

STATE OF NEW MEXICO
ENERGY, MINERAL AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION

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

APPLICATION OF KAISER-FRANCIS CASE NOS 15823-15824
OIL COMPANY FOR POOL CREATION AND
SPECIAL POOL RULES, LEA COUNTY,
NEW MEXICO

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

September 14, 2017

SANTA FE, NEW MEXICO

BEFORE: WILLIAM V. JONES, CHIEF EXAMINER
 DAVID K. BROOKS, LEGAL EXAMINER

 This matter came on for hearing before the
New Mexico Oil Conservation Division, William V. Jones,
Chief Examiner, and David K. Brooks, Legal Examiner, on
Thursday, September 14, 2017, 9:08 a.m., at the
New Mexico Energy, Minerals and Natural Resources
Department, Wendell Chino Building, 1220 South St.
Francis Drive, Porter Hall, Room 102, Santa Fe,
New Mexico

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BY: J. SCOTT HALL

EXHIBITS	DESCRIPTION	ADMITTED
1. North Bell Lake		11
2. Bell Lake Unit		11
3. Bell Lake North, Working Interest Owners, Royalty Owners, ORRI Owners, Non-Participating Royalty Owners, Unleased Mineral Owners and Offset Operations		11
4. North Bell Lake Offset Operators		11
5. Affidavit of Notice		11
6. Maps		30
7. Overview, North Bell Lake		54
CERTIFICATE OF REPORTER		68

1 EXAMINER JONES: Let's call Case Number
2 15821 and 15822. Both are Application of Kaiser-Francis
3 Oil Company for Pool Creation and Special Pool Rules,
4 Lea County, New Mexico.

5 Call for appearances.

6 MR. BRUCE: Mr. Examiner, Jim Bruce, of
7 Santa Fe, representing the applicant. I have three
8 witnesses.

9 EXAMINER JONES: Other appearances?

10 MR. HALL: Scott Hall, Montgomery and
11 Andrews Law Firm, Santa Fe, appearing on behalf of
12 Energen Resources Corporation.

13 I have no witnesses.

14 EXAMINER JONES: Will the three witnesses
15 please stand, and the court reporter swear the
16 witnesses?

17 [Whereupon, Barbara Courtney, Chris Miller
18 and Mike Raines were duly sworn.]

19 EXAMINER JONES: Are these the same
20 witnesses that are on your preparing statement?

21 MR. BRUCE: Yes.

22 EXAMINER JONES: Okay.

23

24

25

1 BARBARA COURTNEY

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

4 DIRECT EXAMINATION

5 BY MR. BRUCE:

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

8 A. Barbara Courtney, Tulsa, Oklahoma.

9 Q. Who are you employed by, and in what capacity?

10 A. Kaiser-Francis Oil Company. I'm a landman.

11 Q. Have you previously testified before the
12 Division?

13 A. I have.

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

16 A. They were.

17 Q. And are you familiar with the land matters
18 involved in these applications?

19 A. Yes.

20 MR. BRUCE: Mr. Examiner, I tender
21 Ms. Courtney as an expert petroleum landman.

22 EXAMINER JONES: Any objection?

23 MR. HALL: No objection.

24 EXAMINER JONES: She is qualified as an
25 expert in petroleum land matters.

1 **Q. (By Mr. Bruce) Ms. Courtney, could you**
2 **identify Exhibit 1 for the Examiner? First of all,**
3 **these cases involve the Bell Lake Unit, what are known**
4 **as in this the North Bell Lake.**

5 **Could you give the Examiner just a little**
6 **information on the Bell Lake Unit?**

7 **A. We're doing north first or south first?**

8 **Q. North.**

9 **A. The Bell Lake Unit was formed in 1953, and it**
10 **covered over 37,000 acres of land. Over the years, it**
11 **was contracted down into two nine-section blocks.**
12 **They're not contiguous, so they were named -- it's**
13 **actually participating areas, but we call them Bell Lake**
14 **North and Bell Lake South.**

15 **Exhibit 1 is just a plat showing the nine**
16 **sections in the Bell Lake Unit. The attachment to it**
17 **are the legal descriptions of those nine sections.**

18 **Q. And what type of land is in the North Bell Lake**
19 **Unit?**

20 **A. The North Bell Lake Unit is all state and**
21 **federal acreage.**

22 **Q. And what does Kaiser-Francis seek in this case,**
23 **briefly?**

24 **A. The creation of new pools for horizontal Bone**
25 **Spring and Wolf Camp Development in the North Bell Lake**

1 North Unit and special pool rules for the new pools.

2 Q. Could you summarize what -- first of all, I'm
3 going to have you describe what Kaiser-Francis is doing.

4 Do we have technical witnesses who are
5 going to support that testimony?

6 A. We do. We have an engineer and a geologist who
7 will testify.

8 Q. Okay. Could you identify Exhibit 2 and briefly
9 run through that?

10 A. Exhibit 2 is that Kaiser-Francis requests
11 special rules and regulations be established for
12 horizontal wells in the Bone Spring pool, and the second
13 page is for horizontal wells in the Wolfcamp pool.

14 But for the Bone Spring, we want a standard
15 oil spacing and proration units of 480 acres, wells to
16 be located no closer than 330 feet from the exterior
17 boundary of the nine section units, 100 feet from the
18 interior north/south boundaries of a standard well unit,
19 with interior setbacks of 50 feet from a quarter-quarter
20 section line for the beginning of a wells producing
21 interval.

22 A special depth bracket allowable of 9,600
23 barrels of oil per day for a standard 480-acre unit
24 and --

25 Q. And that's for the Bone Spring pool?

1 A. For the Bone Spring pool; that's right.

2 -- a GOR of 5,000 cubic feet of gas per
3 barrel of oil, and all other rules in conformance with
4 statewide rules.

5 And for the Bone Spring, we request 6,000
6 barrels of oil per day for a standard 480-acre unit.
7 The plat attached just shows that.

8 MR. BRUCE: Another witness will discuss
9 this. But the two pools, Mr. Examiner, in the South
10 Bell Lake are called the South Bell Lake Wolfcamp and
11 South Bell Lake Bone Spring.

12 Another witness will discuss his
13 discussions with Mr. Kautz and with the BLM on those.

14 EXAMINER JONES: Okay. You knew we were
15 going to ask that.

16 **Q. (By Mr. Bruce) And the top page of the**
17 **exhibit, does that just visually set forth the setbacks**
18 **you are seeking?**

19 A. It does.

20 **Q. And do you ask that these pool rules be**
21 **applicable only within the unit area?**

22 A. Yes.

23 **Q. And why does Kaiser-Francis seek the creation**
24 **of these pools and the institution of the pool rules?**

25 A. Well, we're planning the Bone Spring and

1 Wolfcamp wells beginning next year, and this plan
2 includes drilling more than four wells, and each
3 prospective zone in a mile-wide area. Without special
4 rules, many in-field wells would otherwise be
5 unorthodox, so this gives us more operational
6 flexibility.

7 Because of the number of wells planned and
8 the increased productivity of horizontal wells, an
9 increase in the oil allowable is needed.

10 **Q. And will the rules only apply to horizontal**
11 **wells?**

12 A. Yes.

13 **Q. And any existing or future vertical wells would**
14 **be subject to spacing as set by the Hobbs office; is**
15 **that correct?**

16 A. That's correct.

17 **Q. What is Exhibit 3?**

18 A. Exhibit 3 is a list of all working interest
19 owners, royalty owners, overriding royalty owners and
20 nonparticipating royalty owners and offset operators
21 within the nine sections for the royalty owners, and
22 then a mile around are all the offset operators.

23 **Q. And what is Exhibit 4?**

24 A. Exhibit 4 shows the offset operators and their
25 locations.

1 Q. Okay. And again, they are listed in Exhibit 3?

2 A. They are.

3 Q. And this -- to clarify, Kaiser-Francis is the
4 operator of the North Bell Unit?

5 A. We are.

6 Q. And so you have land records at your
7 headquarters in Tulsa?

8 A. We do.

9 Q. Did you do a subsequent examination to
10 determine who should be notified about this hearing?

11 A. We did. I had the records checked.

12 Q. Okay. You had the county records checked and
13 Internet records checked also?

14 A. Correct.

15 Q. And there have been a number of -- over 60-plus
16 years, there have been a number of ownership changes;
17 have there not?

18 A. Yes, sir.

19 Q. In your opinion, have you made a good-faith
20 effort to locate everyone entitled to notice of these
21 applications?

22 A. Yes, I have.

23 MR. BRUCE: Mr. Examiner, Exhibit 5 is
24 simply my Affidavit of Notice to the interest owners. I
25 did not include all the green cards. I'm going to ask

1 that the cases be continued for two weeks, because I
2 want to verify that everyone received notice, either by
3 mail or by publication. You know, there was about 90 or
4 100 people notified, so I just want to make sure of
5 that.

