ų	PARMINGTON, M. M. PHONE 325-1182	BEFORE THE OIL CONSERVATION COMMISSION Santa Fe, New Mexico FEBRUARY 7, 1962 <u>EXAMINER HEARING</u>
-MEIER REPORTING SERVICE, Inc.		<pre>IN THE MATTER OF: Application of Waterflood Associates, Inc., Western Development Company and Yates Petrol- eum Corporation for a waterflood project, Eddy County, New Mexico. Applicant, in the CASE NO. above-styled cause, seeks permission to in- 2493 stitute a waterflood project in the Artesia Pool on the State 14 and State 647 Leases located in Section 14, Township 18 South, Range 28 East, Eddy County, New Mexico, the injection of water into the Grayburg forma- tion initially will be through six wells located on said leases, said project to be governed by the provisions of Rule 701.</pre>
Y-ME		TRANSCRIPT OF HEARING
EARNLE		MR. NUTTER: We will take up the next case.
	ж. - 6	MR. WHITFIELD: Case No. 2493: Application of Waterflood
I	ALBUGUERQUE, N. M PHONE 243.6691	Associates, Inc., Western Development Company and Yates Petroleum
	PHONE	Corporation for a waterflood project, Eddy County, New Mexico .
		MR. LOSEE: A. R. Losee, appearing on behalf of the
		applicant. We have one witness, Ma. Hal C. Porter.
		(Witness sworn.) HAL CPORTER,



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

DIRECT EXAMINATION

BY MR. LOSEE:

Q Will you state your name, please, sir, residence and occupation?

A My name is Hal C. Porter. I live in Artesia, New Mexico, and I am a petroleum engineer.

Q Are you an employee of Waterflood Associates, Inc.?A Yes, sir.

Q Have you previously testified before this Commission?

A Yes, sir.

MR. NUTTER: His qualifications are accepted.

Q (by Mr. Losee) Waterflood Associates, Western Development Company and Yates Petroleum Corporation have filed this application to institute a waterflood project in Section 14, Township 18 South, Range 28 East, Eddy County, New Mexico. Would you please explain the development history and completion practices of wells in this field?

A Initially, the development occurred in 1952, with drill ing nearly constant up through 1956. In this immediate area, the common practice of completion was to set 8 5/8 casing to a depth of 350 to 650 feet and cement it into the salt section. In other words, it was set in the salt section and cemented. As a rule, a long production string was run to some point above the



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ALBUQUERQUE, N. M PHONE 243-6691 pay zone and cemented, as a rule, with 100 sacks of cement. The wells were completed in open well and the common practice was they were given a light formation fracture treatment; the size of the treatments were on the order of 10,000 gallons of oil and 15,000 pounds of sand.

Q What zones are open to production in this area?

A Zones 4, 5, and 6 of the Grayburg formation. These are commonly referred to as Loco Hills and Pretex and Premier sections.

Q Will any of those zones, in your opinion, have more secondary recovery possibilities than the others?

A Well, sir, that's very hard to determine from the information we have available. However, we feel that the Premier is the most likely to pay the best in the area.

Q Will you please refer to Exhibit No. 1, what has been marked Exhibit No. 1, and explain what that portrays?

A Exhibit No. 1 is an area map showing well locations and lease ownerships in an area which extends at least three miles in each direction from Section 14. It shows the producing wells within the two-mile area.

Q As well as the names of the lessees?

A Yes, sir.

Q Please refer to what has been marked Exhibit No. 2 and explain that, please?

A Exhibit No. 2 is a project plat showing the proposed initial waterflood pattern. The injection wells are shown with



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red triangles around them. The pattern is a regular five-spot pattern. The pattern will be made by converting present producing oil wells to water injection wells. The pattern will be an 80-acre five-spot.

Q Would you explain the ownership or the lessees of the respective leases as to this producing formation that is proposed in this application?

A The injection wells in the center are the producers. Initially, the pattern will be belonging to Waterflood Associates and Western-Yates. Each company will initially have one inside totally closed producing. Initially, Waterflood Associates will have four injection wells and Western-Yates will have two. Responsibility from these initial waterflooding, being applied for the lands are on acregular five-spot basis, away from this initial pattern.

Q Is it anticipated that that will be a unit operation or some other type, and if so, what type?

A We plan for this not to be a unit. It will be a cooperative waterflood with company operation cross lines, with lease line agreements between operators as to their injection wells, the relative amount of water which will be injected in two zones into which water will be injected.

Q Is Waterflood Associates and Yates Petroleum Company, have they reached an agreement as to expenses of conservation of these injection wells and on the basis of sharing the production



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of the producing wells, and if that is true, what is that agreement?

A Yes, sir, the expenses of converting each operator's wells will be by the operator himself. Production of the operator's wells will belong to him, as far as the pressurizing system is concerned. It is presently planned that the Waterflood Associates will install the system, the water plant, as such, and pressure and treat the water if necessary, as a service to Western and Yates, initially.

