MR. MORRIS: Let the record show Mr. Rundell was sworn in the previous case.

DANIEL J. RUNDELL,

called as a witness, having been previously duly sworn on oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BUELL:

Q Will you state your name, your complete name, by whom you are employed, in what capacity, and at what location, please.

A Daniel J. Rundell. I am employed by Pan American Petroleum Corporation as a petroleum engineer and I am now stationed in Farmington, New Mexico.

Q You have testified in a prior Commission case and your qualifications as a petroleum engineer are a matter of public record, are they not?

A Yes.

(Applicant's Exhibit No. 1 marked.)

Q (by Mr. Buell) Would you look now at what has been marked Pan American's Exhibit 1 and briefly state for the record what that exhibit reflects?

A Exhibit 1 is a map of the Totah-Gallup area and Pan American's project areas for their pressure maintenance project in that field.

Q Have you designated those two project areas, Mr.

Rundell?

A The two project areas are shaded in yellow and outlined by heavy blue lines on Exhibit 1. Also shown within the project areas A and B are three wells in project area B which are colored in red. Those wells are proposed water injection wells.

Q Mr. Rundell, what is the significance of the blue dots with a dark blue cross through it in each of the project areas?

A That is our proposed water well which will be developed from the Morrison formation.

Q I notice running through each of the project areas a green line. What is the significance of that green line?

A The green line running through project areas A and B are traces of cross sections which are designated as A, A^1, B, B^1. A, A^1 runs through project area A and B, B^1 runs through project area B.

Q Are you ready to discuss these two cross sections now?

A Yes, sir.

(Applicant's Exhibits Nos. 2 and 3 marked.)

Q (by Mr. Buell) Mr. Rundell, cross section A, A^1, running through project area A has been designated as Pan American's Exhibit 2 and B, B^1, running through project area B has been designated as Pan American's Exhibit 3. Briefly state for the record what those two cross sections reflect.

A Cross Section A, A^1 is a log cross section which runs through project area A. This cross section shows the Gallup formation under project area A as continuous and is susceptible to pressure maintenance for water injection.

Exhibit 3 is cross section B, B^1. It is also a log cross section of the Gallup formation colored yellow and again it shows the Gallup formation as continuous throughout project area B and that it is susceptible to water injection.

(Applicant's Exhibit No. 4 marked.)

Q (by Mr. Buell) All right, sir. Would you look now at Pan American's Exhibit 4, Mr. Rundell, and state what that exhibit reflects.

A Exhibit 4 is a drilling completion program for the proposed Morrison water supply in the Totah-Gallup area.

Q As I recall from Exhibit 1, you reflected a proposed Morrison water supply well for each project area. Is that because you feel there will not be sufficient water production from one supply well to both project areas?

A We have two wells proposed, one in each project area, and that is because the terrain between the two project areas is very, very rough and the problems encountered in building a pipe line to connect the two areas would be just as expensive, probably, as drilling a second well.

Q Based on your evaluation, what do you predict the

capacity of these wells to be?

A We expect each well to produce 10,000 barrels of water per day.

Q What is the contemplated initial injection rate of water into each of the proposed injection wells?

A We anticipate to inject 1,000 barrels of water per day into each well.

Q Do you have any comments you'd like to make about the data contained on Exhibit 4 or is it self-explanatory?

A I see no need for any other comments.

(Applicant's Exhibit No. 5 marked.)

Q (by Mr. Buell) Looking now at Pan American's Exhibit No. 5, would you briefly state for the record what that exhibit reflects?

A Exhibit 5 is a casing cementing program for five water injection wells in project areas A and B. This exhibit shows the Gallup formation adequately covered with cement and if we inject into the Gallup formation it can reasonably be assumed to stay there until produced from another well.

Q In other words, you feel the casing program is such that we can put the water exactly where we want to?

A That's right.

Q All right, sir. Now, I believe, Mr. Rundell, that logs of each of the five wells were submitted to the Commission along

with our application, is that correct?

A Yes, sir, that is correct.

Q Do you see any need for burdening the record by duplicate exhibits of the logs?

A No, sir.

(Applicant's Exhibit No. 6 marked.)

