STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF:	)	
	)	
APPLICATION OF BEACH EXPLORATION, INC., FOR A WATERFLOOD PROJECT, EDDY COUNTY, NEW MEXICO,	)	CASE NOS. 10192 10193
APPLICATION OF BEACH EXPLORATION, INC., FOR STATUTORY UNITIZATION, EDDY COUNTY, NEW MEXICO.	)	
	)	

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

January 10, 1991
11:45 a.m.
Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on January 10, 1991, at 11:45 a.m. at Oil Conservation Division Conference Room, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Deborah F. LaVine, RPR, Certified Court Reporter No. 252, in and for the County of Santa Fe, State of New Mexico.

FOR: OIL CONSERVATION DIVISION

BY: DEBORAH F. LAVINE, RPR
Certified Court Reporter
CCR No. 252

HUNNICUTT REPORTING
1660 OLD PECOS TRAIL, SUITE F
SANTA FE, NEW MEXICO 87501 (505) 982-9770

I N D E X

January 10, 1991
Examiner Hearing
Case Nos. 10192, 10193

	PAGE
APPEARANCES	3
APPLICANT'S WITNESSES:	
CARL BEACH	
Direct Examination by Mr. Bruce	4
Examination by Mr. Stovall	11
Examination by Examiner Catanach	15
CHARLES BEACH	
Direct Examination by Mr. Bruce	18
Examination by Examiner Catanach	21
HAL GILL	
Direct Examination by Mr. Bruce	24
Examination by Examiner Catanach	34
Examination by Mr. Stovall	40

** ** ** **

APPLICANT'S EXHIBITS:	MRKD	ADMTD
A.	5	11
B.	6	11
C.	7	11
D1.	10	11
D2.	10	11
E.	10	11
F.	10	11
G.	26	34
H.	26	34
I.	26	34
J.	19	21
K.	33	34

A P P E A R A N C E S

BEFORE: DAVID R. CATANACH, Hearing Examiner

FOR THE DIVISION:
ROBERT G. STOVALL, ESQ.
General Counsel
Oil Conservation Commission
State Land Office Building
310 Old Santa Fe Trail
Santa Fe, New Mexico 87501

FOR THE APPLICANT:
HINKLE, COX, EATON, COFFIELD & HENSLEY
Attorneys at Law
BY: JAMES G. BRUCE, ESQ.
500 Marquette, Northwest
Suite 800
Albuquerque, New Mexico 87102

** * **

EXAMINER CATANACH: At this time, we'll call case 10192.

MR. STOVALL: Application of Beach Exploration, Inc. for a waterflood project, Eddy County, New Mexico.

EXAMINER CATANACH: Are there appearances in this case?

MR. BRUCE: Mr. Examiner, my name is Jim Bruce from the Hinkle law firm in Albuquerque representing the applicant. I have three witnesses to be sworn, and I would ask that this case be consolidated with case 10193.

EXAMINER CATANACH: At this time, we'll call case 10193.

MR. STOVALL: Application of Beach Exploration, Inc., for statutory unitization, Eddy County, New Mexico.

EXAMINER CATANACH: Are there any other appearances in either of these cases? Will the witnesses please stand to be sworn in.

(Witnesses sworn.)

CARL BEACH

the Witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. My name is Carl Beach. I live in Midland, Texas.

Q. And what is your occupation, and who are you employed by?

A. I'm a landman with Beach Exploration, Inc.

Q. And have you previously testified before the OCD as a landman?

A. Yes, I have.

Q. And are you familiar with the land matters involved in these two cases?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, is the witness considered acceptable?

EXAMINER CATANACH: He is.

Q. (By Mr. Bruce:) Mr. Beach, please state briefly what Beach seeks in these two cases.

(Applicant's Exhibit A was marked for identification.)

A. We seek a secondary recovery project to unitize the acreage shown on Exhibit A for secondary recovery purposes.

Q. Would you please refer to the Exhibit A and just briefly outline it for the examiner.

A. Exhibit A is a plat with a boundary limit of the proposed unit for secondary recovery which we will call the Red Lake unit. It's located in Eddy County, New Mexico.

Q. How many tracts are in the unit?

A. There are 11 tracts in the unit.

Q. And how many of those does Beach operate currently?

A. It currently operates eight of those tracts. We

have pending closings with both Harken Oil & Gas and JFG Enterprises. We have made arrangements to buy those tracts and will operate those tracts as soon as the closings are completed.

Q. And those are tracts 3 and 4?

A. That's correct.

Q. And does this unit area consist of state, federal, and fee land?

A. Yes, it does.

Q. Would you please describe the unitized formation for the examiner.

A. The unitized formation is a Penrose section of the Queen formation, and the top is encountered at a depth of 1630 feet. The base is to the depth of 1720 feet as in the Beach Exploration New Mexico State 36 Number 4 well. It's located 190 feet from the west and 660 from the north line, Section 36, Township 16 South, Range 28 East in Eddy County. As also required on the well, there's a radioactivity log dated 3/17/80.

(Applicant's Exhibit B was marked for identification.)

Q. Would you please refer to Exhibit B and describe it for the examiner.

A. Exhibit B is the unit agreement by which Beach has proposed the unitization of this area. It's a standardized

unit agreement that's been used in several floods.