6 EXAMINER JONES: That's a lot of people.

7 MR. BRUCE: Yeah.

8 EXAMINER JONES: Wow.

9 MR. BRUCE: But what this does contain is
10 the -- you can see everyone is listed. But I need to
11 just make sure that everyone has received notice, so I'd
12 ask that the cases be continued for two weeks just for
13 notification purposes.

14 EXAMINER JONES: Okay.

15 Q. (By Mr. Bruce) Ms. Courtney, were Exhibits 1
16 through 4 prepared by you or under your supervision?

17 A. Yes.

18 MR. BRUCE: Mr. Examiner, I'd move the --

19 Q. (By Mr. Bruce) And in your opinion, is the
20 granting of these applications in the interest of
21 conservation and the prevention of waste?

22 A. Yes.

23 MR. BRUCE: Mr. Examiner, I move the
24 admission of Exhibits 1 through 5.

25 MR. HALL: No objection.

1 EXAMINER JONES: Exhibits 1 through 5 are
2 admitted.

3 Mr. Hall?

4 MR. HALL: No questions.

5 EXAMINER JONES: So this was originally, in
6 1953, the Bell Lake Unit?

7 THE WITNESS: It's still the Bell Lake
8 Unit.

9 EXAMINER JONES: It's still officially the
10 Bell Lake Unit?

11 THE WITNESS: Yes, sir.

12 EXAMINER JONES: But you just --
13 nomenclature, everybody calls it north, and then the
14 south?

15 THE WITNESS: Well, when it was split,
16 there's nine sections, and then there's nine sections
17 open, and then there's nine more sections. So they
18 separated it out and did separate operating agreements
19 with different working interest owners in each
20 nine-section block.

21 EXAMINER JONES: Okay. Is Kaiser-Francis
22 the operator of record of that unit?

23 THE WITNESS: Of the entire unit, yes.

24 EXAMINER JONES: Of the unit, meaning the
25 north and the south?

1 THE WITNESS: Yes.

2 EXAMINER JONES: So that means that you
3 administer -- it was easy to find who were the owners
4 then, correct?

5 THE WITNESS: Yes, it was, because we have
6 a lot of other production, and we have royalty revenue
7 records.

8 EXAMINER JONES: But what sort of unit is
9 this? It's a federal --

10 THE WITNESS: It's a federal exploratory
11 form.

12 EXAMINER JONES: It's on a federal form,
13 though?

14 THE WITNESS: It's an old, old --

15 EXAMINER JONES: An old, old federal form.

16 So is it amenable to being expanded or
17 contracted, and why did it contract when it did?

18 THE WITNESS: Because there was an
19 uneconomic well drilled in the nine sections between the
20 north block and the south block. I mean think it was
21 contracted down over the years, but the last thing that
22 separated the two nine-section blocks was an uneconomic
23 well by federal standards that was drilled in the
24 nine-section block, so that was taken out.

25 EXAMINER JONES: Okay. Does it have any

1 segregation clauses on the leases, or is it the typical
2 federal modified segregation clause?

3 THE WITNESS: I think they're old regular
4 federal leases from the '40s and '50s, and then there
5 are state leases as well. And there are a few fee
6 leases on in the north, though. We're talking north.
7 It's all state and federal.

8 EXAMINER JONES: So there is some fee
9 acreage --

10 THE WITNESS: In the south.

11 EXAMINER JONES: In the south, okay.
12 Is it an all-depths unit?

13 THE WITNESS: Yes, in the north.

14 EXAMINER JONES: In the north?

15 THE WITNESS: (Nods head.)

16 EXAMINER JONES: But not in the south?

17 THE WITNESS: The unit covers all the
18 acreage. But the operating agreement, when it was
19 segregated out and made the nine-section blocks, it's
20 below 9,000 feet.

21 EXAMINER JONES: Okay, it's only below
22 9,000 feet. So what formations are above 9,000?

23 We'll talk about that later, if I don't
24 forget to ask it.

25 THE WITNESS: I should clarify that the

1 leases are all held to all depths. The working interest
2 ownership is 9,000 and below.

3 EXAMINER JONES: Okay. So you've got
4 divided -- is there a different owner?

5 THE WITNESS: Only working interest
6 ownership, but 9,000 feet covers most of the formations
7 we're seeking to drill.

8 EXAMINER JONES: Okay. So as far as -- I'm
9 not going to really ask you about the pool yet, but the
10 pool is going to be contiguous with the unit boundaries?

11 Can you answer that?

12 MR. BRUCE: That is correct.

13 EXAMINER JONES: So the unit boundaries are
14 not going to change in the future.

15 THE WITNESS: No.

16 EXAMINER JONES: It's pretty much set on
17 those?

18 THE WITNESS: They are.

19 EXAMINER JONES: So how many PAs exist out
20 here?

21 THE WITNESS: Well, in the north unit,
22 there's one Devonian, nine-section PA.

23 EXAMINER JONES: Okay.

24 THE WITNESS: And then we have some other
25 wells that are drilled on 40-acre state wide spacings.

1 EXAMINER JONES: Okay. So the other wells
2 are leased wells, then?

3 THE WITNESS: Uh-huh.

4 EXAMINER JONES: So basically, it's a
5 Devonian PA --

6 THE WITNESS: It is.

7 EXAMINER JONES: -- in the north?

8 THE WITNESS: But it's still -- the whole
9 unit is still a Devonian PA.

10 EXAMINER JONES: It was originally a
11 Devonian target, then?

12 THE WITNESS: Yes.

13 EXAMINER JONES: Okay. So guess --

14 MR. BRUCE: Mr. Examiner, I made one
15 mistake. I'm thinking top to bottom. So we just
16 presented testimony on the North Bell Lake Unit.

17 EXAMINER JONES: Yes.

18 MR. BRUCE: And actually, the first two
19 cases are the South Bell Lake Unit, so if we could just
20 change that. The case is called 823 and 824.

21 MR. BROOKS: Are we doing a consolidated
22 hearing on all four cases?

23 MR. BRUCE: No, no, no.

24 MR. BROOKS: So which case are we hearing
25 now --

1 MR. BRUCE: 823 and 824.

2 EXAMINER JONES: Yeah. Please let the
3 court reporter reflect that instead of -- we called
4 Cases 15821 and 15822. Instead, we were meant to call
5 15823 and 15824.

6 MR. BROOKS: Do you need to go back,
7 Mr. Bruce, and ask any further questions of the witness
8 to get this testimony be relevant to the cases we're
9 actually hearing?

10 MR. BRUCE: Yeah.

11 Q. (By Mr. Bruce) The exhibits you were
12 testifying off of and the testimony you were giving were
13 strictly for the North Bell Lake Unit?

14 A. That's correct.

15 MR. BRUCE: Mr. Examiner, the pools for the
16 North Bell Lake Unit are actually the Southwest
17 Ojo-Chiso Bone Spring and Wolfcamp pools.

18 EXAMINER JONES: Okay.

19 MR. BROOKS: Mr. Bruce, do you need to
20 present additional testimony with this witness to make
21 it relevant to the cases we're actually hearing, then?

22 MR. BRUCE: No. We testified solely on the
23 North Bell Lake Unit.

24 MR. BROOKS: When you said you testified to
25 the North Bell Lake Unit, that's what I heard, right?

1 MR. BRUCE: Yes.

2 MR. BROOKS: So which cases are we hearing?

3 EXAMINER JONES: The North Bell Lake, 823
4 and 824.

5 MR. BROOKS: So we're hearing 823 and 4?

6 MR. BRUCE: Yes.

7 MR. BROOKS: Okay. And it's not a
8 consolidated hearing?

9 EXAMINER JONES: These are consolidated.
10 These two cases are --

11 MR. BROOKS: But not for all four?

12 EXAMINER JONES: Not or all four.

13 MR. BROOKS: Okay. Are you passing the
14 witness again?

15 MR. BRUCE: Yes.

16 MR. BROOKS: Okay.

17 And do you have anything further?

18 EXAMINER JONES: No.

19 MR. BROOKS: And we're talking about the
20 South Bell Lake Unit?

21 EXAMINER JONES: North.

22 MR. BROOKS: Yeah, that's what we've been
23 talking about. Okay. You'll have to pardon me because
24 I just came back from vacation, and I have not had a
25 chance to prepare on today's cases at all.

