per
12 day, and you see not very many of them produced water
13 initially.

14 Then further to the right, the casing size in
15 inches and the casing seat depth. Typically what they did
16 was, they set casing in these wells somewhere above the
17 Yates formation and then drilled on through the Yates, and
18 for completion they performed the nitroglycerine shot.

19 And then there's listed the completion interval,
20 the TD of the well, the ground elevation and the estimated
21 top of the Yates formation in that particular well.

22 I've mentioned very briefly your Exhibit Number
23 7, the isopach map of net Yates sand, and it shows it -- it
24 portrays it to be a closed body. And the information that
25 we've gotten from the State and from these other

1 engineering reports we referred to, the consensus seems to
2 be that the Yates reservoir quality just diminishes to the
3 north, the west, the south and the southeast. The sands
4 either lose their porosity and permeability, and/or they
5 become limy and anhydritic, so they lose their attractive
6 properties.

7 There does appear to be -- and this is strictly
8 anecdotal, but there does appear to be oil sitting on water
9 in a very small area of the northeastern corner of the
10 field. Since we don't have any open-hole logs, I can't
11 tell you exactly where that is and I can't verify it to be
12 a fact. But it does seem to be accepted by all the earlier
13 workers.

14 Then the next exhibit is a -- just a map of that
15 cumulative oil-water ratio, cumulative produced oil-water
16 ratio. And it just simply shows that essentially up the
17 middle of the field from southwest to northeast, where the
18 thickest Yates sand, is where the better production came
19 from.

20 And the last exhibit is a cross-section from west
21 to east, left to right, across the area of the Yates field,
22 including the field itself. You see there's a very small
23 index map such that the west end of the cross-section is in
24 the northwestern quarter of Section 14.

25 The next well south -- the next well to the right

1 on the cross-section is straight south of there, then it
2 goes to a well in the field, the USA Number 21, and then --
3 and that is -- at that time is one of the only modern,
4 shall we say, logs that we had in the field.

5 And then it moves up to the fourth well in the
6 cross-section, which is a well drilled by Cities Service.
7 It's a well in the northwest quarter of Section 13, and
8 that was a deep well. I don't remember the TD of it, but
9 it produces from zones well below the Yates formation.

10 And then the last well in the cross-section is
11 off in the next township over. It would be Section -- what
12 is that? -- 18, I believe, of 20 South, 29 East. And that
13 well was drilled by Texas Oil and Gas. It's also a deeper
14 well.

15 Q. So in looking at this last exhibit, Mr. Ebanks,
16 the Yates extends across a wide area in this region, but
17 only this limited area is productive?

18 A. That's to the best of our knowledge.

19 Q. And looking at your Exhibit 7, does that
20 reasonably define -- the reservoir that is continuous
21 across this part of the Russell Federal Lease?

22 A. I'm sorry, rephrase that?

23 Q. In looking at Exhibit 7, is the Yates reservoir
24 continuous across this portion of the Russell Federal
25 Lease?

1 A. Oh, yes.

2 Q. And from a geologic standpoint, do you believe
3 that it's susceptible to waterflooding?

4 A. I certainly do. It already has been waterflooded
5 partially. And over the years, for reasons unknown to me,
6 the waterflood and all the operations out there have kind
7 of slowly degenerated into abuse and neglect, and Doré
8 Energy recognized some possible potential here and asked us
9 to work with them to understand that, and now they've taken
10 it over and they're going to move forward with this.

11 Q. And there's been very little production out there
12 in recent years; is that correct?

13 A. Yes, sir.

14 Q. One final question. Is there any faulting out
15 there that would connect the injection formation with any
16 water-bearing zone in this area?

17 A. Not to our knowledge.

18 Q. Were Exhibits 3 through 9 either prepared by you
19 or under your supervision or compiled from company business
20 records?

21 A. Yes, they were.

22 Q. And in your opinion is the granting of this
23 Application in the interests of conservation and the
24 prevention of waste?

25 A. Very definitely.

1 MR. BRUCE: Mr. Examiner, I'd move the admission
2 of Exhibits 3 through 9.

3 EXAMINER BROOKS: Three through 9 are admitted.
4 did you want to admit 1 and 2 also?

5 MR. BRUCE: Yes, and I was going to do that with
6 my notice, but if I could admit Exhibits 1 and 2.

7 EXAMINER BROOKS: Okay, 1 and 2 are also
8 admitted.

9 MR. BRUCE: And I pass the witness.

10 EXAMINATION

11 BY EXAMINER BROOKS:

12 Q. Okay, do I correctly understand that this is very
13 shallow? You said depth of 800 feet; is that correct?

14 A. Yes, sir, average depth of the Yates sand is
15 about 800 feet below the ground surface.

16 Q. Okay. Is there any fresh water in this area?

17 A. Not down that deep, that we know of. There is a
18 salt layer 100 to 150 feet thick, about 100 feet above the
19 Yates:

20 Q. So that would be at a depth of above 700 feet?

21 A. Yeah, the top level would be, I think, around 450
22 or 500 feet.

23 Q. Now I see that -- let's see, is -- The Capitan is
24 just below this -- the Yates?

25 A. Yes, sir, and the Seven Rivers immediately below

1 that.

2 Q. Okay. Is that -- Is there any communication to
3 the formations below, or --

4 A. Not that we know of. From the very limited well
5 control and the poor quality porosity logs on that cross-
6 section, which is the last exhibit, there does not appear
7 to be much porosity in the Capitan, and it's -- to the best
8 of my knowledge it's a limestone, and it would seem very
9 unlikely that there would be any communication vertically
10 between the Yates and the Seven Rivers.

