

EXAMINER HEARING
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
February 11, 1958

IN THE MATTER OF: Case No. 1381

TRANSCRIPT OF PROCEEDINGS

NEW MEXICO OIL CONSERVATION COMMISSION

Mabry HallSanta Fe, NEW MEXICOREGISTER

HEARING DATE _____ Examiner _____ February 11, 1958 TIME: 9:00 a.m.

NAME:	REPRESENTING:	LOCATION:
<i>R. L. Dineen</i> <i>Robert H. Dineen</i> <i>Harold H. Dineen</i> <i>Frank Dineen</i>	<i>The Dineen Co.</i> <i>The Dineen Co.</i> <i>Kearney St.</i> <i>OCC</i>	<i>Breckenridge, Iowa</i> " <i>Artesian, N. Mex.</i> <i>Santa Fe, N. Mex.</i>

IN THE MATTER OF:

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF PROCEEDINGS

MR. UTZ: The hearing will come to order. The first and only case on the docket today will be Case 1381.

MR. COOLEY: Case 1381: Application of Kersey and Company
for a unit allowable for the Red Lake Unit in Eddy County, New
Mexico.

MR. UTZ: Are there appearances?

-MR. ELLIOTT: Mr. Examiner, I would like to introduce myself as R. L. Elliott, attorney for Kersey and Company and other operators relative to the Red Lake Unit, and at this time I would like to introduce as the first witness Mr. Robert H. Vick.

MR. COOLEY: Will there be any other witnesses?

MR. ELLIOTT: I don't believe it will be necessary for any

other witnesses, unless you want Mr. Kersey for something after we get through.

(Witness sworn.)

MR. UTZ: Let the record show that we asked for other appearances, and there were none. You may proceed.

ROBERT H. VICK

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

By MR. ELLIOTT:

Q State your name.

A Robert H. Vick.

Q Your address?

A The Ibex Company, Breckenridge, Texas.

MR. ELLIOTT: Will the Examiner accept Mr. Vick as an expert from previous appearances, or would you like me to qualify him?

MR. UTZ: No, sir, Mr. Vick's qualifications are acceptable and have been approved before.

Q (By Mr. Elliott) Mr. Vick, application for a permanent allowable in the Red Lake Premier Sand Unit has been made to the Commission and being heard this morning for setting such allowable. As set forth in the application under Exhibits A and B, certain 40-acre tracts or 40-acre units are shown as being included in this Red Lake Unit, and certain information with reference to the

production and water injectivity. I wish you would explain to the Examiner in general the units that are set up in this particular unit, stating just what 40 acres have producing wells and which ones have injection wells and which have both, or none.

A Well, as stated in our application for our requested allowable, the Red Lake Premier Sand Unit is composed of forty-four 40-acre tracts or units. Out of these forty-four 40-acre tracts, seven such tracts have two wells, either one producing well and one injection well, or two producing wells. Nine such tracts have neither a producing well nor an injection well as yet on them, and there are at present eleven water injection wells and thirteen producing wells, which result in thirty-five producing 40-acre tracts as shown on Exhibit B.

MR. PORTER: How many producing wells did you say?

A Thirty-five producing 40-acre tracts, now there are seven such tracts have two wells on them of the thirty-five, thirty-one producing wells.

MR. PORTER: Thank you.

MR. COOLEY: Would you repeat that? Did you say thirty-one producing wells?

A Eleven water injection wells and thirty-one producing wells at the present.

Q (By Mr. Elliott) This results in how many producing 40-acre units?

A Thirty-five producing 40-acre units in the overall Red Lake

Unit.

Q In other words, there are thirty-five 40-acre producing units within the unit as set up?

A Yes, sir.

Q Would you tell the Examiner a little of the history of the injection of water into these wells in this unit, to give him some idea how much water has been injected and what the injectivity rate is in the past and at present?

A Well, the original pilot flood consisted of four injection wells on the Thompson lease, which is the westernmost portion of the presently developed water flood area, four injection wells and one producing well, one center producing well. Water injection commenced approximately June or July of '55 and some, approximately in January, they obtained their first production increase on the center producer, and we have been all the interim time trying to form the overall 1760 acre unit before we commence expansion of the project, and that's nearing its final completion stages right now, but we have gone ahead and expanded the pilot flood to include seven more injection wells which are shown on Exhibit B; and these injection wells currently, of the new ones, currently have forty to forty-five thousand barrels of water cumulative and they are taking water at approximately three hundred to three hundred fifty barrels per day.

MR. PORTER: Per well?

A Yes, sir, that is, and we have just realized some production

increases and are at the approximate end of our fillup period. This three hundred to three hundred fifty barrels per day will probably come down in the near future to something more in line, to two hundred to two hundred fifty barrels per day per injection well. Our cumulative injection total into the overall project, the old pilot and the new, has amounted to 690,000 barrels of water, approximately, to January the 15th, 1958.