1 What you're asking for, if I understand it
2 correctly, is the formation of a pool, a new pool; is
3 that correct?

4 THE WITNESS: Yes, sir.

5 MR. BROOKS: And it's in the Bone Spring?

6 THE WITNESS: And Wolfcamp.

7 MR. BROOKS: Okay. So one pool for those
8 two formations?

9 THE WITNESS: One pool for each.

10 MR. BROOKS: It's a Bone Spring pool and a
11 Wolfcamp --

12 MR. BRUCE: Case 823 is the Bone Spring,
13 and Case 824 is the Wolfcamp.

14 MR. BROOKS: But they're going to have the
15 same horizontal boundaries?

16 THE WITNESS: Yes.

17 MR. BROOKS: And the horizontal boundaries
18 will coincide with the boundaries of the North Bell Lake
19 Unit?

20 THE WITNESS: Yes.

21 MR. BROOKS: As far as -- you know, you've
22 given notice to all the offsets, and I gather they're
23 not concerned about it, but this is in a developed area.
24 Are there other pools that will be surrounding this so
25 that this won't -- this pool will not expand or --

1 MR. BRUCE: This pool will not expand
2 unless the Division -- we're not asking -- we're asking
3 it to be a frozen pool.

4 MR. BROOKS: Okay. So you want the order
5 to say it's a frozen pool?

6 MR. BRUCE: That's correct.

7 MR. BROOKS: Now --

8 MR. BRUCE: There are other primarily Bone
9 Spring pools outside of the units.

10 MR. BROOKS: Yeah. I would have assumed
11 there were, given the fact there's been a lot of
12 development in the area. But I, of course, don't know
13 the boundaries of the various pools.

14 EXAMINER JONES: Nobody does.

15 MR. BROOKS: Except Paul Kautz.

16 There was something said about allowance.
17 Is that part of this case?

18 THE WITNESS: Yes, sir. We were asking for
19 9,600 barrels a day for the Bone Spring and 6,000
20 barrels a day Wolfcamp, for each 480-acre unit.

21 MR. BROOKS: Okay. So the 480-acre, is
22 that going to be a standard unit in this pool?

23 THE WITNESS: Yes.

24 MR. BRUCE: And our next witness will
25 discuss the primary reason for that.

1 MR. BROOKS: Okay. So you want --
2 allowable is set for the pool?

3 THE WITNESS: Yes, sir.

4 MR. BROOKS: What is going to be the
5 allowable for a vertical well if a vertical well were
6 drilled within this area? It won't be in the same pool?

7 MR. BRUCE: No. It would just be whatever
8 Mr. Kautz fixes it in. We wouldn't expect there to be
9 much vertical drilling.

10 MR. BROOKS: I wouldn't expect there to be
11 much vertical drilling, either, but I have a conceptual
12 problem with how you can have the same pool split up for
13 allowable purposes in two different ways, depending upon
14 how -- well, I'm not articulating very well.

15 When vertical and horizontal wells are
16 drilled from the same formation within the same area, I
17 have a problem if their allowables do not add up to 100
18 percent. Because the purpose of allocating the -- the
19 conceptual purpose of allowables doesn't seem to apply
20 once you go in that direction.

21 Say you base vertical wells on one formula
22 and you base horizontal wells on another formula. And I
23 realize we have that problem throughout the state --

24 MR. BRUCE: Yeah. I think --

25 MR. BROOKS: -- as well --

1 MR. BRUCE: -- the mitigating --

2 THE REPORTER: Excuse me. I need one
3 person speaking at a time, please.

4 MR. BROOKS: Go ahead.

5 MR. BRUCE: Well, you know, this is all
6 within one unit area, number one. Number two, there
7 might be one vertical well in the north or south unit.
8 It's an older well.

9 Once again, you're dealing with all the
10 same interest owners. So I don't see...

11 MR. BROOKS: Well, this is a conceptual
12 problem that I have because I like things to make sense.
13 But of course if they work, they don't have to make
14 sense. If they make sense, but they don't work, that's
15 problematic.

16 MR. BRUCE: Well, if this was, for
17 instance, down in the Yeso area down in southern Eddy
18 that people are drilling tons of vertical and -- or
19 were, tons of vertical and horizontal wells, I can see
20 what you're getting at.

21 MR. BROOKS: Well, that was the same
22 problem we had up in the Mancos and, of course, in the
23 northwest. And of course, that's another case where
24 people were drilling.

25 MR. BRUCE: Yeah. And there's nobody out

1 here drilling vertical wells.

2 MR. BROOKS: No, not that I'm aware of.

3 MR. BRUCE: Like I said, I think there
4 might be one existing vertical well sitting somewhere in
5 the unit areas. A geologist or engineer can probably
6 testify about that, but we don't have any allowable
7 issues, either.

8 MR. BROOKS: Yeah. So the only issues --
9 the issues in this case are spacing and allowables,
10 right?

11 MR. BRUCE: Yes.

12 MR. BROOKS: You want to have this new pool
13 to define new spacing rules, spacing and setback rules,
14 and to have an increased allowable, right?

15 MR. BRUCE: Correct.

16 MR. BROOKS: Okay. I guess that's all I
17 had.

18 EXAMINER JONES: I've got one more
19 question. Speaking of interest being all the same, it's
20 a 1953 federal form, and you have a Devonian PA. But as
21 you drill these other wells, are you going to -- did you
22 talk the BLM into changing this into an all-PA Bone
23 Spring and an all-PA Wolfcamp?

24 MR. BRUCE: I think our geologist can
25 testify further about that.

1 THE WITNESS: We have talked extensively
2 with the BLM, and they can tell you that.

3 EXAMINER JONES: So the geologist will talk
4 about the contract being changed? He would agree --

5 MR. BRUCE: Well, about the PA.

6 EXAMINER JONES: About the PA, okay.

7 Thank you very much.

8 THE WITNESS: Thank you.

9 [Whereupon, Ms. Courtney was excused.]

10 CHRIS MILLER

11 having been previously duly sworn under oath,
12 was questioned and testified as follows:

13 DIRECT EXAMINATION

14 BY MR. BRUCE:

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

17 A. Chris Miller, C-h-r-i-s, Tulsa, Oklahoma.

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

19 A. Kaiser-Francis Oil Company. I'm a geologist.

20 Q. And have you previously testified before the
21 Division?

22 A. I have not.

23 Q. Can you please summarize your educational and
24 employment background for the Examiner?

25 A. I received a Bachelor of Science in Geological

1 Engineering from Montana Tech in 1985, a Master's of
2 Science and Geology from the University of Tulsa in
3 1989, and I've been employed with Kaiser-Francis Oil
4 Company since 1989.

5 Q. And does your area of responsibility at
6 Kaiser-Francis include this portion of Southeast
7 New Mexico?

8 A. Yes, it does.

9 Q. And are you familiar with the geologic matters
10 related to both the North and the South Bell Lake units?

11 A. Yes, I am.

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

14 MR. HALL: No objection.

15 EXAMINER JONES: He is so qualified.

16 Q. (By Mr. Bruce) Would you please identify,
17 although it's been previously submitted -- well
18 actually, we've taken your exhibits and have made them
19 all one exhibit with the pages numbered. Why don't you
20 just start with page 1 and start running through the
21 unit and the productive zones, and the reasons why you
22 are asking for the special pool rules?

23 A. All right. Exhibit 6, page 1, shows an outline
24 of the North Bell Lake nine-section contiguous unit in
25 Lea County. We have not drilled a horizontal well

1 within the North Bell Lake Unit yet.

2 Exhibit 6, page 2, shows the stratigraphic
3 column of the Delaware Basin and how we propose to
4 define the pool definition for the Bone Spring interval
5 and the Wolfcamp interval of North Bell Lake.

6 These definitions have been discussed
7 pretty thoroughly with the BLM and Paul Kautz, and both
8 the BLM and Paul Kautz agree with these definitions that
9 we propose at North Bell Lake.

10 **Q. And have they also agreed that these pools**
11 **should apply strictly within the unit area?**

12 A. Yes, they will apply only to the unit area.
13 We're proposing two new pools in North Bell Lake. The
14 first one would cover the entire Bone Spring interval,
15 both the upper Bone Spring and lower Bone Spring. It
16 would be the Ojo Chiso Southwest Bone Spring pool.

17 The second pool we're proposing would be
18 the Ojo Chiso Southwest Wolfcamp pool, defined as the
19 interval from top of the Wolfcamp to the top of the
20 Strawn in North Bell Lake.

21 MR. BRUCE: Getting back to the Examiner's
22 question, have you discussed with the BLM about forming
23 both a Bone Spring PA and a Wolfcamp PA for the North
24 Bell Lake Unit?

25 A. Yes. Those discussions have been ongoing for

1 the past two years, and we've talked about the South
2 Bell Lake. We've actually drilled a horizontal well
3 down there. The process will be to -- we were hoping
4 actually to drill a single well in North Bell Lake
5 and/or South Bell Lake. And since there was so much
6 analogous production around us, we were hoping that the
7 single well would allow us to form a nine-section PA
8 with that one well.

9 There had been some changes in the BLM
10 managerial-wise, and the new person there -- I forget
11 his name, I'm sorry, but --

12 EXAMINER JONES: James Glover?

13 THE WITNESS: Mike, our engineer, will know
14 his name.

15 EXAMINER JONES: Okay.

16 A. He's more thought of -- he probably won't give
17 us a nine-section PA with that one well. We'll probably
18 have to drill one or two or three wells before we can
19 get the entire nine sections into a formal Bone Spring
20 PA and/or Wolfcamp PA.