11 Q. Now the -- You have another witness, so this may
12 be a question I should ask the --

13 A. Try me.

14 Q. -- the other witness, but do you have a plan of
15 operations for how you're going to do this waterflood?

16 A. I think you'd best ask that of the other witness,
17 he's --

18 Q. Okay, I thought that might be the case.

19 A. Yeah, they are -- and they have prepared and are
20 continuing to study their plan, and I think they've got it
21 very well organized.

22 EXAMINER BROOKS: Mr. Ezeanyim?

23 EXAMINATION

24 BY EXAMINER EZEANYIM:

25 Q. Let's go back to Exhibit Number 4. I see your

1 total oil production to date is about 2.4 million barrels?

2 A. Right.

3 Q. And you have an IP of 6 million. Let me ask you
4 a question. This 2.4, is that a combination of primary and
5 the waterflood that has been --

6 A. To the best of our knowledge. These cumulative
7 production numbers were gathered from IHS Energy, which is
8 a successor company to what was formerly known as Petroleum
9 Information, and they're a public oil industry data vendor.
10 They publish and sell all kinds of oil industry data that
11 they gather through state agencies.

12 Q. Uh-huh.

13 A. Presumably in New Mexico they gather it from the
14 Oil Conservation Division, and all they use is the data
15 that are reported by the operators.

16 Q. So you don't know whether this number includes
17 the waterflood that has been approved in 1953 or, you
18 know -- So do you know what all those numbers include?

19 A. I'm confident that they include everything since
20 1942.

21 Q. Okay, include the waterflood?

22 A. Yes, sir.

23 Q. What is the average permeability in this area?

24 A. All I can do there is refer to those core
25 analyses that are listed on page 3 --

1 Q. Page 3?

2 A. -- of Exhibit 3. And you see that there is
3 average permeability for each of those four specific cores
4 that were studied. There's a little table there in the
5 upper portion of -- there, that --

6 Q. Okay.

7 A. And you see they run from 12 to 52 millidarcies.
8 I guess -- If I may, just to backtrack to you, sir, one of
9 the things that Apollo Energy intends to do is to drill
10 some new wells, a few -- a limited number of new wells, and
11 to deepen some other wells. And the only reason I jump in
12 here to steal his fire is that some or all of that drilling
13 will include coring the Yates, which will give us a lot
14 more detailed reservoir data, and all of those operations
15 and holes are going to include running modern logs.

16 And I think also the plan -- I don't know if this
17 is firm in their mind yet, but I feel confident it will
18 come to pass. Virtually all the holes into which they can
19 enter and reach TD, or near TD, they will run modern gamma-
20 ray cased hole neutron porosity logs. So that will give us
21 a whole lot more data too. We're really looking forward to
22 that phase of the operation, and that will really help us,
23 we hope, better understand the reservoir.

24 EXAMINER EZEANYIM: Okay, I'll have questions for
25 the next witness.

1 THE WITNESS: Okay.

2 EXAMINER BROOKS: Very good. Anything further,
3 Mr. Bruce?

4 MR. BRUCE: Nothing further from this witness.

5 EXAMINER BROOKS: Okay, you may call your next
6 witness.

7 GREGORY H. HALL,

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

10 DIRECT EXAMINATION

11 BY MR. BRUCE:

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

13 A. My name is Gregory H. Hall.

14 Q. Where do you reside?

15 A. Edmond, Oklahoma.

16 Q. What is your professional occupation?

17 A. Petroleum engineer.

18 Q. And who do you work for?

19 A. I'm Employed by Greg Hall Oil and Gas, LLC.

20 Q. And is that a consulting firm?

21 A. It is a consulting and oil and gas firm, yes.

22 Q. And what is your relationship to Apollo Energy in
23 this matter?

24 A. I'm a paid consultant.

25 Q. Have you previously testified before the

1 Division?

2 A. No, I have not.

3 Q. Would you please summarize your educational and
4 employment background for the Examiner?

5 A. I have a bachelor's degree from the University of
6 Oklahoma in petroleum engineering, 1974. I was employed by
7 Chevron in the Gulf Coast in drilling and production
8 operations, worked for Kerr-McGee Corporation as a senior
9 production engineer. In 1979 I left and formed my own
10 company that I operated, Dyne Exploration Company, for 25
11 years. I sold that two years ago and have been a
12 consultant since that time period.

13 Q. And with respect to this Application, have you
14 reviewed the data with respect to the proposed waterflood
15 and the injection Application?

16 A. Yes, I have.

17 MR. BRUCE: Mr. Examiner, I'd tender the witness
18 as an expert petroleum engineer.

19 EXAMINER BROOKS: I'm sorry, I forgot your name
20 already.

21 THE WITNESS: Greg.

22 EXAMINER BROOKS: Greg?

23 THE WITNESS: G-r-e-g, Greg Hall.

24 EXAMINER BROOKS: Okay. Mr. Greg, are you a
25 professional engineer --

1 THE WITNESS: No, I'm not.

2 EXAMINER BROOKS: -- in the State of New Mexico?

3 THE WITNESS: No, I'm not.

4 EXAMINER BROOKS: Or in any state?

5 THE WITNESS: No, I'm not.

6 EXAMINER BROOKS: Okay, he is nevertheless
7 qualified for this purpose. Go ahead.

8 Q. (By Mr. Bruce) Mr. Hall, first let's go through
9 the -- well, first let's go through the injection
10 application, and as you're doing that you can describe some
11 of the operations that --

12 A. Sure.

13 Q. -- Apollo Energy has already undertaken and what
14 they plan to do in the future on this project.

15 First, what is Exhibit 10?

16 A. Exhibit 10 is a Form C-108 submitted -- prepared
17 and submitted for the project as the data required to
18 consider the Application.