Q. And of the type that's been approved by the BLM and the land commissioner before; is that correct?

A. That's correct.

Q. And does it describe the unit area, the unitized formation, and name the unit operator?

A. Yes, it does.

Q. And who is the unit operator?

A. It would be Beach Exploration, Inc.

Q. In your opinion, does this unit agreement provide for a fair and equitable plan of unitization?

A. Yes, it does.

(Applicant's Exhibit C was marked for identification.)

Q. And would you please also identify Exhibit C.

A. Exhibit C is the unit operating agreement set by the -- how the unit will be operated by Beach Exploration, Inc.

Q. Does it provide for the allocation and payment of a unit price and for the management of the unit?

A. Yes, it does.

Q. Now does this unit operating agreement contain a provision, a penalty provision, for nonconsenting working interest owners?

A. Yes, it does. Our unit operating agreement

contains a 500 percent nonconsent for nonparticipating owners under the working interest.

Q. And does Beach request that the OCD approve a nonconsent penalty against nonconsenting interest owners?

A. Yes, we do request that. And we understand that the maximum in the state is 200 percent.

Q. Price plus 200 percent?

A. Right.

Q. Is this a voluntary unit?

A. No, it's not.

Q. So you seek statutory unitization?

A. That's correct.

Q. Would you please identify for the record the interest owners in the unit?

A. There's 19 working interest owners, five royalty owners, and 24 overriding royalty owners.

Q. And are these identified by name on Exhibit B of the unit agreement?

A. Yes, they are.

Q. Would you please discuss Beach's efforts to obtain the voluntary approval of this unit.

A. This unit, we began our engineering work approximately two years ago and have been in continuous contact with the working interesting owners associated with this unit. And it's resulted in us purchasing signatures by

all parties. We began actually sending letters out to the parties, formal notices, on September 25th, 1990, notifying them, providing them copies of the unit agreement, the unitization parameters. We follow that up on the 5th with a letter proposing unitization with the unit agreement attached to it. We have made numerous calls to people resolving any issues or any questions that have come up. And currently Beach has --

Q. Go ahead.

A. I'm getting one ahead. We currently have 95.32 percent of the working interest signed up in the unit operating agreement. The remaining interest owners have already agreed to sign it. We have not received their written signature yet, so we have 100 percent verbal commitment.

Q. From the working interest?

A. From the working interest.

Q. And how about the royalty interest?

A. The royalty interest, we currently have 77.66 percent approval in hand, signed. We have verbal commitments on what's remaining, approximately 23 percent, which gives us a little over 90 percent committed verbally and in hand of the royalty owners.

Q. And since this is a federal and state unit, you did obtain preliminary approval from the BLM and from the state land office; did you not?

A. Yes. Yes, we did.

(Applicant's Exhibits D1 and D2 were marked for identification.)

Q. And are those preliminary approval letters submitted as Exhibits D1 and D2?

A. Yes, they are.

(Applicant's Exhibit E was marked for identification.)

Q. And are the ratifications that you have in hand from the working interest and royalty interest owners submitted as Exhibit E?

A. Yes, they are.

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

A. Yes.

Q. And have all interested parties been notified of this hearing?

A. Yes, they have.

(Applicant's Exhibit F was marked for identification.)

Q. And are the notice letter and certified return receipts submitted as Exhibit F?

A. Yes, they are.

Q. In your opinion, will the granting of the unitization and waterflood applications be in the interests of

conservation, the prevention of waste and the protection of correlative rights?

A. Yes, they will.

Q. And were Exhibits A through F prepared by you, under your direction or compiled from company records?

A. Yes.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits A through F.

EXAMINER CATANACH: Exhibits A through F will be admitted as evidence.

(Applicant's Exhibits A through F were admitted into evidence.)

MR. BRUCE: I have no further questions at this time.

EXAMINATION

BY MR. STOVALL:

Q. Mr. Beach, I look at your unit operating agreement, Exhibit C, I guess it is?

A. Yes.

Q. And you've referred to nonconsent interest. When you talk about nonconsent and penalty, are you talking about provision 11.7 on page 9 of that agreement?

A. Yes.

Q. Now it says, the heading of that is Penalties to be Assessed Defaulting Party.

A. That's right.

Q. What is a defaulting party? I didn't have time to read the whole thing.

A. What this actually calls for, it's a standardized secondary recovery unit operating agreement. And it requires 67 percent vote of all working interest parties to spend dollars on a project. If 67 percent elect to do it and the remaining 33 percent elect not to, they then become a defaulting party subject to a nonconsent penalty. But prior to any project being undertaken, it has to be approval by 67 percent of the working interest.

Q. So defaulting to me implies that they have an obligation to pay and have failed to pay. Nonconsent means to me that they have an opportunity and said I don't want to participate in this. Therefore, I'm not going to pay any share of costs. You withhold the costs plus a penalty out of my share of production.

Do you see that distinction in what is intended here, or is that distinction that I've got in my mind not what you mean in this?

A. Well, I think in this case, if they elect not to pay a bill or not to join in, after the clear majority of all the parties have an agreement, they become a defaulting party. They are what is technically a defaulting party under a secondary recovery project.

Q. Which is -- in your mind then what you're saying

is --

A. That's right. They're subject to a penalty for nonconsent or default which we may use interchangeably.

Q. And are you aware that under the statutory unitization act, the division is authorized to approve an agreement which contains only a cost plus 200 percent --

A. That's correct

Q. -- penalty; is that correct?

A. That's correct.

Q. How do you reconcile your penalty provision in this agreement with what we're authorized to do? And what are you going to -- the second part of that question, it's a two-part question, is, What do you do when we approve it only for 200 percent? Are you going to come back and modify the --

A. Technically, it would create -- we could create -- we'd have to know which parties came under which form of agreement. But since we have 100 percent committed that have signed this agreement, they're all subject to the 500 percent nonconsent. The reason we request statutory pooling at this point is, as in the prior case, should one party elect not to sign this and become a nonjoining party, we would need them, you know, in the unit.