Q (by Mr. Buell) Would you go now to Pan American Exhibit 6 and state briefly what that exhibit reflects?

A Exhibit 6 is a pertinent data sheet showing the fluid properties of the Totah-Gallup field.

Q Again, are most of these tabulated data sheets self-explanatory?

A Yes, sir.

(Applicant's Exhibit No. 7 marked.)

Q (by Mr. Buell) Looking now at what has been marked Pan American's Exhibit 7, would you briefly state for the record what that exhibit reflects?

A Exhibit 7 is an oil production rate versus time curve for the project areas in the Totah-Gallup field. On this exhibit is shown the primary performance predicted, secondary performance of the pressure maintenance project. This exhibit shows -- due to pressure maintenance, we can expect an increase in ultimate recovery of 890,000 barrels of oil.

Q Mr. Rundell, in your opinion as an engineer, does it appear to you that an increase in ultimate recovery of that magnitude is a significant conservation effort?

A Yes, sir.

(Applicant's Exhibit No. 8 marked.)

Q (by Mr. Buell) All right, sir. Would you now look at Pan American's Exhibit 8 and state briefly what that exhibit reflects?

A Exhibit 8 is also an oil production rate versus time for project area B in the Totah-Gallup field. Again, it shows primary performance and predicted secondary performance. We can expect through pressure maintenance to increase our ultimate recovery by 1,087,000 barrels of oil.

Q Again, that is a substantial incremental increase in recovery and certainly a significant conservation effort?

A Yes.

Q Turning to Exhibit 1 for just a moment, Mr. Rundell, I would like to particularly direct your attention to the proposed injection wells on both project areas A and B. What type of injection pattern would you call that?

A I would call that a crystal center line injection program.

Q Is that one of the injection patterns evaluated by the engineer committee during unit negotiations?

A Yes, sir.

Q Mr. Rundell, it might be proper at this point to interrupt your testimony to state for the record what while unitization efforts in the Totah field on a field-wide or semi-field-wide basis have not been completely abandoned, the decision has been made in the interest of saving time and getting water into the ground at the quickest possible time on a lease or cooperative lease basis. I believe one other operator in the pool has filed an application which will be set for the Examiner Hearing the 24th of this month.

With that thought in mind, Mr. Rundell, of course, you can't at this time predict what the offset leases to the two project areas, what pattern will be followed there in the way of injection?

A No, sir.

Q Let me ask you this: Are the rules that you are recommending flexible enough such that if any adjustment in the injection pattern is necessitated by the operation of offset operators that those adjustments can be administratively made in a quick period of time?

A Yes, sir, I believe so.

Q All right, sir. What rules, types of rules, are you recommending, Mr. Rundell, that the Commission adopt for our pressure maintenance programs in project areas A and B?

A I recommend that the rules for project areas A and B in the Totah-Gallup field be patterned after Order R-2026 which

authorizes Pan American Petroleum Corporation to institute a pressure maintenance project in the Horse Shoe-Gallup Pool. This order was dated July 13, 1961.

Q In that connection I might point out that a photostatic copy of that order has been designated Pan American's Exhibit No. 9.

(Applicant's Exhibit No. 9 marked.)

Q (by Mr. Buell) In that connection, since this order authorizes the program in the Horse Shoe-Gallup Pool, will there be any necessity for any modification in the language or provisions of this order?

A Yes, sir, there will be some modifications necessary. The Horse Shoe-Gallup field has 40-acre spacing, whereas the Totah-Gallup Pool has 80-acre spacing. In that regard, the changes necessary would be from 40-acre spacing to 80-acre spacing.

Q Will there be any other modifications necessary?

A Yes, sir. There is one more. On Rule No. 8 in the proposed project rules, there is a reservoir pressure versus C curve for the Horse Shoe-Gallup Pool. This curve will not be adequate for the Totah-Gallup Pool. We have attached to Exhibit 9 a Z curve factor versus reservoir pressure which will be acceptable in the Totah-Gallup field.

Q With those two minor modifications, you are recommend-

ing that the order as reflected by Exhibit 9 be adopted for our two project areas?

A Yes, sir.

Q Do you have anything else that you'd like to add at this time, Mr. Rundell?

A No, sir.

