BEFORE EXAMINER STOGNER
OIL CONSERVATION DIVISION
EXHIBIT NO. _____
CASE NO. _____

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

In the matter of the hearing called
by the Oil Conservation Division
for the purpose of considering:

CASE NO. 11523

Application of Phillips Petroleum Company
for Pressure Maintenance Project,
for an EOR, and for 3 Unorthodox Oil Well
Locations, Lea County, New Mexico.

CERTIFICATE OF MAILING AND COMPLIANCE WITH ORDER R-8054

W. THOMAS KELLAHIN, attorney in fact and authorized representative of Phillips Petroleum states that the notice provisions of Division Rule 1207 (Order R-8054) have been complied with, that Applicant has caused to be conducted a good faith diligent effort to find the correct addresses of all interested parties entitled to receive notice, that on the 10th day of April, 1996 I caused to be sent, by certified mail return receipt requested, notice of this hearing and a copy of the application for the referenced case along with the cover letter, at least twenty days prior to the hearing set for May 2, 1996, to the parties shown in the application as evidenced by the attached copies of receipt cards, and that pursuant to Division Rule 1207, notice has been given at the correct addresses provided by such rule.

W. Thomas Kellahin

SUBSCRIBED AND SWORN to before me on this 1st day of May, 1996.

Notary Public

My Commission Expires: June 15th, 1998

BEFORE EXAMINER STOGNER
OIL CONSERVATION DIVISION
Phillips EXHIBIT NO. 18
CASE NO. 11523

SENDER:
- Complete items 1 and/or 2 for additional services.
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Phillips-35 05/02
April 10, 1996

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

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3. Article Addressed to:
Texaco Exploration and Prod., Inc.
P.O. Box 3109
Midland, Texas 79702
Attn: Frank Gray

4a. Article Number
P 326-929-031

4b. Service Type
☐ Registered ☑ Certified
☐ Express Mail ☐ Insured
☑ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
APR 15 1996

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
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Certified Fee	
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Return Receipt Showing to Whom & Date Delivered	

April 1995

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P.O. Box 552
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Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$

800, April 1995

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Mobil Exploration and Production, Inc.
500 West Illinois
Suite 100
Midland, Texas 79701

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2. ☐ Restricted Delivery

Consult postmaster for fee.

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Phillips-35 05/02
April 10, 1996

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P 326-929-030

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4-15-96

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TOTAL Postage & Fees	$
Postmark or Date	

3800, April 1995

Phillips-35 05/02
April 10, 1996

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- April 10, 1996
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- ce does not permit.
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1. ☐ Addressee's Address
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3. Article Addressed to:

State of New Mexico
State Land Office
310 Old Santa Fe Trail
P.O. Box 1148
Santa Fe, New Mexico 87504-1148

4a. Article Number
P 334-798-523

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STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

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Locations, Lea County, New Mexico.

CERTIFICATE OF MAILING AND COMPLIANCE WITH ORDER R-8054

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Notary Public

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Phillips EXHIBIT NO. 18
CASE NO. 11523

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Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$

800, April 1995

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3800, April 1995

Phillips-35 05/02
April 10, 1996

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 PHILLIPS PETROLEUM COMPANY FOR APPROVAL OF A UNIT AGREEMENT, LEA COUNTY, NEW MEXICO	CASE NOS. 11,522
APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR APPROVAL OF A PRESSURE MAINTENANCE PROJECT, TO QUALIFY SAID PROJECT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE ENHANCED OIL RECOVERY ACT, AND FOR THREE UNORTHODOX WELL LOCATIONS, LEA COUNTY, NEW MEXICO	and 11,523 (Consolidated)

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS
EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

May 2nd, 1996
Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, May 2nd, 1996, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

I N D E X

May 2nd, 1996
Examiner Hearing
CASE NOS. 11,522 and 11,523 (Consolidated)

* * *

E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	10	17
Exhibit 2	12	17
Exhibit 3	13	17
Exhibit 4	14	17
Exhibit 5	21	31
Exhibit 6	24	31
Exhibit 7	25	31
Exhibit 8	26	31
Exhibit 9	27	31
Exhibit 10	29	31
Exhibit 11	34, 36	49
Exhibit 12	37	49
Exhibit 13	38	49
Exhibit 14	39	49
Exhibit 15	40	49
Exhibit 16	41	49
Exhibit 17	43	49
Exhibit 18	49	49

* * *

A P P E A R A N C E S

FOR THE DIVISION:

RAND L. CARROLL
Attorney at Law
Legal Counsel to the Division
2040 South Pacheco
Santa Fe, New Mexico 87505

FOR THE APPLICANT:

KELLAHIN & KELLAHIN
117 N. Guadalupe
P.O. Box 2265
Santa Fe, New Mexico 87504-2265
By: W. THOMAS KELLAHIN

* * *

WHEREUPON, the following proceedings were had at 8:40 a.m.:

EXAMINER STOGNER: At this time I'll call Case Number 11,522.

MR. CARROLL: Application of Phillips Petroleum Company for approval of a unit agreement, Lea County, New Mexico.

EXAMINER STOGNER: At this time I'll call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of the Applicant.

We would like to consolidate this case with the following case on the docket and have them heard together.

EXAMINER STOGNER: Are there any other appearances in 11,522 at this time?

At this time, I'll also call Case Number 11,523.

MR. CARROLL: Application of Phillips Petroleum Company for approval of a pressure maintenance project, to qualify said project for the recovered oil tax rate

pursuant to the Enhanced Oil Recovery Act, and for three unorthodox well locations, Lea County, New Mexico.

EXAMINER STOGNER: For the record, are there any appearances in this matter, other than Phillips Petroleum?

Mr. Kellahin?

MR. KELLAHIN: Mr. Examiner, I have three witnesses to be sworn.

EXAMINER STOGNER: Okay, will the witnesses please stand to be sworn?

(Thereupon, the witnesses were sworn.)

MR. KELLAHIN: Mr. Examiner, if you would refer to what is proposed to be Phillips Exhibit Number 1, you'll see a locator map. That map contains a number of Grayburg-San Andres waterflood projects.

The project that we're presenting to you this morning is over on the west side in Section 35, and it's composed of two different -- of three different State of New Mexico oil and gas leases. The northwest portion of Section 35 is the State H-35 lease. To the west of that is the Mable lease; it's an 80-acre standup. And south of that is the Hale lease.

Phillips is 100-percent working interest owner of the three leases, and we have obtained the Commissioner of Public Lands' approval to consolidate all three leases for what our technical witnesses will describe to you as a WAG

project where they inject CO_2 and water in a certain operational sequence for enhanced oil recovery.

This morning we're seeking approval of the unit agreement, we're seeking approval of the waterflood CO_2 project area, we're seeking approval from the Division for the Enhanced Oil Recovery Tax credit.