21 Paul is on board with all that. The BLM
22 actually wanted us to combine the Bone Spring and the
23 Wolfcamp for PA purposes. Paul didn't want to do that,
24 obviously, so Paul allowed us to combine the entire Bone
25 Spring, instead of having to break that up. So we have

1 a Bone Spring and a Wolfcamp definition. So we'll have
2 to form PAs for the Bone Spring and the PAs for the
3 Wolfcamp.

4 **Q. We'll move on to your page 3, please.**

5 A. Page 3 is a cross-section. If we go to page
6 4 -- if you'll look at page 4, page 4 shows the location
7 of the cross-section. This cross-section runs across
8 North Bell Lake.

9 The well to the left is the western-most
10 well. That's a well off the unit. The middle well and
11 the cross-section is a well directly in the middle of
12 the North Bell Lake Unit, and then the eastern-most well
13 is a well off of our unit.

14 The cross-section simply shows the
15 continuity of the Bone Spring interval from the lower
16 Avalon to the Wolfcamp, and the Wolfcamp interval to the
17 Strawn, all continuous across the entire mountain
18 section area.

19 Staying on page 4, this just shows the
20 structure map of the upper Avalon -- or top of the Bone
21 Spring interval, showing a structural high basically in
22 the center of our unit there.

23 The most important thing to see on this map
24 is there's no faulting in the Bone Spring interval, so
25 it's structurally continuous across the entire

1 nine-section unit.

2 Going on to pages 5 and 6, these are the VH
3 maps of the second Bone Spring and third Bone Spring
4 intervals.

5 **Q. Are those the Bone Spring zones you would**
6 **likely test first?**

7 A. Yes. We're testing the second Bone Spring
8 first. The second Bone Spring and the third Bone Spring
9 have been developed pretty much all around our units,
10 and they have the most definition in terms of
11 production. We have really good analogies for what we
12 can expect in the North Bell Lake area and South Bell
13 Lake.

14 So the VH maps simply show a continuous
15 reservoir thick enough for economic reserve and similar
16 in thickness to all of the analogous production
17 surrounding it. So we expect to get similar production
18 from our Bone Spring interval as our offset producers
19 show. These maps were created just using an 8 percent
20 density/porosity cutoff and just VH maps of those two.

21 Now, I should say that there are at least
22 five prospective reservoirs in North Bell Lake. I'm
23 only showing two just for simplicity, but these are the
24 two most likely reservoirs that we go to first.

25 **Q. The first two Bone Spring obviously go to --**

1 A. Yes.

2 **Q. -- and continue on with the next couple of**
3 **pages regarding the Wolfcamp.**

4 A. All right. Page 7 is just a structure map on
5 top of the Wolfcamp. And again, we still see the same
6 structural high on the center of the unit there. Also
7 notice that there is no faulting on this structure map,
8 indicating continuity -- structural continuity across
9 the entire nine-section unit.

10 Page 8 shows a VH map of the Wolfcamp pay
11 interval, again continuous across the unit and analogous
12 to the closest production to our unit, which is a few
13 miles to the northeast and a few miles southwest of us
14 here in North Bell Lake.

15 **Q. So the Bone Spring is continuous across the**
16 **north unit, correct?**

17 A. Yes.

18 **Q. And so is the Wolfcamp?**

19 A. Yes, it is.

20 **Q. And you believe that all of the acreage within**
21 **the unit, the north unit is prospective in both the Bone**
22 **Spring and the Wolfcamp?**

23 A. I do, yes.

24 That pretty much is all the geological
25 exhibits I have for North Bell Lake.

1 Q. Was Exhibit 6 prepared by you or under your
2 supervision?

3 A. Yes, it was.

4 Q. In your opinion, is the granting of the
5 applications on the north unit in the interest of
6 conservation and the prevention of waste?

7 A. Yes.

8 MR. BRUCE: Mr. Examiner, I move the
9 admission of Exhibit 6.

10 MR. HALL: No objection.

11 EXAMINER JONES: Exhibit 6, with the five
12 pages --

13 THE WITNESS: That's eight, I believe.

14 EXAMINER JONES: -- eight pages is
15 admitted.

16 Mr. Hall?

17 MR. HALL: I have no questions.

18 EXAMINER JONES: I guess before I forget,
19 when will you know about this PA business? Is it Chris
20 Wahls, or is it --

21 THE WITNESS: It's Chris, Chris Wahls, yes.

22 So what we're going to do is -- and Mike is
23 really more in charge of doing this. But in summary,
24 what we're going to do is we have a well in South Bell
25 Lake, and it's been on production for almost three

1 months. After six months, we are going to apply for the
2 large PA and see what happens. So they'll turn it down,
3 most likely -- hopefully not, but they'll probably turn
4 it down. Then they'll grant us, and hopefully we'll get
5 approval for these field rule pool definitions.

6 So what will likely happen is we'll get a
7 480-acre PA for that well up in the northeast part of
8 the unit, and then we're going to come over and drill
9 wells on the west side of the unit. So drill them,
10 complete them, produce them for six months, see if we
11 can get a nine-section PA on every well we drill until
12 we get our nine-section PA.

13 EXAMINER JONES: Is the well locations an
14 issue with you, as far as -- that's probably an
15 engineering question anyway. But geologic-wise, do you
16 want --

17 THE WITNESS: Well, to be honest with you,
18 our first well locations -- I think the geologic setting
19 is better to the west of where we drilled, but there's
20 more law control where we drilled. You know, we started
21 planning this three or four years ago, so we wanted to
22 stay close to our control.

23 But the other reason is that we did have
24 and we do have second Bone Spring and third Bone Spring
25 wells pretty much all around us there, right.

1 EXAMINER JONES: Uh-huh.

2 THE WITNESS: So if we drilled a well in
3 the northeast quadrant of the unit, you could show us
4 product from there all the way across the unit, and that
5 was the main reason -- one of the main reasons for
6 drilling it.

7 Now, Chris has taken over from -- I forget
8 who was before Chris, but we were kind of under the
9 impression that we would get a nine-section PA before
10 Chris took over. We don't see a problem with it at all.
11 We're going to get a nine-section PA. The production is
12 way too good out here to worry about drilling an
13 economic well.

14 EXAMINER JONES: Okay. The owners in this
15 unit, they didn't pose -- you haven't had any -- you
16 have one appearance here today, and I forgot who you're
17 appearing for.

18 MR. HALL: Energen.

19 EXAMINER JONES: Energen. Anyway, it's
20 Mr. Brooke's question, so I'll -- in other words, the
21 application here today, did it protect the owners of the
22 unit if the unit is converted into an all PA from the
23 beginning? Is there any downside to them sharing in
24 production?

25 MR. BRUCE: That's why we notified

1 everyone. I mean I think if you'll look strictly at the
2 Division's notice rules, we could have gotten away with
3 a lot less notice. But we wanted everyone in the unit,
4 both unit areas, to know exactly what Kaiser-Francis was
5 doing.

6 I think Ms. Courtney could state this, but
7 I think she and I have gotten a number of emails and
8 phone calls from people just asking what was going on,
9 and they say, "Well, that's fine with us."

10 EXAMINER JONES: Everybody wants a share of
11 every barrel produced out there?

12 MR. BRUCE: That's right.

13 EXAMINER JONES: And the people that own
14 the interest in the first 480 are okay with sharing with
15 the rest of the people because they know that more
16 development will happen, hopefully.

17 MR. BRUCE: Yes.

18 EXAMINER JONES: Okay. But your well
19 locations -- I'll ask the engineer about that, within a
20 480. In other words, because if it's all one PA, from
21 our standpoint, that means you can locate the wells
22 close to the edge without getting an off-standard
23 location exception. So it helps you that way.

24 THE WITNESS: Yes. We'll stay 330 from the
25 exterior line, but would like the flexibility of being

1 100 feet from the interior boundary. Just flexibility.

2 EXAMINER JONES: Okay. Why do you want to
3 drill mile-and-a-half wells out here?

4 THE WITNESS: Well, if you look at the
5 layout -- and Mike, our engineer, can expand on this --
6 mile-and-a-half laterals are -- that's a good length to
7 drill. It's very economical, it's sufficient. So it's
8 a great thing for us to just cut this unit in half and
9 drill north a mile and a half and drill south a mile and
10 a half, and have our central corridor. It's a really
11 beautiful situation. The lateral length is perfect.

12 If you start messing with drilling one-mile
13 laterals anywhere, then it kind of messes everything
14 else up.

15 EXAMINER JONES: Okay.

16 THE WITNESS: If you drill two-mile
17 laterals, for instance, then you're stuck with a
18 one-mile lateral somewhere in the nine-section, so we're
19 just going to stick with a nice one-and-a-half-mile
20 pattern.