MR. BUELL: That's all we have at this time, Mr. Examiner. May I formally offer our Exhibits 1 through 9 into the record?

EXAMINER NUTTER: Applicant's Exhibits 1 through 9 will be admitted in evidence.

Are there any questions of Mr. Rundell?

MR. VERITY: George L. Verity, on behalf of Southwest Production Company. I have one question of the witness.

CROSS EXAMINATION

BY MR. VERITY:

Q I'm curious, more from an academic standpoint than any other, as to why there was a longer maximum peak production in your area B than there was in area A.

MR. BUELL: Are you referring to Exhibits 7 and 8?

MR. VERITY: I am referring to your curve in the project area in the Totah oil production versus time.

THE WITNESS: Are you referring to secondary recovery?

Q (by Mr. Verity) No, I am referring to the primary that you have already experienced. If you notice, your maximum

peak on your primary only lasted a month.

A Yes, sir.

Q The maximum peak on area B lasted nearly a year.

A The reason for that is that we had production up until October of 1961 and at that time the decline started on project area A. In October of '61, on project area B, we were still climbing and the reason it fell off in project area A is that the well declined to that extent. On project area B the wells were curtailed in their production by a flare order which limited the production to that rate. That's our estimated rate that we will produce and since it will continue until it declined, it has to last longer to get primary production out of the field.

MR. VERITY: No other questions.

MR. SWANSON: I am Kenneth Swanson, associated with Aztec Oil & Gas Company in this case.

CROSS EXAMINATION

BY MR. SWANSON:

Q Will you briefly summarize the points of the rule that you are proposing for this project area?

A I believe the rules aren't too briefly consolidated. However, what part were you interested in most of all, the allowables?

Q Yes. The allowable aspect.

A The allowables for the project would be the sum of the

allowables for the several wells in the project areas.

MR. BUELL: Would it help you if you were looking at a copy of that?

THE WITNESS: Yes.

A (continuing) That is Rule No. 2. Allowable for the injection wells may be transferred to producing wells within the project area. That is Rule 3. Roughly, that's what it states, that in the interest of more efficient operation of the project, wells can be shut-in or curtailed because of high GORs or various other reasons which are listed, including pressure regulation, control of pattern or sweep efficiencies, or to observe changes in pressures or changes in characteristics of reservoir liquids or progress of sweep.

Q The allowable, then, would be made up. This is in substance, I assume, essentially the standard allowable rule that is put in effect for pressure maintenance projects which would give a project allowable consisting of top allowable for any well that was converted to an injection well?

A Yes, sir.

Q Plus the sum of all the allowables of the producing wells based on, I suppose, the latest well test?

A Yes.

Q Is it contemplated, then, that as the results of the flood are felt on the individual wells they will be re-tested and increased allowable will result?

A I believe Rule No. 6 states that the allowable assigned to any well which is shut-in or curtailed in accordance with Rule 3 shall be determined by a 24-hour test at a stabilized rate, and it shall be the final 24-hour period of a 72-hour test.

Q You're recommending, then, is that the well would be subject to re-test at such time as the operator deemed it appropriate?

A Yes, sir.

Q Are there any provisions for limiting production from wells offsetting the wells operated outside the project area boundary?

A Yes, sir, Rule No. 7. Rule No. 7 states that any well which offsets, directly or diagonally offsets an offset operator can produce no more than twice the maximum field allowables.

Q Would you have any objection if it was agreeable with the Commission for such an offset well to be granted an allowable equally that of the well within the project area having a double allowable?

A Not unless it has a pressure maintenance project started.

Q Then you would object to it?

A Yes, sir, I would object if there was no pressure maintenance project started in the offset field, in the offset

operator's lease.

MR. SWANSON: That's all.

FURTHER CROSS EXAMINATION

BY MR. MORRIS:

Q In some of the pressure maintenance projects that have been approved by the Commission, a provision has been put in Rule 10, there, that the wells offsetting wells outside the project area would be limited to producing twice the normal allowable. They could not produce twice the normal unit allowable until they had received a substantial response from the water injection program which would preclude a well on the exterior of the unit producing more than the normal unit allowable whenever it got response from the water injection program, the idea being that the additional allowable should be oil being pushed toward the well as a result of the water injection program rather than the well just producing oil that might be drained from outside the unit area. Now, in the cases that we have considered such a restrictive provision has been placed in Rule 10. It is not in the proposed rule you have there. Perhaps a provision of that sort is what Mr. Swanson is asking if you would accept.