As part of the presentation, you will recognize that there are six producing wells that will be at unorthodox locations. Mr. Larry Sanders for Phillips is processing those administratively.

In addition, I think you'll notice on one of the plats, there are two wells that will be directionally drilled. In addition, Mr. Sanders is processing those administratively under Rule 111.

We have three witnesses for you this morning.

Mr. Jamie Welin, who is the landman, will talk about the land consolidation.

Mary Tisdale is the geologist. She will describe for you the geologic considerations.

And then finally, Mr. Larry Hallenbeck will describe for you the engineering aspects of the project, including his efforts to review and to comply with the C-108 requirements.

And with that introduction, then, Mr. Examiner, we'll have Mr. Welin describe his project.

JAMES S. WELIN,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. For the record, sir, would you please state your name and occupation?

A. Yes, I'm James Welin. I'm the area land manager for Phillips Petroleum in the Permian Basin. We office in Odessa, Texas.

Q. On prior occasions, Mr. Welin, have you testified before the Division and qualified as an expert in petroleum land matters?

A. I testified before the Commission 18 years ago.

Q. As part of your duties, have you continued to work with Phillips Petroleum Company in land-title situations?

A. Yes, sir, I have. This is my third trip to the Permian Basin.

I've worked Oklahoma, Arkansas, Louisiana/Gulf Coast, I spent four years in the international division, I was transferred back to the Permian Basin about three years ago.

Q. When we look at Phillips Exhibit 1, are you knowledgeable about the configurations and the documents by

which these various waterfloods and units have been consolidated?

A. Yes, sir, I am.

Q. And are you particularly familiar with the ownership with regards to what we've we've called the State 35 unit?

A. Yes, sir, I am.

MR. KELLAHIN: We tender Mr. Welin as an expert petroleum landman.

EXAMINER STOGNER: Mr. Welin, were you with Phillips whenever you came here, 18 years ago?

THE WITNESS: No, sir, I was with Ammon oil at that time.

EXAMINER STOGNER: All right. Where were you overseas with Phillips?

THE WITNESS: I was never stationed overseas. I was in Bartlesville, Oklahoma, and --

MR. KELLAHIN: I believe that's overseas, Mr. Examiner.

(Laughter)

MR. KELLAHIN: That should qualify.

THE WITNESS: I spent -- basically worked north Africa and South America.

EXAMINER STOGNER: I was born in Osage County, Oklahoma, and it is a foreign country.

Yes, Mr. Welin is so qualified. Thank you, sir.

Q. (By Mr. Kellahin) Let's take a moment, Mr. Welin, and if you'll look at Exhibit 1, identify --

A. Exhibit 1 basically shows the whole Vacuum-Grayburg area. Our project area covers approximately 560 acres in Section 35. It's located about two miles west of Phillips' operated East Vacuum-Grayburg-San Andres unit, which was unitized in December of 1994.

Q. How is that shown on the display?

A. It's the large area furthest to the east, delineated by the "EVGSAU".

Our project area is directly offset by three Texaco operated units: the Central Vacuum unit to the east, which is outlined in the light blue; the Vacuum-Grayburg-San Andres unit to the south, which is in the purple or pink; and the West Vacuum unit to the west. Those are all three Texaco-operated units. They're all part of the Vacuum-Grayburg-San Andres area.

Phillips began development of the Hale and Mable leases in 1938. The state leases are vintage 1933. Conoco also began operations on the State 35, also in 1938.

Q. Have you obtained the permission of the Commissioner of Public Lands to consolidate the three leases under a unit agreement?

A. Yes, sir, we have.

Q. And under that agreement, is Phillips still 100-percent working interest owner of all the properties?

A. That's correct.

Q. Are there any overriding royalties involved in the proposed unit area, Mr. Welin?

A. The Mable lease and the M.E. Hale lease carry overrides on them. They are controlled by the Crescent Porter Hale Foundation, which is a philanthropic organization out of San Francisco.

There's a 10.9375-percent override on the Mable lease, there is a 6.25-percent override on the M.E. Hale lease, and we have not received a signed joinder and ratification, but I spoke with the foundation representatives on Tuesday of this week and they have agreed to sign the ratification and told me it would be in my office on Friday.

Q. All right. At this point, do you have an opinion as to whether or not you'll be able to consolidate on a voluntary basis --

A. Yes.

Q. -- all of the royalty and overrides for operations under a unit concept?

A. We should have 100-percent participation.

Q. As part of your documentation of the unit, have you prepared a proposed participation formula?

A. Yes, sir, we have. Exhibit -- Our proposed Exhibit 2 is a proposed formula that we have worked up. It provides for the formulation -- or the formula is comprised of four components: original oil in place, current production, the cumulative production, and the remaining production.

Q. Has this formula been reviewed by Phillips' technical staff, and do you have their agreement that this proposed participation formula is fair and equitable to all interest owners?

A. Yes, sir, we -- The geologist and the engineer and myself sat down, we have taken all the parameters into effect, and it is the most equitable -- most equitable formula we can come up with. You can jockey around the percentages, and it's not going to change the participation factors more than one percent.

EXAMINER STOGNER: I'd like to interject something.

THE WITNESS: Sure.

EXAMINER STOGNER: The tracts -- You have tracts 1, 2 and 3.

THE WITNESS: Yes, sir.

EXAMINER STOGNER: Could you identify --

THE WITNESS: Yes, sir, Tract Number 1 is the Mable lease over in the very northwest, Tract Number 2 is

the M.E. Hale lease which to the south, and Tract Number 3 is the State H-35.

EXAMINER STOGNER: Thank you, Mr. Kellahin. Thank you, sir.

Q. (By Mr. Kellahin) Have you satisfied yourself that the arithmetic shown on Exhibit Number 2 is accurate?

A. Yes, sir, I have.

Q. Apart from going through the details, give us a general summary of the kinds of percentages, then, that are allocated to the four components of the formula.

A. Okay. Original oil in place was granted with 10-percent participating factor, the current production was given 25 percent, the cumulative production was given 25 percent, and the remaining production was given 40 percent weighted factors.

Q. Has this participation formula been submitted to the Commissioner of Public Lands?

A. Yes, sir, it has, and it has been accepted.

Q. Let's turn now to Exhibit Number 3, Mr. Welin. Would you identify for us what that exhibit is?

A. Exhibit Number 3 is the preliminary approval from the State of New Mexico, Commissioner of Public Lands, dated April 25th.

Q. Other than the general requirements for obtaining the Division approval and the filing fees and the

ratifications, did the Commissioner of Public Lands establish any special conditions or limitations with regards to approval?