19 Q. Okay. Now this was prepared -- signed at the
20 bottom by a Mr. Scott St. John. Have you reviewed all of
21 the data in this Application?

22 A. Yes, and I was instrumental in preparing all of
23 the documentation to submit the Application.

24 Q. Okay. First of all, let's move back to page 3,
25 and could you identify the wells that Apollo Energy seeks

1 approval to commence the waterflood at this time?

2 EXAMINER EZEANYIM: If I may, Mr. Bruce --

3 MR. BRUCE: Yes.

4 EXAMINER EZEANYIM: -- on page 1, I see here that
5 -- on item number IV it says, Is this an expansion of an
6 existing project? And the answer is no.

7 I thought this lease had been an underwater flood
8 with an R-order of R-263. Is it a whole new project?

9 MR. BRUCE: Well, Mr. Examiner, that order is
10 essentially not in effect because of the cessation of
11 production and injection operations. I mean, I said at the
12 beginning that it's a reinstatement, but it's certainly not
13 a current existing project.

14 EXAMINER EZEANYIM: So you want us to treat it as
15 initial project?

16 MR. BRUCE: I think we ought to treat it as an
17 initial project at the --

18 EXAMINER BROOKS: I think we would have to under
19 our Rules, because it is not an existing project as we
20 would define it.

21 MR. BRUCE: Correct. And it's like -- As Mr.
22 Hall will explain, everything is beginning anew here, so I
23 think we --

24 EXAMINER EZEANYIM: Okay.

25 Q. (By Mr. Bruce) Okay, go ahead, Mr. Hall, on page

1 3.

2 A. The Application anticipates the drilling of five
3 brand-new wells, of which we will core the entire Yates
4 interval, and for information and geologic purposes we're
5 going to go on to 1200 feet to run some logs across the
6 Seven Rivers, just because we're there. I mean, we don't
7 have any reason to believe one way or the other that we'll
8 be successful with that.

9 It always has been our intention that these would
10 be the initial wells because of the new nature of the
11 wells, the integrity of the casing and our knowledge of the
12 cementing program, the coring, the placement, all of the
13 things that's necessary for a successful waterflood. And
14 then our intention is is that with these cores we're going
15 to have them analyzed by a separate company for the
16 feasibility study of an enhanced recovery project that
17 would include surfactant and chemical flood.

18 So these would be the five beginning wells. They
19 would be brand-new wells. We've already got a contract to
20 drill them and, you know, we would go through that process,
21 that operation.

22 Q. If things pan out as expected, how many
23 additional injection wells might Apollo seek for this
24 project?

25 A. Twenty or 30.

1 Q. And in the Application, Apollo requested
2 administrative approval for any expansion of the number of
3 injection wells; is that correct?

4 A. That's correct.

5 Q. One other thing. Although five wells are listed
6 here, are there currently two injection wells on this
7 property?

8 A. Correct, the USA 60 and the USA 65 have both been
9 approved by the OCD for disposal purposes. They're not
10 listed as injection wells under a waterflood rule and
11 administrative definitions, but they have been approved,
12 and the USA 60 has been reworked and tested and field-
13 witnessed by the Artesia OCD Field Representative, and is
14 currently taking water.

15 MR. BRUCE: And Mr. Examiner, the orders
16 approving those are fairly recent. They're SWD-1079 and
17 SWD-1080.

18 EXAMINER BROOKS: Okay, and you said the Number
19 65 is taking water?

20 THE WITNESS: The Number 60.

21 EXAMINER BROOKS: Number 60. What about --

22 THE WITNESS: We actually --

23 EXAMINER BROOKS: -- Number 65?

24 THE WITNESS: -- worked on the 65, and it would
25 not pass our own specs for mechanical integrity on the

1 annulus, so we've suspended operations pending either
2 decision to plug it or squeeze -- We may actually drill a
3 new well. We're studying the costs on it right now. We
4 think it might be cheaper just to plug the well and drill a
5 new injection well. But we don't know that quite yet.

6 EXAMINER BROOKS: Okay.

7 EXAMINER EZEANYIM: And these two new wells --
8 these two wells, one well, whatever, will be -- they're not
9 going to participate in the waterflood?

10 THE WITNESS: No, they will be part of -- they
11 will be rolled in, and water will be -- they are currently
12 being injected back into the Yates formation, the produced
13 water, the current produced water, and so they will become
14 part of the waterflood also. It's a distinction by
15 definition, injection well versus disposal well, based upon
16 the Rules of the Commission.

17 EXAMINER EZEANYIM: Yes, okay.

18 Q. (By Mr. Bruce) And as part of Exhibit 10 there's
19 an area-of-review plat, which is partly what Exhibit 2 was
20 taken from. How many wells are there in the area of
21 review, Mr. Hall?

22 A. There are 75 wells.

23 EXAMINER EZEANYIM: What page is that? What --

24 EXAMINER BROOKS: 15, I believe.

25 THE WITNESS: It's on 15 of my...

1 EXAMINER EZEANYIM: How many?

2 THE WITNESS: Seventy-five.

3 Q. (By Mr. Bruce) And how many of those wells are
4 plugged and abandoned?

5 A. I can count from the records 10 wells in that are
6 that have been plugged and abandoned.

7 Q. Okay --

8 EXAMINER EZEANYIM: Out of the 75?

9 THE WITNESS: Out of the 75, that's correct.

10 Q. (By Mr. Bruce) And is data on those plugged and
11 abandoned wells also contained within the Form C-108?

12 A. Yes, it is.

13 Q. Now have the wells that are plugged been properly
14 plugged and abandoned to prevent any movement among the
15 zones?