But assuming everyone signs like we have been told they will do, then everyone would be subject to the 500 percent nonconsent because they would have signed this

agreement agreeing to that rule.

Q. If a party elects not to sign the operating agreement, is it your interpretation then that if they become a so-called defaulting party, they would -- let me back up a a step. If they elect not to sign the agreement but are brought into the unit under the statutory unitization act by the order --

A. Correct.

Q. -- they would then be a full unit member --

A. That's correct.

Q. -- and have the opportunity to participate or not participate; is that correct?

A. That's correct.

Q. In any operation, I mean, this unit has been going on for years?

A. That's right. That's right.

MR. STOVALL: I'm going to ask one favor of you is that let me finish asking the question before you answer because she's having a heck of a time recording two voices simultaneously.

MR. BRUCE: I'll jump in, too.

Q. (By Mr. Stovall:) So would it be your understanding then if I elect to be statutorily unitized, I can go nonconsent for 300 percent less penalty?

A. That's correct.

Q. Or I can participate and avoid any penalty at all

as a --

A. That's correct.

MR. STOVALL: Well, as Mr. Bruce knows, and we've had the discussion before, and I will tell you on the record, I'm not sure I agree that that can be done. But we've got your testimony in the record, and we'll move on as far as proceeding with this case. I have no further questions on that.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Beach, the advertisement for this case included some additional acreage, I believe, than you're now proposing to include in the unit?

A. That's correct.

Q. What is the difference in the two?

A. The original proposed unit, there's one party that under the original proposal, there was a tract to the north that would be operated by now Blanco Engineering. It was in Section 19. And we started dealing with a gentleman that was the owner of Blanco Engineering. And basically he did not want to be part of the unit, did not like the unit proposal. And rather than force him, there is a -- we currently propose another unit or are in the plans of drawing up another unit right to the north of this one, another field. And he is kind of in between and could go to either unit. And he elected to

stay out of this one and wait for the next one. So we contracted him out of it.

Q. So the correct acreage as it stands right now is shown on Exhibit A?

A. That's correct. And that was at his request that it was done.

Q. This entire unit or portions thereof falls within the east Red Lake Queen Grayburg pool. And you propose to only unitize the Penrose formation. Do you have information as to whether the Penrose is the main producing formation in that pool?

A. The Penrose is only producing formation in that pool.

Q. Is the only?

A. That is correct.

MR. BRUCE: We will put on a geologist.

THE WITNESS: Yeah, but it is the only producing formation. I think that was an early field designation, but that is the only pay within the field.

EXAMINER CATANACH: I've got some concerns about that, but I'll talk to the geologist about that.

MR. STOVALL: If I may, Mr. Examiner, let me ask Mr. Beach a question since he's the landman.

Q. (By Mr. Stovall:) Are there any land title reasons for making that vertical division, vertical definition of the

unit, rather than including the entire pool?

A. No, other than that's the only producing formation and that's all that needs to be unitized.

Q. The ownership's not split?

A. No. If you go below the Queen Grayburg, there is some ownership of deep rights, you know, in the Morrow and in that case deeper. But as far as from the surface to the base of this section, there is no difference in ownership. There's no land problems or anything within the Grayburg. The Grayburg, quote, Queen section's all owned by the same parties.

Q. That's strictly a geologic --

A. That's correct. That's correct.

Q. (By Examiner Catanach:) Mr. Beach, does the unit agreement or the unit operating agreement contain an allocation of production to each of these separate tracts?

A. Yes, it does.

Q. And has that allocation been agreed to by all the interest owners who have agreed?

A. Yes, it has.

Q. And you're essentially statutory unitizing at this point approximately five percent of the working interest, but you have 100 percent verbal commitment?

A. That's correct.

Q. And 77.66 percent of the royalty interest, but have

90 percent verbally committed?

A. That's correct.

Q. How about the overrides? What's the situation on that?

A. The overrides are included with the royalty group. The remaining approximately ten percent that we call uncommitted primarily are two large companies, being Exxon and Amoco, who won't give you a verbal commitment and it'll take quite a bit of time, 60 to 90 days, just to get through their system to get us an answer. We've tried to get an answer quickly out them, and then they -- within their system, they can't give you an answer that fast.

EXAMINER CATANACH: I see. I believe that's all I have for now. This witness may be excused.

CHARLES BEACH

the Witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. Charles Beach, Midland, Texas.

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

A. I'm a petroleum geologist for Beach Exploration.

Q. And have you previously testified before the OCD as

a petroleum geologist?

A. Yes, I have.

Q. And were your credentials accepted as a matter of record?

A. Yes.

Q. And are you familiar with the geological matters related to the proposed Red Lake unit?

A. Yes.

MR. BRUCE: Mr. Examiner, is the witness acceptable?

EXAMINER CATANACH: He is.

(Applicant's Exhibit J was marked for identification.)

Q. (By Mr. Bruce:) Mr. Beach, would you please refer to Exhibit J, which is a C-108, and specifically the geological maps in there and discuss the geology of the unitized formation.