Q (By Mr. Elliott) Will you please refer to Exhibit A of the application. Are you familiar with the contents set out in such exhibit?

A Yes, sir.

Q Did you prepare the information that is shown there?

A Yes, sir, with the aid of Mr. Kersey, who is the present operator of the project in the field.

Q Of your own knowledge and from the knowledge that you acquired from Mr. Kersey, is it your opinion that the facts set out in Exhibit A are true and correct?

A Yes, sir, approximately. Only one point might need clarifying a little bit, the 209 barrels per day of actual production which we list as present oil production from the total number of wells is approximately 185 barrels, instead of 209 barrels.

Q Where is the discrepancy?

A On the Welch Stephens No. 3 in Unit H, Section 20, Township 17, Range 28. We list the producing, or the production capacity of that well as ninety barrels, and it was in the process of being

pumped down after the initial production increase, and we estimated at ninety barrels, and in reality it turned out about sixty barrels.

Q Such well is actually making sixty barrels per day, then?

A Yes, sir.

Q Is it continuing to make that?

A Yes, sir.

Q With that correction, then, you would say that Exhibit A is correct in all detail?

A Yes, sir.

Q I --

A (Interrupting) Now it might be pointed out that there are certain other production increases that have transpired since we prepared this statement, which are considered normal for the flood project, but there are other production increases.

Q Would you give the Examiner the benefit of this information, please?

A Along the Hartley No. 1 and No. 2 Wells in Section 20, Township 17, Range 28, the production on this exhibit is listed as one barrel each for the Hartley No. 1 and No. 2, and that total production is approximately forty barrels of oil.

Q Per day?

A Yes, sir.

MR. UTZ: Would you give us those wells again? Are we still on Exhibit A?

A On Exhibit A.

MR. KERSEY: It is twenty barrels, No. 1 is 5 and No. 2 is 15.

MR. UTZ: Which wells were those?

A The Hartley No. 1 and No. 2 in Units I and J of 20, 17, 28.

Q Would you please state the present production on those two wells again?

A Mr. Kersey states that No. 1 is producing five barrels against one on our original report, and the No. 2 Well is producing fifteen barrels per day instead of the one barrel per day.

MR. PORTER:: Is that a very recent development?

MR. KERSEY: Yes, it is within the past week.

Q Are there any other new developments since this application was filed?

A To my knowledge, no.

Q Then with the three changes on this exhibit to show the Hartley No. 1 as producing five, Hartley No. 2 producing fifteen, and the Welch-Stephens No. 3 sixty in lieu of ninety, then Exhibit A is correct and up to date?

A Yes, sir, I believe so.

MR. PORTER: What would the last total be, do you have that please?

MR. KERSEY: That would be twelve barrels off of that, one hundred ninety-seven.

Q Is that what you get, Mr. Vick?

A Well, now, it is definitely hard to state an exact figure

for that, Mr. Porter.

MR. PORTER: Yes, sir, I understand.

A Mr. Kersey says some of the other wells are up a barrel or two in different places.

MR. PORTER: I recognize that that is a fast changing situation.

MR. ELLIOTT: At this time I would like to have introduced as part of this record Exhibit A of the application as changed by these three factors.

MR. UTZ: Do you have copies of those exhibits that you want to enter, or would you like for us to use the ones that you have already filed?

MR. ELLIOTT: Would that be permissible?

MR. UTZ: It will be permissible. I will make the changes.

MR. ELLIOTT: I have some thermofax copies here.

MR. UTZ: I think we should have a little more clarification on the amount of oil here. As I understood your testimony, Mr. Vick, you said that the Stephens No. 3 went from ninety to sixty barrels, and corrected that to sixty barrels a day?

A Well, I tried to explain here, the ninety barrels as we had projected it here on this Exhibit A was an assumption. The well had, the fluid level had built up in the well and we had to move a larger pump unit on the well to enable us to pump it down, and when we did get it pumped down, it levelled off at sixty barrels instead of our anticipated ninety.

MR. UTZ: I'm just trying to get a correct figure for your Exhibit A here. You had two hundred nine barrels?

A Yes.

MR. UTZ: And you added eighteen barrels on the Hartley 1 and 2.

A Yes, sir.

MR. UTZ: And you took thirty barrels off your ninety?

A Yes, sir.

MR. UTZ: So you actually lost twelve barrels, is that correct?

A Yes, sir.

MR. UTZ: One hundred ninety-seven. Is there objection to the entrance of Exhibits A and B -- is that the way you designated them?

MR. ELLIOTT: Well, I haven't introduced anything but A yet. I am going to introduce B.