MR. BUELL: From a legal standpoint -- and then I will let Mr. Rundell give his engineering answer -- I can't help recall, Mr. Morris, the difficulty you had this morning in another case. If you want to open a Pandora's box of interpretations, the words substantial response to all of the people in

this one room, not a one of them would agree on what a substantial response is.

That provision seems to me to be incapable of administering. Now, that is my answer from a legal standpoint.

MR. MORRIS: Mr. Buell, would you have an alternative wording for such a restrictive provision?

MR. BUELL: Mr. Morris, I stand foursquare behind the rule. I think it's well for this Commission to consider the correlative rights of people who are not in a conservation effort, but I also think it is your duty to consider protecting correlative rights of those operators who are engaged in conservation efforts. It's a two-headed coin. In my opinion, the provision that you have just referred to doesn't protect or intend to protect the correlative rights of a person engaged in preventing waste.

MR. SWANSON: It seems there is a problem if the Commission recognizes that allowables may be transferred throughout the project area. You have a problem of protecting correlative rights. If at the very inception of this project, it would be possible to transfer allowables to lease lines, it would be possible, even before the effects of the pressure maintenance project were felt, for the offset operator who had then begun secondary recovery operations to produce at a rate at least double that of his offset operator.

MR. BUELL: Certainly, under the rules we are recommend-

ing, an operator engaging in pressure maintenance operations can transfer to his line twice the normal top allowable. That wouldn't hurt the offset operator who is not engaged in conserva- efforts. It might cut down on the amount of oil from the opera- tor engaged in conservation efforts. I don't consider that a violation of his rights.

MR. SWANSON: It would be possible at the time you commenced injecting water to transfer your allowable to your lease line wells and produce them at double the rate of the offsetting operator. It seems to me necessary to have some sort of adjustment.

MR. BUELL: I don't believe the rules contemplate setting up a project or unit allowable until you're engaged in pressure maintenance operations. The rules do provide that when you convert the wells for injection purposes, you can trans- fer its allowable and certainly I see no difficulty in getting the well converted to injection. It would be for a very short period of time you'd be producing a transferred allowable from injection wells before the water went down the well bore but it would be for a very short time.

MR. SWANSON: Perhaps you have already answered my next question and that is Pan American's feeling at this time is not that it wishes to abandon unit negotiations?

MR. BUELL: None of the operators in the Totah Field have completely turned their backs irrevocably on field-wide

or semi-field-wide units.

MR. SWANSON: That's our feeling, to unitize the whole pool may not be possible but if my interpretation of what you said, instituting this application, in view of the possibilities that it may not be successful, you would like to prepare yourself for lease injection.

MR. BUELL: In the interest of saving time. Based on the relations between Pan American and Aztec in the past I don't think we'll have one bit of difficulty forming a unit.

MR. SWANSON: That's more encouraging.

MR. BUELL: Aztec's attitude has always been one of full and complete cooperation in all regards and no one has been any more interested in preventing waste in this pool than Aztec.

MR. MORRIS: May I ask a question of the witness?

EXAMINER NUTTER: Yes, sir.

FURTHER CROSS EXAMINATION (continued)

BY MR. MORRIS:

Q Mr. Rundell, we have been talking a lot about the wells that are going to be offsetting the Aztec acreage and what they might produce. Could you tell me, with reference to area A, first, what the producing capacity of Well No. 7, located in the Southeast quarter of Section 24, Township 29 North, Range 4 West, please?

A It is approximately 98 barrels per day.

Q And the normal unit allowable in the Totah pool at the

present time is quite a bit in excess of 98 barrels per day, is it not? You shouldn't transfer more to that well than it could produce until it was actually receiving a response from your water injection program?

A That's correct.

EXAMINER NUTTER: Is that a penalized figure?

THE WITNESS: This is the November production figure.

MR. MORRIS: I was asking about the capacity of the well to produce.