A. Okay. I believe it's page 23. You'll find some isopach maps, some cross sections, and some structure maps. That's what I'll be talking about.

EXAMINER CATANACH: Exhibit J?

A. Yes. There you go. The producing zone in the Red Lake east field as a lower member of the Queen formation referred to as the Penrose sand. The sand is a fine to medium grain, well sorted, and rounded to subrounded quartz sand. Porosity average is approximately 15 percent with some zones

calculating as high as 22 percent. The sand thickness range is from 12 feet on the flanks of the field to approximately 26 feet near the apex or the center of the reservoir.

The reservoir is the result of stratigraphic entrapment within a clean lens of sand which facies into a red, shaley sand down dip and becomes tighter up dip as the section becomes more anhydritic and salt filled.

I will point out that the 15 percent average porosity at an average depth of about 1700 feet is what we would probably consider a fairly tight sand.

Q. (By Mr. Bruce:) Is the field continuous across the proposed unit area?

A. Yes, it is.

Q. Does the unit area contain the entire pool?

A. No. To the south end of the pool, you'll see that Kincaid & Watson has already unitized it and flooded it. And to the north end, the reservoir becomes tighter. As you'll look on the isopach map, you can see that the amount of porosity decreases in that area. And at that point, we decided to draw the boundaries there, feeling that was more of a transition zone. And also the field designation is the east Red Lake field in this particular area where we're proposing the unit. And to the north, some of the wells up in there fall under the High Lonesome field. So that was the reason we decided to stop the unit at that point.

Q. In your opinion, has this portion of the pool been adequately defined by development?

A. Yes, it has.

Q. And in your opinion, are the granting of these applications in the interests of conservation and the prevention of waste?

A. Yes.

Q. Now these geological maps contained an Exhibit J, were they prepared under your direction and do you agree with the interpretations in those maps?

A. Yes, I do.

MR. BRUCE: Mr. Examiner, I move the admission of the geological portions of Exhibit J.

EXAMINER CATANACH: The geological portions of Exhibit J will be admitted into evidence.

(Applicant's Exhibit J was admitted into evidence.)

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Beach, the Penrose member of the Queen formation, that's the only producing formation in the pool --

A. In this --

Q. -- to your knowledge?

A. In this unitized area, it would be. I believe when you asked that before, if you'll see section -- I guess it's

31. There is a well that says Bettis Brothers on it, abbreviated. And I think that well was drilled in 1940 and originally completed as maybe a Grayburg well. But that's the only well I know of that's in the area, and it didn't really make any production whatsoever. Everything else within this trend is well defined is Penrose only.

Q. Have in fact the wells in your proposed unit been tested in the Grayburg or --

A. Yes, we have. We've drilled a couple of wells further down to look at the Premier, what they call the Premier sand, and some of the other formations and none of them at the time we tested were economically -- would produce.

Q. Are there any other sands in the Queen formation that are productive?

A. Not in this particular area, no.

Q. As I recall, the unit boundaries were more or less geologically defined. The eastern boundary was more or less defined by a pinch-out, did you say?

A. Yeah, as you go east, the sand becomes -- it basically does pinch out. It becomes more shaley, a red shale, and you lose permeability and porosity. And the wells on that flank of the field have not performed as well, and there's been dry holes that have also defined the limit of the field all along that trend.

Q. And the west boundary would be defined by what?

A. It's an up dip filling of porosity by salt and anhydrite. We have drilled some wells along it. And basically you run into the same problem as you do the down dip. You have poor performance, and the sand actually thins up a little bit, the actual reservoir quality sand thins up. And although you can see the sand, if you run a modern density neutron log, you can see a very characteristic response in a high density reading but a very low, almost zero, neutron reading, which is an indication of salt plugging. And it's been documented up and down this entire trend.

Q. The northern boundary, did you say there was another pool to the north?

A. Yes. This field does continue to the north. It's the same actual sand. It's the High Lonesome. But as you can see on this isopach map, the sand itself becomes thinner. The productive sand becomes thinner, and the reservoir quality is not as good. It seems to be some sort of transition zone. And that's, you know, like Carl had mentioned before, we still plan on at some point trying to unitize another field to the north of there, which we could take in some of these transition wells if we feel that's appropriate at the time.

Q. When you drill wells -- or let me ask you this: Are the wells in the unit, do they penetrate the Grayburg formation?

A. No, not all of them. We drilled, I guess we

drilled a well that one that we did penetrate right in the middle of the field. And it wasn't economical, or it didn't have any shows or any type of reason to want to drill any of the other wells out there in the Grayburg.

Q. Is the Penrose portion of the Queen, is that toward the top end or the low end of the Queen?

A. No, it's in the basal.

Q. In the base of the Queen?

A. Yes.

Q. So all the wells at least penetrate all the way through the Queen?

A. Yes.

Q. Is this field in your opinion pretty much depleted as far as primary production is concerned?

A. Yes, it is.

Q. Do you know what the average production might be?

A. I think it's about -- Howell will testify to that, but I believe it's about a barrel, 1.3 barrels per well.

EXAMINER CATANACH: I believe that's all I have for now. Did you have any other questions?

MR. STOVALL: I don't ask geological questions.

EXAMINER CATANACH: The witness may be excused.

(A discussion was held off the record.)

HAL GILL

the Witness herein, having been first duly sworn, was examined

and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. My name is Hal Gill, and I live in Midland, Texas.