MR. UTZ: Is there objection to the entrance of Exhibit A? If not, it will be so admitted.

Q (By Mr. Elliott) Mr. Vick, on this Exhibit A, before we leave it, we show only one well capable of making more than its allowable on the 40-acre unit, or maximum allowable for the 40-acre unit?

A Yes, sir.

Q Is it your opinion that the flood is progressing in a uniform and foreseeable manner to show other 40-acre units will at most any time possibly exceed the maximum for 40-acre unit?

A Yes, sir, as stated a few moments ago, the Hartley No. 1 and No. 2 Wells which are inside producers, possibly the production increase being realized there will definitely be above the thirty-five barrels per day, or the top unit allowable for a 40-acre tract.

Q Mr. Vick, I should like to now refer you to Exhibit B of the application, which is the plat showing the perimeter and the tracts included in the Red Lake Unit Area. Did you prepare this plat?

A Yes, sir.

Q As shown on said plat, are all of the wells shown to be producing wells, and all of the wells shown to be water injection wells correct?

A Yes, sir, as far as my knowledge goes they are correct.

Q Is the dotted line showing the unit boundary correct?

A Yes, sir.

Q And this unit would result in forty-four 40-acre units?

A Yes, sir.

Q Of which thirty-five of these units are now producing?

A Yes, sir.

MR. ELLIOTT: Mr. Examiner, I should now like to have you enter as an exhibit in this hearing the Exhibit B of the application.

MR. UTZ: Is there objection to the entrance of this Exhibit? If not, it will be accepted.

Q Mr. Vick, according to the application, this particular unit was originally approved by this Commission on January 13, 1955,

for an injection of water in a five-spot pattern on the Thompson lease, I believe, is that correct?

A Yes, sir.

Q And then as this water flood progressed and the unit was put together, you had another hearing to set up this Red Lake Unit?

A Yes.

Q And the Commission approved the Red Lake Unit as set out in Exhibit B, which has been introduced, by order of January 16, 1957?

A Yes.

Q And that this thing has now progressed to the point that the purpose of this hearing is to get a unit allowable set for the production of oil from such unit?

A Yes, sir, that's correct.

Q Are you familiar with the unit agreement and the unit operating agreement which has been prepared?

A Yes, sir.

Q Has this unit agreement and unit operating agreement been signed by all necessary parties?

A Yes, sir, as far as working interests are concerned, and royalty interests, it's my understanding that it is in the final submission form to the United States Geological Survey and Commissioner of Public Land for final approval.

Q This unit agreement is limited to the Red Lake Premier Sand?

A Yes, sir.

Q And includes both State and Federal acreage?

A Yes, sir.

Q Do you know of your own personal knowledge that Mr. Jack Campbell presented the signed unit and unit operating agreements to the Land Commissioner and to the United States Geological Survey for approval?

A I'm not sure. It's my understanding that he has.

Q And is it your understanding that the State has approved the Unit?

A Yes, sir. That's my understanding.

Q And that the United States Geological Survey has tentatively approved the agreement?

A Yes, sir.

MR. ELLIOTT: If it might be permissible, I would like to get into the record at this time the contents of the conversation which I had with the United States Geological Survey before this hearing.

MR. UTZ: You may proceed.

MR. ELLIOTT: Mr. Cooley and myself talked to Mr. James Knauff with the United States Geological Survey in Roswell as to the approval or disapproval of the Red Lake Unit agreement and operating agreement, and he advised us that as far as they were concerned, the unit had been approved, but that it must be forwarded to Washington for final approval; and that he was aware of this hearing for setting a unit allowable for the Red Lake Unit, and that he had no objection for this Commission setting a unit

allowable for the unit, and he advised Mr. Cooley and myself that he would forward a telegram this date to show that they had no opposition to the setting of a unit allowable.

MR. COOLEY: Would you like to request, Mr. Elliott, that the telegram when received be included in the record of this case?

MR. ELLIOTT: Yes, I should like to request that upon the receipt of the telegram from Mr. Knauff that the same be entered in the minutes as an exhibit of this hearing.

MR. COOLEY: It doesn't necessarily need to be an exhibit. Just make it a part of the record.

MR. ELLIOTT: All right, make it a part of the record.

MR. UTZ: Any objection? If no objection, it will be made a part of the record in this case.

Q (By Mr. Elliott) Mr. Vick, is it your opinion that a unit allowable be set for this Red Lake Unit to such an extent as to be able to produce and sell all the oil resulting from this water injection, or if not, that permanent damage might result because of having to hold back on the water injection?

A Yes, sir, that's my definite opinion as a water flooding engineer, that the injection rates that we have set up are comparable to normal water flooding operations, and that it's definitely desirable that we be in a position to produce all of the oil as it comes into the producing wells so affected by our injection wells on the project.

