

Case No.

2615

Application, Transcript,

Small Exhibits, Etc.

REPORT
OF THE BOARD OF COMMISSIONERS
OF THE STATE OF NEW MEXICO
JANUARY 10, 1957

IN THE MATTER OF:

Case No. 2615: (re 2615) Application of Waterflood Associates, Inc. for a hearing, de novo in Case No. 2615, Order No. 2-2304, application of Aztec Oil and Gas Company for a waterflood project, Robinson Pool, Lea County, New Mexico.

BEFORE: Honorable Martin L. Neches, Governor
Mr. A. B. "Ike" Porter, Land Commissioner
Mr. L. B. "Johnny" Walker, Secretary-Director

TRANSCRIPT OF HEARING

MR. PORTER: We will take up next Case 2615.

MR. DURANT: Application of Waterflood Associates, Inc. for a hearing, de novo in Case Number 2615, Order R-2304, application of Aztec Oil and Gas Company for a waterflood project, Robinson Pool, Lea County, New Mexico.

MR. SWANSON: Kenneth A. Swanson, representing Aztec Oil and Gas Company. I am a member of the Bar. I am a member of the law firm of

MR. PORTER: Thank you very much. Do we have any other counsel?

MR. LOSEE: A. J. Losee, representing A. J. Losee and Waterflood Associates.

MR. PORTER: Mr. Losee, Waterflood Associates and one

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other operations?

MR. LORRA: It is merely an other unit of incorporation. It is an association.

MR. PORTER: Thank you, sir. Are there any other appearances in this case?

MR. LORRA: Mr. Porter, there is another. It is representing, STA Oil produced out of Kildan.

MR. PORTER: Thank you.

MR. STANSON: This is now hearing has as its subject here Aztec's section, owned by Aztec and McGrath and in the matter of the Robinson-Grayburg Pool in Eddy and Lea Counties. The matter after notice and publication, was heard by an examiner over two months ago. At any rate elements appear in opposition to the application. The parties appeared before the examiners, gave testimony and entered a statement setting out the reasons for opposition. After a favorable recommendation by the examiner and after the Commission had considered all the evidence any persons interested enough in the area to state his position had offered, an order approving the application without qualification was entered by the Commission. Subsequently, another party, owning acreage offsetting the produced unit boundary to the west, adjoined with the original owning party; and, as is our statutory right, moved to de novo hearing before the Commission. I think it is safe to assume that the adverse parties anticipate introducing additional evidence

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perhaps he could be shown as his wife?

Mr. POMPA: Did you call you, please, Mr. Swanson?

(Witness answers.)

Mr. SWANSON: Mr. Burrows.

We have large exhibition. If we could, we would like them to be displayed?

Mr. POMPA: I think we can get them up there, if we have some stretch tape. You may proceed, Mr. Swanson.

(Whereupon, Applicant's Exhibits Nos. 1 through 3 marked for identification.)

JAMES BURROWS, called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. SWANSON:

Q Will you state your name for the record?

A Jim Burrows.

Q By whom, and in what capacity are you employed, Mr. Burrows?

A I am employed by Aztec Oil and Gas Company as a Petroleum Engineer in Dallas, Texas.

Q Have you previously testified before this Commission?

A Yes, I have.

Q Have you made a study of the project area involved in that application?

A Yes.

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Will you please read a portion of Exhibit No. 1 to the Commission in support of our application?

A Yes, sir, I have.

Q Now these exhibits are placed in front of you, for your personal supervision?

A Yes, they are.

Q Would you refer to the first one, and explain it, please, Mr. Burrows? Is this a copy of Exhibit No. 1 on the cover behind the Commission?

A Yes, sir, it is. Exhibit No. 1 is a brochure showing the lease ownership and well locations in the vicinity of the Robinson-Grayburg and San Andres Oil Pool in Lea and Eddy Counties, New Mexico. The heavy dashed lines represent the pool boundary which straddles the county line between these two counties. The area enclosed by the heavy solid line, in the northeast portion of this pool, is the 17-well proposed Aztec Robinson Project Area. This exhibit also indicates the location of a water supply line belonging to Caprock Water Company from which we intend to procure an adequate supply of injection water in the project area. The 6 wells circled and colored in red are the 6 wells in which we request approval to convert for the injection of water into the lower Grayburg or Premium pay intervals, as shown on our next exhibit.

Q Would you refer to your second exhibit, and explain it, please?

A Exhibit No. 2 is two cross sections, one northwest to



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southeast, and one from north to south and as indicated on the map in the upper right hand corner. The later this referred to well on this exhibit are the intervals into which we propose to inject water. This exhibit indicates that these intervals are continuous throughout the pool and subject to water flooding. This exhibit also indicates structure in this portion of the pool to be that of a southern dip. We are plugging these. The dip of this nose is very slight in every direction, however, and is in the order of $1/4$ of 1 degree. Therefore, we do not consider the structure to have any bearing on the water flooding.

Q Did your study in this regard indicate the presence of any faults or fractures that impair water flooding in this area?

A No, it didn't.

Q Are there presently any zones open to production in any of the wells proposed as injection wells, other than the closed zones indicated to this cross section?

A Yes, 0-3 of the proposed injection well, there is a lower interval, approximately 150 feet below the lower zone shown in red on this exhibit, which is open at this time. We propose to isolate this off by setting a bridge plug above it and to inject only into the two intervals shown in red.

Q You have no present plan to attempt to waterflood the lower zone?

A No.

Q What is the reason for that decision?



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Q. Now, you have the original casing program, Exhibit No. 3, which was introduced with your application, and you have the proposed casing program, Exhibit No. 4, which was introduced with your application, and you have the proposed casing program, Exhibit No. 5, which was introduced with your application. Is that correct?

A. Yes, you have the original casing program, Exhibit No. 3, which was introduced with your application, and you have the proposed casing program, Exhibit No. 4, which was introduced with your application, and you have the proposed casing program, Exhibit No. 5, which was introduced with your application. Is that correct?

A. No.

Q. Would you refer to your next one, and explain it?

A. Exhibit No. 3 is the original casing programs which were utilized in the completion of these wells as producing wells. We propose to utilize these same programs with no changes. As our injection well casing programs, we might note that this exhibit is a corrected copy of exhibit C, which was originally introduced with our application. The correction is on the first well, on the first page where it states R. C. #4 was previously listed with the casing program instead of the stated R. C. #3, which is to be the proposed injection well. We consider that this casing program will adequately protect any fresh water zones which may exist in that it will isolate zones into which we propose to inject water. This exhibit also indicates that we plan to set bridge plugs at approximately 3900 feet in the wells which we previously indicated had the low zone open to isolate this zone.

Q. Is this all in regard to this exhibit, Mr. Burrows?

A. Yes.

Q. Would you refer to your next exhibit, and explain it?



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A Exhibit No. 4 is a data sheet which gives the reservoir rock and fluid properties of the pay zone. These properties are given such as the average porosity of 11.6, and average permeability of 10.2 and the average net pay of 10 feet. This exhibit also indicates that the reservoir is producing under a solution gas drive mechanism and that no gas, oil or water bit found. Finally, feel it is necessary to read this whole exhibit unless it is desired. We would note, however, that the data from which these averages were taken was utilized in the preparation of our performance curve, which is our next exhibit.

Q Would you refer to your next exhibit, please, and explain it?

A Exhibit No. 5 gives the predicted performance curve of the 17-well project area. The cumulative production curve is shown by the heavy dashed line. This curve indicates that as of December of this year, we will have recovered a cumulative production of approximately 175,000 barrels of oil. The curve shown with the short dashes is the Gary production curve. This curve indicates at the present time that the daily production is about 90 barrels a day from the 17 wells, or approximately 5.3 barrels of oil per day per well. We therefore consider the area to be in stripper stages of production.

Continuing to the secondary portion of the curve, we expect a slight degree of response from our water injection, after



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approximately four months. At the end of three months, we anticipate that the unit production will have reached capacity allowable and will continue at capacity allowable rate for approximately two years, and then will begin to decline and will decline to an economic limit approximately 15 years after the commencement of the flood.

At the end of this time, we expect to have recovered an ultimate recovery of 1,115,000 barrels of oil, of which 36% may have eventually been produced by primary production, and the remaining 64% is due solely to our water injection plans.

Q Is it your opinion, then, that this additional 64% recovery would not be realized unless waterflood operations were instituted in this area?

A That is correct.

Q It would be correct, then, to say that that would certainly be caused, if this area was subjected the waterflood operations?

A That is correct.

Q Have you anything further in relation to this exhibit, Mr. Burrows?

A No, sir.

Q Would you refer to your 6th exhibit and explain it, please?

A Exhibit No. 6 is a copy of a letter from Caprock Water Company which states that they have an available supply of injection



...for our proposed ...; and, that ...
 ...to our plans ...

Q. ... this ... you ...
 ... to the Commission with respect to allowable ...
 ... related matters?

A. Yes, I would recommend first that the six wells as shown on Exhibit No. 1 be authorized for conversion to be utilized as injection wells for the purpose of injecting into the lower Grayburg or Premier pay sections as shown. I would further request that the project be governed under the provisions of Rule 701 of the Commission's Rules and Regulations, including those provisions for the allocation of allowables and the provision for administrative approval for a conversion of additional injection wells.

Q. You contemplate, then, that it will be necessary at some later date, that it will be necessary to convert additional wells to injection?

A. Yes.

Q. Why do you think this will be required?

A. Referring to Exhibit No. 1 again, the wells in locations to the west of our project area, the five wells which have been circled but haven't been colored, it is assumed that these wells will be utilized at some future date by Waterflood Associates, Incorporated, adjacent to the project boundary along the northwest flank. The basis of this assumption is that Waterflood Associates

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had indicated that they would not agree to the proposed plan and that their tentative plan was to drill the same number of injection wells, and to locate them in a well circle for injection. When it was first studying this area as a waterflood project, we approached Waterflood Associates concerning utilization of the Astor acreage with the acreage to the west, and they indicated that they preferred not to utilize. This fact presented a very unequitable drainage situation due to the peculiar configuration, due to the common boundary to the west of our project. If we immediately began injection into the next row of wells which would extend our tentative pattern to the east, we would be in the position of having one producing well between the rows of injection wells, whereas the operators to the west would have four and possibly five producing wells between the rows of injection wells. We estimate that under this condition, we would push a net amount of approximately 100,000 barrels of oil off of our lease on the west, to the west of the project area which we consider a serious impairment of our correlative rights. I believe that Exhibit No. 7 will further clarify this properly.

MR. SWANSON: If the Commission please, we thought we might display this one on the board, as well.

MR. PORTER: All right.

Q (By Mr. Swanson) Would you explain Exhibit 7, please, Mr. Burrows?



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Exhibit No. 7 is a general illustration of the boundary configurations on the production of correlative rights. Figure No. 1 indicates the normal situation where an angle of the project boundary and the row of producing wells is approximately 45 degrees. It is apparent that under this pattern, the operators on each side of this common boundary line will have an equal number of producing wells with which to recover their fair share of the oil. It is obvious that correlative rights are protected as shown by the red and blue areas which represent oil which will be swapped by counter-drainage of the projects.

Q Would it be a correct simplification of this exhibit to state that various colored reds would be swept across the line and various sweeps of blue would be produced to the area to the right?

A That is correct.

Q In this situation, correlative rights would be exactly preserved.

A Figure No. 2 indicates a unique situation where the trend of the common boundary line between projects is parallel to the rows of injection wells. It is obvious that if the row of wells nearest the common boundary in the project were to be utilized as injection wells, approximately one-half of the oil, in the proper relation of the units in this row, would be swept off the project area to producing wells in project A, if the injections in both of these wells were initiated at the same time or if project B started injection first.



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Q. Now, if the spacing pattern, how many wells of the well in shape from this, you have included project area to the left of the common line?

A. Since there would be 10 acre production, which is 100 acres, one-half of this would be swept to the west, which would be approximately 40 acres.

Q. This would be the equivalent of how many wells?

A. Two wells.

Q. The oil that should have been produced by two wells to the project would actually be produced by the adjoining project to the west?

A. That is correct. In our Aztec-Robinson project, we were faced with the problem which was similar in principle to that problem presented in figure 2 of this exhibit. We have studied the area to determine the system which would protect us from this loss of 100,000 barrels of stock tank oil, which represents a large percent of our reserves of this project. We believe that we have the answer which will both protect correlative rights and prevent waste. Referring to Exhibit No. 1 again, we propose initially to inject into a row of wells, which will leave two rows of producing wells between the rows of injection wells, along the common boundary. We then propose to conform to the pattern desired by the operators to the west at the later date, by the conversion of two additional wells in the corridor area.



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Q If we were shuttling in to not convert the additional wells in the corridor, we believe that an area of approximately 15 acres of a quantity of oil of approximately 121,000 barrels of oil would be left unswept between these two rows of producing wells. If the flood were completed under these circumstances, we would also plant that if we waited until the rest of the project area were completely flooded out to convert these wells, that a small portion of the 72-acre area might remain unswept due to the condition of continuing plant operations after the other area has been completely flooded out. We therefore propose to convert these two additional wells at a time prior to the time that the rest of the area will be flooded out.

Q Mr. Burrows, would you identify the two additional wells which will be converted for injection?

A One would be the well labeled 3-R in the Northwest Quarter of the Northwest Quarter of Section 31. The other would be the well labeled 2-AC in the Northwest Quarter of the Southeast Quarter of Section 36. I believe that Exhibit 8 will further illustrate this. Exhibit No. 8 contains three figures which give approximate flood fronts in the corridor area under various conditions.

Q May I interrupt you just a minute, Mr. Burrows? You have not displayed the common lease line on this exhibit, have you?

A That is correct.

Q These lines that are drawn are lines along the sides and bottoms of the applicable sections?



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A. ...

Q. ...

A. ...

Q. Thank you, please.

A. This figure indicates the floodfront at the time at which we propose to convert the two additional wells. It is noted that at this time the swept area will be approximately 230 acres, as shown in green, between the two floodfronts. This was chosen as the time for conversion of additional wells because it is approximately the latest time at which the wells can be converted to allow a balance of injectivity after this point, which will allow the ultimate floodfront to meet at producing wells and thereby afford an efficient sweep of the corridor area. This is also the time at which an appreciable amount of water will begin to be produced from the two wells which we propose to convert for injection.

Q. Mr. Burrows, the wells circled in red are indicative of which wells?

A. They are the wells in the Aztec project area.

Q. They will be initially approved, if we receive a favorable order on this application, for injection purposes?

A. That is correct.



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Q And the main elevation in the area is the Aztec?

A They are assuming it is which will be utilized at a future date by the operators to the west.

Q That color red is used between these three blocks, is it not?

A Yes, sir, it is. Continuing to Figure 2 of this exhibit, it indicates the same flood-front as Figure 1 and between these flood-fronts we have constructed a dashed line which represents the approximate ultimate flood-front of the five wells to the west at flood-out conditions independent of the Aztec flood to the east; for example, in the construction of this, we have assumed that the operators to the west will efficiently flood their own acreage. To give an example of this: If the well in the Northwest Quarter of the Southwest Quarter of Section 36, that is the second well from the bottom, colored in yellow; if this well efficiently floods the area between it and the well labeled No. 2 to the west, it will also flood a similar area between it and the well labeled 4-RC to the southeast. The remainder of this flood-front was constructed in a similar manner. In other words, if the operators to the west were to efficiently flood their own acreage, they would produce an ultimate flood-front of approximately as shown by the dashed line in the corridor area to the east.

Q Mr. Burrows, in efficiently flooding their own acreage, have you assumed that they would comply with the existing pattern to the west?



A Yes.

Q How many acres are in the area shown in blue? A About your pardon, are you asking about it?

A In reaching this position, the flood-front to the west has swept an area of approximately 96 acres. From the time at which we propose to convert additional wells, that area is completely flooded out. It is noted that injecting, in the wells, into the five wells to the west, the water pumped into the wells will go both to the northwest and to the southeast, towards the corridor area. We therefore estimate that this 96-acre area will be swept by one-half of the water pumped into these wells, which is equivalent to 2-1/2 net injection wells. In order to flood the entire corridor during the same period of time as the floods to the west, as diversely in the area shown in blue, Aztec must flood the acreage shown in green. This area is approximately 139 acres. We do not consider one-half of the four-well row of injection wells to the southeast will be enough to flood this during this period of time. We therefore propose to convert two additional wells in the corridor area of the approximate flood-front, which will result in four net wells injected into the corridor area. Simple comparison indicates that these four wells can flood an area of 154 acres, while the five wells to the west, or 2-1/2 net wells, flood the 96-acre area. Since we can flood 154 acres, we believe that we have excess injectivity equivalent to flood approximately 150 acres, and that we will meet the flood-front to the west

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slightly better it can reach the position shown in Figure 2, or approximately as shown in Figure 2. Figure 2, of course, represents the area where the best oil will be recovered under our plan, and time for all practical purposes in the area will be swept out. We believe that this plan will pay in water in the best degree possible.

Q Dr. Burrows, is it your testimony that should Aztec be furnishing injections sufficient to flood 135 acres during the period that it is necessary to efficiently flood the area offsetting our proposed acreage to the west, that in fact, the corridor area will be swept of oil and efficiently flooded at that time; that is, at the time of the flood-out in the area to the west?