16 A. Yes, they have.

17 Q. Now of the other wells, how many does Apollo
18 anticipate using, either for injection or for producing
19 operations in the future?

20 A. There are currently approximately 30 wells that
21 we believe can be returned to production. When we started
22 operations the field was shut in by order of the BLM, and
23 we have entered into a consent order with them upon buying
24 it and -- to return a certain number of wells to
25 production, plug a certain number of wells. We've exceeded

1 that.

2 We currently have 10 wells on line and producing
3 right now. And as previously testified, one well, the USA
4 41, has been deepened. And in effect, that qualifies as a
5 plugged well, because we ran casing to TD and circulated
6 cement to surface. So...

7 Q. And Mr. Ebanks didn't refer to this, but there
8 was very little production or injection going on over the
9 last 10 or 15 years?

10 A. For the last two years the field has been shut
11 in, there's been no operations. It was under a -- I don't
12 know the technical name, but it was in violation of BLM
13 rules and the BLM had actually shut the operator in.

14 Prior to that, it was making three or four
15 barrels of oil a day out of really one well, and the water
16 that was being produced was going back into either the USA
17 60 or 65, which was approved and had a mechanical integrity
18 test on both those wells, and was really in a caretaker
19 mode. And there were numerous, as you can see on the map,
20 unplugged wells.

21 Q. And there is an agreement with the BLM requiring
22 wells to be brought into compliance in stages; is that
23 correct?

24 A. That's correct, yes.

25 Q. And Apollo is complying with that requirement?

1 A. Yes, in fact we've exceeded that. To date we've
2 spent approximately \$1.5 million since March on well work,
3 recompletions, running casing, just normal operations to --
4 we are -- we have a rig running in the field right now.

5 Q. With the intent to eventually bring all of these
6 wells into compliance under the BLM's and the Divisions
7 regulations?

8 A. Either to produce them, convert them to a
9 qualified injection well, or to plug them.

10 Q. Would you summarize the proposed injection
11 operations for this waterflood?

12 A. Yes, the field currently makes an average of --
13 percentage oil recovery on average of about 8-percent oil,
14 which is actually higher than we originally thought. There
15 are parts of the field that have an oil cut as high as 25
16 percent. We will repressure the reservoir, and the issue
17 will be how -- at what rate can we get the producing -- the
18 number of wells and the number of producing wells. Our
19 target is 3000 barrels of fluid per day, 100 barrels a day
20 over 30 wells. It's a pretty good number that we can work
21 with. That will require reworking more wells and then an
22 active injection process of putting the produced water plus
23 purchased water back into the ground.

24 Once we get the core data and have that analyzed,
25 if the chemical flood is feasible then we will be looking

1 to build a plant to start injecting chemical into the
2 ground for what would be commonly known as tertiary
3 recovery to see if -- that all depends on the core analysis
4 and the lab work that we'll do.

5 Q. Now, this is a pretty shallow pool, 800 feet or
6 so. So under the Division's regulations, injection was --
7 under the saltwater disposal wells, was limited to 160
8 p.s.i.?

9 A. That's correct.

10 Q. Under Division regulations, you can conduct step-
11 rate tests to increase the improved pressure. Have you
12 done that?

13 A. We have done a step-rate test on the USA 60.

14 Q. And what were the results of that test?

15 A. Our step-rate test indicated that -- and I have
16 the data that I can provide in a subsequent exhibit, that
17 somewhere between 450 and 500 p.s.i., you initiate a
18 fracture. In other words, at that point you can put an
19 unlimited amount of water in the ground without a rise in
20 pressure.

21 At 425 pounds we can put in 1.25 barrels of water
22 per minute. And I apologize, I didn't bring my calculator
23 and I didn't convert that. I don't -- What's that, about
24 700, 800 barrels of water a day? At 425 pounds.

25 Q. And has that data been sent in to the Artesia

1 District Office?

2 A. To the best of our knowledge, yes, it has been
3 submitted. I gave the data to Reagan Smith, who's our
4 regulatory firm, who filed the C-108 Application. They
5 have the information and they've told me they've filed it.
6 I have not seen the file copy yet, but it has been
7 submitted.

8 Q. Okay --

9 EXAMINER EZEANYIM: Do you have that step-rate
10 test here now?

11 THE WITNESS: I can give you the figures. I
12 mean, I've got them written down, because I've got them in
13 the book that I witnessed the test myself.

14 EXAMINER EZEANYIM: I would like to see a plot on
15 that step-rate test --

16 THE WITNESS: Okay.

17 EXAMINER EZEANYIM: -- if you have that, as part
18 of these exhibits.

19 THE WITNESS: This exhibit was prepared in
20 anticipation of this hearing, which was before any well was
21 placed on production. We had no information. We knew that
22 we would cross this bridge, we got permission to convert to
23 disposal wells. And when we did that, while we had the
24 truck there to do the integrity test, we went ahead while
25 we were there. I had an OCD rep there, I asked him to

1 witness it.