Q In other words, it is your opinion that the rate of injection

that you have now set up is the most economical and efficient method of water injection into this particular sand, and that any interruption of such injection might cause permanent damage to the ultimate recovery of oil?

A That's correct, yes, sir.

MR. ELLIOTT: I believe that's all I have.

(Discussion off the record.)

Q (By Mr. Elliott) Mr. Vick, at this hearing we are trying to determine the unit allowable which would be sufficient to take care of the oil which may be produced because of water injection. What is your opinion as to the allowable that would be required to handle this production?

A Well, we would like to recommend that it be set up on an appropriation basis, more or less, from our point of view of recommending our allowable for the succeeding month, or the next producing month, in line; in making an approximation from our production curves and our daily operation during the month of the amount of allowable that we would need for the affected tracts or for just the affected tracts for, on a unit basis, but sending in our supplements or appropriation notices from our production curves on an actual well test basis, or something along that line.

Q Would it be your recommendation that the thirty-five developed or producing tracts be set up for a top allowable; in other words, have the Commission to grant a permanent allowable equivalent to the maximum allowable for thirty-five 40-acre tracts, and then

nominate each month under Rule 1126 of the Conservation Laws as to the actual amount of oil that you think will be produced?

A Yes, sir. I believe that would be, definitely a maximum allowable set up along that line, should be definitely adequate for the production from the unit operations, considering our rate of development and expansion of the overall unit and the present response, that that type of allowable would be adequate.

Q In other words, it's your opinion that the production will never get to the point that it would be more than the amount of the top allowable that would be applicable to thirty-five producing units?

A Yes, sir.

MR. ELLIOTT: Mr. Examiner, as set up by Mr. Vicks' testimony, and requested in the application, we would like the record to show that it is our recommendation, and respectfully request of the Commission that an allowable, permanent allowable be set for the unit equivalent to the top allowable of thirty-five 40-acre producing tracts, and that Mr. Kersey, the operator, will nominate each month under Form 127 as to actual amount of production that he estimates will be needed for the following month.

MR. UTZ: I believe the record will show your statement, it will be a part of the record, at least. Do you have anything further?

MR. ELLIOTT: I believe that's all I have.

MR. UTZ: Are there questions of the witness?

MR. COOLEY: Yes, Mr. Examiner.

MR. UTZ: Mr. Cooley.

CROSS EXAMINATION

By MR. COOLEY:

Q Mr. Vick, do you have knowledge whether the operator of the Red Lake Premier Sand Unit has plans to drill any of the nine undrilled 40-acre tracts contained in the unit?

A Yes, sir. It's currently under a continuous, more or less a continuous stage of investigation and development; as our responses continue from the present water flood, we will be drilling outside wells from time to time, and also completing some of the inside patterns that we have water going into now. I have reference to the area on Exhibit B, this location right here.

Q That won't do for the record.

A Specifically a location in the northeast 330, out of the northeast corner of Unit H, or I mean of Unit P, in Section 20, 17, 28.

MR. UTZ: Would that not be a 330 - 990 location?

A It would be a 330.

MR. UTZ: 990 south and east from Section 20?

A Yes, sir.

Q (By Mr. Cooley) That unit already has an injection well in it, does it not?

A Yes, sir.

Q Then maybe we had better clarify this other point before

we proceed any further on this line of questioning. You stated in your direct testimony that there are thirty-five producing units. I don't believe you meant that in its literal sense, did you? Are there not only thirty-one producing oil wells?

A Well, we consider it as such, Mr. Cooley, as a developed 40-acre tract.

Q That is the distinction I wanted to draw here. There are thirty-five developed 40-acre units?

A Yes, sir.

Q The definition of a developed 40-acre unit being in your understanding that the unit contains at least one producing well or one injection well?

A Yes, sir.

Q But there are only thirty-one, or possibly less, I do not know, producing units, maybe less --

A (Interrupting) Actually thirty-one producing wells.

Q Thirty-one producing wells, and do you have a calculation of how many producing 40-acre tracts there are?

A Well, there would be some twenty-eight or twenty-nine. We don't have that figure, but several of the tracts do have, 40-acre tracts do have two producing wells on them at the present time.

Q So there would be something less than thirty-one producing 40-acre tracts?

A Yes, sir.

Q But thirty-five developed 40-acre tracts as we have defined

that term?

A Yes, sir.

Q Now back to my first question. Do you have knowledge whether the unit operator plans to drill any of the nine undrilled or undeveloped 40-acre tracts to which you have testified?

A Not immediately, but definitely they're under consideration for sometime in the future.

Q They are under consideration for sometime in the future. There are forty-four 40-acre tracts in the unit?

A Yes, sir.