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

A. I work for Beach Exploration as a petroleum engineer.

Q. Have you previously testified before the OCD?

A. No, I have not.

Q. Would you summarize your educational and employment background.

A. Okay. I graduated from the University of Texas at Austin in 1973 with a bachelor of science in mechanical engineering. I have 17 years of experience as a operations and reservoir engineer.

Q. And how long have you been employed by Beach?

A. Four years.

Q. And does your area of responsibility include southeast New Mexico?

A. Yes, it does.

Q. And as part of your job, have you been in charge of engineering matters related to the proposed Red Lake unit and the waterflood for the unit?

A. Yes.

Q. And have you also been qualified as an expert before the Texas Railroad Commission?

A. Yes, I have.

MR. BRUCE: Mr. Examiner, is the witness acceptable?

EXAMINER CATANACH: He is.

Q. (By Mr. Bruce:) Mr. Gill, regarding case 10193, briefly what does Beach seek permission to do?

A. I believe that's 10192, unless I'm mistaken.

Q. 10192. That's right.

A. I hate to correct a lawyer, but --

MR. STOVALL: Somebody has to.

MR. BRUCE: David always does.

A. We seek to institute a secondary recovery waterflood project for the unit area described by Mr. Beach. The waterflood will include 14 injection wells, 12 producing wells and related injection and production equipment.

(Applicant's Exhibits Nos. G, H, and I were marked for identification.)

Q. (By Mr. Bruce:) Would you please describe the production history of the proposed unit area.

A. I'd like to refer you to Exhibits G, H and I which I will use to answer that question. Exhibit G is a separate production curve for each well to be included within the unit area. Exhibit H is a tabular history, production history, for

all of those wells. Exhibit I is a composite production curve which I'll refer to to answer that question.

Production began in 1979, reached a peak in 1982 at approximately 9600 barrels of oil per month. And we currently have total cumulative production as of June 1st, 1990, of 404,913 barrels of oil. This is for the total unit area. There are now 25 wells that are active producing approximately 1,000 barrels a month or 1.3 barrels per day per well on an average basis.

Q. Is the unit area in an advanced state of depletion with respect to primary production?

A. Yes, it is.

Q. In your opinion, has this portion of the pool been adequately defined by development?

A. Yes.

Q. And is this portion of the pool suitable for unitization and waterflood?

A. I believe it is.

Q. Do you think that unitization of this portion of the pool will adversely affect any other portions of this pool or formation?

A. No.

Q. Please describe for the examiner how production will be allocated among the various tracts under the unit agreement.

A. The cumulative production from each tract was combined with any future projected primary production, which is shown on this Exhibit G, to obtain what we call ultimate primary production. This was then used as the method of allocation for our unitization which is shown on Exhibit C in the unit agreement.

Q. Does the participation formula contained in the unit agreement in your opinion allocate the produced and saved hydrocarbons to the separate tracts on a fair and equitable basis?

A. Yes, sir.

Q. Have you calculated the amount of secondary reserves to be obtained from the waterflood project?

A. Yes, we're estimating an additional recovery of 565,800 barrels of oil.

Q. And what will be the life of the waterflood?

A. Approximately 12 years.

Q. Will the waterflood operations in this portion of the pool prevent waste and with reasonable probability result in increased recovery of more hydrocarbons than would otherwise be recovered?

A. Yes.

Q. Will unitization and secondary recovery benefit the working interest owners and the royalty interest owners in the pool?

A. Yes.

Q. Would you please move on then to Exhibit J which is the C-108 and describe in more detail the proposed waterflood application.

A. Okay. I'll refer you to Exhibit J which, unfortunately, I did not number the pages. The first thing I want to refer to is the injection well data sheets which show schematics, typical schematics, and all of the downhole information about all 14 of the injection wells which we propose to use in this unit, including the cementing information and casing information.

Moving on, there's a plat showing what we call the area of review which shows a half-mile radius circle around each of the proposed 14 injection wells.

Q. Could you please briefly discuss the status of any plugged wells within one half mile of the proposed injection wells.

A. Okay. The schematics of the plugging information which we obtained from the OCD records on all of the wells outside of the unit which show to be plugged which indicate that they are properly plugged. Also within that area of review, we have information on all the wells within the area of review presented in tabular form in the 108 application.

Q. Will any of the wells need any recompletion to make sure that there will be no escape of fluids between

formations?

A. I don't believe so, no.

Q. What additional facilities will Beach need to install for the unit and the waterflood, and what is the anticipated cost?

A. We'll have to convert 14 wells to injection. These are existing producing wells at this time. We'll drill and equip one additional producer to complete development of this area. We'll install waterflood plant and injection lines and consolidate production facilities to one central battery and install a makeup water supply pipeline. And the total cost of all of this is $880,000.

Q. Will the oil and gas recovered by unit operations exceed these unit costs plus a reasonable profit?

A. Yes.

Q. And does Beach request that the order in this matter contain an administrative procedure for approving unorthodox well locations or for changing producing wells to injection wells?

A. Yes, as the waterflood continues, it might be necessary to convert additional producing wells to injection or to drill more injection or producing wells. And we request an administrative procedure be established in the order by which a well can be converted to an injection well or a producer or injection well can be drilled. Also it may be

necessary to drill additional injection or producing wells at unorthodox locations, and Beach requests that such unorthodox locations be approved administratively.