A. No, sir.

Q. Turn to Exhibit 4 with me. Would you identify and describe for me what Exhibit 4 is?

A. Exhibit 4 is our proposed unit agreement for this project. It came on a disc from the State, and basically it has not been changed other than unitized formation, the dates and the exhibits to the back.

Q. So that the Examiner understands what the proposed unitized formation is, let me have you turn to the third page of this document. If you'll read down under Section 2 about two-thirds down on the page, you get down to Section 2, it says, (d) --

A. -- (d) --

Q. -- and identifies for the Examiner a unitized formation. What is your understanding of that unitized interval?

A. My understanding of the definition of the unitized interval is, it's the stratigraphic equivalent of the Grayburg-San Andres formation that extends from 4000 feet to 4950 feet in the Hale Number 8 well, which is located in the southeast quarter of the southeast quarter of Section 35. I believe the footages are 650 feet from

the south line and 560 feet from the east line.

Q. Attached to the unit agreement is the Exhibit A, which is the plat of the area.

A. Yes, sir.

Q. And then you have Exhibit B, which is a tabulation of the lease tracts, and finally C is the participation formula.

A. That's correct.

Q. Have all those attachments been approved on a preliminary basis by the Commissioner of Public Lands?

A. Yes, sir, they have.

Q. To the best of your knowledge, information and belief, are these documents true and accurate?

A. Yes, sir, they are.

Q. From a land perspective, Mr. Welin, will the unitized operation provide for an effective and efficient means by which Phillips may have an opportunity to recover additional tertiary oil that they might not otherwise recover?

A. Yes, sir, they do. They provide us -- The unitization will allow us to operate these three separate leases as a single lease.

Q. When you look at Exhibit A to the unit agreement, there is a locator map on which is identified some existing and/or proposed lease-line injection wells?

A. Yes, sir.

Q. What is the status of those wells? Which are actually in the ground and which, if any, are additional lease-line injection wells?

A. We have -- Let's see, there's 12 current lease-line injection wells. They're depicted in the green right on the lease lines to the east, south and to the west. Those are the 12 active.

As far as the internal wells, what are proposed and -- I believe the discussion from the geological and engineering side will take care of that.

Q. When we look at Exhibit A, then, all the lease-line injection wells -- and what I mean by that is, all the wells that are injection wells along the outer perimeter of the proposed unit --

A. They're currently in place.

Q. They're all in place?

A. Yes, sir.

Q. And next to those triangles is a name on the north side. It says Mobil. On the east side it's a combination of Texaco and Phillips, as you move around the pattern.

A. That's correct.

Q. When you see the designation of Texaco, what does that indicate?

A. Well, it's the Texaco Vacuum -- the West Vacuum unit, the Texaco Vacuum-Grayburg-San Andres unit, and the Central Vacuum unit. These leases were all jointly operated as far as waterflood. Back in 1993, we signed a lease-line cooperative injection agreement with Texaco, Conoco and Mobil and began injecting water into these lease-line wells.

Q. All right. If it indicates, then, Texaco next to that injection well, that denominates that Texaco is the operator of that well?

A. Texaco is the operator, that's correct.

Q. And do you have in place, then, lease-line injection wells for all the perimeter injection wells?

A. Yes, sir, we do.

Q. Okay. So it's not necessary that the lease-line injection agreement be a condition of --

A. No, sir. No, sir.

Q. -- approval by this agency?

A. No, sir. I'm sorry.

MR. KELLAHIN: All right. That concludes my examination of Mr. Welin.

We move the introduction of his Exhibits 1 through 4.

EXAMINER STOGNER: Exhibits 1 through 4 will be admitted into evidence at this time.

EXAMINATION

BY EXAMINER STOGNER:

Q. In looking at Exhibit B on -- let's say attachment B on Exhibit Number 4 --

A. Yes, sir.

Q. -- it mentioned the overriding royalty --

A. Yes, sir.

Q. -- percentage. Is that shown on this exhibit?

A. Yes, sir, it is. Oh -- Yes, sir, to -- the Exhibit B to the proposed unit agreement.

Q. And for the overriding on Tract Number 1, for instance, it shows 10.93750 percent?

A. Yes, sir.

Q. But it says --

MR. KELLAHIN: It doesn't show the owner, it doesn't show the owner.

THE WITNESS: No, it doesn't show the -- It doesn't show the owner, sir.

EXAMINER STOGNER: Right.

THE WITNESS: The owner of that is the Crescent Porter Hale Foundation.

EXAMINER STOGNER: That's what I was looking for.

THE WITNESS: Okay.

Q. (By Examiner Stogner) And on Tract Number 2, the 6.25 percent --

A. -- is also owned by the Crescent Porter Hale Foundation.

Q. And there is no overriding in Tract 3?

A. No, sir.

Q. Now, I show a Floyd Oil Company.

A. They are the record title holder. In 1994, Conoco, who was the original operator of the State H-35 lease, sold this lease to Floyd Oil Company. We in turn contacted Floyd and purchased the Grayburg-San Andres rights only. They are still the record title holder of the oil and gas lease. They have ratified.

Q. And you're expecting a signed document from the Carter --

A. From the Crescent Porter Hale Foundation, yes, sir. I spoke with Mr. Bob Frederick, who is their land manager, on Tuesday afternoon, late. He is the -- Ballard Oil and Gas Company out of Houston, Texas, Mr. Ballard, who is the president of Ballard Oil, sits on the board for the Crescent Porter Hale Foundation and has reviewed this matter for the Crescent Porter Hale Foundation.

We had a meeting with them on Friday last week and gave them a presentation. And subsequent to that, Mr. Ballard has left town, but he has agreed verbally over the phone to sign a joinder and ratification, and that should be in my office by Friday.

EXAMINER STOGNER: Mr. Kellahin, would you see that we're notified by -- I don't know if necessarily a signed copy would need to be filed, but some sort of affidavit or notification that it has been received for the record in this matter.

MR. KELLAHIN: Yes, sir, I'd be happy to do that.

Q. (By Examiner Stogner) Was this presented to the Land Office, or was it all done through the mail?

A. It was presented, actual presentation, sir.

EXAMINER STOGNER: Okay. I have no other questions of this witness. You may be excused at this time.

MR. KELLAHIN: Mary?

THE WITNESS: Thank you.

MR. KELLAHIN: Mr. Examiner, Ms. Tisdale is our geologic expert from Phillips, and she's our next witness.

MARY TISDALE,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. For the record, would you please state your name and occupation?

A. I'm Mary Tisdale. I'm a geologist on the New Mexico exploitation team at Phillips Petroleum.

Q. Ms. Tisdale, have you testified on prior occasions before the Division as an expert in petroleum geology?

A. Yes, I have.

Q. Have you applied your expertise to examining the geologic components surrounding the proposed CO_2 waterflood project in what we've described as the State 35 unit?