Q Nine of which are not --

A (Interrupting) Presently drilled.

Q -- not developed in any fashion to date?

A Yes, sir.

Q In the event that any of the nine undeveloped units were subsequently developed, would the operator then seek the allowable benefit from that unit?

A Yes, sir, we would need, possibly need that stipulation.

Q Would it not be then more proper to request that, rather than thirty-five times top unit allowable, that the number of developed 40-acre tracts within the unit times top allowable, which would allow you the latitude for subsequent development of undrilled tracts?

A Yes, sir, that would be definitely the most appropriate way of putting it, I believe.

Q Now, I believe your Exhibit A shows that there are eleven injection wells within the unit area?

A Yes, sir.

Q Are all of these injection wells presently being used?

A Yes, sir.

Q Order R-568 authorized the injection of water into the Thompson wells No. 1, 2, 3, and 4; and Order R-938 authorized subsequent expansion of the pilot water flood, subject to approval of the Oil Conservation Commission, provided the information required by paragraph B of Rule 701 was supplied. Have the seven additional injection wells been approved by the Commission?

A They were submitted on an exhibit similar to the Exhibit B attached there, and I believe you submitted those, didn't you, Harold?

MR. KERSEY: At the hearing at Hobbs, I believe we submitted that plat with these present injection wells and also the proposed additional injection wells that we'll have later.

MR. COOLEY: Off the record here.

(Discussion off the record.)

MR. COOLEY: Let's go back on the record.

Q (By Mr. Cooley) Mr. Vick, the Red Lake Oil Pool has as its vertical limits the Grayburg and the San Andres formations; it is my understanding that under this present injection program you are injecting only into the Grayburg formation?

A Yes, sir, that is correct.

Q Order R-568 authorized injection into the Grayburg producing formation or horizon, and R-938 authorized injection into the water of the Premier Sand of the Red Lake Pool. Would you clarify whether or not these two horizons are one and the same?

A It's our understanding geologically that the Grayburg section is composed of several intervals and our geologists consider the Premier Sand section as the lowermost, lying on top of the San Andres in the immediately lower section of the Grayburg.

Q I realize that the Premier Sand does not comprise the entire Grayburg formation but is it the only productive horizon or zone in this area?

A In the Red Lake Pool.

Q In the Red Lake Pool, the Premier Sand is the productive sand in the Grayburg formation?

A To my knowledge, yes, sir.

Q Would you say, Mr. Vick, that the productive capacity of the wells in the general area here involved has fallen to the point where they would be considered in the stripper stage were it not for water injection?

A Yes, sir, definitely. They were at the economic limit at the time that secondary recovery measures were installed.

Q What do you mean by "economic limit"?

A The point where any profit ceases to be realized from normal operation or day to day operation of the producing properties.

Q Were it not for the institution of some type of secondary

program, the economics of the wells would dictate that the wells be plugged and abandoned?

A Yes, sir, that is correct.

Q Then if any additional oil is to be obtained from the Red Lake Pool in this area, it must be as a result of secondary recovery operations?

A Yes, sir.

Q Mr. Vick, you testified that you felt that the curtailment of production from the wells affected by the injection of water in this area might possibly result in waste, is that correct?

A That's correct, yes, sir.

Q Do you also feel that the rate of development within the unit area as outlined on Exhibit B can be so controlled as to keep the total production from the unit within the limits of the allowable formula that you have proposed, that being the number of developed 40-acre tracts times top unit allowable?

A Yes, sir, that's my opinion. I might say that our projected rate of development is such that it will be in stages from this area toward the edges of the outlined unit, the timing on it will be in response to the way that the outside row of producers reacts to the water injection, and in order to maintain some balance we have a period of time that we can wait for this production to come up on the outside row, and then come in, at a little bit later date and start our injection into the next outside row; but it has to be on a definite time basis because you have to maintain some

semblance of balance on your injection wells to keep from carrying a high water production from your initial injection wells while your outside wells are still driving oil.

Q As a further clarification of that matter, by staging the subsequent development of this water flood, will the peaks of production from any group of producing wells be staggered so that all of your production will not be obtained or all of your wells will not peak at the same time?

A That is correct. It will definitely have a levelling effect on your peak production of this time interval which we will put these outside rows of injection wells on.

Q Will the production from the wells in the center, or the wells which you might expect to be your highest producers in the initial stages -- let me ask you how will it be shared throughout the unit?

A Well, relatively, the inside wells will be higher than the outside wells on a theoretical basis.

Q The production from those wells will be higher?

A Yes, sir.

Q The revenues, how will it be shared?

A The unit participation formula is set up on a cumulative production factor, and an acreage factor, and a well factor, which was included to derive the participation percentages for each of the various interests in the Red Lake Unit, and that was set up initially and won't vary any, but each unit will share according to

this percentage in the overall production from, no matter which well it comes from.