Q. Would you please describe in more detail your proposed injection operations and injection pressures.

A. Okay. We plan to inject an average -- we're expecting an average of 150 barrels of water per day in each injection well with an anticipated maximum rate of 250 barrels of water per day. The average injection pressure that we're anticipating to do this will be 1,000 pounds with a maximum of 1,500 pounds requested at this hearing. And I'd like to direct you to the data on the proposed operation in this form C-108 which I'd like to read through my explanation of this proposed injection pressure on it.

Q. Now the pressure exceeds the standard two pounds per foot, does it not?

A. Yes, it does. And we believe this is going to be necessary in order to adequately flood this pay, which is a fairly tight sand. There are other Penrose sand waterfloods near the proposed unit, including the Kincaid & Watson east Red Lake unit, which directly offsets us to the south, and the Armstrong Energy High Lonesome Penrose unit and the Armstrong Energy east High Lonesome Penrose sand unit, all of which have operated of pressures up to 1,225 pounds and have been successful projects. And there are many other Penrose sand

waterflood projects that are in operation in this district, and all are injecting at maximum pressures of in the range of 1,400 to 1,850 pounds.

Examples of these are the Anadarko-Langlie Mattix Penrose sand unit, which has pressures as high as 1,850 pounds, the Skelly Penrose A unit, which has maximum pressures of 1,650 pounds, and the Skelly Penrose B unit, which has pressures as high as 1,700 pounds. The Penrose sand in the proposed Red Lake unit is in some cases a fairly tight sand and may require this magnitude of pressure to inject adequate quantities of water to be a viable project. Although it is advisable to limit injection pressures to reasonable ranges, a gradient of two-tenths of the psi per foot of depth is in no way a reasonable pressure limit for this formation and could threaten the very success of the project.

In some cases in tight wells, which would be edge wells or wells with poor pay development, pressures in excess of the fracture gradient are required to inject adequate volumes of water to effectively flood the nearby pay. This will result in conservation by increased recovery as opposed to if we're not granted this type of pressure, I feel like reserves will be wasted.

Q. What is the source of the injection water?

A. The City of Carlsbad Double Eagle water system is the source.

Q. And is the injected water compatible with the formation water?

A. Yes, and has been used in the Kincaid & Watson flood offsetting us to the south and also several other Penrose floods in the area.

Q. Is there any proposed stimulation program?

A. None.

Q. And are the fresh water sources within a mile of the proposed injection wells noted in the C-108?

A. Yes.

Q. And analyses of those wells are contained in the C-108?

A. Yes.

Q. Are there any faults or hydrologic connection between fresh water sources and the injection formation?

A. No. All wells in the area are properly completed, and injection will not contaminate fresh water sources.

Q. And what project allowable does Beach request?

A. In accordance with OCD Rule 701, parenthesis, F3, Beach requests that each producing well be granted an allowable equal to its capacity to produce.

Q. And were all of the surface owners and offset operators notified as required by the C-108?

A. Yes.

(Applicant's Exhibit K was

marked for identification.)

Q. And are the certified return receipts submitted as Exhibit K?

A. They are.

Q. In your opinion, is the unitized operation and management of this pool necessary to carry on the secondary recovery operations?

A. Yes.

Q. And in your opinion, will it substantially increase ultimate recovery of oil from the pool?

A. Yes.

Q. In your opinion, is granting of these applications in the interests of conservation and the prevention of waste?

A. Yes.

Q. And were Exhibits G through K prepared by you or under your direction or compiled from company records?

A. Yes.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits G through K.

EXAMINER CATANACH: Exhibits G through K will be admitted as evidence.

(Applicant's Exhibits G through I and K were admitted into evidence.)

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Gill, has Beach conducted any step rate tests or injectivity tests on any of these proposed injection wells?

A. No.

Q. Do you have an idea of what the fracture pressure in the Penrose might be?

A. It would be only a guess, but I would expect it to be between 1,000 and 1,500 pounds just based on the treatment records.

Q. Now Beach is requesting, as I understand it, 1,500 pounds pressure limit?

A. Maximum pressure limit. We don't expect to have to go to that. But just to have the latitude to conduct the flood for maximum recovery, we feel like that is an appropriate pressure limit.

Q. In the offset waterflood projects, do you know if there have been any problems with water out of zone in those projects?

A. None that I'm aware of. I do know that they were all highly successful projects as far as the secondary recovery on waterflooding.

Q. And they all injected at above 1,000 pounds?

A. They injected at a maximum of 1,225 pounds. And that refers specifically to the Kincaid & Watson unit, directly offsetting us to the south.

Q. Now was it your testimony that it may be necessary

to inject water at a pressure which exceeds the fracture pressure of the formation?

A. In a situation where you have a very tight edge well that has very little pay, I believe in some cases that it's necessary to inject at above the fracture pressure initially in order to get what we would consider to be a minimum amount of water to adequately flood the nearby pay to that well. The kind of rates that I'm talking about, 150 to 250 barrels a day, are rates that in no way would propagate any kind of a fracture for any appreciable distance from the wellbore, which is what I know is a concern from an engineering standpoint. You don't want to inject such an amount of water that you propagate a large fracture in the formation and consequently bypass reserves. But that's in no way what would happen in this case. I mean, we're not proposing to inject at 2,000 barrels a day. We're going to limit our injection to a maximum of 250 barrels of water per day which is a very minimal amount of water.

Q. Would you be willing to venture a guess as to how far that fracture might propagate from the wellbore at the current rates, at the proposed rate?

A. Less than 50 feet.

Q. Are you aware of standard procedure in waterflood cases is to initially permit at .2 psi per foot which would give you guys somewhere around 300 to 400 pounds? Are you

testifying that that is inadequate even initially to start flooding?