A. Yes, I have.

Q. Based upon that study, do you now have expert opinions with respect to the appropriateness of attempting a CO_2 waterflood project for the unit?

A. Yes, I do.

MR. KELLAHIN: We tender Ms. Tisdale as an expert petroleum geologist.

EXAMINER STOGNER: Ms. Tisdale is so qualified.

Q. (By Mr. Kellahin) Let me ask you to start by turning to what we have marked as Exhibit Number 5, and if you also have a copy of Exhibit 1, which is the locator map, or perhaps some other locator map that would help us identify the wells --

EXAMINER STOGNER: Would this one be more appropriate? This is the Exhibit A on --

MR. KELLAHIN: Yes, sir, I think that's larger scale, and it's certainly easier to follow.

EXAMINER STOGNER: That's the one I'll have open

on my desk to refer to.

MR. KELLAHIN: All right, sir.

Q. (By Mr. Kellahin) Mr. Welin has defined for us a proposed unitized formation. His documents refer to a type well. Are we now looking at the log of the type well when we direct our attention to Exhibit 5?

A. Yes, we are.

Q. Locate the well for us.

A. On the map that you selected, the well is actually going to be renamed the State 35 Unit Number 36. So it is down in the southeastern corner of Section 35.

Q. Using Exhibit 5 as the type log, then, describe for us what you see on the log for the unitized interval, what the geologic plan is for the flooding of these formations and how you have picked the top and the base of the unitized interval.

A. This log shows the top of the unitized interval, which is 4000 feet, a subsea depth of 27, and then the base of the unitized interval, which is 4950 or a subsea depth of 929. The interval that we propose to unitize is the Grayburg-San Andres interval, as you can see on this log.

Your Grayburg formation is predominantly a sandy dolomite with interbedded sands, and then your San Andres reservoir is predominantly dolomite. The San Andreses separate into two major shallowing upward carbonate

sequences, which are known as the upper San Andres and your lower San Andres interval. Those are separated by what is regionally called the Lovington sand.

You can see here that the zone that we plan on -- or the interval that we plan on injecting CO_2 into is the San Andres, both the upper and the lower San Andres. This is the primary productive interval in the proposed State 35 unit, and it's approximately 400 feet thick, the gross interval of the productive portion of the San Andres reservoir.

Q. By comparison, is this the interval that's being flooded in the other projects in this vicinity?

A. Yes, it is. This is the same interval that has been waterflooded in CVU, and also it's the same interval that is being flooded in Phillips' East Vacuum-Grayburg-San Andres Unit.

Q. Do the operators in these other units confine their injection to the San Andres interval? Or are they also injecting into the Grayburg?

A. I think in CVU they are all -- they may be injecting water into some of the Grayburg.

Q. Is there any geologic risk in trying to separate between the Grayburg and the San Andres in terms of injection or recoveries out of those reservoirs?

A. No, there's not.

Q. All right. So there's no reason to worry about keeping production or injection isolated to one or the other; is that right?

A. Yes.

Q. You're seeking approval, then, to have the opportunity to inject and produce through the entire unitized interval, then?

A. We plan on injecting only into the San Andres.

Q. All right. Your recoveries, then, would be out of the San Andres, but you do have some open-hole completions in the Grayburg?

A. Yes, we do. We have some old 1938 wells that are open-hole completions that we do have the Grayburg open in.

Q. Geologically, then, do you see any reason to isolate those old producing wells so that they're confined to the San Andres?

A. No, we do not.

Q. All right. Let's turn to Exhibit Number 6 and have you identify and describe what we're seeing there.

A. Okay. Exhibit Number 6 is a structure map on top of the San Andres reservoir. What it shows is that you have approximately 200 feet of dip on the San Andres in Section 35. You can see your highest structural position is in the southern portion of the proposed State 35 unit and that your anticlinal feature trends east-west.

Q. When we look at our locator map, our reference map, and compare it to structure, is there a logic to the location of the injection wells and producers insofar as it affects structure?

A. Yes, it is. Most of the active injectors that we have at this time are actually surrounding the high structural portion of our proposed State 35 unit.

Q. If that portion of the project is successful as a phase-one operation, would you then have the opportunity to initiate a second phase and move up to the northwest portion of the unitized area?

A. We actually have a phase two, which would expand on the -- expand injection on the H-35 lease to the west. When we drill the six proposed wells we're going to core two of those wells, and with that information we will evaluate the expansion of the project.

Q. Let's turn now to Exhibit Number 7. If you'll identify and describe for us Exhibit Number 7.

A. Okay, Exhibit Number 7 is a net pay map of the San Andres. This is net pay above minus 700 feet, which has historically been called the oil-water in the Vacuum-Grayburg-San Andres Pool, the oil-water contact.

Q. You've described it as a net-pay map. What criteria did you suggest as a geologist by which you constructed a net-pay map?

A. Well, it is, like I said, pay above minus 700 feet, and we used a 5-percent porosity cutoff.

Q. What does this show you?

A. What this shows is that the net pay thickness varies from 284 feet, once again, in the southern portion of Section 35 to approximately 45 feet in the northwestern portion or on the old Mable lease.

Q. Geologically, when you look at the structural and the thickness components, are you seeing anything that is geologically different with regards to this project, as compared to the other projects in this vicinity?

A. No, it is very similar.

Q. Let's look at reservoir continuity. If you'll take a look at Exhibit Number 8, let me have you direct your attention to the cross-section locator map. You've constructed a number of cross-sections in this area?

A. Yes, we have.

Q. And describe for the Examiner the three cross-sections that he's about to see, using the locator map so that he can see the orientation of those cross-sections.

A. Well, we're actually going to show you two cross-sections --

Q. All right.

A. -- today. We're going to show you F-F', which is an east-west section --

Q. On the southern end of the unit?

A. -- on the southern portion of the block. And then we're going to show you a north-south cross-section that runs from the Mobil Bridges State lease through Section 35 and into Vacuum-Grayburg-San Andres.

Q. Based upon your examination and preparation of those cross-sections, do you have a geologic opinion as to whether there is adequate reservoir continuity in all directions in this unitized area, to give you a reasonable opportunity to be successful with a CO_2 waterflood project?

A. Yes, I do.

Q. Okay, let's look at the cross-section. Exhibit 9 is which cross-section?

A. F-F'.

Q. This is the F-F'. This is the one that runs east-west on the south side. Describe for us what you see.

A. Okay, what this cross-section shows, once again, is that you're structurally high in the eastern portion of the block, you're climbing up on structure.

What it also shows is, there is some variability in your porosity development in the upper San Andres, but in this portion of the field your upper San Andres porosity is continuous.

What it also shows is a significant thickness of the your porosity in the lower San Andres in this area.