Q Let me ask this question first. Will an undrilled 40-acre tract have any share of the production?

A Yes, sir, on the twenty-five percent acreage factor which was included in the formula, participation formula, it would have, it would be very nominal but it would be actually a participation.

Q And this participation will be from the very first day of distribution of unit funds?

A Well, actually, when the unit goes into effect.

Q When the unit goes into effect?

A Yes, sir.

Q Everyone will then commence sharing, it will not be staged out?

A No, sir.

Q What will be the disposition of production from the time you first got a kick on any of these wells; your present production, for instance, which is prior to formal approval of the unit, how will the present production be allocated?

A According to the -- well, actually, the present ownership, Mr. Cooley --

Q (Interrupting) Just a minute. In accordance with the terms of the leases?

A Yes, sir. Now it was our hopes and our feeling that this unit agreement will actually be in effect a considerable length of

time before these last responses that we have obtained there, but we had some difficulty in getting signatures on the total unit agreement and it has held us up just that long.

Q Can you identify the wells for me, please, from which you are getting the response at the present time?

A Well, from Exhibit B, we're presently having a response on the Hartley No. 1 and 2, which are in I and G, Units I and G of Section 20.

Q Those are State Leases?

A Yes, sir. We presently have an increase on Stephens Federal No. 3, which is in Unit H of Section 20.

Q As the name implies, that is a Federal lease?

A Yes, sir. And we presently have a slight increase on No. 12 of Unit D in Section 28, which is the Welch State Red Lake.

Q How much of an increase do you have on that one?

A That is approximately a barrel or two or three, Harold?

MR. KERSEY: Yes, about two barrels, approximately.

A Right straight across the bottom there, the No. 4 Piatt State Delhi in Unit A of Section 29 had a slight response, two or three barrels; and the No. 2 and No. 5 Wells in Unit B and C of the same Section 29 had slight increases. The No. 3 - Yates State Delhi in Unit D of Section 29, approximately what is that, Harold?

MR. KERSEY: It is approximately three or four barrels now.

A And the Well No. 6 - Delhi State in Unit J of Section 19, 17, 28, is making approximately twenty barrels; the Thompson State

No. 5 and No. 6 in Unit J and Unit M of Section 20, 17, 28, are producing approximately thirty-five barrels total between the two. We can go back to Exhibit A, I was taking them from Exhibit B, some of the names might be a little bit different.

Q I don't believe it is necessary, Mr. Vick. I was just trying to get some idea of what the impact, prior to final approval of this unit agreement, is going to be on the rights of the various operators throughout the unit, especially the royalty owners. Back to this formula set out in the unit agreement. You did tell us an cumulative production factor?

A Yes, sir.

Q Does that include the primary recovery of the well?

A Yes, sir, that was the primary recovery to the date that working up the unit agreement was commenced, I believe it was.

Q Why was that criterion used, Mr. Vick?

A Well, in old depleted fields such as this, we feel and it is more or less an accepted engineering fact that the actual oil in place or left in place is in direct proportion to the cumulative primary production.

Q The higher the primary production, the greater the amount of oil still in place?

A Still in place, yes, sir.

Q And the wells which were converted to injection wells also have this cumulative figure?

A Yes, sir, they were taken, or the unit participation was

on 40-acre tracts, and whether that tract had two producing wells with a cumulative of so much, or whether it had one with the same cumulative, it was still the same participation factor.

Q And production during secondary recovery has no bearing on how they share in the proceeds from the unit?

A That's correct, no bearing whatsoever.

MR. ELLIOTT: What is that question?

MR. COOLEY: Does the production since injection of water or the cutoff date have any bearing whatsoever on the amount of participation?

MR. ELLIOTT: You mean up to the time the unit is approved?

MR. COOLEY: Yes, sir.

MR. ELLIOTT: All right.

MR. COOLEY: To and beyond that.

A After unit approval it would have no bearing on which well it was taken from, each interest would share according to his participation factor.

Q Will production subject to the injection of water and prior to the approval be added on to the cumulative production figure?

A No, sir.

Q You have already made a cutoff date for cumulative production for all wells?

A Yes. If it extends over too long a period of time, we will, can come in and recalculate the cumulative production figures to a new date and set it up on the same basis but on a cumulative

production figure, but we feel that it would be along that line, it would be hard to satisfy various interests in dividing this secondary recovery production.

Q In any calculation after the date that the injection wells would be converted, it would be?

A Yes, sir.

Q Because they haven't had an opportunity to produce any more even though they might have, they have been converted to water injection wells?