EXAMINER NUTTER: Under the limiting GOR of that pool?

THE WITNESS: That is the maximum fluid the well can produce. This figure is the average November daily production.

MR. BUELL: I still don't think you get the significance of Mr. Nutter's question. The production from that well results from a penalized allowable due to having a high GOR?

THE WITNESS: No, sir.

EXAMINER NUTTER: What is the ratio?

THE WITNESS: At that time it was less than 2000. I don't know what it is right now.

EXAMINER NUTTER: In other words, it has an allowable based on the old GOR test and this rate of production was not the rate of production which would be assigned and permitted under these new ratios recently run?

THE WITNESS: No, sir.

MR. BUELL: It would probably be much less.

Q (by Mr. Morris) Are there any other wells in area A that offset any wells that will be producing that directly offset any of Aztec's?

A In project A, the only producing well directly or diagonally offsetting Aztec's acreage, Well 2 directly offsets one of Aztec's wells.

Q Now, referring to area B, was this Well 117, that's up in the extreme Northwest quarter of Section 35, Township 29 North, Range 13 West --

A That well has not yet been completed.

Q Is that --

A It is drilled but it is not yet completed.

Q -- a Gallup well?

A Yes.

Q A producing well?

A Yes.

MR. BUELL: Is that a top allowable well or less than a top allowable well?

THE WITNESS: Less than top allowable.

Q (by Mr. Morris) Are there any other wells in project area B which will offset Aztec's acreage?

A No, sir. That is the only producing well that directly or diagonally offsets any of Aztec's acreage.

Q What about your Well No. 87 which is also in the Northwest quarter of Section 35? Do you have the ability of that

well to produce?

A Yes, sir. It is presently producing approximately 20 barrels per day.

Q At least as far as Aztec is concerned, there is very little danger of being able to transfer allowables to any well in excess of the normal unit allowable. The Commission is just concerned with Aztec, here. As to your other offsetting operators, do you contemplate that allowables will be assigned to any wells on the extremity of either of these two areas which will be able to produce in excess of normal unit allowable until those wells have received a response from the water injection program?

A The only other well in Section 35 is Well No. 99 which offsets one of Aspen's wells, Well No. 1, and that well is presently producing approximately 112 barrels per day. Pardon me, 124 barrels per day, not 112.

Q Than, in that state of affairs, Mr. Rundell, Pan American should have no objection to the inclusion of the limitation or possibly Aztec should have no objection to a limitation being left out. It's rather moot, isn't it?

MR. BUELL: The principle isn't moot. We realized that we had that answer available to us. All of our wells offsetting another operator were limited. As far as actually taking any advantage of that provision, we don't feel it's a matter of principle. People who are engaged in conservation efforts are entitled to protection of their rights just the same as those

who are not.

Q (by Mr. Morris) In your opinion, will the approval of these two project areas in any way impede the formation of the field-wide unit in this area?

A From an engineering standpoint, I can see no reason at all to think that it would stop the formation of a unit.

MR. MORRIS: Mr. Buell, from a legal standpoint, do you think the formation of that, the approval of these two project areas would impede future progress toward a field-wide unitization?

MR. BUELL: No, sir. One, I don't think it would interfere under even normal circumstances and it certainly can't interfere when the operators have agreed to proceed in this manner in order to serve conservation to the utmost while unitization negotiations are being re-evaluated, I don't see how it can impede it in any way. This was not just the decision of Pan American, this was the decision of the operators, as I understand it.

Is that right?

MR. SWANSON: Well, I think the operators have now decided that we will follow this procedure. It's my recollection that Pan American originally initiated this type of approach. However, there is a deterrent to the formation of the unit and obtaining approval for lease-wide injection at this time.

Q (by Mr. Morris) Are the wells that you are going to convert to injection in each of these areas high GOR wells?

A Yes, they are.

Q All of them?

A Yes, sir. I don't know the exact number, but as I recall, all or most of those wells are now high GOR.

Q So the amount of gas being produced should drop off appreciably upon the institution of this project?

A Yes, sir. I don't mean to say they are any higher than the others.

EXAMINER NUTTER: All of the wells in the pool are high GORs?