A. I believe that would be inadequate in the edge wells --

Q. Int the edge wells.

A. -- initially. In some wells within the better part of the unit, I believe we could inject 250 barrels of water easily at 400 pounds. But in the edge wells, no way.

Q. How many edge wells are we talking about?

A. Oh, there's probably half of the injection wells would probably fall into that category, so six or seven. All we're asking for is the latitude to do it in a way which we feel like is going to recover the maximum amount of oil.

Q. Well, we have to be concerned with the protection of fresh water, which is our main concern.

A. Yes, I understand your concern. But I feel that the wells are properly cemented. And we're going to run tubing and packer and isolate the injection intervals. And like I say, I don't think you could propagate a fracture that would come anywhere near to getting to a fresh water zone.

Q. Speaking of the fresh water zone, is that the Ogallala formation you're talking about?

A. You've got me there. Do you know what the --

(A discussion was held off the record.)

Q. (By Examiner Catanach:) Let me ask you this. Do

you know what depths the fresh water is at?

A. I believe that's in here somewhere too. Okay. The base of the only known source of fresh water, which is the Triassic sand -- I'm reading this off the geological data sheet in the C-108 -- occurs at an approximate depth of 75 feet in the wells with the lower elevations. There's a ridge running through this unit, and some wells are higher elevations. There's very marginal fresh water.

Q. Would you be willing or would your company be willing to run some injectivity tests, some step rate tests to actually try to pinpoint what the fracture pressure might be?

A. We would certainly be willing to do that, yes. But if they indicated that the fracture pressure was 300 pounds and we can't inject water in the ground at that rate, at that pressure, then where would we be? I'd like to point out that we're between two floods that have utilized pressures in excess of 1,000 pounds.

Q. We've run across this problem before.

A. But the rates that we're talking about injecting at, again, getting -- and this gets into fluid dynamics. And if I had an expert here from Halliburton, he could tell you a lot more about propagating a fracture. But once you start a fracture as you're coming away from the wellbore, you're going to have -- if you've got a formation that has any porosity and permeability at all, you're going to have a certain amount of

leak off. And the further that fluid goes out, the more leak off you have. And eventually you get to where there is no further propagation of a fracture. And we're talking about very low rates of injection here. There's, in my opinion, absolutely no way you could threaten the fresh water sources.

Q. Is there a method currently available by which you could actually determine if or where the fractures were propagating?

A. There is treatment companies such as Halliburton that do this on computer projections. And they think they can tell you how far out a fracture will go given a certain rate pressure, porosity, permeability, that sort of thing, yes.

Q. So these fractures, you believe, are -- they're going to be horizontal fractures and not vertical fractures?

A. I believe the fracture would be a vertical fracture but would be for the most part contained within the Penrose pay itself. The theory today is that when you induce a fracture by treatment that it's a vertical fracture as opposed to being a horizontal fracture.

Q. And the rates would prevent the fracture from propagating out of the Penrose formation in your opinion?

A. Yes.

Q. Are each of these tracts within the proposed unit, have they been developed in the --

A. Yes.

Q. They each have a well drilled on those tracts?

A. Yes, each tract has a well.

Q. Looking at the map of the area, in Section 25, it looks like the east half of the northwest quarter, there may be a tract there that has not been developed.

A. There's a well right on the south end of that tract. It's called the Latham State.

Q. Right. But that's an 80-acre tract, and there should be two wells on there?

A. Yes. It is an 80-acre tract. Now whether there should be two wells in there or not is a different thing. I believe the pay quality in that area has indicated to us that it would not be worth drilling another well on the north end of that particular 80-acre tract.

MR. STOVALL: Let me clarify. I think that we're talking when we use the term "tract," I believe the examiner is referring to a 40-acre standard proration unit; is that what you mean?

EXAMINER CATANACH: Yeah, that's what I'm referring to.

EXAMINATION

BY MR. STOVALL:

Q. And when you're referring to a tract, you may be referring to a leasehold subdivision. So it may be two different uses of the term.

A. Okay.

Q. In looking at that again. That 40 acres in the northeast of the northwest in 25 and also it looks like the southwest of the southeast of 36 also does not have a well on that proration unit; is that --

A. Correct. Which, again, we believe, and the isopach map presented in the C-108 data will show that the pay development in that area will not warrant drilling a well in that location at this time. Now, you know, if we go to war and the price of oil is $70 a barrel, who knows? We might want to drill that. But at this point in time, I can't see that ever being drilled.

Q. Likewise the southeast of the northeast of 36?

A. Correct.

Q. Are you familiar with the participation formula?

A. Yes.

Q. And included in that formula, is that part of the calculation used to determine tract participation?

A. The formula contains only existing production and projected future primary production from the wells within the unit with the exception of the one interior well which we would propose to drill in the northwest quarter of the northwest quarter of section 36. So I guess to answer your question, no, the undeveloped 40s have not been given any credence as far as the allocation formula.

Q. When you say "credence," what do you mean?

A. In other words, no credit was given for an undeveloped 40-acre.

Q. So they -- well, let me back up and ask you a question. Let's look at the west half of the southeast of 36, just as a simple example. And I have to go back to the unit. If we're getting outside your area of understanding, please let me know. But is that a distinct tract for participation purposes? And please don't ask him to answer the question. If we need to ask either Mr. Beach, we'll get them back. Tell me what you know and what you don't know.