A Yes, sir.

Q I noticed two small green areas shown on figure 3. What is the significance of those areas?

A These small areas represent areas where we believe that a small amount of unrecoverable oil may be left.

Q Under Aztec's proposed pattern, would these areas be swept?

A No.

Q In your opinion, would an appreciable amount of oil be left in these areas?

A No, these areas are outside of the outer row of producing wells in the pool; and we believe that the pay quality is much poorer than it is in the interior of the pools. This is also indicated by a dry hole, which is approximately 530 feet south of



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...in the ... area ... in the ... area ... in the ... area ...

...is it likely that the same ... would not ... areas and that in the ... throughout the ... pools there might be some ... of?

Yes, sir.

Is it likely that in those areas which are unswept, there would be no significant amount of pay oil, because of the pay oil in those areas being very poor?

A That is correct. To return to the correlative rights aspect, I turn briefly to Exhibit No. 7. We note that in Figure No. 1, for correlative rights to be protected, each operator in projects "A" and "B" will each have an equal number of producing wells along the common boundary. To return again to the Exhibit No. 1, under our plan, initially, the operators on each side of the common boundary line will have an equal number of producing wells. The operators to the west would have six producing wells along the common boundary and the Aztec project would have six producing wells along the common boundary, and the Aztec project would have six producing wells along the common boundary at the time of conversion of two additional wells. The loss of wells due to the conversion of these wells and the flooding out of other wells would result in each operator having three wells in the corridor area



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which would produce a fair share of the oil that remains. In opposition to this, the operators to the west have proposed a plan whereby they will drill four and possibly five producing wells in the row of wells between the two rows.

I beg your pardon for the interruption. I believe you're testifying under Aztec's proposals that Aztec would have six wells initially, on each side of the boundary line, and after conversion they would each have three wells, which would protect the correlative rights; and I believe you were testifying that the other operators had made another proposal?

A Under the proposal of the offset operators to the west, we would be in the position of having only one well between the two rows of injection wells, whereas the operators to the west would have four, and possibly five.

So in conclusion, we believe that our plan with this provision, with later conformance by the operators to the west, we eventually will sweep the corridor area, and also the remainder of our project area; and the balance of the oil is to be pushed along the common boundary line and thereby protect correlative rights, and prevent waste.

We would also note that if no flood were initiated to the west, our plan would allow an efficient sweep of our project area; or if the project wells shown to the west, we believe, would have an efficient sweep of our areas. Our plan would also allow us to initiate a flood at the earliest possible date, since we now



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have a complete agreement with McGeech and Smith in the normal area, a tentative approval by the USBL; and we are ready to start our flood and increase our economic picture in this pool.

Q Mr. Dearnley, are you generally familiar with the efforts made by Aztec and the other operators to the west to work out some arrangements that would work out this unusual western lease boundary?

A Yes.

Q Would you briefly review what those efforts have been?

A I believe that the operators to the west have proposed that the location for the well shown in the Northwest Quarter of the Southeast Quarter of Section 36 be unitized with ours.

Q That the well on the 40 acre tract on which well No. 3 is located be included in Aztec's unit area?

A Yes, sir, I believe that is what their proposal was.

Q Have you made a study as to whether or not this would preserve correlative rights?

A Yes.

Q What was your conclusion?

A I concluded that under this situation that the project area, including this 40-acre tract, will be pushing approximately 33,000,000 barrels of oil to the wells to the west.

Q Even if this would equalize correlative rights, would there be any other objections you would have to such a proposal?

A Yes, the undrilled injection well shown in the Northwest Quarter of the Southwest Quarter of Section 36, of course, hasn't



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been drilled; and in fact, the other two will be drilled.

Q Do you understand that the area on which that undeveloped well would have to be located?

A Yes, I believe so. Speaking to the operator to the west indicated that this was actually owned and controlled by Hughes Oil and Refining Company.

Q In your opinion, if it is difficult to make a trade with Hughes, anyway, you would not drill a producing well on the tract contributed by them to you?

A Yes, it might be difficult and certainly time consuming.

Q Have you had thought as to the time that it would take to settle our differences in this area?

A I believe it would be in the order of three months.

Q Then it would probably result in additional delay then if we had tried some other approach than what has been proposed today?

A Yes, I believe it would.

Q Do you have anything further?

A No.

MR. SWANSON: That concludes our examination.

MR. PORTER: Mr. Swanson, your aspect of time was very good. Do you intend to offer your exhibits?

MR. SWANSON: Yes, sir.

MR. PORTER: Without objection, the Exhibits will be admitted into the record.



(Witnesses, applicants Exhibits Nos. 1 through 5 admitted in evidence.)

Q. Now, each of you has a portion of Mr. Lusk's?

A. Yes, sir.

THE EXAMINATION

Q. Now, Mr. Lusk,

Mr. Lusk, I believe you have testified that your wells in said project area have at times produced 157 barrels of oil, is that correct?

A. Yes.

Q. Now, are you counting the three wells that are not owned by Aztec, but are within your unit boundary, within the 157 calculation?

A. Yes, that is as of December 1st of this year.

Q. I believe your estimate of the amount of oil that would be recovered from your project area when you have completed your secondary recovery operation was 1,115,000 barrels, is that correct?

A. That is correct.

Q. The ratio of the amount of oil to be recovered to what has already been recovered, is then 6 to 1 is that not right, approximately 6 to 1?

A. That would be approximately correct.

Q. Do you know of any waterflood project in the state of New Mexico that has recovered six times the amount of oil, after the institution of the waterflood project, by a ratio of 6 to 1?



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A I can't think of one, however, I might think that there has been an increase of some of the other wells, an exhibit of a very long primary producing life under a very low rate of production.

Q Do you know of any project areas in New Mexico that have even produced three times the amount after secondary operations were started, compared to what they produced up to that time?

A I don't know of many of them that have been completely flooded out so that I could check.

Q Isn't it true, though, that actually your calculations of 6 to 1 recovery up to this point is a most optimistic outlook?

A No, sir. I believe it is a reasonable engineering estimate.

Q But none of the project areas in New Mexico have recovered half of that estimate, ratio-wise?

A I don't know that.

Q Earlier in your testimony, you mentioned that you had discussed with BTA, the Waterflood Associates, the possibility of unitizing their acreage, which you understood they control to the west of your west lease line, is that right?

A Yes.

Q Actually your map shows that your offset operators starting from north to south is Waterflood Associates, F. L. Benson, BTA, and Dob Oil Producers. Of those five people, did you contact any parties other than Waterflood Associates?

A No, because they initially indicated that they controlled



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Q Now, would you make plans to purchase an acre, or more acres, and any other land that they are willing to sell up to the line?

A When Lohrhood indicated that they were not willing to sell, I was willing to purchase, and for a lease with an option of a leasehold agreement, whereby the producing wells could be drilled along your west leasehold?

A Not to great length.

Q When did you first call to Lohrhood Associates?

A I can't remember the exact date. It's been, I suppose, approximately four months ago.

Q If I may use what I think is your Exhibit No. 5, noted as Figure 2 up here --

MR. SWANSON: If you will, I'm sorry, that is No. 7.

MR. LOSEE: Yes, Figure 2 of No. 7.

Q (By Mr. Losee:) You have indicated that this is somewhat similar to the west leasehold of your project area, and that the water lying west of these four injection wells would be swept across the line?

A Yes, I believe this area to the west would be swept to the producing wells to the west.

Q You have drawn this Figure 2 -- is this your 40-acre jagged line -- so that it bends on every acre up to the northeast, have you not?

A That is correct.

Q If we were to draw this on 160 acres, so that your line



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on some 40-acre, and 80-acre, and 160-acre areas here (indicating) so that actually, we're not really looking at a 160-acre area that you have divided as being in Project "A", then that would be the effect of the boundary line along there in your Figure 2, if it then came up to this point, and across here, (indicating) rather than being jumped on 40-acre subdivisions, it were jumped on 160's, what would be the effect on correlative rights?

A Then Project "B" would have two producing wells in the row of wells between the injection wells; and Project "A" would have three producing wells.

Q Well, your Project "A" would have how many producing wells?

A Project "A" would have three producing wells.

Q This well (indicating) and this well (indicating) and this well (indicating)?

A That is correct.

Q And Project "B" would have what number?

A Two producing wells.

Q This well (indicating) and this well (indicating). What would be the effect on correlative rights, if that kind of a west line configuration were adopted in your project area?

A I estimate off hand that Project "B" would push oil to the west in the ratio of 3 to 2. In other words, there would be some oil pushed to the west that wouldn't be compensated by counter-drainage.



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A No. 1 well is located in the area between
10 and 120; each well and Project "B" would pump to 10; but
I can't see that there would be any additional oil pushed from
Project "A" to Project "B".

Q Not by virtue of this injection will here?

A A small corner might be pushed.

Q Under this re-drafting of your project, isn't it true that the correlative rights would be substantially protected with the addition of this one well up here?

A With that well up here, -- there, you say?

Q Yes, sir. With this as a producer?

A Your question, that will be a producer?

C Yes.

A I'd have to study a little more to say for sure that they would be.

Q Well, can you say that they would not be protected?

A No, because I'd have to study the significance further.

Q Well, now, referring back to your Exhibit No. 1, and if the BTA Well No. 3 was contributed to your unit, would that then not conflict exactly to what I have drafted on your Exhibit 2 on

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Q Now, so that your unit also would be protected on the north and so that the correlative rights of each party would be protected on each side of the line?

A No, I don't believe they would be protected. I believe under this situation, the project to the east would have two producing wells in that area, and the area to the west would have three or possibly four producing wells in that area.

Q Would you describe which would be the three or possibly four producing wells, from your exhibit?

A The producing wells of the operator to the west would be Well No. 1 located in the Southeast Quarter of the Southwest Quarter of Section 36 under this situation. The operator to the west would then have the Well No. 3 and in the Northwest Quarter of the Southeast Quarter of Section 36 --

Q Excuse me, Mr. Burrows, I must have mis-stated my question. I said if BTA were to contribute that well to your unit and square off that corner in 160's?

A I don't believe I understand the question.

Q If BTA Well No. 3, located in the Northwest Quarter of the Southeast Quarter contributed to your unit, so that on Exhibit 1 you would have within your unit the entire Southeast Quarter, is it not true that under that situation, the correlative rights of the parties on each side of that line would be protected?

MR. SWANSON: If the Commission please, Mr. Burrows has testified to that already. It has been gone into and I believe he



has testified in his opinion that the number of producing wells and correlative rights would not be balanced. I felt that was my purpose in having him testify to that again.

MR. MOORE: If the Commission please, I attempted, I use of his Exhibit 7, Figure 2, which happens to be diagonal 60 acre tracts, which is not the picture. Then, the witness at that time answered what would have happened to correlative rights, based on that. I then reviewed his other maps so that the two are actually identical, as adapted by the examiner, and I think he should be able to answer the question.

MR. PORTER: Will the witness proceed to answer the question please, if you can answer?

MR. SWANSON: I wonder if the witness could be refreshed as to what the question is?

Q (By Mr. Losee) If Well No. 3 located in the Northwest Quarter of the Southeast Quarter, were contributed to your unit, is it not true that the correlative rights on each side of that lease line, divided, then, in diagonal 160 acre tracts, would be adequately protected?

A No, sir, I don't believe it would. I believe that there would still be a difference in the number of wells to produce from the corridor area.

Q Isn't it true that there are actually three wells on each side of the line, one of which would have been drilled to the west side, in Waterflood Associates No. 3 in Section 30, an undrilled

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location owned by Brinson in Section 36, and EPA Oil Production Well No. 1 on the west side of the line, whereas on the east side of the line, that will be all these wells to balance No. 3?

A If we considered that a balance row of wells, there would be a distribution of producing wells, including the undrilled locations and possibly including the abandoned well which might be placed on production. On this situation that you stated, where the 40 acre tract and the Northeast quarter of the Southeast quarter of Section 36 was contributed to the unit project area, the operators to the west would still have three and possibly four wells in the corridor area, whereas the project to the east would have two producing wells between the rows of producing wells.

Q Well, I have got to have you name the four producing wells that would be west of the line, please, sir?

A The producing wells that would be to the west of the line would be the Well No. 1, in the Southeast quarter of the Southwest Quarter of Section 36, and the undrilled location shown in the Southeast Quarter of the Northeast quarter of Section 36, and the well labeled No. 3 in the Southeast Quarter of the Southwest Quarter of Section 30, and the developed Well No. 1 in the Southwest Quarter of the Southwest Quarter of Section 30.

Q This undrilled location doesn't have any well on it now does it, this Brinson 40 acres?

A That is correct.

Q Do you know if that Well No. 1 in its abandoned condition



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Q Able to produce any oil?

A I don't know whether it is or not. I am sure it could be used to produce oil if it had drill-out plugs, whatever condition it's in.

Q Then, what well would you have inside your project line?

A Then we would have the well No. 3 in the Northwest Quarter of the Southeast Quarter of Section 36, which under your stipulation would be in the project in the east and be the well labeled 2-1 in the Northwest Quarter of the Northwest Quarter of Section 31.

Q Also, in my hypothetical situation, up there, in your Exhibit 1, I said your one well would be a producer rather than an injector?

A Well, then, I'd still have to study that further because the sweep wouldn't be quite as efficient.

Q Well, to arrive at that calculation of the number of wells, the people on the west side of the line would have to drill one new well and recomplete the one well that is abandoned, would they not?

A Yes, sir.

Q Would there be anything to keep you all from drilling a couple of new wells, within your boundary line?

A What is the question?

Q Is there anything to keep Aztec from drilling a couple of wells within their lease line, inside their project area?

A We already have wells on all of our production units.

Q Well, isn't this No. 1 this abandoned hole an appropriate



unit for an injection well?

A Yes, I believe so, yes.

Q You have had other operators claim that, I think possibly you all might have two wells on one operation unit, would that be possible?

A I don't know whether that is illegal or not.

Q Earlier in your testimony you said that if Aztec, without any lease-line consideration or joinder of this DTA 40, if Aztec were to put the injection wells on at the protestant's request, about 100,000 barrels of oil would pass to the operators to the west that you were not compensated for it by counter-drainage. Would you explain how you arrived at that calculation of 100,000 barrels of oil, briefly?

A It was done by a geometric estimate of the areas, which would be --

MR. PORTER: Would you speak a little louder?

A Which would be flushed across the common boundary line.

Q Did you attribute so many barrels to each 40 acre subdivision on that lease-line, or half of the 40 acre lease on the subdivision in arriving at that calculation?

A I believe I utilized, since these wells are not all placed right in the middle of 40 acre tracts, I considered the differences in spacing.

Q Did you attribute so many barrels surrounding each of your wells, such as for example your 4-AC well?

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A Yes, in my mind I would push that off to the side. The only barrier of oil would be pushed off of your project area that is to be re-planted.

A I don't have an acre figure available.

Q Do you have any approximate figure?

A I haven't checked the spacing yet, but it would represent approximately 20 acres of oil.

Q How many barrels of oil was that, in your calculation, approximately, you don't need to get your computer out, if you can tell us approximately how many barrels?

A It will be approximately 20 acres and 1657 barrels per acre.

Q About 33,000 barrels on that 20 acre tract?

A Approximately that.

Q Would be pushed off your lease line if you adopted protestant's proposed pattern?

A Under your protestant's proposed pattern, it would probably be approximately 10 acres or 17,000.

Q All right. That's 17 of the 100,000 barrels. Where is the other acreage?

A In 2-RC.

Q Do you have a like 17,000?

A It might be approximately that, I would still have to check the spacing to see.



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Q What is the size of the 40-acre area? Is it the same as the 40-acre area that is being pushed off your lease line?

A It would be similar to the 40-acre area that is being pushed off, is that right?

Q Under the suggestion of pushing in into the 40-acre area, which is what Mr. Burrows's proposed pattern -- Figure 101 labeled 101, in the southwest corner of the northwest quarter of Section 21, how much would you push off from that?

A If the spacing were in the middle of the 40 acres, approximately that amount, I have given a total figure; working up these figures, it wouldn't be accurate.

Q Well, all I'm trying to find out, Mr. Burrows, is you have made an estimate that there is 100,000 barrels that is going to be pushed off to our lease line if you adopt the pattern that has already been adopted in the field. I am trying to ascertain where that 100,000 barrels is. At this point, you have testified to 34,000 being pushed over on our lease line. I realize your figures are approximate?

A We stated the 4-RC would push some oil off. The 2-RC would push some oil off.

Q That is each would be 17,000? This is without BTA's 40-acre contribution to your well?

A Then, each one of those would be 33,000, instead of 17,000.

Q So that that is 66 of the 100,000 barrels?



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A Yes.

Q Now, if we add your 15,000 to the contribution to your well, would it be 50,000 in your well?

A If that well is contributing to our well, this would run up quite a bit of an imbalance, yes, sir.

Q Actually not of over 60,000 bar day.

A No, I don't. In that case, well, it would be approximately, if it wasn't for the oil spacing of some of our wells.