Q Have you discussed this cooperative flood with the surrounding operators in this same field, and if so, what has your response been?

A Yes, sir, I have discussed this plan with the operators in the immediate area, and I have had acceptance and agreement from each operator and have had also from nearly every operator shown on this map to the extent that they have no objection and concur with our plans.

Q It is not from this exhibit that a lease which has been marked SPH in Section 11 and a lease marked Cursey & Company in Section 14 are direct offsets of the wells that are directly offsetting that pattern; have you obtained their written permission for this application?

A Yes, sir, I have obtained from them permission stating that they have no objection; they did not give their permission because it was not theirs to give, but they did, however, state



FARMINGTON, N. M. PHONE 325-1182 DEARNLEY-MEIER REPORTING SERVICE, Inc. ALBUQUERQUE, N. M. PHONE 243-6691 that they were in accord with this plan and had no objection to it, and an agreement is under negotiation with SPH wherein a lease line agreement for injection as described previously will be made across the northeastern boundary of Section 14, and also under discussion is an agreement with Cursey & Company, whereby the well in Section 14, the Southwest of the Southeast quarter will be unitized with the Waterflood Associate's wells in the Southeast of the Southeast quarter, Section 14. So, that water may be put into Section 14, Well No. 15, when it becomes time to expand to that, and the ownership of these 40-acre tracts will share on some sort of an agreed basis, will share the oil production from Well No. 1, which is shown as Cursey & Company.

Q Is there anything else you would like to explain, with reference to this exhibit?

A Well, sir, yes, I would like to state that these same zones are being flooded, being successfully flooded in the Loco Hills, the Square Lake and Roberts Pools, and also the Artesia Pool west of here. It's being done successfully on an 80-acre or five-spot, such as we propose here.

Q Will you refer to Exhibit No. 3 and explain what it portrays?

A Exhibit No. 3 is an accumulated production map. It figures beneath the wells which are involved in this project, applied to indicate the number of barrels of oil which those wells have produced.



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Q The figures are applicable on the injection and producing wells in this present application?

A Yes, sir, they were the only ones shown on this one.

Q Please refer to Exhibit No. 4 and No. 4A, at the same time, and explain what they portray?

A Figures 4 and 5 show the five wells involved in the application, which belong to Waterflood Associates, the four injection wells and one producer, and it portrays the production history of barrels per month against the months along the bottom. You will note that the production has declined to 470 barrels per month on those wells, which is an average of 3.1 barrels per day per well.

Q On Exhibit No. 4A, your production runs from 1,000 up to 2,000 and falls off down there to 55 and there is a short increase in 1955. Would you explain the reason for that on this decline curve?

A The production from '52 up through April of 1955 is from two wells, and in 1955 additional drilling occurred, and again in early 1956, additional drilling occurred. That accounts for the increase in production in '56. The curve represents all five wells.

Q The purpose of this exhibit is to show that those wells are in advanced stages of depletion, commonly referred to as "stripper wells." The production from the entire Waterflood Associates wells in there averages just slightly more than two



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barrels per well per day, with no single well able to produce any where near the top allowable.

Q That is also for the Waterflood wells in this application; none of them are producing anywhere near the top allowable?

A No, sir. The average of the wells immediately involved here is 3.1 barrels per day per well.

Q Please refer to Exhibit No. 4B and explain what that shows.

A Exhibit 4B shows the production history of the three wells involved in the application which belong to Western Development Company and Yates. The purpose of this exhibit is to show the advanced stages of depletion of these wells. These wells have declined to a productivity rate of 2.78 barrels per day, which is in the range generally classified as "stripper wells".

Q Will either of these wells produce a top allowable?

A No, sir.

Q Do you have any idea what the maximum production from any of these three wells might be?

A I don't know exactly, but I wouldn't think any of them were capable of producing over ten barrels per day.

Q Please refer to your Exhibit 5A and 5B and explain what it portrays.

A Exhibits 5A and 5B are tabulary oil production history which is shown graphically over 4 and 4B. It also has the total accumulated barrels of oil which these leases have produced, at



the bottom. Pardon me, not leases but these wells.

Q Well, you are referring to those included in this application for waterflood, are you not?

A Yes, sir.

Q Are these charts of the first production from the wells?

A Yes, sir.

Q Do you have, before we leave these, do you have any production history or figures on any of the wells that are not included in this application but that are offset wells belonging either to Waterflood Associates or Western-Yates?

A Yes, I do. The offset wells have been very similar to those wells that are under discussion here. They are all in advanced stages of depletion, near their economic limit.

Q Please refer to your Exhibit No. 6 and explain its meaning.

A Exhibit No. 6 is a combination of well data. It shows the names of the wells involved, the completion dates, and the perforation levels.

Q It is noted that the Waterflood's No. 7 well shows a casing program without cement. Under this application, would that well be a producer or an injection well?