21 EXAMINER JONES: Okay. We didn't ask
22 Ms. Courtney, but are you aware of any surface
23 restrictions to putting your locations in the very
24 center of this?

25 THE WITNESS: There are very few. But what

1 restrictions there are, we've been dealing with the BLM,
2 with surveyors and BLM.

3 EXAMINER JONES: Okay. It's Lea County,
4 so --

5 THE WITNESS: It's Lea County. So Mike
6 sends in a Plan of Development to the BLM every year,
7 showing exactly what we're thinking and where everything
8 is going to go. So we go down to Carlsbad and meet with
9 them and talk with them.

10 EXAMINER JONES: Okay. So what happens if
11 you don't get your well out to mile and a half? You're
12 not proposing here rules that would actually require --
13 I guess you would need an Auster spacing unit; is that
14 correct.

15 MR. BRUCE: Well, Mr. Examiner, I think if
16 the standard unit is 480 acres, the next witness will
17 discuss how many wells they're going to drill.
18 Basically, take the second Bone Spring and drill three
19 across each well unit. And if it's a single well unit
20 and you make a mile-and-a-half well with at least one of
21 them --

22 EXAMINER JONES: Okay.

23 MR. BRUCE: -- which seems reasonable where
24 they're going to be, the 480 ought to be left to it.

25 EXAMINER JONES: Okay. It sounds like you

1 figured we'd ask that.

2 So you've got five prospective reservoirs,
3 and it goes right from the Wolfcamp into the Strawn.
4 There's no upper pin here?

5 THE WITNESS: No. It really thins up on
6 that structure that we're on.

7 EXAMINER JONES: Okay.

8 THE WITNESS: Yeah. There is no Wolfcamp C
9 or D in stuff out here. It just ends up to the Strawn.
10 Paul and I talked about that a little bit.

11 EXAMINER JONES: Okay. And the oil area,
12 it's just definitely oil?

13 THE WITNESS: Yeah.

14 EXAMINER JONES: Do you know where the
15 Wolfcamp ends and the Bone Spring begins, moving uphole?
16 I mean, is it real easy to pick?

17 THE WITNESS: Yes, real easy.

18 EXAMINER JONES: And you and Paul agree to
19 the picks?

20 THE WITNESS: Yes.

21 EXAMINER JONES: As far as legacy wells,
22 are there any vertical wells you're using from the Bone
23 Spring or the Wolfcamp out here?

24 THE WITNESS: If you'll look at page 2, I
25 think there are -- I think this is in South Bell Lake,

1 so this is not really -- there are two old vertical
2 wells -- I think they're in South Bell Lake -- that are
3 in the Bell Lake/Bone Spring pool. And those wells are
4 drilled into what I have listed here as the upper Avalon
5 on page 2.

6 EXAMINER JONES: Okay.

7 THE WITNESS: So if you can envision a
8 vertical well drilled into the upper Avalon and
9 perforated in the upper Avalon.

10 The problem with that pool, with changing
11 that particular pool into what we want, is the pool
12 definition stops at the top of the lower Avalon. So it
13 only takes that tiny little -- well, upper Bone Spring
14 interval, and that's the pool definition.

15 EXAMINER JONES: Okay.

16 THE WITNESS: So it's really not bothersome
17 because they're old wells. They're on their last leg.
18 So we just decided to make this more of a horizontal
19 order, hopefully. We don't anticipate drilling a well
20 like that again.

21 EXAMINER JONES: That Avalon, is it a
22 conventional reservoir kind --

23 THE WITNESS: Yes, it's a conventional
24 reservoir on that structural high that you see out
25 there.

1 EXAMINER JONES: Okay. What about in the
2 legacy horizontal wells; it's just the one well?

3 THE WITNESS: Just one well in South Bell
4 Lake.

5 EXAMINER JONES: So they've agreed to make
6 that into the defining well, or whatever the BLM calls
7 it, the beginning well in the --

8 THE WITNESS: Well, we had --

9 EXAMINER JONES: -- the required well or
10 whatever the name of it is?

11 THE WITNESS: Are you talking about the
12 pool definition or --

13 EXAMINER JONES: Well, for the --

14 THE WITNESS: We had to put that well in a
15 different pool name. You know, Paul Kautz gave us --
16 actually, I can never remember the name of that pool,
17 but I think it's -- it's the pool name that's
18 surrounding South Bell Lake.

19 EXAMINER JONES: Okay.

20 THE WITNESS: So we put it in that pool.
21 And hopefully, once we get this approved, we're just
22 going to sundry the pool name of that well into what we
23 want here.

24 Does that answer your question?

25 EXAMINER JONES: Yes.

1 And the owners that have been noticed,
2 because everybody was noticed, so all those owners will
3 understand they're going to start sharing with everybody
4 else.

5 THE WITNESS: Yes.

6 EXAMINER JONES: But it's an older well?
7 It's been there a long time; is that correct?

8 THE WITNESS: The vertical well?

9 EXAMINER JONES: No, that horizontal.

10 THE WITNESS: Oh, no, no. That's a brand
11 new well.

12 EXAMINER JONES: A brand new well?

13 THE WITNESS: Yeah. It just started
14 producing last June.

15 EXAMINER JONES: And your well control
16 you've got out here, is that from the Devonian wells
17 that were drilled?

18 THE WITNESS: Yep. Yep, pretty much.

19 EXAMINER JONES: So you've got decent logs?

20 THE WITNESS: We've got good enough logs.
21 You know, when we drilled our first horizontal well in
22 South Bell Lake, we did a vertical pilot hole through
23 the Wolfcamp and ran Schlumberger's greatest logs and
24 cored -- you know, took some vertical cores, sidewall
25 vertical cores. And then we came up and drilled our

1 second Bone Spring well, and we're going to do the same
2 at North Bell Lake. That's what we call the pilot well,
3 where we get a lot of geologic information. That's a
4 little better than the old '70s, '80s triple combo logs
5 we had.

6 EXAMINER JONES: Okay, but it's not called
7 platform express anymore? It's called something
8 different?

9 THE WITNESS: No, it's not.

10 EXAMINER JONES: They changed the name just
11 to sell more --

12 THE WITNESS: It's hard to keep up with it,
13 to be honest with you.

14 EXAMINER JONES: Okay. Any more questions?

15 MR. BROOKS: Well, I have a lot more
16 questions, but I don't know that I'm going to get any
17 more answers, so I think I'll pass the witness.

18 EXAMINER JONES: Okay.

19 Thanks, Mr. Miller.

20 THE WITNESS: Thank you.

21 [Whereupon, Mr. Miller was excused.]

22

23

24

25

1 MIKE RAINES

2 having been previously duly sworn under oath,
3 was questioned and testified as follows:

4 DIRECT EXAMINATION

5 BY MR. BRUCE:

6 Q. Could you please state your name and city of
7 residence?

8 A. Mike Raines, Tulsa, Oklahoma.

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

10 A. I work for Kaiser-Francis Oil Company as a
11 petroleum engineer.

12 Q. Have you previously testified before the
13 Division?

14 A. No.

15 Q. Could you please summarize your education and
16 background for the Examiner, please?

17 A. I graduated from Oklahoma State University in
18 1984 with a Bachelor of Science in Petroleum
19 Engineering.

20 Q. And what has been your employment since then?

21 A. I worked for Amarada Hess for 18 years, and
22 I've worked for Kaiser-Francis Oil Company for the last
23 15 years.

24 Q. Does your area of responsibility at
25 Kaiser-Francis include this portion of Southeast

1 **New Mexico?**

2 A. Yes, it does.

3 **Q. And are you familiar with the engineering**
4 **matters related to the North Bell Lake Unit**
5 **Applications?**

6 A. Yes, I am.

7 MR. BRUCE: Mr. Examiner, I tender
8 Mr. Raines as an expert petroleum engineer.

9 EXAMINER JONES: I'm sorry, how do you
10 spell your name?

11 THE WITNESS: R-a-i-n-e-s.

12 EXAMINER JONES: Any objection?

13 MR. HALL: No objection.

14 EXAMINER JONES: He's so qualified.

15 **Q. (By Mr. Bruce) Mr. Raines, again we've taken**
16 **your exhibit and just stapled all the pages together, 1**
17 **through 11. If you could start with page 1, give a**
18 **little overview of what you're seeking, and then go into**
19 **the technical -- some of the well unit orientations, the**
20 **surface locations, and why you're asking for the**
21 **increased allowables in that and the relaxed setbacks.**

22 A. Yes. The current allowable is 320 barrels a
23 day per 40-acre unit, and a 2000-to-1 GOR.

24 We are asking, for the Bone Spring, for
25 9,600 barrels of oil a day for the 480-acre unit, which

1 would be equivalent to 800 barrels a day per 40. And
2 for the Wolfcamp, we're asking for 6,000 barrels of oil
3 a day per 480-acre unit, which would be equivalent to
4 500 barrels a day per 40. And for both Bone Spring and
5 Wolfcamp, we're asking for a GOR of 5,000.