Q Well, that is 50,000. We haven't accounted for the other 55,000. Where is that, sir?

A Well, then, the well labeled 1-A in the Southwest Quarter of the Northwest Quarter of Section 31 would push some oil to the west.

Q Wouldn't that be counter-balanced by the Beinson Well No. 2 pushing oil off its lease line and into your well 2-A?

A It might be, approximately.

Q Well, now, it would be as close as we can determine at this time, would it not?

A Close as I can determine here, yes.

Q Do you know where the other 33,000 is sir?

A Of course, we would still have two injection wells, the 3-R in the Northeast Quarter of the Northwest Quarter of Section 31, pushing oil off, and the well 1-A in the Southwest Quarter of the Southeast Quarter of Section 30 would be pushing oil off.

Q The Well 1-A, if that were a producer, would that be



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Q Now, why not?

A No, I wouldn't be producing any oil off the well up to now, I'm not even sure our oil is any.

Q Now, isn't that just what you're saying, on your 3-4 well would not, and, as counter-drainage? Is the oil pumped off the waterflood area by Well No. 3?

A As far as counter-drainage, because it is, however, we wouldn't sweep the area as efficiently.

Q Actually, then, Mr. Burrows, if the 11X 12 were contributed to your unit area, this 100,000 calculation would be reduced substantially, and would be almost nil?

A If the BTA well were added to our unit?

Q Yes.

A I believe that would still, would be approximately 33,000 barrels of oil off our unit, not compensated for by counter-drainage.

Q Now, you have referred to that figure of 33,000; but when we went through your break-down of 100,000, you attributed 66,000 barrels going to the BTA Well No. 3 is that not right?

A 66,000 to the BTA Well No. 3?

Q Yes, sir.

A That is approximately 33,000 to the Well No. 3.

Q I think we will leave this line of questioning. Your proposed injection well pattern, Mr. Burrows, it is not a true 5-spot pattern, is it?



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A Yes, it is a 5-spot pattern. It would be on a different line of flow.

Q At 14, 10 is a 5-spot or is it?

A Started on a different line of flow, then took off an additional row to the east of it. It would be a 5-spot.

Q (By Mr. Losee) How many completely enclosed 5-spot patterns do you have within your proposed array?

A We would have one completely enclosed initially.

Q Then, when you talk about this double corridor, would that create any true 5-spot patterns, double corridor of producing wells?

A I didn't understand the question?

Q I am sorry, I will have to refer to this exhibit. Do you know the number?

MR. SWANSON: That is No. 8, it would be on the right, I am sorry they are not marked by number.

Q (By Mr. Losee) Your figures 1 and 2 show what I call a double corridor, with injection wells on each side, that is not a true 5-spot pattern, is it?

A Not in that area.

Q But, generally speaking, is it not true that a 5-spot pattern with four injection wells pushing each producer is more efficient, and will recover more oil, than a pattern consisting of three or less injection wells?

A If it is possible to convert? Would you repeat that



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again, sir?

Q Generally speaking, is it not true that a 5-spot pattern with four injection wells pushing on one producing well, is the most efficient and will produce more oil than a pattern consisting of three or less injection wells?

A Yes.

Q Wouldn't that also be applicable to this Robinson-Pool, I think the statement you made is a general statement about 5-spot locations, would that not be true as to this Robinson-Pool?

A In any particular 5-spot.

Q Well, then, Mr. Burrows, without regard to the ownership of the leases in this Robinson-Pool, is it not true that an incorporation of the existing Hewmont pattern developed on 5-spot locations will result in a greater recovery of oil than if the pattern is changed?

A No, in my opinion, not appreciably any more or any different than the plan that we have.

MR. LOSER: I believe that is all.

MR. PORTER: Does anyone have any questions of this witness?

MR. SWANSON: Yes, sir.

REDIRECT EXAMINATION

BY MR. SWANSON:

Q Mr. Burrows, the intimation has been made that your estimate of secondary recovery is quite high. We are comparing the



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primary production when you have recovered; with the primary source, isn't it a primary source that gives you a produce in oil that is available to the oil hole?

A Yes, I believe.

Q Secondary recovery in your estimation was all oil after some force other than that originally present in this field was used to recover the oil?

A Secondary recovery on my --

Q Secondary recovery in your estimation as opposed to the primary recovery?

A 64% of the total, by secondary recovery; and 36% by primary.

Q And that secondary portion would be all oil recovery after injection was commenced?

A That, plus some primary would be in that percent, some additional primary would be in that percent also.

Q If secondary procedures were not commenced in that, would it not be possible to recover additional oil than what has been recovered today?

A Yes.

Q What is the rough average life in this project area? How long are they?

A They were completed at many different times. Some, I believe, were completed as early as 1930.



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Q I was referring to this question to Aztec's project.

A Aztec's was approximately three years old.

Q You were referring to some wells that were then drilled at a much earlier date, approximately, than were any wells at

A I believe in the early 30's.

Q These wells are in the Robinson-Jungburg Pool?

A Yes.

Q Have you any idea as to what their primary recovery has been?

A Some have a primary recovery, I believe, of more than 17 hundred thousand barrels, which was produced at a very low rate through the whole life of it.

Q Is it possible, in your opinion, that the long productive life of these wells have utilized reservoirs that might otherwise have been utilized in Aztec's project area?

A Yes, sir, that is possible.

Q Mr. Burrows, have you made as accurate an engineering study as you are capable of making, with respect to the amount of oil that would be moved from the Aztec project area to the leases to the west?

A Yes, I have.

Q Was it more detailed than estimating by the areas, and the acres involved, than applying the rough acre foot oil that is in place there?

A Yes.



Q And what was the conclusion as to the effect on correlative rights, if our opponent's plan was adopted in this area?

A That we would push approximately 100,000 barrels of oil off our lease, to the wells to the west.

Q And if our area did include the 40 acre tract that has been mentioned, what will be the effect on correlative rights?

A That still approximately 55,000 barrels of oil might be pushed to the west.

Q Regardless of whether your engineering estimates are accurate, whether it is 10,000 or 1,000,000 barrels recovered in this corridor area, because of the number of producing wells in this area, due to the Aztec wells and the wells to the west, what proportion of it would be recovered by each area, if their proposal is adopted?

A It would be produced approximately in relation to the number of wells that were in the area to produce it.

Q And if we conformed to Mr. Losce's original proposal, that we put 5 wells along it, we would have how many producing wells in the corridor?

A We would then have two.

Q I beg your pardon, wasn't it in your testimony that Aztec would have one, whereas the areas to the west would have four? I am assuming that we are not trading 40 acre tracts in any manner?

A Then we would have one producing well to their four or

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possibly live.

Q So that it would produce more oil and a sizable production to it or to an operator for us. One other point, as I said, I brought his proposal in regarding the lease-lane situation from Exhibit 7, was that it was to drill an additional well north of our 1-A. If you will refer to your Exhibit 1, you will notice that there is a tract there with Angelo's name on it, just off of our 40 acre wells?

A Yes.

Q Would you show what that exhibit shows, with relation to that well?

A A dry hole approximately 330 feet north of the half section line.

Q So, it might be conjecture whether it is possible to drill a producing well at the suggested location?

A Yes.

Q Perhaps his suggestion was that our Well 1-A not be converted to injection purposes, but that it be left as a producer in that situation. Would there be conformance to the existing pattern to the west?

A Not full.

Q Would this have any effect on the oil that you might expect to recover under that situation, under the well immediately north of the Number 3-R?

A Yes, no oil will be swept between those two wells.



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Q Do you think that proposed right stands in relation with the waterflood, the only way to reach the reservoir?

A Yes.

MR. MALLON: I have no further questions.

MR. PORTER: Anyone else have a question?

MR. MALLON: I have one, one question.

CROSS EXAMINATION

BY MR. LOSEE:

Q What practical experience have you had in the waterflood industry, Mr. Burrows?

A Well, I worked with waterflood off and on approximately four years with Aztec.

Q How many floods does Aztec operate?

A They are, they have approximately, I don't know exactly, in the order of 10 that we have an interest in, that are in various stages of study.

Q How many do you operate, does Aztec operate out of that 10 that they have an interest in?

A Well, we are not operating any that are actually pumping water at this time.

MR. LOSEE: Thank you.

MR. PORTER: Any other questions?

The witness may be excused.

(Witness excused.)



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Mr. PORTER: We suggest an opening statement to Mr. L.

Mr. L. LOSEE: Very short, please.

(Mr. L. LOSEE: I think we should start at 1:00 P.M.)

(The hearing was called to order by Mr. PORTER at 1:15 P.M.)

Mr. PORTER: The hearing will come to order, please. Is

there?

Mr. LOSEE: Mr. PORTER, a midstream stationer. The application of Aztec as to the location of the injection wells conflicts with the pattern that has already been established in this Robinson-Square Lake Field to the west which has been under operation from three to four years. This application for a to now hearing is based upon the firm belief of substantially all of the operators of the producing properties in the Robinson Pool that if the Aztec application and pattern is approved, that waste of secondary oil will occur not only in their areas of the Robinson Pool but in the Aztec area, and particularly so where the two conflicting patterns meet. I have two witnesses, Mr. Jennings and Mr. Sayers.

MR. PORTER: We will have them both sworn.

(Witnesses sworn.)

WALTER D. JENNINGS, called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. LOSEE:

Q Would you state your name, residence, and occupation?

A Walter D. Jennings, Midland, Texas, currently employed by



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Q What did you do in the summer of 1952?

A I worked for the Oklahoma Geological Survey.

Q How long?

A About three months, from May to August.

Q On which side of the country?

A You outlined it in your report.

Q Did you graduate with a BS degree from the University of Oklahoma?

A When did you graduate?

A 1953.

Q Since the date of your graduation, what positions have you held and by whom have you been employed?

A I was employed by Pan American Petroleum Company in 1955 as an Engineer, field capacity, and continued in that capacity until July of 1957, at which time I was moved to the Midland District Office and worked in the Reservoir Section for them and through 1960; at that time I went to work for BTA.

Q Since your graduation, have you attended any schools or seminars?

A I attended Pan American's logging school and their six-week reservoir course at the general office in Tulsa.

Q Have you had any practical experience with waterflood operations?

A As field experience, as far as laying pipe and watching the water go in the ground, I have relatively none. As far as the



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... of water oil engineer and ...
 concerned, the day ...
 Ambassadors ...
 I have been working for ...

MR. LOOSE: Mr. Foster, are the witnesses' qualifications accepted?

MR. FOSTER: Yes, sir, they are.

(By Mr. Loose) Mr. Jennings, are you familiar with the Robinson Pool area?

A I am.

Q Have you an opportunity to study this reservoir and its pay characteristics?

A Yes, I have.

(Whereupon, Protestant's Exhibits 1 through ... marked for identification.)

Q Please refer to what has been marked Protestant's Exhibit 1 and explain it. If the Commission will pardon the witness?

A Exhibit 1 is a map of the Grayburg, Square Lake, and Robinson area, showing the currently operating waterfloods in blue. The blue wells shown in this area are currently injecting water. Those in the red area have been permitted by this Commission for injection. The white circled areas are what I consider a logical extension of this existing pattern over into the Aztec pattern which is here (indicating). In about 1958, Ambassador initiated waterflooding in this six well area (indicating) as a pilot flood. It



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was abandoned, all oil was purchased by demand, and they continued the waterflood operations and did not expand it into this area or into this area (indicating); and last relief associated with the oil field and a new injection water line this area (indicating). The oil field areas have been shown on a larger scale in these other exhibits.

Q By the logical extension of this pattern, do you mean a logical five-spot extension?

A Yes, I do.

Q Please refer to your Exhibit 2 and explain what it portrays.

A Exhibit 2 is an idealized five-spot pattern which was formerly adopted by the Applicant for its waterflood. The blues are the injection wells. The blue area is that which would be flooded out with water, and the yellow where the oil will remain. I have divided this into three stages of water flooding. In the initial stage or Stage 1, radial extension of the water from this injection well, any of the six, goes out radially until such time -- and how far this radial extension goes is a function of the rock properties and the relative saturation in the rock and so it is very difficult to say how much radial extension you will have. At any rate, the next experience will be water break-through at producing wells. That is shown in the dark blue and we will call that stage 2. At that time, more or less an erosion effect of oil will take place, as this continues to produce a relatively high



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low rate. This area in there (indicating) is flooding. All
much of the oil of production will go, to be immaterial to
produce the remaining oil. If you stayed with it long enough, you
would get all that oil; but, as a matter of principle, people
don't stay with that long enough, because it is not economical.

I might point out that in this five-spot, you can see in the
absence of back-up surrounding in five-spot wells, if this is
expanded in this direction, this area, this direction, the oil
tends to squirt out, where it is not backed up and again, it is an
opinion from experience only that a pilot waterflood is only a
gauge as to whether waterflooding will work, for this reason, that
it squirts out up the opening and around the sides.

Q If one or both of the injection wells, or producing wells,
were missing from that five-spot pattern, does it radically effect
the recovery that is anticipated?

A Well any departure from the idealized five-spot will
result in waste. If this injection well here (indicating) were
left off, out of the pattern, there would be a considerable amount
of oil left in this area. How much, I couldn't say, but this well,
this producing well, here (indicating) would be watered out from
this well. Again, it is having to back up a well over here
(indicating) so that at some time, this well must be taking over
injection, because this well is watered out (indicating). The same
with this one (indicating). At that time, there will be some oil
left out there.



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Q Please refer to what has been marked as "Proclamation Exhibit No. 3" and explain what it portrays?

A Exhibit No. 3 is essentially an aerial map that has been blown up, showing the extension of the salt flat pattern to the field. The red wells are producing, the blue wells are currently injecting water in the wells or later, or of that property that has been permitted; and this is Aztec's fence line here (indicating) and, we have shown in previous testimony the inclusion of this 40 acre tract, the area pictured in yellow, are those operators who are either represented in this hearing as being opposed to this application, or have testimony to be entered by letter of their objection.

Q Under Aztec's proposed pattern, how many true idealized five-spot locations will they have?

A As you can see, if this was enclosed, they would have one idealized five-spot, with one three-way, one three-way here, (indicating) and a three-way there (indicating) and a two-way out there (indicating).

Q Now, if their proposed injection wells were made to conform with the existing pattern to the west, how many enclosed five-spot locations would they then have?

A We would have one, two, three fully enclosed five-spot and one two way five-spot and one two-way and one remote.

Q Please refer to what has been marked as "Exhibit 4" and explain what it portrays?



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A Again, this is a map of that pattern showing an irregular pattern, and injection wells are in an irregular pattern, not in a straight line. There was some a straight line shown on the map through this, if Aztec pattern was continuous in this direction, and this pattern continuous in this direction (indicating), unless there are two wells of water injection, probably the most amount of recovery would be received from this area (indicating) and consequently, the water coming from the west. First, it would be in my opinion an uneconomical venture to put these wells back to work without production from here (indicating). Secondly, in all oil fields with this rarity, in order to protect correlative rights in this area -- we will single out different properties. They have operated four wells in this area, one here (indicating), one here (indicating), one here (indicating) and one up here (indicating). Five, I beg your pardon. Of these, four would be water injection wells. In order to protect correlative rights, these must continue in order to recover their oil out of this area. In summation, I think this would recover the most amount of oil out of this area, if it would be economically justified.

Q Now, Mr. Jennings, is one method of taking care of the two conflicting patterns, as they meet?

A Yes, sir, it is.

Q That is not necessarily the place they meet?

A Somewhere between Aztec, it doesn't necessarily have to



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... (indicating) ...

Q Now your last ... (indicating) ...

A Exhibit 3 being open on would ... (indicating) ...

Q Mr. Jennings, I believe you have stated that would be the most economical, our plan on Exhibit 4. Why do you think the operators would not use that plan to meet the two conflicting patterns?

A Well, again, I stated economics, and I believe the operators that are in this field and operate in this field will realize that it is not any economic boon to mankind and I don't believe that it could have been supported economically.

Q Again, will you refer back to your Exhibit 3 and would you state the importance of the contribution by BTA to this 40 acre tract, your Well No. 3 to the unit area?

A Well, we have drawn their lease line on a staggered 160



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Q Well, do you think in that event

A That would be a good thing, I think. I think that would be a good thing, I think that would be a good thing.

Q Now, how many injection wells are there in the area?

A There are five injection wells in the area.

Q Under their proposed plan, how many injection wells will they have?

A They will have six injection wells and one, two, three, four, five, six, seven, eight, nine, ten producing wells.

Q Is that going to be the unbalanced injection to producing wells under their proposed plan, is that going to have any effect on the other operators to the west when the pattern meets?

A Well, of course, the ideal situation for everyone is to have two producing wells for two injection wells or each to have one injection and one producing. Any time you depart from that scheme, somebody is going to have to give up or get an extra producing well or injection well, and that is where it compensates adjoining parties.

Q After studying this pattern and their explanation, have you reached an opinion as to whether or not waste would or not occur in the Aztec project area under this proposed pattern of injection wells?

A Well, it is my opinion that if they were to conform to the pattern, that they will recover more oil only because they have several more enclosed five-spots than they have in the pattern



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which they were prepared. In any case, I believe, it is better to work out the other way, or to be able to work out the way were laid out any or for others.