THE WITNESS: Yes, sir.

Q (by Mr. Morris) They should help the gas-gathering situation in this area to some extent?

A Yes, it may.

Q Is there any reason for recommending urgency of approval of this particular project? Are you in a pressure decline to the point where you have to get water in the ground within thirty days?

A We probably could get water in the ground within thirty days if it were approved. However, we are anxious to get started. We want to drill the water supply wells and we don't want to start any work whatever until we have an order granted and we are ready to start work. For that reason, we would like to see an order as soon as possible.

MR. MORRIS: I believe that's all; thank you.

EXAMINER NUTTER: Does anyone have any questions of Mr. Rundell?

FURTHER CROSS EXAMINATION

BY MR. VERITY:

Q On your allowable, will your production from each of the unit areas be greater or less if this order is granted prior to the time that the waterflood takes effect?

A Our production from either one of these areas will be less.

Q After you get an order granted, will you take your five injection wells off production immediately after the order is granted?

A No, sir.

Q When would you take them off?

A When we are ready to begin injecting water into the formation; at that time.

Q What is your project area's allowable to date under the proposed rule?

A After we went to injecting water, the project area allowable will be the sum of the allowables of the various wells within the project area. As I understand the order, until the project area is actually under pressure maintenance program, the allowable will remain the same as it is now based on the productive capacity of the well and the limiting GOR.

Q After you start converting your five producing wells

to water injection wells, will your total production decline or increase for a time?

A It will probably decline for a time.

Q So, you will actually produce less oil after you start your project than you are presently producing?

A For a short time. However, we hope that that time will be very short.

Q Well, that time would continue from the time you start converting to water injection wells until such time as there is a substantial effect from the waterflood?

A I don't know. I'd have to dig into the matter a little further.

Q Your production wouldn't increase from your other wells until the waterflood takes effect, will it?

A No, sir, it won't.

MR. BUELL: Our proposed injection wells are not top allowable?

THE WITNESS: No, sir. Under that bore when we convert those wells to water injection, we can transfer top allowable.

MR. BUELL: That's assuming we have the capacity on the other wells in the project area there that can make it?

THE WITNESS: That's right.

MR. BUELL: It also assumes we are not under an arbitrary limitation of gas handling facilities. I believe, Mr. Rundell, your testimony was accurate. Our production should not

increase although we have an opportunity to when we convert to water injection.

MR. VERITY: You're actually going to decline in the amount of oil that you take out of the ground for a time until your waterflood takes effect.

MR. BUELL: Assuming we have no current unused capacity and I think that's a correct situation.

EXAMINER NUTTER: As soon as you put a well on water injection you would have a certain amount of equivalent gas volume due to that water that was being injected which could increase the allowable assigned to those high GOR wells and you could conceivably produce more liquid.

MR. BUELL: We are dealing with a situation here where we have allowables. Now, we are not producing due to the limitation of gas handling facilities so obtaining credit against high GOR wells for water injection, I don't believe at this time or probably not in the forseeable future is going to be beneficial.

EXAMINER NUTTER: It would depend on the gas handling facilities?

MR. BUELL: Yes.

CROSS EXAMINATION

BY MR. NUTTER:

Q You have given us the proposed rules here as well as the curve for the C factor. Now, referring to Rule 8 in your

proposed rules in the formula in average reservoir pressure at mid point, could you give me a datum that could be prescribed?

A The datum, plus 200 feet.

MR. BUELL: Are you sure of that?

Q (by Examiner Nutter) You don't have a datum for the Horse Shoe-Gallup? Do you have a pressure for this area which you would use in addition to the bottomhole pressure?

A The reservoir pressure now?

Q No, sir. You have the average reservoir pressure at mid point in the Horse Shoe-Gallup Oil Pool in project area, psig. Do you have atmospheric pressure to use here?

A I still didn't understand the question, Mr. Nutter.

Q The 12.01 that you have for the Totah. Will that have to be another figure?

A I think that's fine for atmospheric pressure.

Q How about reservoir temperature?

A Reservoir temperature is, I believe, 158 degrees. I can verify that in just one second.

MR. BUELL: 155.

Q (by Examiner Nutter) Is that the same datum that you used for bottomhole pressure?