6 And the increased allowable is needed to
7 develop our multiple stacked pay zones and to support
8 our planned well density. And there's a great deal of
9 offset production data and numerical modeling that we've
10 done to support our development production forecast that
11 leads to the increase in allowables we're requesting.

12 **Q. Turn to page 2 and discuss what that shows.**

13 A. Sure. Page 2 shows the configuration of our
14 Bell Lake North and South units, along with all of the
15 offset production data. Both North and South units are
16 three-mile-by-three-mile square units.

17 There's a great deal of production shown in
18 the maps surrounding Bell Lake. All of that offset
19 production has been utilized, along with detailed
20 geologic and engineering evaluations, to optimize our
21 development for well spacing for lateral length for
22 directional orientation. And I'll review some of that
23 information on the following pages.

24 **Q. In looking at this page 2, the vast majority of**
25 **the wells out here have been one-mile laterals, correct?**

1 A. That's correct.

2 **Q. Except just immediately to the west of the**
3 **South Unit, they've all been pretty much stand-up well**
4 **units?**

5 A. That's correct. Some of the early wells
6 drilled in this area in Southern Lea County were
7 east/west-oriented laterals, and the industry pretty
8 quickly figured out that stand-ups that are
9 north/south-oriented laterals were better wells.

10 **Q. And let's go on to your Development Plan, page**
11 **3.**

12 A. Page 3 shows the North Bell Lake Unit. The
13 three-mile-by-three-mile configuration allows us to set
14 up in the center with a corridor, with an infrastructure
15 corridor, with our pads, roads, pipelines and power
16 lines. This minimizes our surface impacts and also
17 creates more efficient capital deployment because it's
18 less expensive, since we're centralizing everything.

19 Chris Miller earlier testified about our
20 mile-and-a-half laterals, and I think this graphic
21 depicts that. It allows us to set up in the center and
22 drill mile-and-a-half laterals to the north and to the
23 south.

24 **Q. Go ahead. On to page 4.**

25 A. Sure. Page 4 illustrates our multiple stacked

1 pay zones. In the Bell Lake/Bone Spring pool, we have
2 over 3,000 feet of gross interval, with four discrete
3 development zones that were initially going to target
4 the upper and lower Avalon and the second and third Bone
5 Spring. We've done a great deal of technical work that
6 suggests that six wells per one-mile-wide drainage area
7 is the most efficient.

8 The Bone Spring is over 1,700 gross feet,
9 with two discrete development zones that we've
10 identified, the Wolfcamp A and B. Technical work also
11 suggests that six wells across a one-mile wide drainage
12 area is also optimal for the Wolfcamp.

13 **Q. And could you discuss the offset production? I**
14 **refer you to page 5.**

15 A. Yes. The next few pages really lay out the
16 technical work that we've done to develop a production
17 forecast to support our allowable request. It starts
18 here with page 5, with the offset production review.

19 On the left-hand side is a map showing all
20 of the offset wells around North and South Bell Lake.
21 It's a bubble map, with the size of the bubbles relative
22 to our estimate of ultimate recovery for each well.
23 Each bubble is colored to represent the completion zone.
24 Green is the Bone Spring wells, red colors are Wolfcamp
25 completions.

1 On the right-hand side are six graphs
2 illustrating all the production data. Graph Number 1,
3 in the upper left-hand corner, shows the well count
4 added by year, wells drilled and completed added by
5 year. It starts in 2011 with 68 wells. It reaches a
6 peak in 2014 and '15 at about 270 wells added for the
7 year, and then it begins to decrease. In 2017, this is
8 for the first three months only. So we think the final
9 well count in '17 will be about 200 wells added.

10 Graphs 3 and 4 in the center illustrate the
11 average oil and gas rates for wells added in that year.
12 It shows an increasing trend. If you'll look at Graph
13 3, in 2012, the average well came on at 305 barrels of
14 oil a day. That rate doubled by 2014 to almost 600
15 barrels a day. It doubled again in 2017. So the
16 current wells coming on production this year have
17 averaged over 1,200 barrels a day. We think that trend
18 is going to continue. We expect, in 2018 and '19,
19 averages of 1,400 and 1,600 barrels a day per well.
20 Those numbers are important because we've utilized them
21 in our production forecast.

22 The main reason why the well performance is
23 increasing is because people are drilling longer
24 laterals, which is shown in Graph 6, with a moderate
25 increase in lateral length over time.

1 But the biggest change is shown in Graph 5,
2 where operators are completing wells with larger and
3 larger fracs. You can see in 2011 about 500 pounds per
4 foot is the average profit concentration. That doubled
5 by 2014, and it's doubled again in 2017, with the
6 average profit concentration well over 2,000 pounds a
7 foot.

8 **Q. When you're looking at Graph 2, you're shown**
9 **the higher GOR the longer the production. That's just a**
10 **natural increase, isn't it? Nothing special about it?**

11 A. Nothing special about it. It's a natural
12 increase. I wanted to include this to show that this is
13 a cumulative GOR for wells that were put on production
14 as of the dates shown there. So wells that have been on
15 production since 2011 have a cumulative GOR today of
16 over 5,000 wells that have not produced as long and have
17 a cumulative GOR of less than that, as the graph shows.

18 **Q. So there wouldn't be an undue of waste of**
19 **reservoir energy by approving a higher GOR?**

20 A. That's correct.

21 **Q. One other thing. When you're looking at Graph**
22 **6, as you pointed out, most of the laterals are roughly**
23 **one mile long, but people are drilling longer laterals.**

24 Does the optimal size of a lateral depend
25 on a number of things, including geology and operational

1 **feasibility?**

2 A. Yes, sir. It depends on geology, it depends on
3 how efficient an operator can drill that lateral, how
4 cheaply they can drill it, and it also depends on the
5 capital required to support whatever lateral length it
6 should choose.

7 Often, longer lateral lengths will require
8 surface operations to be set up differently. And that's
9 one of the reasons why, for our Bell Lake Unit,
10 mile-and-a-half laterals are most economic, because it
11 requires us to deploy less capital because we can
12 centralize all those facilities.

13 **Q. And let's go into your simulation work. Turn**
14 **to page 6, please.**

15 A. Pages 6 and 7 detail all the reservoir
16 simulation work that we have done to support our
17 conclusion of optimal number of wells required and also
18 to develop production forecasts to use.

19 We've set up a simulation over an initial
20 area of one and a half miles by one mile drainage area,
21 or 960 acres. We drill mile-and-a-half laterals, with
22 the 7,500 foot completed interval 40-stage fracs, 200
23 pounds per foot proppant concentration. We identify the
24 permeability in the fractures, in the fractured web
25 area, in the reservoir, and also define the frac half

1 length.

2 What the results show is as you add more
3 wells, the overall oil recovery is greater. If you'll
4 look at the table, the bottom of the page, four wells
5 results in about 3.5 million barrels recovery. That
6 overall recovery continues to increase as we increase
7 well count all the way up to eight wells, where the
8 total recovery is over 4.4 million barrels.

9 The maps on the right-hand side depict the
10 pressure relationship across the reservoir at the end of
11 the simulation run.

12 In the four-well case, you can see the blue
13 area between the well spacing, which indicates not much
14 drainage between the wells. Five, six and eight cases
15 show an increase in the efficiency of the drainage
16 between those wells.

17 **Q. And what does page 7 then reflect?**

18 A. Page 7 shows a series of production plots for
19 each of the simulation cases. Plots 1 and 2, oil and
20 gas rates per day; Plots 3 and 4 showing cumulative oil
21 and cumulative gas; Plots 5 and 6 showing the evolution
22 of GOR versus time and pressure versus time.

23 The tables on the left-hand side, the first
24 table shows those same results, indicating that the
25 overall recovery increases as the well count increases.

1 The second table focuses in on the results per well,
2 which shows that as the well count increases, the
3 average recovery per well decreases.

4 Q. So it's kind of a balancing act, all of those
5 different factors?

6 A. It's a balancing act, and we tie it together on
7 the next page when we go over the economics.

8 Q. Why don't you do that?

9 A. Page 8 shows, in the first graph in the upper
10 left, those same results, with the red line showing how
11 the recovery increases as the well count increases. The
12 blue line shows that the per-well recovery decreases as
13 the well count increases. And the graph in the lower
14 right-hand side shows the economics of those cases.

15 We have combined the production forecast
16 from the simulation with capital necessary to drill and
17 complete the wells and to build the production
18 facilities.

19 The red line shows that the incremental
20 discounted rate of return decreases as the well count
21 increases, and that's because the average recovery per
22 well is going down, but the same amount of capital per
23 well is required as the well count increases.