Under their proposed pattern, is there any waste would occur in their pattern?

A If there were waste would occur in an enclosed div. up with three, under the report.

Q Now, in reference to the area due to the test, with their existing floods and their proposed floods, have you reached an opinion as to whether waste would occur in relation to the change of this waterflood pattern?

A Well, if the existing pattern is adhered to, I think waste will not occur.

Q You think waste will occur if it isn't?

A Yes, I do.

Q Do you have anything else to say about these exhibits?

A I do not.

Q Were these exhibits prepared by you?

A Yes.

MR. LOSSE: We move that Exhibits 1, 2 and 3 be admitted.

MR. PORTER: Without objection, we will admit Exhibits 1, 2 and 3.

(Whereupon Exhibits Nos. 1, 2, and 3 admitted in evidence.)

MR. PORTER: Mr. Swanson, do you have a question?



is that correct?

A That is correct.

Q Now, as far as your property is concerned, once more, and illustrate for me on Exhibit that would be a straight line for production purposes on each side of the line?

A Assuming inclusion of this tract?

Q Yes, sir.

A There would be a producing well, or, two, three.

Q Now, would you illustrate the wells available to the Aztec side of the line?

A Those were the Aztec wells.

Q I beg your pardon, my first question was what would be the wells available to the operators to the west for production purposes?

A There would be one, two, three.

Q Now, will you illustrate the available wells to the Aztec unit? in that same situation.

A One, two, and if you'd like to, three.

Q Well, would you like to?

A The number of producing wells is not the yardstick for determination of correlative rights.

Q You disagree with the Exhibit of what happens when your lease line is a line in a parallel direction with the injection row?

A The ideal case is straight up and down, this is correct.

Q What happens if you incline the common boundary to a 45

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Q Now angle, straight up and down?

A Well, certainly that depended on the other line, but I think --

Q Indicating.

A State the question again.

Q If you should align your injection wells parallel with your boundary line, that would be the effect, would correlating rights be preserved as portrayed in your exhibit, if they align vertically up and down?

A Is that for figure 2?

Q Yes.

A Well, I think it was adequately covered, but if you have any questions --

Q If we do consider the last well that you pointed out, that I consider with much hesitation, would it be conceivable to receive any oil by offset injection wells?

A This would be an injection well, on the proposed pattern that would be the extension.

Q Well, that would be an injection well on our side?

A It would be, if you choose to make it an injection well.

Q Do you have an offsetting injection well on your side of the line to push the oil to it?

A That would be the well (indicating).

Q So that it is unfair to say that it's as close to the



Underway?

A Well, it's as clear as this well.

Well, I think it's a pretty good illustration of the common boundary, that is the problem we have.

Mr. SWANSON: I think there is nothing further, Mr. Porter.

Mr. PORTER: Does anyone else have a question? Mr. ROSE - do you have a question?

Mr. ROSE: Yes.

REDIRECT EXAMINATION

BY MR. ROSE:

Q Mr. Jennings, you stated that the number of injection wells on the lease line was not necessarily the yardstick to determine correlative rights. Would you elaborate on that statement?

A Well, we have heard much today on the number of producing wells and the number of injection wells. I don't see why it isn't self-explanatory, that if you have two producing and two injection wells, that this is not balanced, assuming backup in every direction. There is an edge of the field last, and so inequities are going to occur. I have tried to say that, but along these common boundaries, Aztec has the option to drill these wells, if they wish to; and, then, there is a perfect 160 that way. If it turns out that the flood stops here, one is going to have one more than the other has.

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Mr. LOSSE: I will start in 1951.

Mr. LOSSE: Please carefully place into my questions of the witness. The witness is, of course,

(also so excused.)

Mr. FORMAN: Give your best witness, please.

JACK SAYERS, called as a witness, having first been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. LOSSE:

Q Will you state your name, residence and occupation?

A My name is Jack Sayers, I live in Artesia, New Mexico, I am a Petroleum Engineer with Waterflood Associates.

Q You have not previously testified before this Commission?

A No, I haven't.

Q Where did you obtain your public education?

A At Cushing High School, Cushing, Oklahoma.

Q Did you graduate?

A Yes, sir.

Q What college have you attended and what degrees have you received?

A I attended Tulsa University, and obtained a BS degree in Engineering.

Q What year?

A '59.

Q Since graduation by whom have you been employed?



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A I was with the old company for about a year and a half.

A I was with the old company for about a year and a half. I was with the old company for about a year and a half. I was with the old company for about a year and a half.

Q What happened when you had to leave the old company?

A Well, when I was with the old company, they started a waterflood in the company field in 1955, and I was working in June of 1956 and I became engineer up until the time we sold out.

Q How many wells in that project?

A 43 wells.

Q Since your graduation from school, were you in any special training schools?

A I attended an advanced reservoir engineering course at Texas A and M, that is an advanced course.

MR. LOSEE: Mr. Porter, are the witness's credentials satisfactory?

MR. PORTER: Yes, they are.

Q (By Mr. Losee) Mr. Sayers, does Waterflood Associates have any wells in the Robinson-Grayburg Pool area?

A Yes, they do.

Q Approximately how many?

A Approximately 17.

Q Have you made a study of the reservoir characteristics of this pool?



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A. Yes, sir, I have. I think if these proposed injection wells were approved, their placement would certainly be set and it would be detrimental not only in this field but in many other fields in New Mexico.

Q. This, sir, in my mind, certainly will occur if the established pattern is not followed.

Q. Have you ever formed any opinion with respect to whether or not the placement in operation of multiple patterns would hinder further negotiations for these land agreements?

A. Yes, sir, I have. I think if these proposed injection wells were approved, their placement would certainly be set and it would be detrimental not only in this field but in many other fields in New Mexico.

Q. This 160 acre tract that offsets Aztec's area, described as the Northwest Quarter of Section 36 as shown on the map, Exhibit 3 to be owned by Brinson and Woodall, has your company made negotiations to purchase this tract?

A. Yes, sir, we have.

Q. Have you concluded those negotiations?

A. No, sir.

Q. Do you know why?

A. Well, it was because of the irregular or the proposed injection wells of Aztec, which did not conform to the established pattern in the field.

MR. LOSEE: I have no further questions.



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Q. Now, in your opinion, should Aztec's proposed

approval, and then, and production of that same oil, should be produced under the existing pattern?

A. Yes, sir, I believe so much. In fact?

Q. Yes.

A. No, not in excess.

Q. Should the suggestions put forth by you and Mr. Jennings today to approved by the Commission or agreed to by Aztec, that is, leaving out the 40 acre tract, should we conform with the existing pattern, would any oil from Aztec be produced by leaches to the west by counter-drainage?

A. Well, there possibly would. I haven't made enough of a study of the two patterns.

MR. SWANSON: That's all.

MR. FORTER: Does anyone else have a question?

The witness may be excused.

(Witness excused)

MR. LOSEE: At this time, I have some letters, which I would like to quickly read into the record.

"Oil Conservation Commission

P. O. Box 871

Santa Fe, New Mexico

Gentlemen:



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It is the policy of this company to report to the client the results of its operations in the oil and gas industry.

All of our reports are prepared by experienced engineers and geologists, who are members of the American Institute of Professional Engineers, and who are also members of the American Association of Petroleum Engineers. Our reports are prepared in accordance with the standards of the American Institute of Professional Engineers, and are subject to the review and approval of the American Association of Petroleum Engineers.

If the pattern in the subject area is not uniform, it is recommended that the pattern be changed to a five-spot pattern. This is because the five-spot pattern is the most efficient pattern for waterflood operations, and it is the only pattern that can be used in a five-spot pattern.

Very truly yours,

FOR MR. PORTER, JR., INC.

s/ A. P. Giddell
A. P. Giddell

"New Mexico Oil Conservation Commission
P. O. Box 371
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr. Secretary

Dear Sir:

Western Development Company of Delaware, as an overriding royalty owner in three wells in the Square Lake Pool, concurs with Waterflood Associates, Incorporated, in their position on pattern flooding within the subject area. Deviation from the established five-spot pattern would result in an inefficient water flood sweep and secondary recovery would be substantially decreased, resulting in waste. We feel the present established pattern should be continued throughout the pool area in the interests of conservation and the protection of correlative rights.

Very truly yours,

WESTERN DEVELOPMENT COMPANY
of Delaware

s/ A. J. Davenport
A. J. Davenport
Production Superintendent



"Oil Conservation Commission

P. O. Box 871

Santa Fe, New Mexico

Gentlemen:

As an operator and royalty owner in the Robinson Pool, Albi County, New Mexico, I find it extremely important in the application of Waste Oil & Gas Company, Inc. application project case No. 2815.

The well pattern approved by the examiner bearing in Order No. A-2304 is in direct conflict with the already pattern heretofore approved by other operators in the Robinson Pool as well as the Square Lake Pool. If as confirmed when these two injection patterns meet both the operator and royalty interest owner will suffer. Therefore I object to Order No. A-2304.

Yours truly

s/ H. L. Brinson

H. L. Brinson"

"N. M. Oil Conservation Commission

Box 871

Santa Fe, New Mexico

Gentlemen:

The Kennedy Oil Company thoughts concerning the changing of an established waterflood injection pattern, within a given area, is that the change is not in the interest of conservation, and that waste will occur.

This waste of recoverable oil, where off patterns meet, will cause reduced secondary recoveries, and effect economics in the contact area.

Very truly yours,

KENNEDY OIL COMPANY

s/ Robert B. Kennedy

Robert B. Kennedy
Vice President"



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"Mr. Hal C. Porter:
Waterflood Association
301 South Main
Albany, New York

Dear Mr. Porter:

Regarding the letter heading of October 10, 1947
to the Newmont Oil & Gas Company's proposed change in
injection pattern in the Robinson Pool, Newmont Oil Company
supports your protest to this change.

If the proposed change is effected, it appears that there
is a significant question as to whether or not water rights
are being adequately protected. There is also a good possibility
that waste will occur.

In our opinion, continuation of the established pattern
would make cooperation among the many operators in the area
easier to reach and thereby would more efficiently flood this
reservoir, and insure protection of correlative rights. We there-
fore concur that the established pattern should be maintained
throughout this area.

Yours very truly,

NEWMONT OIL COMPANY

s/ Herman J. Ledbetter

Herman J. Ledbetter
Superintendent"

I move that these five letters be made a part of the record
in this case.

MR. PORTER: Any objection to the Counsel's motion?

The letters will be admitted to the record.

MR. LOSER: That is the Protestant's case.

MR. PORTER: Does anyone else have any statements to
present at this time?

MR. SWANSON: Yes, sir. I will try to simplify what has



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and work. Sept. 2. I am sure it is likely we will probably
make an attempt at something. In fact, I have been thinking
that, if we can get some more information about the
arrangement to find a boundary for it, we may be able to do so
and the installation of a well or two pieces of similar units.
Perhaps we haven't as much time as we should have been. We don't
think there was no intention in the location of such a unit, so this
unit acreage owned by Jackson and Union in the southeast portion.
So we necessarily had to resort to some other technique which
would, without creating waste, protect correlative rights. I think
it has been obvious that without some sort of adjustment, it would
be materially out of balance. Witnesses for the opponent said that
this would be the case. We have introduced evidence which clearly
shows that there would be no waste involved. This would be done by
converting additional wells to injection at an early enough date
that the corridor would be flooded out at the same time that the
acreage to the west of it would be flooded out. I don't see that
this is going to cause much waste if it is completed. Now, it is
based on an assumption. We have agreed that this would not be a
solution.

The letters which have been introduced in testimony, unfortunately the people weren't here to see and perhaps understand what plan we have to solve this problem. We would be the first to state that certainly a problem is posed by this situation and does call for some solution. We feel that this is a feasible solution. It



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has not been attached to the claim to show any correlation of
correlation of the; that is, the fact that the Commission is
in.

A. L. LARSEN: Mr. Jones?

A. L. LARSEN: The Commission has been called upon to
appeal a change in injection well patterns already existing in a
pool. We realize that there exists in other states a variety of
injection well patterns under waterflood programs, probably
caused by the diverse spacing regulations and rules of those
states. However, we realize and are proud of the fact that spacing
regulations and decisions in this state follow a regular pattern and
generally result in recovery of greater volume of oil, with the
least amount of expense to the operator. We feel that this
Commission should follow this primary practice in the secondary
recovery field.

It seems obvious in this case that the offset operators of the
Aztec project area, that the applicant in this case would have only
six initial injection wells out of a total of 16 and will not bear
its fair share of the burden of recovering the secondary oil. The
testimony of the protestant we think conclusively shows that a
continuation of the existing pattern in the Robinson Pool will
recover the greatest volume of secondary oil. I believe the
applicant's witnesses agreed with that statement. In addition, we
think the testimony of the protestant's witnesses is to that effect
particularly where the two conflicting flood patterns meet. Now,



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...and
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The Correlation of



CERTIFICATE

STATE OF NEW MEXICO)
)
 COUNTY OF BERNALILLO) ss

I, STEPHEN McCRYSTAL, 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.

Stephen M. Crystal

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NEWMONT OIL COMPANY

300 BOOKER BUILDING
ARTESIA, NEW MEXICO

October 4, 1962

NEW MEXICO
DISTRICT OFFICE

Mr. Hal C. Porter
Waterflood Associates
301 Booker Building
Artesia, New Mexico

Dear Mr. Porter:

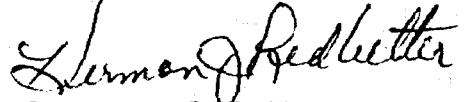
Regarding the de novo hearing of October 18, 1962 to protest Aztec Oil & Gas Company's proposed change in injection pattern in the Robinson Pool, Newmont Oil Company supports your protest to this change.

If the proposed change is effected, it appears that there is a significant question as to whether correlative rights are being adequately protected. There is also a good possibility that waste will occur.

In our opinion, continuation of the established pattern would make cooperation among the many operator's in the area easier to reach and thereby would most efficiently flood this reservoir, and insure protection of correlative rights. We therefore concur that the established pattern should be maintained throughout this area.

Yours very truly,

NEWMONT OIL COMPANY



Herman J. Ledbetter
Superintendent

HJL-sf

Kennedy Oil Company

--- OIL PRODUCERS ---

P. O. Box 151

Artesia, New Mexico

October 16, 1962

N.M. Oil Conservation Commission
Box 871
Santa Fe, New Mexico

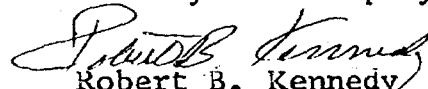
Gentlemen:

The Kennedy Oil Company thoughts concerning the changing of an established waterflood injection pattern, within a given area, is that the change is not in the interest of conservation, and that waste will occur.

This waste of recoverable oil, where off patterns meet, will cause reduced secondary recoveries, and effect economics in the contact area.

Very truly yours,

Kennedy Oil Company


Robert B. Kennedy
Vice President

RBK:b

PHONES
OFFICE MU 3-1352
RES. MU 4-7196

H. L. BRINSON
OIL PRODUCER
MIDLAND NATIONAL BANK BLDG.
BOX 314
MIDLAND, TEXAS

October 17, 1962

Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Gentlemen:

As an operator and royalty owner in the Robinson Pool, Eddy County, New Mexico, I find I am extremely interested in the application of Aztec Oil & Gas Company for a water-flood project Case No. 2615.

The well pattern approved by the examiner hearing in Order No. R-2304 is in direct conflict with the orderly pattern heretofore adopted by other operators in the Robinson Pool as well as the Square Lake Pool. I am confident when these two injection patterns meet both the operator and royalty interest owner will suffer. Therefore I object to Order No. R-2304.

Yours truly


H. L. Brinson

Western Development Company *of Delaware*

~~65 GLEN PLAZA, SANTA FE, NEW MEXICO~~
~~TELEPHONE TOLCO 1-5568~~
~~P. O. BOX 427 ARTEZIA, NEW MEXICO~~

October 16, 1962

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr., Secretary

Dear Sir:

Western Development Company of Delaware, as an overriding royalty owner in three wells in the Square Lake Pool, concurs with Water Flood Associates, Incorporated, in their position on pattern flooding within the subject area. Deviation from the established five-spot pattern would result in an inefficient water flood sweep and secondary recovery would be substantially decreased, resulting in waste. We feel the present established pattern should be continued throughout the pool area in the interests of conservation and the protection of correlative rights.

Very truly yours,

WESTERN DEVELOPMENT COMPANY
of Delaware


R. J. Davenport
Production Superintendent

RJD:cm

DOB OIL PROPERTIES, INC.
WESTERN BUILDING
MIDLAND, TEXAS

MUTUAL 3-2002

October 17, 1962

Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Gentlemen:

This is in regard to the application of Aztec Oil and Gas Company for a water flood, Case No. 2615.

As an operator in the Robinson Field in Eddy County, New Mexico, we hereby object to the authorized pattern for injection wells, Order No. R-2304, because the pattern does not conform to that established by Newmont Oil Company, Waterflood Associates, and Sinclair Oil & Gas Company in their operated and proposed flood areas.