A Yes, sir.

Q Referring to your cross section there, we see that most of the wells in the cross section appear to have this main Gallup connected by the yellow line across the two cross sections. Are

those the only perforated intervals in these wells?

A In these particular wells, the wells that belong to Pan American, they are; and as for Aztec, I am not sure about Aztec's wells here.

Q Will the injection wells here have the same perforated interval and be putting water into the same bench of the Gallup sand as the producing wells will be producing from?

A No.

Q No sands will be under flood and water won't be put into sands that are not being produced?

A In these injection wells, all the water we will inject will go into this main Gallup sand. Now, on some of the other wells, there is one other zone which is open in the formation. However, it won't be subjected to water injection.

Q Are they some of the other wells that Pan American operates?

A Yes, sir, in the Totah-Gallup field, the Navajo Tribal "H" No. 7 is also producing from the lower zone and also No. 9 is producing from both the upper and lower, and No. 11 is producing from the upper and lower. The rest of the wells produce from this main sand, which is colored in yellow only.

Q No. 7, 9, and 11 are producing from the upper and lower, is that correct?

A No. 7 is producing from the lower zone only.

Q You are going to be injecting into the upper zone?

A Yes.

Q Is this well in the Southeast quarter of Section 24?

A Yes, sir.

Q So, you wouldn't expect that that well would receive any stimulation whatsoever from the injection program?

A I'm sure that the well will be opened in the main zone.

Q Do you plan additional perforations?

A I would certainly recommend it to my management for that to happen.

Q Now, the exhibit that you gave pertaining to the Morrison water well. Is that pretty much applicable to both of your proposed Morrison water wells?

A Yes, sir, it is.

Q And, on your Exhibit No. 8 and Exhibit No. 7, the primary plus your secondary on area B totals 1,600,000 barrels?

A Yes, sir.

Q You estimate an ultimate primary of 513,000 barrels?

A Yes, sir.

Q So your secondary would be 1,087,000 barrels?

A Yes, sir.

Q Now, in area A the difference between the two would be approximately 890,000 barrels?

A Yes, sir, that is correct.

EXAMINER NUTTER: Are there any further questions of Mr. Rundell?

FURTHER CROSS EXAMINATION (continued)

BY MR. MORRIS:

Q Mr. Rundell, on Exhibits 7 and 8, I note there a point on each one the word "buzz". Is this water that you are injecting into it?

A The "buzz" in this case means when we expect to get an increase in production.

EXAMINER NUTTER: That's the "substantial response"?

THE WITNESS: Yes, a substantial response.

EXAMINER NUTTER: Does anyone have any further questions of the witness?

He may be excused.

(Witness excused.)

EXAMINER NUTTER: Do you have anything further?

MR. BUELL: No, sir, that's all we have.

EXAMINER NUTTER: Does anyone have anything they wish to offer in Case No. 2449?

MR. ANDERSON: John Anderson, with the USGS. We have no objection to the proposed pressure maintenance project on a lease basis. However, both of them, rather, the two together, involve Indian and Federal acreage; and in this case, why, it will be necessary for Pan American to file applications for approval of each project in duplicate with the Survey.

EXAMINER NUTTER: Is there anything further?

MR. VERITY: Southwest Production Company has no objec-

tion to the granting of the application.

MR. SWANSON: Aztec has no objection to granting the application by the Commission but would recommend that the Commission consider points we covered relative to our allowable.

EXAMINER NUTTER: If there is nothing further in Case No. 2449, we will take the case under advisement and the Hearing is adjourned.

(The taking of testimony concluded at 4:10 p.m.)

* * * * *

STATE OF NEW MEXICO)
) ss.
COUNTY OF SAN JUAN)

I, THOMAS F. HORNE, NOTARY PUBLIC in and for the County of San Juan, State of New Mexico, do hereby certify that the foregoing and attached transcript of hearing was reported by me in stenotype and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

Thomas F. Horne
NOTARY PUBLIC

My Commission Expires:

October 2, 1965

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2449, heard by me on 1-4, 1962.