24 The blue line shows the net present value
25 relationship. It increases from four wells to five, it

1 increases from five to six, but it decreases from six to
2 eight because the incremental production for those final
3 two wells won't pay for the capital deployment. So we
4 conclude that the optimal well count six wells.

5 **Q. And what does page 9 show?**

6 A. Page 9 shows how we have developed production
7 forecasts that lead to our request for allowables
8 increase. This production forecast is for the Bone
9 Spring Unit. It's for our 480-acre spacing unit.

10 In this production forecast, we have
11 developed all four intervals: The second Bone, the
12 third Bone, the lower and upper Avalon. The wells are
13 brought on production on average based on a 30-day
14 drilling complete time.

15 We're drilling them and completing them in
16 batches of three and then putting them on production.
17 So the first three wells come on at day 1; the next
18 three, day 90; the next three, day 180; and the final
19 three at day 270.

20 The graph shows how that production
21 forecast builds and reaches a peak at 9,228 barrels of
22 oil a day, about 34 million cubic feet of gas a day, and
23 the GOR peaks at about 4,900 standard cubic feet per
24 barrel.

25 The 9,200-barrels-a-day oil production

1 would be an average of 770 barrels of oil per 40. We're
2 asking for 800 barrels of oil a day per 40, equivalent
3 to the 9,600 barrels of oil a day for the 480, and we're
4 asking for a 5,000 to 1 GOR.

5 **Q. And then what about the Wolfcamp? And I refer**
6 **you to page 10.**

7 A. Page 10 shows the development of our production
8 forecast for the Wolfcamp Unit. It was developed in a
9 similar fashion. It's for the 480-acre spacing unit.
10 We've got six wells, three in the Wolfcamp A, three in
11 the Wolfcamp B, that are being brought on, as the
12 previous page did, an average of 30 days to drill and
13 complete each one.

14 The graph on the left-hand side shows that
15 the oil rate peaks at about 5,780 barrels a day. We're
16 asking for a 6,000 barrels-of-oil per day allowable for
17 our 480. And the GOR peaks at a little over 4,700
18 standard cubic feet per barrel, and we're asking for
19 5,000.

20 **Q. Could you summarize your testimony, Mr. Raines?**

21 A. Yes. Page 11 shows the summary. We have
22 multiple landing zones in the Bone Spring and the
23 Wolfcamp. We've done a lot of technical work to assess
24 various development schemes. We believe that the
25 optimum economic recovery occurs at six wells per

1 one-mile drainage area.

2 In order to accommodate this well count for
3 this number of completions, we're requesting the
4 allowables of 9,600 barrels a day for Bone Spring, 6,000
5 for the Wolfcamp, and a 5,000 to 1 GOR for both.

6 Q. And based on the number of wells you see being
7 drilled here and all the offset development, which
8 contains a lot of information, do you think these
9 allowable figures are fair and reasonable?

10 A. Yes, I do.

11 Q. Once again, because you're looking at multiple
12 wells, any well unit, does Kaiser-Francis need the
13 setback relief so that it can place wells as necessary
14 in a well unit or in a participating area?

15 A. Yes.

16 Q. Was Exhibit 7 prepared by you or under your
17 supervision?

18 A. Yes.

19 Q. And in your opinion, is the granting of these
20 applications in the interest of conservation and the
21 prevention of waste?

22 A. Yes.

23 MR. BRUCE: Mr. Examiner, I move the
24 admission of Exhibit 7.

25 MR. HALL: No objection.

1 EXAMINER JONES: Exhibit 7 is admitted.

2 MR. HALL: I have no questions.

3 EXAMINER JONES: I appreciate you doing all
4 this work. It's wonderful what you did. It kind of
5 coincides with some of the work that Devon had done in
6 some of their hearings they shared with us.

7 Mr. Bruce actually, I think, presented
8 them. But they estimated the six-well density per
9 section as best economically -- you know, they also --
10 you input into your model for your wells, you took a
11 production forecast that you got from offset wells and
12 then backed into some reservoir perimeters and then put
13 it in your model. Is that what you did?

14 THE WITNESS: That's one method that we
15 used, yes. Another method we used to try to verify
16 those numbers is based on our South Bell Lake 263 H well
17 that has just recently come on production. We did a
18 DFIT test on that well before we did the completion.

19 Now that we've done the frac job, we also
20 have some additional permeability calculations that we
21 can do from the pressures and rates from the pumping of
22 those frac jobs. And now we've got almost 90 days of
23 production on that well, and we have a decline that we
24 use to fit back into the model to try to make sure that
25 our perm numbers that we're using are valid.

1 EXAMINER JONES: Okay. So that well --
2 you're happy with that well, so far?

3 THE WITNESS: Very much so.

4 EXAMINER JONES: I can understand why
5 nobody objected to this application. It sort of makes
6 sense to make it into one big project area and just
7 enable you to plan your whole thing out, instead of
8 being limited to PAs that grow as the wells are
9 completed and tested.

10 So all of this work you did, it shows the
11 six wells. But you could also do the situation where
12 you drill one well at one level and another well at
13 another level 50 feet away or so, and then do a zipper
14 frac or whatever on them? That doesn't preclude you
15 from doing that, does it?

16 THE WITNESS: That's correct.

17 EXAMINER JONES: And your Wolfcamp, is that
18 higher pressure out here than the Bone Spring?

19 THE WITNESS: A little bit, just because
20 it's a little deeper.

21 EXAMINER JONES: Oh, just because it's
22 deeper?

23 THE WITNESS: Yeah. We're not into the geo
24 pressure intervals that many of the wells deeper in the
25 basin experience in all that.

1 EXAMINER JONES: Okay. So it's deeper in
2 the basin, where the Wolfcamp is higher?

3 THE WITNESS: Correct. We're up on a
4 structure, and so our Wolfcamp is just a little bit
5 above normal pressure. It's just a little over
6 9-pound-per-gallon grading.

7 EXAMINER JONES: Okay. Mr. Miller said he
8 used 8 percent density cutoff on his porosity numbers.
9 So you basically used his log analysis data and --

10 THE WITNESS: That's correct. We imported
11 Chris's structure map and his pay isopach, and also his
12 porosity grid into the simulation work.

13 EXAMINER JONES: Okay. So you've got a
14 nice simulator in-house, or do you contract that out?

15 THE WITNESS: We do all the work in-house.
16 We're using a product from Gemini Solutions. It's
17 called Merlin. It's a PC-based application. It runs
18 very fast, but it's a complex simulator.

19 EXAMINER JONES: Okay. So you can -- it's
20 really robust? You can put in all kinds of layers and
21 whatever complexity you want in it, it sounds like?

22 THE WITNESS: That's correct. The more
23 data you have, the more complex you can make it.

24 EXAMINER JONES: I was going to ask you how
25 you had time to do all of this, but I guess --

1 THE WITNESS: We had a team of people
2 working on it.

3 EXAMINER JONES: With the amount of
4 money -- if this is correct, the amount of money you're
5 going to make off of this, it's worth spending some
6 people working on it for a while.

7 Your profit size, is that -- your profit
8 concentration is going up in these wells. It seems to
9 be -- we hear that all over. People say well, more
10 pounds of sand per foot is, you know, up to 2,000. It's
11 getting better.

12 What size are you using out here?

13 THE WITNESS: We primarily use 30/50. It's
14 the most commonly available and most economic.

15 EXAMINER JONES: Okay. We use the smaller
16 stuff, starting out like a hundred meshes.

17 THE WITNESS: We use the hundred meshes of
18 diversion control initially.

19 EXAMINER JONES: Okay.

20 THE WITNESS: And I know a lot of operators
21 are pumping that hundred mesh for their whole job. We
22 have a little bit different feeling about that.

23 EXAMINER JONES: So you tail end with some
24 bigger stuff?

25 THE WITNESS: Correct.

1 EXAMINER JONES: And you don't get sand
2 coming back? You don't see a lot of sand coming back?

3 THE WITNESS: Not very much. We do get
4 some sand back in the initial days of the flowback, but
5 not very much.

6 EXAMINER JONES: Okay. And your
7 simulation, did it confirm about the standup wells being
8 better, or that just an empirical thing? In other
9 words, all of the geologic data you put in and the
10 stress data, I guess, does that confirm that you really
11 do need to drill wells north/south?

12 THE WITNESS: We haven't used a simulator
13 to analyze that problem. What we have done is simply
14 analyze the offset production data. There are a lot of
15 east/west wells that were drilled early in the trend.

16 EXAMINER JONES: Okay.

17 THE WITNESS: It's a very consistent
18 conclusion, no matter where you point the lens, that
19 east/west wells are poorer than north/south wells by
20 about 20 percent. And this is correct throughout the
21 whole basin, not just in Southern Lea County.