If the pattern initiated by Aztec is adjoined to that pattern already established, we believe correlative rights will be almost impossible to protect and waste will occur where the two flood patterns coincide.

Yours very truly,

DOB OIL PROPERTIES, INC.


A. F. Giebel

AFG:ms

Case 2015

AZTEC OIL & GAS COMPANY

920 MERCANTILE SECURITIES BLDG.
DALLAS 1, TEXAS

July 6, 1962

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. A. L. Porter, Jr., Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: Application of Aztec Oil & Gas
Company for Hearing on Waterflood
Project for a Portion of the
Robinson Grayburg-San Andres
Oil Pool, Lea and Eddy Counties,
New Mexico

Dear Mr. Porter:

Application is hereby made by Aztec Oil & Gas Company for approval of a waterflood project to be known as the Aztec-Robinson Waterflood Project. The proposed project would cover the area described by sections or subdivisions thereof set out in Exhibit "A" and designated on the plat attached hereto as Exhibit "B".

It is proposed that water obtained from the Caprock Water Company, or some other commercial source of supply, will be injected into the Grayburg formation encountered at a depth of approximately three thousand eight hundred and fifty feet (3,850') through approximately six (6) injection wells. It is expected that injection will commence at a rate of approximately five hundred (500) barrels per day per injection well.

The casing program of the proposed injection wells is shown on Exhibit "C".

Logs of the proposed injection wells are enclosed with this application.

A list of the names and addresses of all the lessees within a two mile radius of the proposed project area known to applicant is appended to this application.

Pursuant to Rule 701, Aztec Oil & Gas Company respectfully requests permission for such waterflood project and requests that the matter be

Mr. A. L. Porter, Jr.

-2-

July 6, 1962

set for hearing at an early date.

Respectfully submitted,

ASTEC OIL & GAS COMPANY

By Kenneth A. Swanson
Kenneth A. Swanson
Attorney

KAS/et

cc: All Lessees Within
a Two-Mile Radius

EXHIBIT "A"

Aztec-Robinson Waterflood Project Area

Township 16 South, Range 31 East, N.M.P.M.

Section 36: $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$

Township 16 South, Range 32 East, N.M.P.M.

Section 30: SW $\frac{1}{4}$ SW $\frac{1}{4}$

Section 31: $\frac{1}{4}$ N $\frac{1}{2}$, $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$

(containing 600.00 acres, more or less)

Lea and Eddy Counties, New Mexico

AZTEC OIL & GAS COMPANY

Casing Programs
Producing Wells to be Converted to Injection Wells
Robinson Pool
Ica and Eddy Counties, New Mexico
Proposed Aztec-Robinson Waterflood Project
EXHIBIT "C"

Well No.	Location	Surface Casing				Production Casing				Injection Equipment			Perfs
		Casing	Cement	Casing	Cement	Bridge Plug	Injection Tubing						
		Size OD (")	Depth (')	Top Depth (')	Base Depth (')	Size OD (")	Depth (')	Sx Depth (')	Top Depth (')	Depth (')	Size OD (")	Est. Depth Plr (')	
State "NO" #1	650 FSL, 1900 FTL, Sec. 36-16S-31E	8-5/8	333	250	Surface 333	4-1/2	3997	225	2325-3997	-	2-3/8	3770	3753-59 3798-3809 3814-20 3823-31 3834-40
State "NO" #1	1900 FSL, 650 FTL Sec. 31-16S-32E	8-5/8	330	250	Surface 330	4-1/2	4020	200	2775-4020	3900	2-3/8	3725	3776-84 3815-19 3824-32 3835-40 3845-56 3968-78
Trinson Fed. #1	1980 FTL, 2240 FTL, Sec. 31-16S-32E	8-5/8	330	350	Surface 330	4-1/2	4018	225	2325-4018	-	2-3/8	3750	3800-06 3834-48 3859-67

Well No.	Location	Surface Casing				Production Casing				Injection Equipment			Perfs
		Casing		Cement		Casing		Cement		Bridge Plug	Injection Tubing		
		Size OD (")	Depth (')	Top Depth (')	Base Depth (')	Size OD (")	Depth (')	Top Depth (')	Base Depth (')	Depth (')	Size OD (")	Est. Depth Pkr (')	
Drinson Fed. #3	1960 FTL, 660 FTL, Sec. 31-168-32E	8-5/8	330	250	Surface 330	4-1/2	4085	225	2350-4085	Previously set at 3970	2-3/8	3800	3248-54 3882-88 3890-92 3903-09 4010-54
State "N" #3	990 FTL, 1700 FTL, Sec. 31-168-32E	8-5/8	331	250	Surface 331	4-1/2	4215	200	3005-4215	3900	2-3/8	3750	3806-18 3823-48 3957-71
Jumble State "A" #3	1800 FTL, 1980 FTL, Sec. 31-168-32E	10-3/4	360	100	Surface 360	5-1/2	4033	200	- 4033	-	2-3/8	3750	3805-08 3841-69

JES/et
7-0-62

A. J. LOSEE
EDWARD B. STEWART

LAW OFFICES
LOSEE AND STEWART
CARTER BUILDING - P. O. DRAWER 239
ARTESIA, NEW MEXICO

10 September 1962

Mr. A. L. Porter, Jr., Secretary
New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Re: Application of Aztec Oil & Gas Company for a
secondary recovery project in the Robinson
Pool, Case No. 2615, Order No. R-2304

Dear Mr. Porter:

Enclosed herewith is Application of Water-Flood Associates, Inc.
and BTA Oil Producers for a de novo hearing before the Oil
Conservation Commission of New Mexico on the subject application.

This Application is submitted in triplicate and we are furnishing
each of the parties that receive a carbon of this letter with a
copy of this application.

Our clients' only complaint is with the location of the injection
wells. If permissible under the rules and if desired by the
Commission, the de novo hearing might well be limited to evidence
on the location of the injection wells.

If there is any further information I can furnish you in connec-
tion with this matter, please do not hesitate to advise me.

Very truly yours,


A. J. Losee

AJL/bk
Enclosures

cc Mr. Richard Morris
Seth, Montgomery, Federici and Andrews
Box 871
Santa Fe, New Mexico

DOCKET MAILED

Date 10-4-62
jk

Mr. A. L. Porter, Jr., Secretary
Page -2-
10 September 1962

cc Aztec Oil & Gas Company
920 Mercantile Securities Building
Dallas 1, Texas

BTA Oil Producers
104 S. Pecos
Midland, Texas
Attention: Mr. Walter D. Jenkins

Mr. Hal Porter
Water-Flood Associates, Inc.
Booker Building
Artesia, New Mexico

DOCKET MAILED

~~Date~~_____

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF :
AZTEC OIL & GAS COMPANY FOR A SECONDARY :
RECOVERY PROJECT, ROBINSON GRAYBURG-SAN : Case No. 2615
ANDRES POOL, LEA AND EDDY COUNTIES, NEW :
MEXICO. :
:

APPLICATION FOR DE NOVO HEARING

COMES WATER-FLOOD ASSOCIATES, INC., and BTA OIL
PRODUCERS by their attorneys, Losee and Stewart, and respect-
fully state:

1. That on August 13, 1962, the Oil Conservation
Commission of New Mexico, hereinafter referred to as the
"Commission", pursuant to a hearing held by Daniel S. Nutter,
Examiner, on August 8, 1962, entered its Order Number R-2304
authorizing Aztec Oil & Gas Company to institute a waterflood
project in the Robinson Grayburg-San Andres Pool, Lea and
Eddy Counties, New Mexico, hereinafter referred to as the
"Robinson Pool", by the injection of water into the Grayburg
formation through the wells hereinafter described and provid-
ing that the waterflood project would be governed by the
provisions of Rule 701 and that the Commission would retain
jurisdiction of the cause for the entry of such further orders
as may be necessary.

2. That Water-Flood Associates, Inc., operates 17
wells within said Robinson Pool and is the owner of the
following developed and undeveloped acreage in said pool,
to-wit:

Township 16 South, Range 32 East, N.M.P.M.

Section 30: SE/4

Township 16 South, Range 31 East, N.M.P.M.

Section 25: SW/4 NE/4, SW/4, N/2 SE/4,
SW/4 SE/4

Section 35: N/2, SW/4, W/2 SE/4.

3. That BTA Oil Producers operates 5 wells within said Robinson Pool and is the owner of the following developed and undeveloped acreage in said pool, to-wit:

Township 16 South, Range 31 East, N.M.P.M.

Section 36: NW/4 SE/4, SW/4, N/2 NW/4,
SW/4 NW/4.

4. That Commission Order Number R-2304 authorized the injection of water into the Grayburg formation through the following described wells:

State "RC" Well No. 1, Unit L, Section 31,
Township 16 South, Range 32 East;

State "RC" Well No. 3, Unit P, Section 36,
Township 16 South, Range 31 East;

State "R" Well No. 3, Unit N, Section 31,
Township 16 South, Range 32 East;

Brinson Federal Well No. 1, Unit F, Section 31,
Township 16 South, Range 32 East;

Brinson Federal Well No. 3, Unit B, Section 31,
Township 16 South, Range 32 East; and

Humble State "A" Well No. 3, Unit J, Section 31,
Township 16 South, Range 32 East.

5. That on June 21, 1962, the Commission entered its Order Number R-2270 in Case Number 2580 authorizing Water-Flood Associates, Inc., to institute a waterflood

project in the Robinson Pool by the injection of water into the Grayburg formation through the following described wells:

Kennedy-Johnson "A" Well No. 4, Unit E,
Section 35, Township 16 South, Range 31 East;

Kennedy-Johnson "A" Well No. 5, Unit O,
Section 35, Township 16 South, Range 31 East;

Carper-Johnson "A" Well No. 1, Unit G,
Section 35, Township 16 South, Range 31 East;

Carper-Johnson "A" Well No. 3, Unit K,
Section 35, Township 16 South, Range 31 East;

Water-Flood Associates, Inc., undeveloped
location, Unit C, Section 35, Township 16
South, Range 31 East;

Water-Flood Associates, Inc., undeveloped
location, Unit M, Section 35, Township 16
South, Range 31 East.

The location of these injection wells was an extension of the already established pattern and authorized injection wells of Newmont Oil Company in the Square Lake Pool adjoining the Robinson Pool on the West. Water-Flood Associates, Inc., is presently converting 4 of the above wells into injection wells in conformity with this Order.

6. The injection well pattern authorized by Order R-2304, does not adhere or conform to the injection well pattern established by the previously entered Order R-2270 and therefore at such time as the two opposite injection patterns meet in the Robinson Pool, waste will occur and correlative rights will not be protected.

7. That Applicants are parties adversely affected by that portion of Commission Order Number R-2304 authorizing

the injection of water into the Grayburg formation through the wells described in paragraph number 4 hereof.

WHEREFORE, Applicants pray the orders of the Commission as follows:

(1) That this matter be set for a de novo hearing before the Commission at the next regular hearing date following the expiration of 15 days from the date this application is filed with the Commission and due notice be given thereof as required by law;

(2) That if desired by the Commission and permissible under the rules, such de novo hearing be limited to evidence on the location of the proposed injection wells of Aztec Oil & Gas Company in the project area;

(3) That Commission Order Number R-2304 be modified to authorize an injection well pattern for Aztec Oil & Gas Company which will conform to the established injection well pattern previously authorized in the Robinson Pool and in the adjacent Square Lake Pool; and

(4) For such other relief as may be just in the premises.

WATER-FLOOD ASSOCIATES, INC.
BTA OIL PRODUCERS

By _____

A. J. Losee of
LOSEE AND STEWART
Attorneys at Law
P. O. Drawer 239
Artesia, New Mexico

DOCKET MAILED

Date 10-4-62

GOVERNOR
EDWIN L. MECHEM
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER



STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

P. O. BOX 671
SANTA FE

November 21, 1962

Mr. A. J. Losee
Losee & Stewart
Attorneys at Law
Box 239
Artesia, New Mexico

Re: Case No. 2615
Order No. R-2304-A
Applicant:
Waterflood Associates, Inc.

Dear Sir:

Enclosed herewith are two copies of the above-referenced
Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x

Artesia OCC x

Artec OCC

OTHER Mr. Kenneth Swanson

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 2615
Order No. R-2304-A

APPLICATION OF WATERFLOOD ASSOCIATES, INC.
FOR A HEARING DE NOVO IN CASE NO. 2615,
ORDER NO. R-2304, APPLICATION OF AZTEC OIL
& GAS COMPANY FOR A WATERFLOOD PROJECT,
ROBINSON POOL, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing de novo at 9 o'clock a.m. on October 18, 1962, at Farmington, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 21st day of November, 1962, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Aztec Oil & Gas Company, is the operator of certain leases comprising, in part, the following-described acreage in Lea and Eddy Counties, New Mexico:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
Section 36: E/2 SE/4 and SW/4 SE/4

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 30: SW/4 SE/4
Section 31: W/2, W/2 E/2, and SE/4 SE/4

(3) That the applicant seeks permission to institute a secondary recovery project in the Robinson Grayburg-San Andres Pool on the above-described acreage, by the injection of water into the Grayburg formation through the following-described wells:

State "BC" Well No. 1, Unit L, Section 31, Township
16 South, Range 32 East;

State "RC" Well No. 3, Unit P, Section 36, Township
16 South, Range 31 East;
State "R" Well No. 3, Unit N, Section 31, Township
16 South, Range 32 East;
Brinson Federal Well No. 1, Unit F, Section 31,
Township 16 South, Range 32 East;
Brinson Federal Well No. 3, Unit B, Section 31,
Township 16 South, Range 32 East; and
Humble State "A" Well No. 3, Unit J, Section 31,
Township 16 South, Range 32 East.

(4) That although Aztec Oil & Gas Company's proposed pattern for water injection wells may be out of phase with a previously established pattern to the west, such rearrangement of pattern is necessary to provide adequate protection of correlative rights.

(5) That the pattern as proposed by Aztec Oil & Gas Company, including the later conversion of two additional wells to water injection, should result in a thorough and efficient sweep of the oil in the subject area, thereby allowing the ultimate recovery of otherwise unrecoverable oil.

(6) That the applicant should be permitted to institute a waterflood project on the above-described acreage by the conversion to water injection of the above-described wells; provided, however, that applicant's State "RC" Well No. 2, located in Unit I of Section 36, Township 16 South, Range 31 East, NMPM, Eddy County, New Mexico, and its State "R" Well No. 3, located in Unit C of Section 31, Township 16 South, Range 32 East, NMPM, Lea County, New Mexico, should also be converted to water injection when the efficiency of sweep by previously authorized water injection wells would be augmented thereby.

(7) That the Commission, after notice and hearing, should order additional wells placed on water injection if it is determined that such action is necessary in order to protect correlative rights and prevent waste.

(8) That the wells on the subject leases have reached an advanced stage of depletion and should be classified as "stripper" wells; that, accordingly, the subject project should be governed by the waterflood provisions of Rule 701.

IT IS THEREFORE ORDERED:

(1) That Aztec Oil & Gas Company is hereby authorized to institute a waterflood project in the Robinson Grayburg-San Andres Pool, Lea and Eddy Counties, New Mexico, by the injection of water into the Grayburg formation through the following-described wells:

State "RC" Well No. 1, Unit L, Section 31, Township
16 South, Range 32 East;

-3-

CASE No. 2615

Order No. R-2304-A

State "RC" Well No. 3, Unit P, Section 36, Township 16 South, Range 31 East;
State "R" Well No. 3, Unit N, Section 31, Township 16 South, Range 32 East;
Brinson Federal Well No. 1, Unit F, Section 31, Township 16 South, Range 32 East;
Brinson Federal Well No. 3, Unit B, Section 31, Township 16 South, Range 32 East; and
Humble State "A" Well No. 3, Unit J, Section 31, Township 16 South, Range 32 East.

(2) That Aztec Oil & Gas Company shall convert its State "RC" Well No. 2, located in Unit I of Section 36, Township 16 South, Range 31 East, NMPM, Eddy County, New Mexico, and its State "R" Well No. 3, located in Unit C of section 31, Township 16 South, Range 32 East, NMPM, Lea County, New Mexico, to water injection when the efficiency of sweep of the above-described injection wells will be augmented thereby.

(3) That the project area for said waterflood project shall comprise the following-described acreage:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
Section 36: E/2 SE/4 and SW/4 SE/4

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 30: SW/4 SE/4
Section 31: W/2, W/2 E/2, and SE/4 SE/4

subject to approval by the Regional Supervisor of the United States Geological Survey and the Commissioner of Public Lands for the State of New Mexico.

(4) That the subject waterflood project shall be governed by the provisions of Rule 701.

(5) That Order No. R-2304 entered by the Commission on August 13, 1962, is hereby superseded.