2 So at any rate, we have submitted that, but --

3 MR. BRUCE: And Mr. Examiner, we will -- after
4 the hearing we will submit -- I will submit --

5 THE WITNESS: Tell you what I can do, I can give
6 you a hand-drawn copy right --

7 EXAMINER EZEANYIM: Okay.

8 THE WITNESS: -- before I leave.

9 EXAMINER EZEANYIM: Okay.

10 THE WITNESS: I'll draw one, and then we'll
11 submit --

12 EXAMINER EZEANYIM: Yeah.

13 THE WITNESS: -- on a nice graph what it actually
14 is.

15 EXAMINER EZEANYIM: Because it appears to me that
16 the attorney is asking for right now -- I'll get 160 at 800
17 feet. You are asking for --

18 MR. BRUCE: We would like 400 to 425.

19 EXAMINER EZEANYIM: Yeah, that would -- you know,
20 that's why it's important that we get these --

21 MR. BRUCE: Yeah, we will submit that to you,
22 both --

23 THE WITNESS: And I might also, on the injection
24 rates, clarify something. If in fact we go to a large
25 number of injection wells and proceed with the chemical

1 flood, those rates will be in 100 barrels a day or less --

2 EXAMINER EZEANYIM: Uh-huh.

3 THE WITNESS: -- due to the nature of the
4 chemical and the tortuosity. If you pump it in too fast it
5 breaks down and shears, and it doesn't do any good. So
6 once we get into that phase, it's going to require a large
7 number of injection wells at that 3000 barrels a day, at a
8 much lower rate. And so we would be well under any
9 pressures there.

10 We were doing this for the purpose of an upper
11 limit, but I actually think it's probably going to be
12 around the 200-, 250-p.s.i. range. But I'll give that to
13 you, and we will submit a subsequent application as part of
14 this proceeding here.

15 EXAMINER EZEANYIM: Okay.

16 THE WITNESS: We'll get that for you.

17 EXAMINER EZEANYIM: Good.

18 Q. (By Mr. Bruce) And before we move off the wells
19 and the tests you've been doing, maybe you could briefly
20 describe how you will be re-entering and re-completing the
21 wells so that they are capable of being used in this
22 waterflood.

23 A. As I said, obviously on the new wells we've
24 submitted the Application, and all those will be in
25 compliance, groundwater, casing, cement. And we also,

1 because of the shallow depth, anticipate just circulating
2 cement to surface. So you've got a double string there.

3 On the existing wells, we're fortunate in that
4 7-inch casing was the standard that they use. And so on
5 many of the wells that currently are shut in -- probably
6 I've counted at least 10 -- but that I know have been used
7 for injection, they have 4-1/2 casing run inside the
8 7-inch, which has been cemented to surface too. I can
9 verify that because I can see the cement.

10 On the other wells that we -- if we can get
11 through the debris, we will go ahead and run 7-inch -- I
12 mean, I'm sorry, 4-1/2. And because of the distance
13 between the top of the injected zone or the producing zone,
14 which is around 800 feet, and the typical 7-inch was set
15 between 650 feet and 725 feet, there will be at least 100
16 feet of open hole between the 4-1/2 and the open hole of
17 cement there, and then cement to the surface inside the
18 7-inch. So it will be more than adequate to protect any
19 movement of fluids and any migration from injected water.

20 Q. But in this particular area the State Engineer
21 Office has been contacted, has it not?

22 A. That's correct.

23 Q. And there are no known freshwater sources?

24 A. That is correct.

25 Q. What is going to be the source of the injection

1 water?

2 A. It will be produced water, starting out. We have
3 a couple of edge wells that make mostly water, that we'll
4 put pumping units on and produce that, along with the field
5 production. And then we're in the process of contracting
6 from -- I believe it's the Carlsbad water supply, actually
7 purchasing fresh water to mix with the surfactant. It
8 requires fresh water and high-quality water to make the
9 surfactant work, and we'll purchase that water.

10 Q. And because this is water from the same zone,
11 there aren't any compatibility problems --

12 A. That's correct.

13 Q. -- that you can see?

14 And since these wells have not been producing for
15 quite some time, would you classify them in effect as
16 stripper wells?

17 A. They are definitely stripper wells.

18 Q. Have you made an estimate -- and I know there is
19 some data in the report submitted as Exhibit 3 -- in the
20 report as to what might be recovered under this --

21 A. We have a minimum target, just to get our money
22 back, of 100,000 barrels of oil. We think we can recover
23 between half a million and 700,000 barrels of oil between
24 what's remaining on the waterflood, and then the surfactant
25 flood.

1 Q. And so you believe that waterflood operations are
2 feasible at this time?

3 A. That's correct.

4 Q. In your opinion, is the granting of this
5 Application in the interests of conservation and the
6 prevention of waste?

7 A. Yes.

8 Q. And was Exhibit 10 prepared under your
9 supervision?

10 A. Yes, it was.

11 MR. BRUCE: Mr. Examiner, I'd move the admission
12 of Exhibit 10.

13 EXAMINER BROOKS: Exhibit 10 will be admitted.

14 MR. BRUCE: I have no further questions of the
15 witness.

16 EXAMINATION

17 BY EXAMINER BROOKS:

18 Q. Okay, you list these five new wells that you're
19 -- These are new wells --

20 A. That's correct.

21 Q. -- these five wells listed on Exhibit 10? And
22 these are the ones that you're asking to be permitted for
23 injection at this time?

24 A. That's correct.

25 Q. And you will submit administrative applications

1 for any additional wells that you want to be permitted?

2 A. Yes, we will.

3 Q. Okay. Now you have said that your plan is to do
4 a waterflood with produced water from this unit, correct?

5 A. That's correct.

6 Q. And then you're going to do a surfactant flood?

7 A. If the chemists tell us that it has a chance of
8 working. That's yet to be determined. We have to take
9 sufficient core data and then have it analyzed in the lab
10 and see if what they would design will yield an amount of
11 oil in an economic manner.

12 We believe there's sufficient oil left on the
13 edge of the field, reinstating the flood, to get another
14 100,000 to 150,000 barrels of oil. In the scheme of things
15 that's not a lot, but it will pay for the front-end cost of
16 drilling the wells and refurbishing the fields, and put us
17 in a position that if the chemical flood is feasible we can
18 just immediately go to that step.