And you can see the oil-water contact is plotted on the cross-section. And it also shows that structure comes into play. As you move west you're moving offstructure, and your thick lower San Andres pay is below your oil-water contact.

EXAMINER STOGNER: All right, before we move off of this one --

THE WITNESS: Okay.

EXAMINER STOGNER: -- there's a lot of -- In fact, you've got all the members --

THE WITNESS: There's a lot of --

EXAMINER STOGNER: -- and everything --

THE WITNESS: Right.

EXAMINER STOGNER: -- marked on this cross-section.

THE WITNESS: Right.

EXAMINER STOGNER: Which is the zone or the colored markers in which the CO_2 is going to be injected?

THE WITNESS: Okay, the yellow -- The upper yellow marker is the top, and then we will be injecting in all the layers down to the oil-water contact, which is a blue line, flat line running through the -- That is the injection interval.

EXAMINER STOGNER: Okay. Before you get too far ahead of me --

THE WITNESS: Right, no.

EXAMINER STOGNER: Okay, thank you. Go ahead.

Q. (By Mr. Kellahin) What's the basis for selecting that top and bottom as the injection interval?

A. Well, this is equivalent to the injection interval in our East Vacuum-Grayburg-San Andres unit. This is the interval in which we've seen CO_2 response there. It's also the interval where you have your best porosity in this area.

Q. Let's look at the reservoir from the perspective of the north-south cross-section, if you'll turn to Exhibit 10. For Exhibit 10 are you using the same color code and geologic markers as we saw on Exhibit 9?

A. Yes, sir. Yes, I am.

Q. Describe for us what you see when we look at Exhibit 10.

A. Okay. Exhibit 10, once again, shows that you're climbing up on structure in your San Andres in the southern portion of Section 35.

It also shows your porosity development in both your upper and lower San Andres and the variability that we see there.

And once again, it shows how structure is an important factor in your lower San Andres. In the southern portion of Section 35, you're putting your best porosity

high on structure, in the southern portion of Section 35.

Q. Are Exhibits 6 through 10 your geologic work product?

A. Yes, they are.

Q. And do they represent your geologic conclusion and opinions?

A. Yes, they do.

Q. Summarize your opinion with regards to the appropriateness of utilizing this area geologically for a potential CO_2 project.

A. We feel -- Our original evaluation was a comparison with our East Vacuum-Grayburg-San Andres unit where we have seen significant CO_2 response. We feel that this Section 35 area is equivalent to -- the reservoir is equivalent to and the quality of the reservoir is equivalent to what we've seen in our East Vacuum-Grayburg-San Andres CO_2 flood, and we feel that this is a good area to CO_2 flood.

Q. Is there a reasonable geologic explanation to the boundary of the proposed unit? When you look at the east side, you're obviously up against another waterflood in this same reservoir?

A. Well, the -- Yes, we're up against other San Andres waterfloods. On three sides the boundary is defined by other units. This section has not been unitized, and we

are surrounded by units on all sides, so those boundaries are not necessarily geologic.

Our northern boundary is based on geology. We see a decrease in reservoir quality as you move north up into the Mobil Bridges State unit. And we feel, like I said earlier, with the two cores that we cut -- The two northernmost wells that we drill, we're going to cut cores and we will evaluate expanding in the northern portion. And if the evaluation deems at that time that we should try and expand into the Mobil Bridges State lease, we will propose that.

Q. At this point in time, do you see any reasonable geologic basis for including properties other than you have proposed for this unit?

A. No, we do not.

MR. KELLAHIN: That concludes my examination of Ms. Tisdale.

We move the introduction of her Exhibits 5 through 10.

EXAMINER STOGNER: Exhibits 5 through 10 will be admitted into evidence at this time.

EXAMINATION

BY EXAMINER STOGNER:

Q. Ms. Tisdale, in referring to Exhibit Number 5 --

A. Yes, sir.

Q. -- you've meticulously subdivided the San Andres, and this is, I understand, going to be the CO_2 injection zone.

A. Right.

Q. Are there going to be particular perforations in certain of these zones, or are some zones -- or are they all going to be perforated?

A. No, just certain zones will be perforated within --

Q. And what zones are going to be perforated?

A. Your main reservoir in the upper San Andres are the zones on the type log that are labeled C and C2. They're red and blue in the center of your upper San Andres.

That is the primary reservoir in the upper San Andres.

And then in your lower San Andres section, what is labeled as the G zone -- it's kind of a funny pink patterned --

Q. -- mauve.

A. Yeah.

And then your I and J zones will also be perforated in the lower San Andres.

Q. Now, that's a funny pink zone and a blue zone.

A. Yeah. Those will be the injection zones.

Q. Now, are those zones presently being injected with water?

A. Yes, they are.

Q. In these particular perfs?

A. Yes.

Q. Okay. So there will be no additional perforations or -- You're going to use the existing perforations, in other words?

A. Yes, we will.

Q. Okay. Now, other than some of the extremely old completions, the open-hole completions --

A. Right.

Q. -- are you going to be producing from these same zones, or are you going to have additional perforations for the producers?

A. The producers that have been -- The recent producers, drilled in the Eighties, are only open in the San Andres in these zones.

EXAMINER STOGNER: I had one other question, but it slipped my mind at this time.

So Mr. Kellahin...

Ms. Tisdale, you may be excused at this time. If I remember it, I'll ask.

MR. KELLAHIN: We call our petroleum engineering witness, Mr. Larry Hallenbeck, at this time, Mr. Examiner.

LARRY HALLENBECK,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Hallenbeck, for the record would you please state your name and occupation?

A. My name is Larry Hallenbeck. I am a petroleum engineer for Phillips Petroleum Company in the exploitation unit at our Odessa office.

Q. All right. Have you been involved on behalf of your company as the petroleum engineer responsible for the petroleum engineering aspects of the proposed unit area?

A. Yes, I have.

MR. KELLAHIN: We tender Mr. Hallenbeck as an expert witness.

EXAMINER STOGNER: Mr. Hallenbeck is so qualified.

MR. KELLAHIN: Let's turn to Exhibit 11. It simply duplicates what we are using, I think, as our locator map; is that not true, Mr. Hallenbeck?

A. Yes, Exhibit Number 11 is slightly different. It has the current well names and the current situation on the Hale, Mable and H-35 leases.

Q. All right, I misspoke then. This is the current

status. When we look at the locator map that Mr. Stogner is using, that shows the proposed plan if it's approved?

A. That's correct.

Q. And so he will see a difference. There are some open red circles that represent what on his locator map?

A. Those are proposed new-well locations.

Q. All right. The color code he is looking at shows him what, sir, on his locator map? The little one he's using that's attached to the unit agreement.