A Along that same line, we had the same discussion develop in the Caprock-Unit agreement, and initially it was their point of view that the actual secondary recovery produced oil due to the water flood in the Caprock Field would be taken off of their future participation on some month to month basis or something, but if one operator's tract had produced a considerable amount of secondary oil, then he would be more or less penalized on future secondary oil until such a time as that secondary oil were allocated back to the various, into other overall participation.

Q No such provision has been made in this?

A No, sir, as yet not.

MR. COOLEY: I believe that's all the questions I have.

MR. UTZ: Mr. Porter.

By MR. PORTER:

Q Mr. Vick, most of these wells in this unit 10 to 12 years old?

A Yes, I do not recall exactly. I believe 19 and 44 to 47, something like that, was the initial production.

Q Of course, the vertical limits of the Red Lake Pool have been defined as Grayburg-San Andres. Do you know whether or not these particular wells were completed in both these formations?

A To my knowledge, in the interpretation of our geological department, they are only in the Premier portion.

Q Premier of the Grayburg?

A Yes, sir.

MR. PORTER: Thank you.

MR. UTZ: Any other questions of Mr. Vick? Mr. Nutter.

By MR. NUTTER:

Q Mr. Vick, if the injection well in this unit agreement should receive top allowable wells and all -- or if the 40-acre tracts with injection wells should receive top normal unit allowable, and if all of the offsetting 40-acre tracts which are developed should receive a top normal unit allowable, will sufficient allowable be assigned to this area to enable you to produce the producing wells without waste or without having to curtail?

A It's my opinion, Mr. Nutter, that it could be, since we do have approximately some four hundred acres under development right now, that that would be sufficient to care for the production.

Q Is that the producing 40-acre tracts that are offsetting the injection program?

A I see. Well, it's my opinion that that would be adequate.

Q How many injection tracts are there?

A There are eleven injection wells, presently.

Q How many producing wells or how many developed 40-acre tracts offset those eleven injection tracts?

A I believe according to our previous count, wasn't it sixteen?

Q There are sixteen?

A Yes, sir.

Q Which gives you a total of twenty-seven tracts either injection or offsetting producing tracts?

A Yes, sir.

Q You think that the total allowable derived from a normal unit allowable times those twenty-seven forty-acre tracts would be sufficient for the unit?

A I believe it would be adequate, yes, sir.

Q Another thing, Mr. Vick, I think you stated there were thirty-five developed 40-acre tracts. I count thirty-six on the Exhibit B. What is the cause for that difference in total developed tracts?

A I don't know, Mr. Nutter, unless it was --

MR. NUTTER: Off the record.

(Discussion off the record.)

MR. UTZ: We are now back on the record. Would you care to answer that question, Mr. Vick?

A After a recalculation, we would like to state that the discrepancy in our total number of producing or developed tracts

was in error, the correct number being thirty-six instead of thirty-five.

MR. COOLEY: Which well was it that you omitted?

A The omission was --

MR. COOLEY: (Interrupting) Refer to Exhibit B.

A Referring to Exhibit B, the Staley Oil Company Well No. 1 in Unit H, Section 30, 17, 28.

MR. NUTTER: Mr. Vick, is that Staley Well No. 1 also sometimes referred to as the Scannell Well No. 1?

A Yes, sir.

MR. COOLEY: Is that well committed to the Unit agreement?

A Yes, sir, it has been. It was used in deriving the participation formula and was included in the unit calculation.

MR. COOLEY: The owners of the well have signed the unit agreement and it is committed?

A Yes, sir.

MR. COOLEY: Is it presently being operated by the unit operators?

A No, sir, by the owners of the lease.

MR. UTZ: Does that not give us two Scannell No. 1's?

A I believe we refer to this, to the 80-acre lease in Section 20, as the Shell State Scannell No. 1 and 2 wells, in O and B.

MR. ELLIOTT: Mr. Examiner, with your permission I would like to amend our application to show that a request for the following allowable be made for the Red Lake Unit; that is, that we be

allowed to receive top allowable for each 40-acre tract on which a water injection well is located, plus a top allowable for each 40-acre tract either directly offsetting or diagonally offsetting the 40-acre tracts on which water injection wells are located.

MR. NUTTER: Do you mean each developed 40-acre tract, Mr. Elliott, directly or diagonally offsetting an injection tract?

MR. ELLIOTT: That is correct.

MR. NUTTER: Thank you.

MR. UTZ: Is there objection to the amendment of the application?

MR. COOLEY: In view of the fact that the amendment is a restriction of the authority requested in the scope of the hearing as advertised, the Commission has no objection to this amendment.

MR. UTZ: The amendment is so ordered. Any other questions of the witness?

By MR. UTZ:

Q Mr. Vick, I believe I understood in your direct testimony that there were injection wells which you were now injecting around 300 barrels a day, and that you thought the injection rate would drop to around 200 after fillup? A Yes, sir.