19 Q. So what you're expecting is 100,000 to 150,000
20 for the waterflood?

21 A. That's correct.

22 Q. And then you said 500,000 to 700,00 total. Would
23 that be --

24 A. That would be about 10-percent of the original
25 oil in place, which is about a middle-of-the road number in

1 terms of recovery factor.

2 Q. And that number is the total from both the
3 waterflood and the --

4 A. That's correct.

5 Q. -- contemplated surfactant flood?

6 Okay. Now do you contemplate that you'll file a
7 subsequent proceeding with the Division to authorize the
8 surfactant flood?

9 A. I don't know -- to be honest, I don't know the
10 answer. I actually looked through some of the regulation,
11 and I could -- first of all I'm not a lawyer, and I'm not
12 familiar with New Mexico Rules in general. But as I looked
13 through, I couldn't find the distinction in a definition
14 between secondary and tertiary.

15 Q. Well, I think there really isn't in our rules as
16 they're written, although it says that we will permit the
17 injection of water or the injection of any other fluid
18 basically?

19 A. Correct, and so our attitude would be, we -- I
20 mean, we will do what the OCD requires, that's number one.

21 Q. Right.

22 A. And the second thing is, we have absolutely no
23 problem with filing our data and what we intend to do and
24 the chemical nature of what we intend to inject. I mean,
25 it will be a freshwater surfactant -- basically Tide and

1 water is what it is -- and we have no problem with filing
2 that also.

3 Q. Now you have 65 wells -- You said 75 wells, 10 of
4 them were plugged. Do you have 65 wells existing in this
5 area?

6 A. There are between 60 and 65, yes, sir.

7 Q. And you're going to use approximately 30 of those
8 -- Well, you said you have 30 injectors. So you're going
9 to drill five new wells and those will be injectors, right?

10 A. That's correct.

11 Q. So you're going to use about 25 injectors from
12 the --

13 A. We hope that we can. We will try to re-enter all
14 of them. If we can't, we will plug them -- as we re-enter
15 them, we will plug them under the supervision of the BLM.

16 Q. And you contemplate using the remainder as
17 producing wells?

18 A. Approximately 30 producing wells, that's correct.

19 Q. Now is there anything in the material to show --
20 in the material that you've submitted, to show how you --
21 what configuration you're going to do your producing wells
22 and your --

23 A. There isn't --

24 Q. -- injection wells?

25 A. -- because we will make that decision as a

1 combination based upon available wellbores -- in other
2 words, what we're able to work with -- plus what ultimate
3 injection pattern that the chemists tell us would be -- you
4 know, whether it be a fivespot or a ninespot.

5 It may be that we actually have more injectors
6 than producers, because the key will be the quality of
7 water and chemical that goes in, and then letting it go
8 where it goes. And we may actually end up with more
9 injection wells, but we just don't know that right now,
10 till we get the core data and put the plan together.

11 Q. Okay. Mr. Bruce asked if you considered these
12 wells to be stripper wells and you answered in the
13 affirmative. Now under the applicable injection rules,
14 waterflood rules, we say stripper is equivalent to the
15 wells being in an advanced state of depletion. Would it be
16 correct to characterize the wells in this area as in an
17 advanced state of depletion?

18 A. Most of the wells have between a 1- and 3-percent
19 oil cut. That's pretty advanced.

20 EXAMINER BROOKS: Okay, Mr. Ezeanyim?

21 EXAMINATION

22 BY EXAMINER EZEANYIM:

23 Q. David has asked most of the questions, but let's
24 go back to that secondary/tertiary. Our rules indicate --
25 between secondary and tertiary. I want to explore what

1 David just said. Currently we're looking at secondary
2 waterfloods, right?

3 A. That's correct.

4 Q. And you are thinking about doing tertiary with
5 your chemical or your surfactants, you say that you can do
6 tertiary. I think at that point you have to come in tog
7 that. I don't think we can approve tertiary in this
8 hearing until you do your, you know, waterflood first.

9 A. Would that be administrative with a technical
10 committee, or would it have to be republished and --

11 Q. Yeah --

12 A. -- get a new order?

13 Q. -- I think it has to come into hearing again,
14 that -- you want to demonstrate that you need to do that
15 tertiary, I think.

16 EXAMINER BROOKS: That would be my inclination
17 also.

18 THE WITNESS: Okay.

19 EXAMINER EZEANYIM: The Rules didn't state that,
20 but I think you need to do that, because that's a secondary
21 -- in a tertiary phase, and we want to know that what you
22 are doing is correct, that it's not going to produce waste,
23 that what you are doing is going to recover something.

24 Let's say, for example now, your secondary
25 recovery with the waterflood, you are going to go 100,000

1 to 150,000. And after that with your study, as you're
2 doing this, you conclude that you can do -- you can flood
3 it too for tertiary recovery. Then you have to demonstrate
4 that again. It's not going to be through administrative,
5 it has to come to hearing.

6 A. And so -- and put on testimony of core data and
7 core data --

8 Q. Yes --

9 A. -- test --

10 Q. -- yes.

11 A. -- and results of flood-plot tests, that's --

12 EXAMINER BROOKS: Right.

13 EXAMINER EZEANYIM: Yeah, so --

14 THE WITNESS: I mean, we'll do what we need to
15 do.

16 EXAMINER EZEANYIM: So that's why it has to come
17 to the hearing again, to establish those facts.

18 EXAMINER BROOKS: Yeah, as opposed to approving
19 additional wells for injection, which would be
20 administratively done.