A. The little red circles indicate the proposed wells that we are administratively seeking approval on.

Q. The black are current producers?

A. Yes, the black are current producers. The triangles are the current injectors. But the -- This exhibit here shows a conversion that we are also proposing in the -- as part of the CO_2 flood.

Q. All right. As part of your package, then, we're going to be able to show the Division Examiner the current status, and then you subsequently have another map that's going to show him the conversion?

A. That's correct.

Q. And he can draw that comparison?

A. Right.

Q. All right. Let's start with that project the way it is now.

A. Yes.

Q. Describe for us how we get to where we are and what we're doing now.

A. Okay. Exhibit 11 is basically the current injection/production scenario in the Hale, Mable, H-35 leases. Basically, the waterflood in this area, because it wasn't part of a unit, was developed along the lease lines. So Conoco operated that northern piece of the section, and we entered into a lease-line agreement with Conoco, Texaco and Phillips to basically waterflood this area along the lease line.

Later on, we added a couple of internal injectors in the Hale lease, the Number 12 and 13. And so that brings us currently to having about 14 active injectors and about 16 active producers in the total area.

Q. Under the current operations, as of the end of December of 1995, can you approximate for the Examiner what has been your cumulative primary and secondary recovery as to that point?

A. Right, as of January of this year, we've cumulatively produced 17.2 million barrels from all three leases, and approximately one half of that has been due to the secondary operations that were initiated in 1982.

Q. If nothing else is done with the project area, what is your forecast of the remaining recoverable oil

under the current operation plan?

A. We estimate under the current economic conditions that the waterflood, with a high water cut, that we could produce another million barrels of secondary oil, and at that time the economics would not allow further production.

Q. Within the project area, what is your total daily oil rate?

A. Currently we're producing about 420 barrels a day at a 95-percent water cut, and we're injecting about 10,000 to 12,000 barrels a day of water.

Q. Based upon your analysis, what do you forecast is the opportunity for incremental recovery if the Division approves your project?

A. Under the proposed CO_2 project that we are proposing, we estimate that we can recover an additional above waterflood of about 7.2 million barrels, to the year 2010.

Q. Let's turn to Exhibit Number 12. Identify and describe for us what you're showing.

A. Okay. Exhibit Number 12 basically shows the historical oil production and water injection history on all three leases.

Also on these curves is the -- You'll notice there's two different colors on each plot. One is the observed actual data from the leases, the other is the

model forecast that we have generated for use in evaluation of the unit. I might take a moment to describe the process we went through.

We took the geologic data that Ms. Tisdale testified to, directly into a 3-D reservoir simulator, and basically used a lot of the information from our simulation at East Vacuum, PVT, perm data, and constructed a full-field 3-D model, put in the historical start dates and all the well locations and allowed the model to predict the current -- predict the oil production and the water injection throughout the time.

So what you're seeing there is kind of the mystery match, so to speak, of the 3-D model, in addition to the historical data.

What you see on the oil plot is basically for 30 or 40 years. These leases were basically on top allowable. And then in 1982, when the water injection project was initiated, as you can see on the water-injection plot, the allowable was increased to account for the pressure-maintenance project. And we got a nice peak in waterflood of around 5000 barrels a day, and -- so that the waterflood was very successful.

Q. All right, sir. Let's turn to Exhibit Number 13, if you'll identify and describe that display.

A. Okay, Exhibit 13 shows a more recent plot of the

data, again showing both the model forecast and the observed data on each plot.

The top one shows the current -- the match on the oil rate, when the waterflood began, and then the subsequent forecast of what will happen if we just continue the operations as-is.

And the bottom plot shows the water cut and the water cut forecast. And as you can see, if we just carry on the waterflood, we'll just continue oil-rate decline, a very slow decline, and the water cut will just continue to increase and get closer and closer to 100 percent.

But of course, we reach economic limits at approximately 2010, based on current oil prices and the cost of operation. So we've estimated that with current operations we could produce another million barrels from this project.

Q. Let's turn to Exhibit 14 now, and show the Examiner what you propose to do in order to obtain the additional 7 million barrels.

A. Right. Okay, on Exhibit 14, basically, the project consists of converting the current water injectors into CO_2/water injectors. In addition, we will drill the six wells that are circled, that are little red circles, and also make one additional conversion, called the 26W well. That well is currently a producer, and we'll convert

that to injection as well.

So basically, we're converting, and we'll begin the injection of CO_2. We estimate over time injecting nearly 45 billion standard cubic feet of CO_2, and at a -- which represents about 40 percent of original oil in place, pore volume slug of CO_2. We'll do that on a -- water and CO_2 cycles, at about a WAG ratio of about 1.4, is what we're estimating.

Q. Turn to Exhibit 15 and have you summarize for us the capital expenditures, the investment that Phillips proposes to make.

A. Yes, Exhibit 15 has a total investment of about $8 million, $8.1 million, to do the project.

A few highlights on this is, the new wells represents about $3 million of that. We also plan to reinject the produced gas as CO_2 becomes produced and the produced gas will no longer be able to have a saleable product, and we plan to put facilities in to reinject this gas, along with purchasing the CO_2.

Q. The plan of operation at this point, then, is for the recovery of oil, that as you begin to cycle the CO_2, that and any methane that's recovered is simply reinjected back into the reservoir?

A. That's correct.

Q. You don't plan at this point the investment of

facilities where you could strip additional hydrocarbons out of the gas pool?

A. Right, this project is a very small CO_2 flood in comparison to a lot of floods, and there is not enough reserves and potential to justify economically any enhanced NGL recovery process.

Q. Eventually, then, over time, as you deplete the reservoir of oil, you'll eventually recover what gas that you can recover and determine how you can make that marketable?

A. Yeah, at that time that would have to be another decision made based on the economics.

Q. All right. Let's look at Exhibit 16, then, and have you describe for us what you and the computer simulation have modeled for us in terms of a forecast of the incremental oil to be attributed to the CO_2 recovery.

A. Yeah, the estimated 7.1 million barrels basically comes under -- between the red and green curves. The red curve shows that if we go ahead with CO_2, we plan to peak out at around 2500 to 2600 barrels a day in the year 2000 and then go on a decline from there, for a total recovery of 7.1 million barrels.

Q. As part of the project, do you currently anticipate the need for the utilization of any fresh water as injection water?

A. No, we do not -- We currently produce at a sufficiently high water cut that we have plenty of water for the WAG CO_2 process.

Q. Let's now turn, Mr. Hallenbeck, to the subject of the qualification of the project pursuant to the compliance with what we characterize as the Division Form C-108.

Are you familiar with that procedure, and were you responsible for compliance with that filing?

A. Yes, I was.

Q. And when we look at Exhibit Number 17, the white binder, does that represent this issue?

A. Yes.

Q. When we look at the various components of the C-108 filing, have you identified for the Division the area of review for which you then have examined the wellbore integrity for all the existing wells within that area?