....., Examiner
New Mexico Oil Conservation Commission

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

January 4, 1962

EXAMINER HEARING

IN THE MATTER OF:

Application of Pan American Petroleum Corporation for a pressure maintenance project, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks permission to institute a pressure maintenance project on its Navajo Tribal "H" and Gallegos Canyon Unit Leases, San Juan County, New Mexico, in the Totah-Gallup Oil Pool with water injection initially to be through five wells located in Section 35, Township 29 North, Range 13 West, Section 12, Township 28 North, Range 13 West, and Sections 13 and 24, Township 29 North, Range 14 West, and requests adoption of special rules to govern the operation of said project.

CASE NO. 2449

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

EXAMINER NUTTER: The Hearing will come to order, please. The next case is 2449.

MR. MORRIS: Application of Pan American Petroleum Corporation for a pressure maintenance project, San Juan County, New Mexico.

MR. BUELL: For Pan American Petroleum Corporation, Guy Buell. We have one witness, Mr. Daniel Rundell.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 4, 1962

EXAMINER HEARING

IN THE MATTER OF:

Application of Pan American Petroleum Corporation for a pressure maintenance project, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks permission to institute a pressure maintenance project on its Navajo Tribal "H" and Gallegos Canyon Unit Leases, San Juan County, New Mexico, in the Totah-Gallup Oil Pool with water injection initially to be through five wells located in Section 35, Township 29 North, Range 13 West, and Sections 13 and 24, Township 29 North, Range 14 West, and requests adoption of special rules to govern the operation of said project.

CASE NO. 2449

BEFORE:

Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: We will call next Case 2449.

MR. MORRIS: Mr. Examiner, the applicant in this case requests that it be dismissed with the understanding that they may at a later time refile their application.

MR. NUTTER: Case 2449 will be dismissed with that understanding.

DEARNLEY-MEIER REPORTING SERVICE, Inc.
PHONE CH 3-6691
ALBUQUERQUE, NEW MEXICO

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission, at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill, and ability.

IN WITNESS WHEREOF, I have affixed my hand and notarial seal this 4th day of January, 1962.

Ada Dearnley
COURT REPORTER-NOTARY PUBLIC

My commission expires:

June 19, 1963

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2947, heard by me on 1/4, 1962.

....., Examiner
New Mexico Oil Conservation Commission

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

November 29, 1961

EXAMINER HEARING

IN THE MATTER OF:
Application of Pan American Petroleum Corporation for a pressure maintenance project, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks permission to institute a pressure maintenance project on its Navajo Tribal "H" and Gallegos Canyon Unit Leases, San Juan County, New Mexico, in the Totah-Gallup Oil Pool with water injection initially to be through five wells located in Section 35, Township 29 North, Range 13 West, Section 12, Township 28 North, Range 13 West, and Sections 13 and 24, Township 29 North, Range 14 West, and requests adoption of special rules to govern the operation of said project.

CASE NO. 2449

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

EXAMINER NUTTER: We will call Case No. 2449.

MR. WHITFIELD: Application of Pan American Petroleum Corporation for a pressure maintenance project, San Juan County, New Mexico.

MR. BUELL: Guy Buell for Pan American.

MR. VERITY: George Verity representing Southwest Production Company.

MR. SWANSON: Kenneth Swanson for Aztec Oil & Gas, associated with local counsel.

MR. WOLF: Walter Wolf, Jr., appearing as observer for the Navajo tribe.

MR. VERITY: I would like to move this case be continued until the first Examiner Hearing in January.

MR. BUELL: May it please the Examiner, in view of your two prior decisions, Pan American will not resist the motion for continuance to the first Examiner Hearing in January.

EXAMINER NUTTER: Case No. 2449 will be continued to the first Examiner Hearing in January.

The Hearing is recessed.

* * * * *

STATE OF NEW MEXICO)
) ss.
COUNTY OF SAN JUAN)

I, THOMAS F. HORNE, NOTARY PUBLIC in and for the County of San Juan, State of New Mexico, do hereby certify that the foregoing and attached transcript of hearing was reported by me in stenotype and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

Thomas F. Horne
NOTARY PUBLIC

My Commission Expires:

October 2, 1965

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2447, heard by me on 11-27, 1967.

....., Examiner
New Mexico Oil Conservation Commission