21 EXAMINER EZEANYIM: It could be administratively
22 done. Okay, so I wanted to clarify that. I know you --
23 but I wanted to clarify that.

24 THE WITNESS: Well, and you're right. It wasn't
25 -- As I read the Rules, it wasn't clear. But that's okay,

1 we want to do what you want us to do, and --

2 EXAMINER BROOKS: Well, you've no doubt noticed
3 when you studied our injection rules that they're not a
4 model of clarity.

5 THE WITNESS: I reserve judgment to the --
6 (Laughter)

7 EXAMINER EZEANYIM: Do you have --

8 THE WITNESS: I'm an engineer.

9 Q. (By Examiner Ezeanyim) Do you have the current
10 pressures in this field?

11 A. The field static water level, on average, is 250
12 feet from the surface --

13 Q. Uh-huh.

14 A. -- and the field has been shut in over two years.
15 That's probably a -- you know, 500 feet of fluid -- it's
16 probably got a bottomhole pressure in the 200 -- We haven't
17 taken any bottomhole pressure surveys. It's probably
18 between 200 and 250 pounds bottomhole pressure.

19 Q. Now you said you talked to the State Engineer's
20 Office and they told you that -- no fresh water in the
21 area --

22 A. That's correct.

23 Q. -- above that? Okay.

24 However, we still have to do our area of review
25 on those -- on the wells, you know, to make sure. Even if

1 we think there's no water to protect, we don't want all
2 those injected water to come up.

3 A. That's correct.

4 Q. So have you done enough wells to demonstrate your
5 area of review on these wells?

6 A. Well, we did -- yes, we checked offset operators.
7 Quite honestly, most of these -- all of the offset wells
8 have had surface casing run at a deeper depth than the
9 Yates. I mean, the deeper wells, 10,000, 12,000 feet --
10 they drilled a well that -- they've set surface pipe at 300
11 feet and a conductor pipe and a surface pipe at 900 to 1000
12 feet. So I mean, they've got two strings of pipe, and then
13 they've got their production pipe, so those wells...

14 There are some fringe dry holes defining the
15 boundary of the field. I mean, those have a pole sticking
16 up out of the ground, under BLM rules, and were plugged
17 back when they were drilled under BLM's supervision.

18 What I would offer as the most compelling
19 evidence is that there was a substantial amount of water
20 injected in this from 1956 to whenever the -- and there
21 have been no reported surface leaks -- there have been no
22 reported incidents since then.

23 So the best one could determine without any other
24 information is, they put 14 million barrels of water in the
25 ground and produced 2.4 million barrels of oil. That --

1 Probably nothing that we're going to do on the scale is
2 going to alter that.

3 Q. And most of the cement in this case is circulated
4 to the surface?

5 A. Many of them are. Some have 8-5/8 setdown, and
6 then they might only circulate 75 sacks. We just can only
7 go off the sundry notice records that the BLM has, and then
8 what's also filed at the OCD websites.

9 I would say this right now, is that at the rate
10 we're injecting and at the rate we are withdrawing and the
11 static level of the field that 250 feet below the surface,
12 at this moment in time it probably wouldn't matter. In
13 other words, if you're putting it in and you're taking it
14 out and you're not increasing the bottomhole pressure --
15 and it's not like we're going to be putting it in at 1500
16 pounds and have the bottom of -- you know, the reservoir
17 overcharged, and water is going to be percolated to the
18 surface. It's a relatively low bottomhole pressure
19 operation right now.

20 Q. I'm still looking for area-of-review analysis
21 here because we need to have those, even though your
22 attorney stated that ownership is identical.

23 Could somebody define to me, what do you mean by
24 identical ownership, if I may ask, in this area? Mr.
25 Bruce? You said that ownership is identical. How do you

1 define that? Ownership is identical --

2 THE WITNESS: The identical ownership, it's --

3 MR. BRUCE: Oh, oh --

4 THE WITNESS: -- it's my understanding it's all
5 one lease --

6 MR. BRUCE: -- and it's --

7 THE WITNESS: -- it's all --

8 MR. BRUCE: -- it's --

9 THE WITNESS: -- owned by one person.

10 MR. BRUCE: Yeah, it's a single federal lease,
11 obviously the same royalty owner. Apollo is the only
12 working interest owner, and the overriding royalty
13 ownership is common, all in the Yates formation. There are
14 no differences in ownership as to any of the acreage
15 exhibited on Exhibit 2, as to the Yates formation.

16 EXAMINER EZEANYIM: Yeah, okay.

17 Mr. Hall, we still need information on these,
18 the five wells, area-of-review wells, their condition, and
19 this --

20 MR. BRUCE: And that should be -- Most of that is
21 on Exhibit 10, pages -- the last 25 pages of the exhibit.

22 EXAMINER EZEANYIM: Oh, okay, it's not in tabular
23 form. I was looking for --

24 MR. BRUCE: We -- if you require -- if you would
25 like some other -- We can put it in tabular form, if you --

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EXAMINER EZEANYIM: Okay.

THE WITNESS: It's, I think, pages -- What did I mark on here?

EXAMINER BROOKS: Starting with --

MR. BRUCE: If you look in the lower --

EXAMINER BROOKS: -- page 25 --

MR. BRUCE: -- right corner --

THE WITNESS: Yeah --

MR. BRUCE: Starting with page --

THE WITNESS: -- 25 to 49.

EXAMINER EZEANYIM: Okay.

THE WITNESS: That's every well in the area, with surface pipe --

EXAMINER EZEANYIM: Yeah.

THE WITNESS: -- with all the required information.