A. Say that -- ask your question again.

Q. The west half of the southeast quarter of Section 36 --

A. Okay.

Q. -- do you know whether that is a single tract for allocation purposes under the unit agreement?

A. Yes, that is a single -- now when you say, again, we're going to cross up here. When I say "tract," I'm talking about that 80 acres.

Q. That being a land participation area as defined in the unit agreement?

A. Yes.

Q. Having nothing to do with proration units or anything else?

A. Right.

Q. So it will participate, that tract will participate in unit expenses and production as an entity, if you will, the whole 80 acres being one?

A. Yes.

Q. One entity within --

A. It's all part of the same lease though.

Q. And so in assigning a participation factor to that tract, as we're using it now being the 80-acre land entity --

A. Uh-huh.

Q. -- it only receives credit -- well, let me ask you. Is acreage any part of the formula for participation?

A. No.

Q. It is not. So that tract will receive credit based upon the past production and the estimated future recovery from, it looks like, the Number 1 well and the Beach, is that Hinkle State?

A. The Hinkle State A lease, yes, sir. That's correct.

Q. And if you look, now just for comparison to make sure I'm understanding what you're seeing in the north half of Section 36, that whole, the entire 320-acre north half is another lease or tract for participation?

A. Correct.

Q. And that tract being the north half will receive -- The allocation of production and expenses to that tract will

be based on the historic production from, it looks like, six wells, am I correct, four that will be injectors and two that will be producers, all of which have been producers at one point?

A. Yes.

Q. And so you look at the historic production from all six of those wells plus the projected production from the two producing wells; is that how you --

A. That's correct, yes.

Q. And then the well to be drilled will add something to that tract?

A. Correct.

MR. STOVALL: Okay. I think I understand the methodology anyway. I'll let you go back do whatever you're doing, David.

Q. (By Examiner Catanach:) Mr. Gill, how did you determine the ratio of primary to secondary production?

A. By comparison primarily with the Kincaid & Watson unit to the south and also other units that have already been flooded within the area.

Q. Do you know what that ratio was?

A. 1.3 to 1 is the ratio.

Q. (By Mr. Stovall:) Let me ask you one more question on your tract participation. I now am looking at your tract map and the unit agreement. And the west half of southeast of 36 appears to be tract 5B.

A. Yes.

Q. Look at the unit agreement. Tract 5B is going to receive just under one percent of tract participation?

A. Okay.

Q. And so is that based entirely on the historic production from the Hinkle State A Number 1 well?

A. Plus any projected future prime production.

Q. It would have to be an injector well; right?

A. Correct. But what you do is take the production today and project what it would produce to its economic limit if it continued to produce as opposed to being converted to injection.

Q. Now if that were, let's say -- I wasn't going to ask any engineering questions, but I'm now finding myself in that. If that were left as a producer, for example, would the projected production be higher than if it's treated as an injector because -- do you give any credit for secondary recovery from that tract? I guess that's my question. In making that estimated ultimate recovery which is used to determine percentage, do you give any credit for determining the ultimate projection? Do you make an estimate of what benefits secondary recovery gives that tract, or do you have assume that it's a zero because it's a --

A. Basically, we're assuming that each tract will contribute to the waterflood proportionately to what it has

done historically on primary production, and that's the reason for using that as an allocation factor. So, yes, that tract receives an allocation of the secondary based on what it has done on a primary basis. Did I answer your question?

MR. STOVALL: I think so. Let me look.

EXAMINER CATANACH: He's not sure.

MR. STOVALL: I'll be the first to admit that.

Q. (By Mr. Stovall:) And I'm looking at now tract number 6 which is the east half of the northwest of 25, which is another 80-acre tract with only one well on it. But that well is going to continue to be a producer.

A. Right.

Q. Now you're showing on Exhibit C of the unit agreement, that tract shows a 12,000 barrel ultimate recovery. Tract 5B shows a 4,000 barrel ultimate recovery. I assume obviously that the tract, the Latham State Number 1 well was a better well to begin with. But they're being treated the same way even though one is an injector and one's a producer. The ratios are the same; is that right?

A. Correct, yes.

MR. STOVALL: Now I'll get out of this before I get into further trouble.

EXAMINER CATANACH: Just one more question.

Q. (By Examiner Catanach:) What is the average current production for a well in the unit?

A. 1.3 barrels of oil per day per well.

Q. Any gas?

A. Very little.

EXAMINER CATANACH: I believe that's all I have. Is there anything further in these two cases? There being nothing, case 10192 and 10193 will be taken under advisement.

(The foregoing hearing was adjourned at the approximate hour of 12:50 p.m.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10192 & 10193 heard by me on January 10 1991.

David R. Catanach, Examiner
Oil Conservation Division

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

REPORTER'S CERTIFICATE

I, DEBORAH F. LAVINE, RPR, a Certified Court Reporter and Notary Public, DO HEREBY CERTIFY that I stenographically reported these proceedings before the Oil Conservation Division; and that the foregoing is a true, complete and accurate transcript of the proceedings of said hearing as appears from my stenographic notes so taken and transcribed under my personal supervision.

I FURTHER CERTIFY that I am not related to nor employed by any of the parties hereto and have no interest in the outcome hereof.

DATED at Santa Fe, New Mexico, this 11th of February, 1991.

DEBORAH F. LAVINE, RPR
Certified Court Reporter
CCR No. 252, Notary Public

My Commission Expires:
August 6th, 1993