Q Is that correct?

A Yes, sir, in those ranges.

Q Let me ask you this question. Why will it be necessary to drop your injection rate to 200?

A Well, it's a process of actually, no action on our part,

it's controlled by the reservoir. The reservoir will take a certain volume of water at a certain pressure, unless your pressure is increased as your void space fills up and the water front from your injection wells radiates out, it takes an increased amount of pressure to push the same volume through; or if you aren't in a position or you can't increase your pressure due to your overburden of the formation in your water injection well, your breakdown pressure, then you have to accept this decrease in water volume, that comes about normally from your formation. At the same pressure your volume as it extends away from the well is just gradually decreased to some, what we call our steady injection rate after fillup.

Q Then it is a matter of injection pressure rather than rate of injection?

A Yes, sir, in this instance.

Q You don't feel that by dropping your rate of injection 100 barrels per day there would be any loss of oil in the reservoir?

A No, sir. Well, there might possibly be some on a theoretical basis, but again here we are controlled by our maximum injection pressure that we can apply to the sand face. When we exceed that, we get a breakthrough of water and subsequent decrease in efficiency of the overall water flooding program. When we are confined to this condition, we have to accept the decrease in injection volume as normal.

Q Is there a decrease in injection volume common to all water

flood projects?

A Yes, sir, at a constant pressure, it's very normal.

Q Mr. Vick, how far from an injection well do you believe that there would be response in a producing well?

A Well, it would depend primarily on your permeability profile and your permeability range. The higher the permeability, assuming one constant pressure on your injection well, the greater the permeability, the farther out you could extend your actual water flood front.

Q What is the greatest distance in this Red Lake project that you have detected response at the present time?

A We are encountering a production increase on one certain producing well approximately 1320 feet from the nearest injection well.

Q Then the original purpose in your requesting allowable for all developed 40-acre tracts in the unit was actually an effort to transfer allowables from those wells not affected by the water flood to wells affected by the water flood, so that you would not have to restrict your production, is that a correct statement?

A Yes, sir, that is correct.

Q I believe you consider this a secondary recovery project, do you not?

A Yes, sir.

Q Would you have a definition of your own for a secondary recovery project?

A Well, briefly, a project that is installed at somewhere near the economic limit on primary production on a property where the bottomhole pressure is completely gone, or is in the near region of being; all of your bottomhole energy more or less has been dissipated, all of these facts coming in together place you at your economic limit, no energy in the reservoir to produce the oil to the well bore, and unless something externally is applied.

Q Would you consider economics entirely, or would you consider bottomhole pressure as a criterion for determining the difference between a secondary recovery project and primary recovery, or --

A (Interrupting) I feel that from an engineering standpoint, it is your engineering aspects, your bottomhole pressure and such, but they all definitely tie in with the economics. You may have a shallow zone that is not costing you much to produce; therefore you can produce it to the lower limit. On a deeper zone, you would be restricted to a higher figure of your daily production as to your economic limit.

Q You would tie the two together?

A Yes, sir, definitely.

Q Would you have any opinion as to what the lowest economic limit would be in the wells in the nature of the Red Lake Pool?

A We feel that with Mr. Kersey operating the properties presently, we have a very -- what we call an economical operator, and that has enabled us or him to produce the wells down to a barrel or in some cases a half a barrel and still with his reduced

overhead and reduced operating expenses to continue to produce the wells at that rate with no profit, but with no loss in actual operation.

Q By using economics, then, we get into the matter as to who is operating the well?

A Yes.

Q How cheaply he can operate.

MR. UTZ: Any other questions? Mr. Porter.

MR. PORTER: May I direct a question to you, Mr. Kersey? There have been a number of these wells that have been down to one barrel for several years?

MR. KERSEY: That's right.

MR. PORTER: I have wondered how you have done it.

MR. KERSEY: In some it is kind of hard, you just kind of have to balance out.

MR. UTZ: Any other questions in this case? The witness may be dismissed.

(Witness excused.)

MR. UTZ: Any statements to be made?

MR. KERSEY: Mr. Vick is employed by the Ibex Company and myself as a water flood operator on this project. I ascribe to all the remarks he has made, and they meet with my approval.

MR. UTZ: Any further statements? If not, the case will be taken under advisement.

The hearing is adjourned.

C E R T I F I C A T E

STATE OF NEW MEXICO)
) ss
 COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this *3rd* day of March, 1958, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
 NOTARY PUBLIC

My commission expires:

June 19, 1959.

I do hereby certify that the foregoing is a complete report of the proceedings in the *St. ...* hearing of Case No. *1381*, heard by me on *Feb. 11*, 1958.
Charles P. ...
 Examiner
 New Mexico Oil Conservation Commission