EXAMINER EZEANYIM: So all the information I need is there. Okay. Okay, we'll take a look at that.

THE WITNESS: And I'll give you a hand copy of the step-rate test, and I'll submit a --

EXAMINER EZEANYIM: Okay.

THE WITNESS: -- we'll make sure that a formal one -- I'll get a copy of it, I'll expedite that to --

EXAMINER EZEANYIM: That would be very helpful.

THE WITNESS: Yeah.

1 EXAMINER EZEANYIM: Okay, thank you.

2 Q. (By Examiner Ezeanyim) And you say you're asking
3 for up to 425 p.s.i.?

4 A. You know, my attitude would be 400 pounds. I
5 mean, that's well below any limit or tolerance. That would
6 be acceptable to us. That's what we, I think, originally
7 asked for in the original disposal application, was 400
8 pounds.

9 Q. And did you get it?

10 A. No. Remember, they gave us 165 because of the
11 rule --

12 Q. Yeah.

13 A. -- subject to the step-rate test, which we've
14 submitted.

15 Q. Okay.

16 A. And I...

17 EXAMINER BROOKS: I'm sorry, is there a question?

18 EXAMINER EZEANYIM: Yeah, I --

19 THE WITNESS: Oh, no, no, no.

20 EXAMINER EZEANYIM: -- I thought you are making a
21 statement.

22 THE WITNESS: No, I just said we have submitted
23 that step-rate test. It was 165, then subject to the
24 submission of the step-rate test it would be raised.

25 EXAMINER EZEANYIM: No further questions.

1 EXAMINER BROOKS: Okay, would either of you like
2 to ask the witness any questions?

3 MR. SWAZO: No, I have no questions, Mr.
4 Examiner.

5 MS. ALTOMARE: (Shakes head)

6 THE WITNESS: Why are you doing this?

7 EXAMINER BROOKS: Okay, I don't have any further
8 questions.

9 Mr. Bruce, do you have any follow-up?

10 MR. BRUCE: I have no further questions of the
11 witness.

12 EXAMINER BROOKS: Okay. What I'm going to do,
13 then, in this case is, I'm going to -- we are going -- the
14 undertaking was made to supplement the record with a copy
15 of the step-rate tests. Nevertheless, I'm going to take
16 Case Number 13,935 -- Oh, I'm sorry, do you have something
17 else?

18 MR. BRUCE: Just one final matter, the affidavit
19 of notice --

20 EXAMINER BROOKS: Oh, okay, sure.

21 MR. BRUCE: -- marked as Exhibit 11, the offset
22 operators, and the BLM and surface owner and the Division's
23 -- the District Office were notified, and I'd --

24 EXAMINER BROOKS: Okay, now these are offset
25 operators in the Yates?

1 MR. BRUCE: Their wells penetrate the Yates.

2 EXAMINER BROOKS: Okay, so --

3 MR. BRUCE: The only operator in the Yates -- and
4 Mr. Hall could confirm this -- is Apollo. But these wells
5 penetrate the Yates within the area of review.

6 EXAMINER BROOKS: Okay. Are there any tracts
7 within the area of review where there's not a well that
8 permeates the Yates?

9 MR. BRUCE: I think the Yates is the shallowest
10 producing --

11 THE WITNESS: That's correct.

12 MR. BRUCE: -- zone, and so --

13 EXAMINER BROOKS: Yeah, but you had some areas
14 where there didn't appear to be any wells. I have to go
15 back to your map.

16 MR. BRUCE: There are -- Yeah.

17 THE WITNESS: There's a 1500-acre base lease
18 where the black line was drawn around. That's the border.
19 We honestly don't know what's out there.

20 EXAMINER BROOKS: What I like to see on these
21 notice things -- Mr. Bruce, perhaps you can supplement it,
22 the record, with this also -- what I like to see is a map
23 that shows the ownership so we can -- or shows who you've
24 notified as to each offsetting tract so we can see that the
25 Rules have been complied with. I mean --

1 MR. BRUCE: I'll submit that --

2 EXAMINER BROOKS: -- not that we don't trust you,
3 but it helps us document to be sure that everything has
4 actually been done correctly.

5 MR. BRUCE: It's -- Okay, I'll supplement Exhibit
6 2, which is the basic exhibit.

7 EXAMINER BROOKS: Yeah, because you understand
8 how the rules work, that if you have a tract for which
9 there's not an operator, then you have to notify working
10 interest owners. I don't think you'd have to go to the
11 next step as mineral owners because the BLM, as I take it,
12 is the mineral owner throughout this entire --

13 MR. BRUCE: Throughout the entire area.

14 EXAMINER BROOKS: Okay, I appreciate that.

15 Since we're going to supplement the record, I
16 think rather than -- I think we're causing ourselves a
17 certain amount of unnecessary work by continuing cases to
18 supplement the record, so what I'm going to do in this case
19 is take -- we will take Case Number 13,935 under
20 advisement, subject to the record being supplemented with
21 the step-rate test and the ownership map.

22 Is there anything else to be supplemented?

23 MR. BRUCE: That's all I recall.

24 EXAMINER BROOKS: Okay. And what we will do is,
25 we will remind you -- If we don't get these within a

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reasonable period of time, we will give you a reminder. If we'd end up not getting them, then we'll have to dismiss the case, but --

EXAMINER EZEANYIM: Without prejudice.

EXAMINER BROOKS: Without prejudice, of course. Okay, 13,935 is taken under advisement.

THE WITNESS: Thank you.

(Thereupon, these proceedings were concluded at 10:17 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examining hearing of Case No. _____ heard by me on _____.

_____, Examiner
Oil Conservation Division