(6) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


EDWIN L. MECHEM, Chairman


E. S. WALKER, Member


A. L. PORTER, Jr., Member & Secretary

esf

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

EXHIBIT No. 2
DATE 2-6-67

C O R R E C T E D

AZTEC OIL & GAS COMPANY

Casing Programs
Producing Wells to be Converted to Injection Wells
Robinson Pool
Lee and Eddy Counties, New Mexico
Proposed Aztec-Robinson Waterflood Project

EXHIBIT "C"

Well No.	Location	Surface Casing		Production Casing		Injection Equipment		Perfs
		Casing	Cement	Casing	Cement	Bridge Plug	Injection Tubing	
		Size OD (")	Depth (')	Size OD (")	Top Depth (')	Base Depth (')	Size OD (")	Est. Depth Pkr (')
State "RC" #3	660 FSL, 660 FTL Sec. 36-16S-31E	8-5/8	326	4-1/2	3991	3900	2-3/8	3700
			250 Surface		200 2640 - 3991			3752-54 3756-62 3796-3800 3803-09 3811-17 3819-26' 3828-30 3834-37 3948-60
State "RC" #1	1980 FSL, 660 FTL Sec. 31-16S-32E	8-5/8	330	4-1/2	4020	3900	2-3/8	3725
			250 Surface		200 2775 - 4020			3776-84 3815-19 3824-32 3835-40 3845-56 3968-78
Brinson Fed. #1	1980 FTL, 2240 FTL Sec. 31-16S-32E	8-5/8	330	4-1/2	4018	-	2-3/8	3750
			350 Surface		225 2325 - 4018			3800-06 3834-48 3859-67

EXHIBIT "C"
Page 2

Well No.	Location	Surface Casing		Production Casing		Injection Equipment		Perfs				
		Casing	Cement	Casing	Cement	Bridge Plug	Injection Tubing					
		Size OD (")	Depth (')	Size OD (")	Depth (')	Top Depth (')	Base Depth (')	Depth (')	Size OD (")	Est. Depth Pkr (')		
Brinson Fed. #3	1980 FEL, 660 FNL Sec. 31-16S-32E	8-5/8	330	250 Surface	350	4-1/2	4085	225	2350 - 4085	2-3/8	3800	3848-54 3882-88 3890-92 3903-09 4040-54
State "A" #3	590 FSL, 1700 FNL Sec. 31-16S-32E	8-5/8	331	250 Surface	331	4-1/2	4215	200	3005 - 4215	2-3/8	3750	3806-18 3823-48 3957-71
Humble St. "A" #3	1880 FSL, 1980 FEL Sec. 31-16S-32E	10-3/4	360	100 Surface	360	5-1/2	4033	200 -	4033	2-3/8	3750	3805-08 3841-69
JFB:eta 8-1-62												

JFB:eta
8-1-62

AZTEC OIL & GAS COMPANY

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT NO. 1
CASE 2615

Data Sheet
Reservoir Rock and Fluid Properties
Northeast Robinson Pool
Lea and Eddy Counties, New Mexico

Proposed Aztec Robinson Waterflood Project

Original Reservoir Pressure, psig @ +150 Ft	1160
Reservoir Temperature, °F	90
Estimated Original Solution GOR, Cu Ft/Bbl	500
Estimated Formation Volume Factor @ 1160 psig, Bbls/Bbl	1.25
Average Gravity of Crude, °API	36
Producing Mechanism	Solution Gas Drive
Average Porosity, %	15.6
Average Permeability (Air), md	10.2
Average Permeability (Water), md	2.8
Average Permeability (Oil), md	4.5
Average Water Saturation, %	49.2
Average Net Pay in Premier Zone, Ft	10
Gas-Oil or Water-Oil Contacts in Premier	None Indicated
Type Accumulation	Stratigraphic Trap

JFB:gta
7-31-62

July 17, 1962

Aztec Oil and Gas Company
920 Mercantile Securities Building
Dallas, Texas

ADDITIONAL COPY

Attention: Mr. J. F. Burrows

Re: Injection Water for
Robinson Field Area

Gentlemen:

Please be advised that Caprock Water Company has injection water available to serve your project, and we are willing to furnish the necessary water to you at your plant site.

Yours very truly,

CAPROCK WATER COMPANY

H. N. Morgan
H. N. Morgan

HNM/ee

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
AZTEC EXHIBIT No. 4
2615
ONE

DOCKET: EXAMINER HEARING - WEDNESDAY - AUGUST 8, 1962

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or
Elvis A. Utz, as alternate examiner:

CASE 2009: (Reopened)

Application of Gulf Oil Corporation for a four-month extension of the effectiveness of Order No. R-1726, Lea County, New Mexico. Applicant, in the above-styled cause, seeks a four-month extension of the effectiveness of Order No. R-1726, which established a temporary 200-acre non-standard gas proration unit in the SW/4 and the SW/4 SE/4 of Section 23, Township 22 South, Range 37 East, Blinebry Gas Pool, Lea County, New Mexico.

CASE 2612: Application of Texaco Inc. for a tubing exception, Lea County, New Mexico. Applicant, in the above-styled cause, seeks permission to produce its C. C. Fristoe (b) NCT-2 Well No. 6, located in Unit H of Section 35, Township 25 South, Range 37 East, Lea County, New Mexico, North Justis-Devonian Pool, through a string of 1 1/2 inch OD tubing run with a packer inside of a 2 7/8 inch OD casing.

CASE 2613: Application of Shell Oil Company for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks permission to complete its Middleton Federal "A" Well No. 1, located in Unit H of Section 18, Township 19 South, Range 32 East, Lea County, New Mexico, as a triple completion (conventional) in the Bone Spring, Wolfcamp and Pennsylvanian formations, with the production of oil from all zones to be through parallel strings of 2 3/8 inch tubing.

CASE 2614: Application of Pan American Petroleum Corporation for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks permission to complete its USA H. V. Pike Well No. 1, located in Unit A of Section 6, Township 23 South, Range 38 East, Lea County, New Mexico as a triple completion (conventional) in the Blinebry Oil Pool, Tubb Gas Pool and Drinkard Oil Pool, with the production of oil from the Blinebry and Drinkard formations and gas from the Tubb formations through parallel strings of tubing.

CASE 2615: Application of Aztec Oil & Gas Company for a waterflood project, Lea and Eddy Counties, New Mexico. Applicant, in the above-styled cause, seeks permission to institute a waterflood project in the Robinson Grayburg-San Andres Oil Pool in an area underlying the E/2 SE/4 and SW/4 SE/4, Section 36, Township 16 South, Range 31 East and the SW/4 SE/4 Section 30 and the W/2, W/2 E/2, and SE/4 SE/4 of Section 31, Township 16 South, Range 32 East, Lea and Eddy Counties, New Mexico, with injection of water to be into the Grayburg formation in six injection wells, said project to be governed by the provisions of Rule 701.

CASE 2616: Application of Tenneco Oil Company for a waterflood project, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks permission to institute a waterflood project in the Cha Cha-Gallup Oil Pool in an area underlying Section 31, Township 29 North, Range 13 West, San Juan County, New Mexico, with injection of water into the Gallup formation at an approximate depth of 5500-5700 feet, said project to be governed by the provisions of Rule 701.

CASE 2355: (Reopened)
In the matter of the application of H. L. Brown, Jr., and Clem E. George for establishment of special rules and regulations for the Bluitt-Wolfcamp Gas Pool, Roosevelt County, New Mexico. Case 2355 will be reopened pursuant to Order No. R-2051 to permit the applicant and other interested parties to appear and show cause why the Bluitt-Wolfcamp Gas Pool should not be developed on 160-acre proration units.

CASE 2345: (Reopened)
In the matter of the application of Continental Oil Company for the establishment of special rules and regulations for the Rattlesnake-Pennsylvanian Pool, San Juan County, New Mexico. Case 2345 will be reopened pursuant to Order No. R-2049 to permit the applicant and other interested parties to appear and show cause why the subject pool should not be developed on 40-acre proration units.

CASE 2617: Application of Continental Oil Company for a dual completion, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks permission to complete its Rattlesnake Well No. 140, located in Unit H of Section 11, Township 29 North, Range 19 West, San Juan County, New Mexico, as a dual completion (conventional) in the Organ Rock and Pennsylvanian-Paradox formations in the Rattlesnake-Pennsylvanian Field, with the production of oil and gas from the Pennsylvanian-Paradox formation to be through 2 7/8-inch tubing at a depth of 6658 to 6710 feet, Applicant proposes to dispose of salt water into the Organ Rock formation at a depth of 4175 to 4320 feet through a parallel string of 2 7/8 inch tubing.

P. 2615

AZTEC OIL & GAS COMPANY

920 MERCANTILE SECURITIES BLDG.

DALLAS 1, TEXAS

July 6, 1962

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. A. L. Porter, Jr., Secretary-Director
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: Application of Aztec Oil & Gas
Company for Hearing on Waterflood
Project for a Portion of the
Robinson Grayburg-San Andres
Oil Pool, Lea and Eddy Counties,
New Mexico

Dear Mr. Porter:

Application is hereby made by Aztec Oil & Gas Company for approval of a waterflood project to be known as the Aztec-Robinson Waterflood Project. The proposed project would cover the area described by sections or subdivisions thereof set out in Exhibit "A" and designated on the plat attached hereto as Exhibit "B".

It is proposed that water obtained from the Caprock Water Company, or some other commercial source of supply, will be injected into the Grayburg formation encountered at a depth of approximately three thousand eight hundred and fifty feet (3,850') through approximately six (6) injection wells. It is expected that injection will commence at a rate of approximately five hundred (500) barrels per day per injection well.

The casing program of the proposed injection wells is shown on Exhibit "C".

Logs of the proposed injection wells are enclosed with this application.

A list of the names and addresses of all the lessees within a two mile radius of the proposed project area known to applicant is appended to this application.

Pursuant to Rule 701, Aztec Oil & Gas Company respectfully requests permission for such waterflood project and requests that the matter be

Mr. A. L. Porter, Jr.

-2-

July 6, 1962

set for hearing at an early date.

Respectfully submitted,

ASTEC OIL & GAS COMPANY

By Kenneth A. Swanson
Kenneth A. Swanson
Attorney

KAS/et

cc: All Lessees Within
a Two-Mile Radius

LIST OF LESSEES AND ADDRESSES KNOWN TO
APPLICANT WITHIN TWO MILES OF PROPOSED
PROJECT AREA

Tidewater Oil Company
P. O. Box 1231
Midland, Texas

Pan American Petroleum Corporation
P. O. Box 480
Farmington, New Mexico

The Pure Oil Company
P. O. Box 671
Midland, Texas

Continental Oil Company
P. O. Box 431
Midland, Texas

Sinclair Oil & Gas Company
P. O. Box 1470
Midland, Texas

Shell Oil Company
P. O. Box 1810
Midland, Texas

Mobil Oil Company
P. O. Box 900
Dallas, Texas

The Atlantic Refining Company
P. O. Box 1610
Midland, Texas

Southern Union Production Company
Fidelity Union Tower
Dallas 1, Texas

Lee Drilling Company
P. O. Box 1109
Midland, Texas

Waterflood Associates, Inc.
2017 Lubbock Avenue
Fort Worth, Texas

Humble Oil & Refining Company
P. O. Box 1600
Midland, Texas

Hudson & Hudson, Inc.
1810 Electric Bldg.
Fort Worth, Texas

Santiago Oil & Gas Company
P. O. Box 1205
Midland, Texas

Mr. I. W. Lovelady
Petroleum Building
Odessa, Texas

Mr. O. F. Featherstone
200 W. First Street
Roswell, New Mexico

Mr. M. A. Machris
707 Midland Tower
Midland, Texas

Hondo Oil & Gas Company
410 E. College Blvd.
Roswell, New Mexico

Blue Pacific Drilling Corporation
P. O. Box 832
Midland, Texas

DOB Oil Properties, Inc.
Western Building
Midland, Texas

EXHIBIT "A"

Aztec-Robinson Waterflood Project Area

Township 16 South, Range 31 East, N.M.P.M.

Section 36: $E\frac{1}{2}SW\frac{1}{4}$, $SW\frac{1}{4}SE\frac{1}{4}$

Township 16 South, Range 32 East, N.M.P.M.

Section 30: $SW\frac{1}{4}SE\frac{1}{4}$

Section 31: $W\frac{1}{2}$, $W\frac{1}{2}E\frac{1}{2}$, $SE\frac{1}{4}SE\frac{1}{4}$

(containing 680.00 acres, more or less)

Lea and Eddy Counties, New Mexico

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

CASE NO. 2615
ORDER NO. R-2304-L

APPLICATION OF WATERFLOOD ASSOCIATES, INC.
FOR A HEARING DE NOVO IN CASE NO. 2615,
ORDER NO. R-2304, APPLICATION OF AZTEC OIL
& GAS COMPANY FOR A WATERFLOOD PROJECT,
ROBINSON POOL, LEA COUNTY, NEW MEXICO.

NUNC PRO TUNC ORDER

BY THE COMMISSION:

It appearing to the Commission that due to clerical error
Order No. R-2304-A, dated November 21, 1962, does not correctly
state the intended order of the Commission,

IT IS THEREFORE ORDERED:

(1) That the phrase "State 'R' Well No. 3" is hereby
stricken from paragraph (6) of the findings and from paragraph
(2) of the ordering provisions of Order No. R-2304-A, and the
phrase "Federal 'R' Well No. 3" is hereby interlineated in lieu
thereof.

(2) That the correction set forth above be entered nunc
pro tunc as of November 21, 1962.

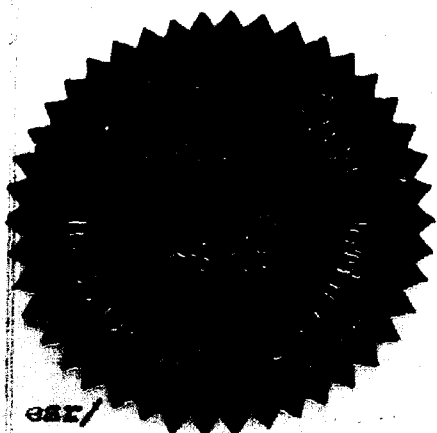
DONE at Santa Fe, New Mexico, on this 1st day of February,
1963.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jack M. Campbell
JACK M. CAMPBELL, Chairman

E. S. Walker
E. S. WALKER, Member

A. L. Porter, Jr.
A. L. PORTER, Jr., Member & Secretary



esr/

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission



LAND COMMISSIONER
H. S. JOHNNY WALKER
MEMBER

P. O. BOX 871
SANTA FE

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

February 1, 1963

Mr. Richard S. Morris
Seth, Montgomery, Federici & Andrews
Attorneys at Law
Box 828
Santa Fe, New Mexico

Re: Case No. 2615
Order No. R-2304-B
Applicant:
Aztec Oil & Gas Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A handwritten signature in cursive script that reads "A. L. Porter, Jr.".

A. L. PORTER, Jr.
Secretary-Director

ix/

Carbon copy of order also sent to:

Hobbs OCC x

Artesia OCC x

Astec OCC

OTHER Mr. Kenneth Swanson, Mr. H. C. Porter and Mr. Frank Irby

GOVERNOR
EDWIN L. MECHEM
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER



STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

P. O. BOX 871
SANTA FE

August 13, 1962

Mr. Richard S. Morris
Seth, Montgomery, Federici &
Andrews
Attorneys at Law
Box 828
Santa Fe, New Mexico

Re: Case No. 2615
Order No. R-2304
Applicant:
Aztec Oil & Gas Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x

Artesia OCC x

Aztec OCC

OTHER Mr. Kenneth Swanson, Mr. H. C. Porter and Mr. Frank Irby

NOTE: THIS HEARING WILL BE HELD IN FARMINGTON, NEW MEXICO

NO. 30-62

DOCKET: REGULAR HEARING - THURSDAY - OCTOBER 18, 1962

OIL CONSERVATION COMMISSION - 9 A.M., FARMINGTON CITY HALL, 800 MUNICIPAL DRIVE, FARMINGTON, NEW MEXICO

- ALLOWABLE:
- (1) Consideration of the oil allowable for November, 1962.
 - (2) Consideration of the allowable production of gas for November, 1962, from ten prorated pools in Lea and Eddy Counties, New Mexico, also consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for November, 1962.

CASE 2615: (De Novo)

Application of Waterflood Associates, Inc. for a hearing de novo in Case No. 2615, Order No. R-2304, application of Aztec Oil & Gas Company for a waterflood project, Robinson Pool, Lea County, New Mexico.

CASE 2665:

In the matter of the hearing called by the Oil Conservation Commission, on its own motion, to permit Great American Oil Company and all interested parties to appear and show cause why the following wells should not be plugged in accordance with a Commission-approved plugging program:

- (1) John Sargent Estate Well No. 5, located 380 feet from the East line and 880 feet from the South line of Section 4, Township 1 South, Range 2 East, Martin & Borders Survey, Rio Arriba County, New Mexico.
- (2) John Sargent Estate Well No. 1, located 940 feet from the South line and 1620 feet from the West line of Section 4, Township 1 South, Range 2 East, Martin & Borders Survey, Rio Arriba County, New Mexico.
- (3) John Sargent Estate Well No. 3, located 2380 feet from the South line and 1980 feet from the West line of Section 32, Township 1 North, Range 2 East, Martin & Borders Survey, Rio Arriba County, New Mexico.