A. Yes, we have.

Q. As part of that process, have you satisfied yourself that there are no wells which I would characterize to be problem wells insofar as you would recommend to the Division Examiner that Phillips engage in additional remedial activity on those wellbores to make them suitable of existing within proximity to the flood?

A. That is correct. We have not come across any problem-area wells.

Q. All right. You have noticed, and we'll talk about, three wells that you identified that require further explanation by you?

A. That's correct.

Q. All right. When we look at likely sources of fresh water, what is your opinion as to the deepest known producing fresh water in this area?

A. The Ogallala fresh water is at a base of around 300 feet in this area.

Q. Is all the surface casing for wellbores in this area cemented such that the Ogallala is protected?

A. Yes, all wells have the Ogallala protected.

Q. If injection is approved into the San Andres, do you see any opportunity to have that injection material migrate out of that reservoir and contaminate any other reservoirs?

A. No, not with the -- our current standards and practices, there would be no chance of contamination.

Q. Let me have you just walk us through the book, so that the Examiner can see how you've organized the material.

A. Okay. Of course, the C-108 form is first. The first major thing is a comparison of well names. We have the old well names, with the new well designation that would be part of the unit.

Then we have a section called "Proposed Injection Wells", and in this section we have put down all the Phillips-operated injection wells and included a wellbore diagram, as well as an injection well data sheet, showing the perforations, casing history and all that information.

We've also included the proposed non-unit injection wells as well. You know, Texaco operates five of the injection wells along the lease line. We've included all that information as well, even though Texaco is currently operator of those wells.

Q. As part of your area of review and investigation, then, did you expand that area so that you would have covered the Texaco injection wells as if they were to be approved for the project?

A. That is correct, we took the outermost well that was going to be part of the project, whether it was a Texaco-operated or a Phillips-operated well, and used the half-mile radius from them.

Q. All right, sir. What then do we see in the booklet? You've got some wellbore schematics?

A. Yes. If you'll notice, in the back pocket of the C-108 is a couple of sheets showing three separate wells that we identified that the Commission may kind of red-flag when they first look at the C-108.

Q. Let's talk about those, then. If you'll take the

supplement out of the pocket part at the back --

A. Right.

Q. -- let's look at the locator map, and you have identified in yellow, then --

A. Right.

Q. -- three wells that require further explanation?

A. Right. The first well is within the unit boundary and is the Number 9 well. And that indicates in the section with the top of cement that the production casing has a top of cement of 5810.

However, this well has an intermediate string that's set at 4940 and has cement above that. So this well currently, although the production string doesn't have cement along the proposed interval, the intermediate string covers that interval quite well.

It's left that way, because it's currently a deeper completion, and this will -- if we leave this well the way it is now, we'll be able to come and recomplete this well in the upper San Andres at a later date -- sorry, in the San Andres.

Q. Do you recommend to the Division Examiner that any remedial activity be undertaken on the H-35 Number 9?

A. No.

Q. All right. Doesn't pose a risk, then?

A. No.

Q. Let's turn to the next one. Which one do you have?

A. Okay, I have the North Vacuum-Abo Unit Number 286 well.

Q. That's the Mobil well?

A. Right.

Q. All right.

A. Again, this well is completed in a deeper zone, and the actual production casing is not cemented across the interval. However, it has the same configuration, an intermediate string which is set at 5000 feet and has cement behind it, 2700 sacks of cement behind it. So the intermediate string is thus covering the zone that we'll be flooding.

Q. And again, would you recommend any remedial activity on this well?

A. No, we're not recommending any activity be initiated on that well either.

Q. All right. Then the last well is the Texaco State BA Number 6?

A. That's correct. Again, it's a very similar situation, it's a completion in a lower zone. The intermediate string is set at 4835 and has 2000 sacks of cement behind it.

Again, same situation where they're currently

producing in a lower zone, and by leaving the well this way, they would have the opportunity to recomplete the well in another zone at a later date.

So we feel that those wells are -- just might raise some question marks when you see the top of cement on the production side, but we feel that the intermediate covers all those three situations.

Q. Take us through the book and show us the tab section that has a summary of the plan of operation.

A. Okay. At the very back it's Attachment VII, basically summarizes what we believe the injection rates will be.

We're anticipating an average injection rate of about 1500. However, we have some wells that will take substantially more than that, so our maximum daily rate of 5000 barrels of water is what we think the maximum injection will be.

On CO_2, we estimate that we'll average about 3 million a day into wells, but we'll have a maximum of 5 million a day.

We currently have approval to inject water at surface pressure of 2150, and we'll actually be reducing that as we begin the CO_2 injection process. The CO_2 is delivered at the unit at approximately 1850 pounds, and so we'll be injecting CO_2 at that pressure, and we'll bring

back the water injection pressure to match the bottomhole injection pressure of the CO_2. As you know, the density of CO_2 is less than water.

The next attachment is a description of the injection zones in the unitized interval. It's already been discussed, and the base of the Ogallala Aquifer, at 220 feet, is the main primary aquifer that needs to be carefully observed.

Q. Within this section, then, you've also provided the freshwater documentation, you've got water analysis --

A. Right.

Q. -- you've got a plat that shows the location of the freshwater sources within the area?

A. Right. Attachment Number XI is a chemical analysis of fresh water. It shows a locator map where we have five freshwater wells in the -- around the area of the unit. We've included chemical analysis from the latest tests of those wells, and they all indicate that the fresh water is secure, that there's no contamination in those five wells.

Q. Summarize for us, Mr. Hallenbeck, your engineering conclusions with regards to the feasibility of this project.

A. Well, we've had very good success at our East Vacuum-Grayburg-San Andres unit in CO_2 flooding, and we

believe the Hale represents a very similar reservoir quality and can be a very good project in itself.

We are able to do this project, I might add, because we made the acquisition of the old Conoco lease that makes the project big enough and viable enough for CO_2 injection.

So we think it's a very viable economic project.

MR. KELLAHIN: Mr. Examiner, our last exhibit, which I have yet to mark, but it would be Exhibit 18, is the certificate of notification of hearing.

I move the introduction of Exhibits 11 through 17, including what I will mark as 18, which is the notice of hearing.

EXAMINER STOGNER: I'm sorry, what was those numbers again?

MR. KELLAHIN: 11 through 18.

EXAMINER STOGNER: Exhibits 11 through 18 will be admitted into evidence. And Exhibit 18 is what you just handed me; is that right?

MR. KELLAHIN: Yes, sir.

With that introduction, Mr. Examiner, that concludes my examination of Mr. Hallenbeck.

EXAMINER STOGNER: Before I cross-examine this gentleman further, I notice that the overriding royalty interests wasn't notified. Do you have any explanation or

anything to add about that?