22 EXAMINER JONES: Okay. And your 5,000
23 limiting GOR, is that what you expected going into this,
24 or did you see some evidence of that in other -- so
25 you're looking at that both for the Wolfcamp and the

1 Bone Spring?

2 THE WITNESS: Correct. They're similar
3 fluid systems of the Wolfcamp, and this area has an
4 initial GOR of just a little over 1,000. The same thing
5 for the Bone Spring. They're both in the mid-40s, API
6 gravity about 44 or 45, very similar fluid systems.

7 EXAMINER JONES: Okay.

8 THE WITNESS: And there are so many
9 horizontal wells that have been on production as early
10 as 2010 that we can use to analyze GOR increase with
11 time. There's plenty of vertical production out here
12 also that we can look at for that GOR evolution.

13 EXAMINER JONES: We've seen a lot of
14 requests for 5,000 limiting GOR on the Bone Spring in
15 the past. I haven't been around forever, like some of
16 these guys have, but they've seen them. So it does need
17 to be higher, I guess.

18 So you need this increased allowable for
19 your production, but you haven't seen where producing
20 wells at higher rates than this reservoir will damage
21 your reservoir at all?

22 THE WITNESS: That's correct.

23 EXAMINER JONES: And that's because -- is
24 that because it's the type of drive mechanism or the
25 solution gas drive, or is that just well known in the

1 industry right now?

2 THE WITNESS: I don't know if it's well
3 known or not.

4 EXAMINER JONES: Okay.

5 THE WITNESS: But the primary mechanism, in
6 our view, related to the withdrawal rate that would
7 cause damage isn't in the reservoir, it's in the
8 fracture network.

9 EXAMINER JONES: Okay.

10 THE WITNESS: If you withdraw the -- if you
11 produce at a very high rate, you have a high drawdown in
12 that fracture network which can refluidize your sand,
13 which causes sand flowback, which then creates a
14 reduction in permeability in that fracture network
15 because it's not propped open like it was.

16 EXAMINER JONES: Okay.

17 THE WITNESS: Most of the effects at that
18 high rate are felt within the fractured area and not in
19 the reservoir matrix itself.

20 EXAMINER JONES: Okay. So if you're
21 consistent with your production, maybe it won't do that?
22 In other words, surging your well might do some damage
23 to it?

24 THE WITNESS: It might, or more
25 importantly, during the initial flowback producing it at

1 too high of a rate. A more conservative withdrawal rate
2 during the initial flowback, and then just allow the
3 well to decline naturally.

4 EXAMINER JONES: Okay. So you're saying
5 the conservative -- can you repeat that? So it might be
6 a good thing to go do or --

7 THE WITNESS: Yes. The most optimal way to
8 produce the well would be to open it up during the
9 flowback to a conservative choke setting.

10 EXAMINER JONES: Okay. Watch it real
11 closely to make sure you're not damaging --

12 THE WITNESS: Watch it closely.

13 EXAMINER JONES: -- your frac job?

14 THE WITNESS: If you're producing sand, cut
15 the rate back.

16 EXAMINER JONES: Okay, yeah. What about
17 initial reservoir pressure and bubble point pressure and
18 that kind of stuff?

19 THE WITNESS: Out initial reservoir
20 pressure out here in the Bone Spring is about 4,500 psi.
21 We've taken fluid samples for our first well, and it
22 shows a bubble point pressure of about 3,500 psi.

23 EXAMINER JONES: So you've actually taken
24 some samples, downhole samples or --

25 THE WITNESS: We've taken surface separator

1 samples and recombined them in the lab.

2 EXAMINER JONES: Recombined the samples,
3 okay.

4 Is the Wolfcamp -- you expect that to be
5 similar in the Wolfcamp?

6 THE WITNESS: I expect the bubblepoint
7 pressure to be similar to that, and the reservoir
8 pressure will be a little bit higher because it's a
9 little deeper. Probably around 5,000 psi reservoir
10 pressure.

11 EXAMINER JONES: Okay. I think that's
12 about it. Oh, the Devonian. How many wells are
13 actually producing from the Devonian out here?

14 THE WITNESS: We have one well producing.

15 EXAMINER JONES: Just one well producing in
16 40-acre spacing; is that correct?

17 THE WITNESS: [Witness nods head.]

18 MR. BRUCE: I haven't looked out here in a
19 long time. I know there's some 160-acre Devonian
20 somewhere around here.

21 EXAMINER JONES: So that lease that's on
22 that well is held -- we don't know if that's a federal
23 lease or a state lease. But if this all goes through
24 and it makes it one PA, it's going to hold every lease
25 in here. And depending on the segregation clause for

1 the whole -- however much extent those leases go out
2 beyond it, there's no hesitation on the landowner's part
3 to -- because of that, I take it?

4 MR. BRUCE: You'll have to ask Ms. Courtney
5 about that. Obviously, they've been out here for
6 60-something years.

7 EXAMINER JONES: Yeah. The notice -- I
8 might have missed this, but can I ask Ms. Courtney a
9 question real quickly?

10 Ms. Courtney, did you notice all the
11 override owners also?

12 MS. COURTNEY: Yes, sir.

13 EXAMINER JONES: Okay.

14 Mr. Brooks?

15 MR. BROOKS: I will also ask Ms. Courtney a
16 question, if I may, on the notice issues. Like most of
17 my questions, you can feel free to respond to it,
18 Mr. Bruce.

19 Did I understand that you noticed not only
20 all owners in the two units, the North Unit and the
21 South Unit and the one-mile area around that, but you
22 also noticed the people in between who might not have
23 owned it in the periphery of either unit?

24 MR. BRUCE: Well, we notified every single
25 interest owner in each unit --

1 MR. BROOKS: Right.

2 MR. BRUCE: -- working royalty, override,
3 NPRI, and then the operators of the existing Bone Spring
4 or Wolfcamp wells within a mile boundary around each
5 unit.

6 MR. BROOKS: Okay. So I heard you say
7 something -- I heard one of the witnesses or you say
8 something about notifying additional people. And I
9 thought maybe that was in the area that's in between the
10 two units, but not in the periphery of either one of
11 them. That would be --

12 MR. BRUCE: I think I just said I needed
13 more time to put together everything to make sure
14 everybody received actual notice or publication notice.

15 MR. BROOKS: Okay. Well, very good. I
16 will drop that subject.

17 I just want to clarify. Because I'm not an
18 engineer, so I can't elaborate much on what -- getting
19 to the intricacies of your testimony, but I think Mr.
20 Jones did a good job of exploring that. You are
21 drilling, you said, north/south wells, right.

22 THE WITNESS: Correct.

23 MR. BROOKS: Exclusively?

24 THE WITNESS: Correct.

25 MR. BROOKS: And you're going to -- the

1 upshot of your study was that three wells would be
2 appropriate to develop a 480-acre unit?

3 THE WITNESS: That's correct.

4 MR. BROOKS: The 400-acre unit would
5 consist of the east or west half of one section, and the
6 adjacent quarter sections of the section to the north or
7 to the south of that first section?

8 THE WITNESS: Correct.

9 MR. BROOKS: For instance, if you're
10 drilling Section 12, your unit would be the east half of
11 Section 12, and the southeast of Section 1.

12 If you were drilling the west half, it'd be
13 the west half of Section 12 and the southwest quarter of
14 Section 1, right?

15 THE WITNESS: Correct.

16 MR. BROOKS: And you'd have a separate unit
17 for the half sections in Section 36 of the quarter
18 sections in the north half of Section 1?

19 THE WITNESS: Correct.

20 MR. BROOKS: Okay. And in each of those,
21 you're going to drill three horizontal wells?

22 THE WITNESS: In each zone, yes.

23 MR. BROOKS: More or less equally spaced?

24 THE WITNESS: Yes, sir.

25 MR. BROOKS: So you'll be drilling three

1 wells across an area the width of which is one-half
2 section?

3 THE WITNESS: That's correct.

4 MR. BROOKS: And six across an area, the
5 width of which is one mile?

6 THE WITNESS: That is correct.

7 MR. BROOKS: Okay. I should have said one
8 half of the width is one-half mile of the section.
9 Okay, I think I understand that.

10 And you figured that that is where the
11 optimal production would occur?

12 THE WITNESS: At today's product prices and
13 service costs, yes.

14 MR. BROOKS: But of course, that could
15 change any day?

16 THE WITNESS: It could.

17 MR. BROOKS: Because it's dependent on
18 factors other than the reservoir characteristics?

19 THE WITNESS: Correct.

20 MR. BROOKS: Thank you. That's all I have.

21 MR. BRUCE: I have nothing further in these
22 cases, and I'd ask that cases 15823 and 15824 be
23 continued for two weeks just to confirm notice.

24 EXAMINER JONES: Cases 15823 and 15824 are
25 continued till September 28th.

[Proceedings concluded at 10:34 a.m.]

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1 STATE OF NEW MEXICO
2 COUNTY OF BERNALILLO

3

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