CASE 2666:

In the matter of the hearing called by the Oil Conservation Commission on its own motion to permit M. J. Florance and all interested parties to appear and show cause why the M. J. Florance Pooled Unit Well No. 1, located 1980 feet

CASE 2666: from the South line and 1760 feet from the East line of
(Continued) Section 8, Township 30 North, Range 11 West, San Juan County,
New Mexico, should not be plugged in accordance with a
Commission approved plugging program.

CASE 2667: Southeastern New Mexico nomenclature case calling for an
order creating new pools and extending certain existing
pools in Lea County, New Mexico.

(a) Create a new oil pool for Queen production, designated
as the Mesa-Queen Pool, and described as:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 16: NW/4

(b) Extend the Corbin-Abo Pool to include:

TOWNSHIP 18 SOUTH, RANGE 33 EAST, NMPM
Section 2: NW/4

(c) Extend the North Justis-Blindbry Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 2: NW/4

(d) Extend the North Justis-Devonian Pool to include:

TOWNSHIP 24 SOUTH, RANGE 37 EAST, NMPM
Section 35: NE/4

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 2: NW/4

(e) Extend the North Justis Tubb-Drinkard Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 2: NW/4

(f) Extend the South Lane-Pennsylvanian Pool to include:

TOWNSHIP 10 SOUTH, RANGE 33 EAST, NMPM
Section 35: NE/4

(g) Extend the Lusk-Strawn (Pennsylvanian) Pool to include:

CASE 2667: (Cont.) TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM
Section 20: SW/4
Section 29: N/2

- (h) Extend the Middle Lynch-Yates Pool to include:

TOWNSHIP 20 SOUTH, RANGE 34 EAST, NMPM
Section 22: NE/4 SW/4

- (i) Extend the Vacuum-Abo Pool to include:

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 7: N/2 SE/4

- (j) Extend the Vacuum-Queen Pool to include:

TOWNSHIP 18 SOUTH, RANGE 34 EAST, NMPM
Section 6: SE/4

CASE 2668:

Northwestern New Mexico nomenclature case calling for an order extending certain existing pools in Rio Arriba, Sandoval and San Juan Counties, New Mexico.

- (a) Extend the Aztec-Pictured Cliffs Pool to include:

TOWNSHIP 29 NORTH, RANGE 9 WEST, NMPM
Section 27: SE/4
Section 34: E/2

- (b) Extend the Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 29 NORTH, RANGE 9 WEST, NMPM
Section 15: SW/4
Section 22: NW/4

- (c) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 23 NORTH, RANGE 1 WEST, NMPM
Section 4: W/2
Section 8: N/2

TOWNSHIP 23 NORTH, RANGE 2 WEST, NMPM
Section 1: SE/4
Section 12: E/2
Section 13: E/2
Section 24: NE/4

Docket No. 30-62

Regular Hearing Thursday October 18, 1962

CASE 2668: (Cont.) TOWNSHIP 24 NORTH, RANGE 2 WEST, NMPM
Section 36: E/2

- (d) Extend the Blanco-Mesaverde Pool to include:

TOWNSHIP 26 NORTH, RANGE 6 WEST, NMPM
Section 2: N/2

- (e) Extend the Boulder-Mancos Oil Pool to include:

TOWNSHIP 28 NORTH, RANGE 1 WEST, NMPM
Section 14: SW/4 SE/4
Section 26: N/2 & NW/4 SE/4

- (f) Extend the Devils Fork-Gallup Pool to include:

TOWNSHIP 24 NORTH, RANGE 6 WEST, NMPM
Section 16: W/2 NW/4

- (g) Extend the Puerto Chiquito-Gallup Oil Pool to include:

TOWNSHIP 27 NORTH, RANGE 1 EAST, NMPM
Section 20: S/2 SE/4
Section 21: SW/4 SW/4
Section 29: N/2 NE/4

iqg/

OIL CONSERVATION COMMISSION

P. O. BOX 871

SANTA FE, NEW MEXICO

August 20, 1962

C
O
P
Y
Mr. Richard S. Morris
Seth, Montgomery, Federici & Andrews
Attorneys at Law
Box 828
Santa Fe, New Mexico

Dear Mr. Morris:

Enclosed herewith is Commission Order No. R-2304 entered in Case No. 2615 approving the Aztec Robinson Waterflood Project.

According to our calculations, when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 714 barrels per day.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate district proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provision of Rule 701, it behooves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project. area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

OIL CONSERVATION COMMISSION

P. O. BOX 871

SANTA FE, NEW MEXICO

-2-

Mr. Richard S. Morris
August 20, 1962

Your cooperation in keeping the Commission so informed as to the status of the project and the wells therein will be appreciated.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

cc: Mr. Kenneth Swanson

Enclosure (1)

C
O
P
Y

A. J. LOSEE
EDWARD B. STEWART

LAW OFFICES
LOSEE AND STEWART
CARPER BUILDING - P. O. DRAWER 239
ARTESIA, NEW MEXICO

20 September 1962

AIR MAIL

Mr. Kenneth A. Swanson, Attorney
Aztec Oil & Gas Company
920 Mercantile Securities Building
Dallas 1, Texas

Re: Application of Aztec Oil & Gas Company
for a Secondary Recovery Project
Oil Conservation Commission Case No. 2615

Dear Mr. Swanson:

My letter returning the transcript in the above case to
Mrs. Rodriguez apparently crossed in the mails with your
letter of September 18. I am sure when the transcript is
received by the Commission they will send it on to you.

Very truly yours,


A. J. Losee

AJL:jat

cc: Mrs. Ida Rodriguez, Administrative Secretary
New Mexico Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

C
O
P
Y

ARTEC OIL & GAS COMPANY

920 MERCANTILE SECURITIES BUILDING

DALLAS 1, TEXAS

September 18, 1952

Mr. A. J. Losee
Losee and Stewart
Attorneys at Law
P. O. Drawer 239
Artesia, New Mexico

Re: Case No. 2615
Order No. R-2304
Application of Aztec Oil &
Gas Company for a Secondary
Recovery Project in the
Robinson Pool

Dear Mr. Losee:

In view of your application for a de novo hearing in the subject case, we requested from the Commission the use of a copy of the subject case and were informed that it had been checked out to you. Ida Rodriguez informed us that it would be permissible to request you to mail the copy now in your possession directly to us; and upon being so informed, she would check out the transcript to Aztec.

If you have no further need for the transcript, we would appreciate having it sent to us as soon as possible, in order that our preparations for the de novo hearing might be commenced. Should you not be able to furnish it to us immediately, we would appreciate being so informed in order that we might make other arrangements.

Yours very truly,

ORIGINAL SIGNED BY
KENNETH A. SWANSON

KAS/et

cc: Mrs. Ida Rodriguez ✓
Administrative Secretary
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

August 31, 1962.

Mr. A. J. Losee
Losee & Stewart
P. O. Drawer 239
Artesia, New Mexico

Dear Mr. Losee,

This copy of Case 2615 is to belong to the Oil Conservation Commission. Please return it to Ida Rodriguez as soon as you are through with it.

Yours truly,

ADA DEARNLEY

1 encl.

cc - Ida Rodriguez

DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, N. M.
PHONE 243-6691

FARMINGTON, N. M.
PHONE 325-1142



BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 2615
Order No. R-2304

APPLICATION OF AZTEC OIL & GAS
COMPANY FOR A SECONDARY RECOVERY
PROJECT, ROBINSON GRAYBURG-SAN
ANDRES POOL, LEA AND EDDY COUNTIES,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on August 8, 1962, at Santa Fe, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 13th day of August, 1962, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Daniel S. Nutter, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Aztec Oil & Gas Company, is the operator of certain leases comprising, in part, the following-described acreage in Lea and Eddy Counties, New Mexico:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
Section 36: E/2 SE/4 and SW/4 SE/4

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 30: SW/4 SE/4
Section 31: W/2, W/2 E/2, and SE/4 SE/4

(3) That the applicant seeks permission to institute a secondary recovery project in the Robinson Grayburg-San Andres Pool on the above-described acreage, by the injection of water into the Grayburg formation through the following-described wells:

State "EC" Well No. 1, Unit L, Section 31, Township
16 South, Range 32 East;

-2-

CASE No. 2615
Order No. R-2304

State "RC" Well No. 3, Unit P, Section 36, Township
16 South, Range 31 East;
State "R" Well No. 3, Unit N, Section 31, Township
16 South, Range 32 East;
Brinson Federal Well No. 1, Unit F, Section 31,
Township 16 South, Range 32 East;
Brinson Federal Well No. 3, Unit B, Section 31,
Township 16 South, Range 32 East; and
Humble State "A" Well No. 3, Unit J, Section 31,
Township 16 South, Range 32 East.

(4) That the conversion to water injection of the above-described wells will be in the interest of the protection of correlative rights and will result in the avoidance of waste.

(5) That the wells on the subject leases have reached an advanced stage of depletion and should be classified as "stripper" wells; that, accordingly, the subject project should be governed by the waterflood provisions of Rule 701.

IT IS THEREFORE ORDERED:

(1) That Aztec Oil & Gas Company is hereby authorized to institute a waterflood project in the Robinson Grayburg-San Andres Pool, Lea and Eddy Counties, New Mexico, by the injection of water into the Grayburg formation through the following-described wells:

State "RC" Well No. 1, Unit L, Section 31, Township
16 South, Range 32 East;
State "RC" Well No. 3, Unit P, Section 36, Township
16 South, Range 31 East;
State "R" Well No. 3, Unit N, Section 31, Township
16 South, Range 32 East;
Brinson Federal Well No. 1, Unit F, Section 31,
Township 16 South, Range 32 East;
Brinson Federal Well No. 3, Unit B, Section 31,
Township 16 South, Range 32 East; and
Humble State "A" Well No. 3, Unit J, Section 31,
Township 16 South, Range 32 East.

(2) That the project area for said waterflood project shall comprise the following-described acreage:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
Section 36: E/2 SE/4 and SW/4 SE/4

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 30: SW/4 SE/4
Section 31: W/2, W/2 E/2, and SE/4 SE/4

subject to approval by the Regional Supervisor of the United States Geological Survey and the Commissioner of Public Lands for the State of New Mexico.

-3-

CASE No. 2615
Order No. R-2304

(3) That the subject waterflood project shall be governed by the provisions of Rule 701.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



E. L. Mechem

EDWIN L. MECHEM, Chairman

E. S. Walker

E. S. WALKER, Member

A. L. Porter, Jr.

A. L. PORTER, Jr., Member & Secretary

esr/

AZTEC OIL & GAS COMPANY

920 MERCANTILE SECURITIES BLDG.

DALLAS 1, TEXAS

October 4, 1962

LAND DEPARTMENT

H. L. SNIDER, JR., MANAGER
KENNETH A. SWANSON, ATTORNEY
GORDON E. COE, ATTORNEY

Mr. Dan Nutter, Chief Engineer
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: Case 2615, Aztec-Robinson Waterflood
Project, Lea and Eddy Counties,
New Mexico

Dear Dan:

Thank you for your letter advising us that the Commission will hear the subject case de novo on October 18, 1962 at Farmington. We, of course, will be there and plan to present again all of the testimony that you heard at the original hearing along with the exhibits introduced into evidence. Since the petition for de novo hearing filed by Waterflood Associates and B. T. A. indicated that their only argument was with our proposed injection pattern, we plan to offer additional evidence and exhibits in support of the pattern.

This plan is based on our surmise that the Commission does not desire to limit the de novo hearing to evidence on the location of the proposed injection wells as suggested in Paragraph (2) on Page 4 of the Application for De Novo Hearing. We would prefer to present the entire case to the Commission. If, however, the Commission should decide to so limit the de novo hearing, we shall be happy to comply and I am confident that we would be notified of any such decision.

With best personal regards.

Sincerely,

Kenneth

KAS:mjb

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 8, 1962

EXAMINER HEARING

DEARNLEY-MEIER REPORTING SERVICE, Inc.

FARMINGTON, N. M.
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IN THE MATTER OF:

Application of Aztec Oil & Gas Company
for a waterflood project, Lea and Eddy
Counties, New Mexico. Applicant, in
the above-styled cause, seeks permission
to institute a waterflood project in the
Robinson Grayburg-San Andres Oil Pool in
an area underlying the E/2 SE/4 and
SW/4 SE/4, Section 36, Township 16 South,
Range 31 East and the SW/4 SE/4, Section
30 and the W/2, W/2 E/2, and SE/4 SE/4
of Section 31, Township 16 South, Range
32 East, Lea and Eddy Counties, New
Mexico, with injection of water to be
into the Grayburg formation in six in-
jection wells, said project to be
governed by the provisions of Rule 701.

Case 2615

BEFORE: Mr. Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: We will call Case 2615.

MR. FLINT: Application of Aztec Oil & Gas Company for
a waterflood project, Lea and Eddy Counties, New Mexico.

MR. MORRIS: If the Examiner please, Richard Morris of
Seth, Montgomery, Federici and Andrews, appearing on behalf of



the applicant, Aztec Oil and Gas Company. Associated with me in the case is Mr. Kenneth Swanson, attorney for Aztec Oil and Gas Company and a member of the Texas Bar, who will present the case.

MR. SWANSON: I wonder at this time if there would be any other appearances?

MR. NUTTER: We will call for appearances in 2615.

MR. PORTER: Does that include statements?

MR. NUTTER: Yes.

MR. PORTER: H. C. Porter, representing Water Flood Associates, Artesia, New Mexico.

MR. NUTTER: Any other appearances?

MR. IRBY: I may wish to ask some questions. I will know after Mr. Swanson completes his direct examination. I am Frank Irby, State Engineer's Office.

MR. NUTTER: Would you please proceed, Mr. Swanson?

MR. SWANSON: We have one witness to present testimony at this hearing.

(Witness sworn.)

(Whereupon, Applicant's Exhibits Nos. 1, 2 & 3 were marked for identification.)

JIM BURROWS

called as a witness, having been first duly sworn, testified as

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follows:

DIRECT EXAMINATION

BY MR. SWANSON:

Q Would you please state your name for the record?

A Jim Burrows.

Q By whom are you employed, Mr. Burrows?

A Aztec Oil and Gas Company.

Q What capacity?

A As a petroleum engineer in Dallas.

Q Have you previously testified as an expert before this Commission?

A Yes.

MR. SWANSON: Are the witness's qualifications acceptable?

MR. NUTTER: Yes.

Q (By Mr. Swanson) This application involves Aztec's request for a waterflood project in the Robinson Pool. Are you familiar with this pool?

A Yes.

Q And the application? A Yes.

Q Have you made a study of this area including some exhibits that you want to present to the Commission?

A Yes.

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Q Would you refer to the first one and explain it, please?

MR. SWANSON: Mr. Porter, would you like a copy of our exhibits?

MR. PORTER: Please.

MR. SWANSON: Mr. Irby, would you like a copy?

MR. IRBY: Please.

A Exhibit No. 1 is a base map which gives the lease ownership and well locations in the vicinity of the Robinson Grayburg-San Andres Oil Pool. The pool boundary which straddles the Lea and Eddy County line is designated by the heavy dashed line. The seventeen-well proposed Aztec Robinson project area located in the northeast portion of the pool is noted by the heavy solid line. The yellow acreage noted in the project area is operated by Aztec Oil and Gas Company, and the light blue acreage is operated by McGrath and Smith. This light blue acreage was included in our application because we have tentative agreement to unitize the area within the project area. This exhibit also indicates the approximate location of a water supply line of the Caprock Water Company from which we believe we can obtain an adequate supply of source water; and inside the project area, the six wells circled and colored in red represent a five-spot or staggered line drive waterflood pattern and are the wells which we request approval to convert for injection of water into the

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Grayburg or Premier pay sections as noted on Exhibit 2.

Q Will you refer to Exhibit 2 and explain it, please, Mr. Burrows?

A Exhibit No. 2 is two cross sections. One is northwest to southeast, and one southwest to northeast as traced on the base map in the upper right-hand corner. The intervals colored in red are the Premier zones which we propose to inject water into. This exhibit indicates that these zones are continuous throughout the project area and subject to waterflood.

This exhibit also indicates the structure in the area to be a southeast plunging nose, but the dip in all directions of this nose is very slight, in the order of one-half degree; therefore we don't consider the structure to have any bearing on the secondary recovery in this area.

Q Did your study in this regard indicate the presence of any faults or fractures that might impair waterflooding in this area?

A No.

Q Are there presently any other zones open to production in the proposed injection wells than those that are shown on this cross section?

A Yes. In three of the wells there is a lower zone down in the San Andres approximately 150 feet which is open. We

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propose to set bridge plug to isolate this zone, as noted in our next exhibit, which is the casing program.

Q You have no plans at this time to attempt to waterflood that lower zone?

A Not initially with the other zone.

Q What is the reason for that decision?

A We consider that there would be too much risk involved in simultaneously flooding the San Andres zone and the Grayburg intervals, in that channeling or deep zones may arise.

Q Would you refer to your next exhibit, please, and explain it?

A Exhibit No. 3 is the casing program which was originally utilized in completing these proposed injection wells as producing wells. We might note that this exhibit is a corrected copy of the Exhibit C which was submitted with our application. The correction is on the first page where we inadvertently listed the State RC No. 4 and its casing program, instead of the State RC No. 3 which is the proposed injection well. We consider these casings and cement that now exists to adequately protect any fresh water sources from damage, and to isolate the zones in which we propose to inject water. As we've noted previously, we intend to set bridge plugs over the lower intervals now open in three of the wells, and we propose to protect the casing by utilizing injection

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through tubing and the lower packer.