MR. KELLAHIN: The notification is for the CO_2 project pursuant to the C-108. These are the offset operators. In addition, the unit is -- would be a voluntary agreement, and because of our actual contact in what I believe is our commitment of that interest on a voluntary basis, we did not provide them further notification, Mr. Examiner.

EXAMINATION

BY EXAMINER STOGNER:

Q. Let's review these three wells, the potential problem wells that you identified. The injection zone is, of course, covered by the intermediate casing --

A. That's correct.

Q. -- as you stated?

What is it? About 100, 150 feet from the injection interval to the bottom of that casing shoe in these instances?

A. Yeah, see, most of these intermediate strings are set well into the San Andres. So the actual depth of injection is going to be -- Do you have that pipeline?

Q. You're referring to Exhibit Number 5 now, correct?

A. Yeah, which has no depth on it. Yeah, here it is, 5000. Again, around 4500 is -- plus or minus above

that 100 feet, would be the -- you know, say 4200 to 4600.

Q. Now, these wells are already out there, obviously, and water injection is going on around them?

A. Right, correct, that's a point I did not bring up, that we've heard of no reported problems from these wells, as both the Bridges State and the Central Vacuum unit where these wells are located are under current waterflood operations.

Q. Now, what kind of -- Are there any potential problems that CO_2 injection into this zone might cause, like a higher corrosive environment, where this casing could deteriorate even further?

A. Well, the CO_2 is going to be, of course, injected through a tubing string that will be protected with special material for CO_2 injectors like we have over in our East Vacuum Unit and will be set with a packer into that interval, so that there may be some additional corrosive activity in the casing, but it will be restricted to the casing below the packer, which will be set in that interval, so --

Q. I was talking about the --

A. The producers --

A. -- the corrosive in these particular three wells.

A. Well, we have not experienced on our East Vacuum

unit significant corrosion in the producers, primarily because of the reduced pressure that you have in those wells, as opposed -- You know, so the partial pressure of CO_2 is not as corrosive a force as it is in the injectors.

Q. What are the age of these three problem wells? I'll just call them "problem wells" --

A. Yeah, okay.

Q. -- just to designate them at this time.

A. Okay, the first well within our unit interval was drilled in 1985, 12-24-85. The Texaco well was drilled in 1963. Oh, excuse me, the north -- the Abo well, the Mobil well, was drilled in 1985. The Phillips well was drilled in 1963. And that's listed in that table, in attachment 6.

Q. And the Texaco well is about the same time, 1963 also?

A. Yeah.

Q. So it's not like these are circa 1930 or 1940s wells?

A. Right, that's correct. I might point out for the Commission's information, Texaco is planning to AFE a CO_2 project in the Central Vacuum unit this year. I know that's not -- just for your information.

Q. Well, according to your Application, three of those Texaco injectors that are lease-line, I'm assuming that Phillips will be the one injecting the CO_2 into those

wells?

A. Well, we're currently in negotiations with Texaco on exactly how we're going to configure the lease line. As you know, the water injection, Texaco operated their wells and we operated our wells, and we billed them half and they billed us half for any cost.

We're trying to possibly arrange where we would operate all the wells. But, you know, Texaco is not quite far enough along on their analysis yet to determine whether -- exactly how we're going to operate those wells and who's going to operate them.

In any event, we will be under some very -- very cooperative situation, because even if we operate the wells, we'll want to coordinate our activities with the Central Vacuum project.

Q. In referring to Exhibit Number 14, that's your -- I guess the new well numbering scheme --

A. Right.

Q. -- and I guess the proposed project --

A. Right.

Q. -- I guess it slipped me. The Number 24 and 34, those are the blue wells?

A. Yes, right, I didn't describe those. Those are current producers that have not produced to their -- what we believe is their potential. Those wells were drilled in

the early 1990s and experienced quite a bit of problem during drilling. And we recently have been evaluating either correcting the mechanical condition of the wells or redrilling the wells.

So we -- In our AFE for our management, we included the cost of basically replacing those wells, because we believe geologically and from a flooding perspective, they're excellent locations.

However, during the drilling process, the formation may have been damaged beyond repair. But we're currently determining the viability of either repairing them or replacing them.

Q. And just as a review on your Exhibit Number 14, your green wells are going to be your proposed WAG wells, or water and gas injection --

A. That's correct.

Q. And the black ones up to the north, the two Mobils and the Number 6W, those are to remain water injectors?

A. Right, the -- That's a little bit misleading.

The 6W will be reactivated as a water injector. The two Mobil wells are currently inactive, and there are no plans -- Those were Mobil-operated, Mobil-owned wells. There's no plans at this point to reactivate those.

The 158W is a current Texaco-operated water

injector.

Q. How about the 158, above it?

A. Right, the 158 will be a water injector, is currently a water injector.

Q. And will remain one?

A. And will remain one.

Q. Okay. Now, looking over to the extreme west side, you have a Number 67W, I believe, that's a Texaco well --

A. Right.

Q. -- as a water injector. Is that a present water injector?

A. Yes.

Q. And that will remain a water injector?

A. That's correct.

Q. And the two Phillips-operated will be converted. And then you have two in the south, the Number 62 and the 63 --

A. That's correct.

Q. -- presently Texaco water injectors --

A. Uh-huh.

Q. -- that will be converted to WAGs?

A. Right.

Q. Okay. And then I guess the same -- Those two Texaco wells are like the three over to the eastern edge?

A. Yes.

Q. Texaco will remain the operator --

A. Right.

Q. -- at this point?

A. The only difference is that there's different units.

On the right-hand side is the Central Vacuum unit that we are a partner of. On the bottom, south side, is the 100-percent Texaco-operated Vacuum-Grayburg unit. That's the only differences.

EXAMINER STOGNER: A lot of information to digest, and I don't have any other questions at this time, Mr. Kellahin.

MR. KELLAHIN: That concludes our presentation, Mr. Examiner.

EXAMINER STOGNER: Counsel, do you have any questions?

MR. CARROLL: No, I don't.

EXAMINER STOGNER: You may be excused.

Do you have anything further, Mr. Kellahin?

MR. KELLAHIN: No, sir.

EXAMINER STOGNER: Other than the submission of acknowledgement that the overriding royalty -- There will be nothing further in this case, or these cases.

Mr. Kellahin, I'm going to ask also from you a

rough draft.

MR. KELLAHIN: All right, sir, be happy to supply it.

EXAMINER STOGNER: And with that, let's take a 20-minute recess at this time.

(Thereupon, these proceedings were concluded at 9:35 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11522 and 11523 heard by me on 8 May 1996.

, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

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

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

WITNESS MY HAND AND SEAL May 4th, 1996.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998