Q Have you anything else in regards to this exhibit, Mr. Burrows?

A No.

Q Would you refer to your next one and explain it, please?

(Whereupon, Applicant's Exhibit No. 4 was marked for identification.)

A Exhibit No. 4 is a data sheet which gives the average reservoir, rock, and fluid properties of this portion of the Robinson Pool, such as the average porosity of 15.6 percent, the average permeability of 10.2 millidarcies, and the average net pay of ten feet. This exhibit also indicates that the area is producing under a solution gas drive type of reservoir mechanism, and that no gas-oil or water-oil contacts have been indicated. I don't consider it necessary to read this entire exhibit unless it's desired. I might note that the data from which these average figures were taken were utilized in the derivation of the performance curve presented in our next exhibit.

Q Would you refer to your next exhibit and explain it, please?

(Whereupon, Applicant's Exhibit No. 5 was marked for identification.)

A The next exhibit contains the predicted performance

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curve for the seventeen-well study area. As shown on the cumulative production curve which has the long dashes, we expect to have a cumulative primary recovery of approximately 175,000 barrels as of December of this year, which is the time we anticipate an injection will commence. The daily production curve which has the short dashes indicates that the production from the seventeen-well area is now approximately ninety barrels of oil per day or 5.3 barrels of oil per day per well. Thus we consider the area to be in the stripper stages of primary production.

Continuing to the secondary portion of the curve, the daily production rate curve indicates that we expect a slight degree of response after approximately four months of injection, and at the end of seven months we estimate that the production rate will be top allowable for the unit; then estimate that we'll have top allowable production for approximately two years and production will begin to decline, will decline to an economic limit within about fifteen years following the commencement of the flood. At the end of this period we expect to have recovered an ultimate recovery of 1,115,000 barrels, of which thirty-six percent might eventually have been produced by primary production, and sixty-four percent is due solely to waterflood operations.

Q It's your opinion then that this additional sixty-four percent would not be recovered unless waterflood operations were



instituted?

A That's correct.

Q Then would it not be correct to say that waste would certainly be caused unless this waterflood project was approved and carried out?

A Yes, sir.

Q Will you refer to your next exhibit, please, Mr. Burrows?

(Whereupon, Applicant's Exhibit No. 6 was marked for identification.)

A Our final exhibit is a letter from Caprock Water Company which states that they have injection water available to serve our project and are willing to furnish this water to our plant site.

Q Mr. Burrows, have you any recommendations to make to the Commission with regard to proration schedules and things of that nature?

A We request first that the six wells which we have indicated be authorized for injection into the Premier intervals, and that the project be governed by Rule 701 of the Commission rules and regulations, including the allocation of allowables and the administrative approval for conversion of additional wells.

Q It's contemplated then that it will be necessary at

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some later date to convert additional wells to injection purposes?

A Yes.

Q Why do you think this will be required? Would you like to refer to Exhibit No. 1?

A On Exhibit 1, the small circles which haven't been colored is the assumed pattern which will meet the project along the northwest project boundary. Because of the peculiar configuration of the unit boundary along the west side, we have chosen to or propose to inject into a row of wells which will leave two rows of producing wells between the injection wells. After flooding out to the nearest row of producing wells in this corridor area, we believe that additional oil, considerable additional oil will be left in the corridor between the two wells; so in order to recover this oil we propose to convert two additional wells in the southeast row of the two rows.

Q Have you considered other possible injection patterns that could be utilized in this area?

A Yes, we've considered other areas and we've considered that our proposed injection pattern will prevent waste and will result in the protection of correlative rights, and therefore have chosen it.

Q Have you made a study of the possibility of extending into this project area the injection pattern that has developed

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in the area to the west, the Square Lake area?

A Yes.

Q And if that pattern of injection were continued into this area, what would be Aztec's primary objection to it?

A The primary objection would be that because in the row of producing wells that would result with the complete row of project wells in this area, we would only have one producing well in this row and a large amount of oil would be pushed to the adjoining acreage to the west, considerably more than would be pushed back by counterflow.

Q Have you made a calculation of the amount of oil that could be involved in this situation?

A Yes, my study has indicated that approximately 135,000 barrels of oil will be left in this corridor zone to be recovered by converting additional wells at a later date.

Q If the Square Lake pattern of injection wells were extended into our area, have you made a determination of the approximate number of barrels of oil that would be pushed from the project area to the leases adjoining it on the west that would not be compensated by counter-drainage?

A Yes.

Q What would that figure be?

A Approximately 100,000 barrels.

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Q In your opinion, is it possible to recover the oil that would remain in the corridor between the two rows of producing wells by converting additional wells to injection, without causing any waste?

A Yes.

Q If that is done would there be any violation of correlative rights as between the lease and mineral owners to the west and those within the project area?

A No.

MR. SWANSON: This concludes our direct presentation of evidence. At this time we would like to ask for the admission of Aztec Exhibits 1 through 6 into evidence.

MR. NUTTER: Aztec's Exhibits 1 through 6 will be admitted into evidence.

(Whereupon, Applicant's Exhibits Nos. 1 through 6 were admitted in evidence.)

MR. NUTTER: Any questions of Mr. Burrows?

CROSS EXAMINATION

BY MR. FLINT:

Q How old is the casing in the proposed injection wells?

A Approximately three to three and a half years.

Q So that it will not be necessary, in your opinion, to replace any casing?

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A No, sir.

Q Are there any fresh water producing formations in the affected wells?

A Not to my knowledge.

Q If there should be any, do you feel that any potential fresh water producing formations would be protected by your casing program?

A Yes, sir.

Q Could you explain in a little more detail the location of adjacent or nearby waterflood projects?

A There has been a project established to the south and east of the project area in Sections 5 and 6 and 7, which is operated by Water Flood Associates, in which there are two injection wells, I believe one in the Southeast Quarter of the Southeast Quarter of Section 6, and one in the Southwest, Southwest Quarter of the Northwest Quarter of Section 5 in Township 17 South, Range 32 East. To the west in the Square Lake pool there are considerable numbers of injection wells already injecting water and I believe orders have been completed to extend this flood by stages by Newmont. In Section 35 Water Flood Associates has had a hearing for injection, and I believe six wells which extend this pattern from the Square Lake Pool to the west. There are other projects approximately four miles to the east and



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three miles south. I don't know the locations of all of them.

Q Mr. Burrows, referring to your cross section, Exhibit No. 2, I believe it is, is the pink colored area the porosity that you expect to be flooding in this project?

A That's the gross intervals which contain the porosity. All of it we don't consider pay.

Q Of your six injection wells, are all six of those open in both of these bands of porosity?

A I believe that two of the injection wells are not open in the upper band at the present time.

Q Is it your intention to perforate that and flood that upper band in those wells?

A This upper band, it's indicated that it's much less permeable than the other zone, and we intend initially to commence injection into only the zones that are now open and to perforate those zones. Later, if we're getting any water in them, in other words, as detected by tracer surveys or something, if we are getting water in there effectively, we'll perforate the upper interval.

Q It would appear on your Cross Section A-A¹ that you have two injection wells, being the fourth one from the left and the fifth from the left. Would those be the two wells?

A I believe that's correct.

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Q Which of those wells are on your casing program?

A It would be the Brinson Federal "R" No. 1, that is the fourth one from the left, and the Humble State "A" No. 3, the last well in the casing program exhibit.

Q In other words, the Brinson Federal No. 1 is the third well on the casing program exhibit; is that correct, the one at the bottom of the first page?

A That's correct.

Q It's perforated from 3800 to 3867, which would be entirely in the lower band; is that correct?

A I believe 3800.

Q Is that the top figure?

A It's the top figure there.

Q Is that the number in the top band?

A Yes, I believe so. It's kind of difficult to read, though.

Q If that's 3800 right in the middle of the upper band, then the 3867 would extend into the lower band?

A Yes. The Brinson No. 1 is open in the upper zone.

Q And also in the lower?

A Yes.

Q That would also hold true for the Humble State "A" No. 3, then?



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A Yes, sir.

Q Open in both zones?

A Yes, sir.

Q There will be a bridge plug set in the State "A" RC No. 3 at 3900 feet which will exclude that lowermost perforation, 3848 to 60; is that correct?

A Which well is that?

Q State "A" RC No. 3.

A Yes, sir.

Q The 3848 to 60, is that in the San Andres?

A That's a lower interval, the Lovington Zone of the San Andres, which is in this pool.

Q And you'll set a bridge plug at 3900 feet in the RC No. 1 to exclude the perforation from 3968 to 78; is that correct?

A Yes, sir.

Q And in the State "R" No. 3 a bridge plug will be set at 3900 feet to exclude the perforation 3957 to 71?

A Yes, sir.

Q What about that Brinson Federal No. 3, Mr. Burrows?

A It already has a bridge plug set at 3970, which has isolated those lower zones.

Q It would have a set of lower perforations also that would still be open then, 3903 to 09, wouldn't it?

A I believe those are in the lower pick interval.

Q Those will be the only perforations in any of these



wells below 3900 feet that will be open, though, won't they?

A Right. That Lovington Zone; that's correct.

Q On your Exhibit No. 1, Mr. Burrows, to the west of your project area, I see five wells or five locations which have the larger circles around them but which are not colored in. What do the larger circles indicate?

A That is an assumed pattern. It would be an extension of the pattern to the west. Two of them, two of the injection wells that haven't been drilled.

Q Have any of those injection wells as yet been authorized by the Commission, do you know?

A I believe in this row, no, sir.

MR. NUTTER: I would like to excuse the witness, subject to recall, and call Mr. Porter to the stand, please.

MR. PORTER: That is Mr. Hal Porter?

MR. NUTTER: Mr. Porter with Water Flood Associates.

(Witness sworn.)

HAL PORTER

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

DIRECT EXAMINATION

BY MR. NUTTER:

Q Are you Mr. Hal Porter representing Water Flood

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Associates, Inc.?

A Yes, sir. However, Mr. Examiner, I do not have legal counsel if that's required. I'm not sure whether it is or not.

Q I don't think it will be. I just want to ask you some questions regarding a flood that Water Flood Associates has been authorized; has Water Flood Associates been authorized a flood west of the proposed flood that's under consideration here today?

A Yes, sir. Water Flood Associates has been issued an Order No. R-2270 in Case 2580 which authorized six injection wells in Section 35.

Q Would you describe for the record the location of the injection wells which have been authorized by the Commission, Mr. Porter?

A Yes, sir. Am I permitted to enter an exhibit showing those or just pass up a map?

A I think if you'll just enumerate the wells, that will be sufficient, Mr. Porter.

A In Section 35, 16, 31, the well marked on Exhibit 1 of Aztec as No. 2 in the Southwest of the Northwest Quarter. That well number is wrong, that's No. 4 and it's not plugged as shown; that is one of the injection wells. Then the well marked 3-X, which is in the Northeast Quarter of the Southwest Quarter is an authorized injection well; and the well marked No. 5 which is in

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the Southwest of the Southeast Quarter is an authorized injection well; as well as the well marked 1-X, which is in the Southwest of the Northeast Quarter, Section 35; two new wells which have not yet been drilled but which are authorized is a new well in the Northeast Quarter of the Northwest Quarter and one in the Southwest of the Southwest Quarter. That acreage marked BTA is being assigned to Water Flood Associates and the agreement has been made. Those are the six injection wells.

Q Has Water Flood Associates actually commenced work on any of these wells to convert them to water injection?

A Yes, sir, we have cleaned out the four present producers, the presently completed wells. We have them cleaned out and we have started our plant and plan to begin injection in September.

Q Have you commenced the drilling of the two undrilled locations?

A No, sir, not yet. We plan, however, to drill the BTA farmout within the next month or so.

Q Do you expect to have those two wells completed and on injection by September first, or will that be just the four wells that have been completed to date?

A The four that have been completed. We don't expect to start injecting into the BTA well until the Newmont pattern is

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completed in Section 34 and under the Commission order for the staging of that flood, they are authorized to begin injection in Section 34 on the first day of April of 1963.

Q So your ETA well would go on injection at approximately the same time that Newmont's wells in Section 34 would go on injection?

A Yes, sir.

MR. NUTTER: I believe that's all. Does anyone have any questions they wish to ask Mr. Porter? You may be excused.

(Witness excused.)

JIM BURROWS

recalled as a witness, having been previously duly sworn, testified further as follows:

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Burrows, you stated that it was your opinion that the circled locations which you have not colored in would be an extension of the existing pattern of the flood to the west; was that your statement?

A Right.

Q Which would be an extension of the locations which Mr. Porter has testified have been authorized for injection?

A I believe that's correct, yes, sir.



Q You stated also, Mr. Burrows, that in the corridor of wells between the two rows of injection wells there would be a row of two producing wells; is that it?

A Yes.

Q Can the two rows of producing wells produce all of the oil that's there upon injection in your proposed locations as well as an extension of Water Flood Associates flood along the pattern that you've indicated, without the conversion of additional wells to water injection?

A No, sir.

Q Where would the additional wells be drilled or put on injection there in the corridor?

A One would be the Federal "R" No. 3, which is located in the Northeast Quarter of the Northwest Quarter of Section 31; and the State "RC" No. 2, which is located in the Northeast Quarter of the Southeast Quarter of Section 36.

Q When would those wells be put on injection, after the water from your presently proposed injection wells has passed those wells, after you've had a water break-through?

A Either at that time or possibly before that time.

Q Well, the conversion of those two wells would be an extension of Water Flood Associates' pattern, would it not?

A Yes, it would.

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Q Maybe I misunderstood you, you said that you would have to convert two wells to the southeast, or is this what you meant, the wells on the southeast flank of the corridor?

A Southeast flank of the corridor.

MR. NUTTER: I believe that is all. Thank you. Any further questions of Mr. Burrows? He may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Swanson?

MR. SWANSON: No, sir.

MR. NUTTER: Does anyone have anything to offer in Case 2615?

MR. PORTER: Hal Porter, representing Water Flood Associates, Artesia, New Mexico. I have a statement I would like to read. Water Flood Associates is offset operator to Aztec to the north and within three locations to the west, operating wells in Sections 35 and 25, 16, 31 and Section 30, 16, 32. The original five-spot waterflood pattern was established by Ambassador Oil Company in Square Lake Pool. Newmont later purchased the flood and has expanded the established pattern eastward two miles, including Section 24, which offsets Water Flood production. Sinclair has set the established pattern to the south.

On June 21, 1962 the Commission issued order No. R-2270 in Case 2580, which was a permit to an extension of an established

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pattern into Section 35 of the Robinson Pool by Water Flood Associates. This project, if approved, the water injection would begin on September 1st. As part of the exhibits and testimony presented in this case, the plat was presented showing our proposed expansion under the established pattern. As offset operator we want to cooperate with Aztec on a lease line cooperative basis; however, we feel that whereas an operator may have his own particular reasons for preferring one pattern over another, that when a pattern is established in the area, the established pattern should be followed. With all due regard to Aztec, Water Flood Associates feels they must protest the establishment of any pattern which does not adhere to that already established in the pool. We feel that any such deviation would lead to a serious violation of correlative rights, and at some point where the two patterns would eventually meet, result in a waste due to insufficient sweep. Also any precedent so established by permitting different patterns in the same pool could lead to a disorderly rather than an orderly waterflood development of pools and a resultant loss of secondary reserves.

In summation, we would like to call to the Commission's attention that we feel that we have a unique situation here. We were aware that a pattern had been established in the area to the west and would have been happy to continue that pattern if we



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felt it could be done with reasonable expectation that the Commission would logically approve it. Of course, first we realize it's necessary that the most efficient pattern be established to recover the oil that's there to be recovered. Our engineers have made a detailed study of this problem and it is their considered opinion that what perhaps could be referred to as a modified approach to the established pattern, or a later concurrence with the established pattern, would efficiently produce the oil that is in the corridor without any waste whatsoever. If our lease line had been other than it was -- it just coincidentally aligns itself in the same parallel direction with the existing injection wells -- we wouldn't have this problem; but should we continue the existing injection pattern into our area, we'd be in a position of having one producing well between the rows of injection wells on each side of our common boundary to other individuals for producing wells. Obviously we would not be allowed an opportunity to recover our share of the oil in that area. We feel that this is not protection of correlative rights.

Mr. Burrows has testified that in his opinion, based on his study, approximately 100,000 barrels of the oil would be pushed from the project area to the area to the west. It is our opinion that this proposal will affect the production of oil without waste and will completely protect correlative rights.



MR. NUTTER: Thank you. Does anyone else have anything they wish to offer in Case 2615? We'll take the case under advisement and call a fifteen minute recess.

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 31st day of August, 1962.

Ada Dearnley
Notary Public-Court Reporter

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. 2615
heard by me on Aug 8, 1962.
[Signature] Examiner
New Mexico Oil Conservation Commission

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CASE 2615: Application of AZTEC
OIL & GAS CO. for a waterflood
project, Lea and Eddy Counties.