A That is a producer.

Q Western-Yates Well No. 123 is shown with a 5/8-inch set at 345 without cement and there is a notation that there was no water in the hole. Where did you obtain the information that



there was no water in the hole?

A That was recorded on the driller's log at the time it was being drilled. Also on this exhibit, Waterflood Associates Well No. 8 shows no cement behind the 8 5/8.

Q Before we leave this exhibit and while this casing program is present, would you explain what type of program you intend for the casing program of the injection wells and what type for the producing wells?

A For the injection wells, we would like to inject down the casing. It is noted that, as a rule, surface pipe is set in to the salt and cemented, long strings set immediately above the pay and cemented. Any fresh water which might be present in the area are protected by strings of casing and two cement jobs, with the exception of the injection wells, where the surface pipe is not cemented. In the case of the surface pipe not being cemented, we plan to run tubing with a packer and set the packer down below the top of the cement, behind the long strings. We feel that where the surface pipe is cemented that adequate protection will be given to any water which might be present in the area.

Q What wells will that type of injection program be used on, the last one you mentioned with tubing and packer?

A The wells for tubing and packer will be used on Waterflood Associates State No. 14, No. 8, and Western-Yates State 647 No. 123, both of which have no cement behind the surface pipe.



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Q Have you directed a letter to the State Engineers Office and received a copy of their reply over the signature of Frank Irby, dated February 2, 1962?

A Yes, sir, I have.

Q Have you talked to Mr. Irby subsequent to your receipt of this letter?'

Yes, sir, I have. Mr. Irby stated that he would pre-А fer injection be made through tubing and packer set at a reasonable depth below the top of the cement, outside the production In that event, his office offered no objection to the string. granting of this application. I talked to Mr. Irby yesterday; he was in Carlsbad and I talked to him over the phone. He said he would not be able to be present here today. I discussed our situation with him and he said that upon a receipt of further information that he would withdraw this letter and would make further recommendations to the Commission on this matter. He stated to me that I might state for him here that he had no objection to other methods of injection as long as the water which might be present in the area were properly protected. I agreed to send Mr. Irby further information regarding our well completion plans and he agreed to write another letter to the Commission stating his position on the matter, after he had reconsidered the other fields in the area where we were going down the casing, or in the Loco Hills, Square Lake and the Roberts, with the same type of well completion. We plan to leave it and utilize it.



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with the surface pipe open to the atmosphere. In the event we do get a leak, water should come immediately to the surface and we will know to take immediate steps.

Q Do you feel like this casing program for your injection wells will satisfactorily protect any shallow water in this area?

A Yes, sir, it will.

Q Would you explain what type of casing program you would propose for the producing wells in this application?

A The producing wells are completed just like the injection wells. In other words, they have surface pipe set into the salt and cemented the long string above the pay and cemented it. No changes are planned for the general casing program for the producers. In the event that this well, Waterflood Associates No. 7, where there is no cement in the long string, no water was encountered there, and this well has been producing since 1955 without -- with no leak of any water into the well or without any hydrocarbides cominb up around the casing. Therefore, it is assumed that this well is satisfactorily equipped to continue producing in the same method or manner.

Q Please refer to your Exhibit No. 7 and state what that portrays.

A Exhibit No. 7 is a letter from Cisco Pipeline Company in Breckenridge, Texas. They state that they have plenty of water available for this waterflood and they are presently preparing a contract for negotiations between them and Waterflood Associates



FARMINGTON, N. M. PHONE 325-1182 DEARNLEY-MEIER REPORTING SERVICE, Inc. ALBUQUERQUE, N. M PHONE 243-6691 as representing the operators here, to make water available for this waterflood.

Q Do you have a similar letter from Caprock Water Company?

A Yes, sir, I have a letter from Caprock Company that states that they are in a good position to furnish water and nave water available, also.

Q Are one of these sources the ones in which you intend to secure your water for this program?

A Yes, sir.

Q From your knowledge of those two companies' operations, do they nave available to them a sufficient volume of water to furnish you with what you will need in this application?

A Yes, sir. Cisco Pipe Company has agreed to furnish water up to a rate of 5,000 barrels a day, which will be in excess of our demands. As to Caprock Company's quantities, they have not said how much; they do say they have sufficient water available. They have talked to them about our requirements.

Q Do you feel like the quality of the water will be such that it can satisfactorily be used in this waterflood program?

A Yes, sir. The water which Cisco Pipe Company has is presently being used by the Graridge waterflood, the Artesia, which is located about three miles south and west of here. It is quite satisfactory there and no reason it will not be satisfactory here. I have seen the analysis on the water; it is mildly corrosive, however, sufficient character to meet our



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FARMINGTON, PHONE 325 purposes here. The water which Caprock Company proposes to furnish us, according to them, comes from a shallow water bed about eight miles north of here. I have seen an analysis of the water and it is very good water.

Q Would you explain what your anticipations are on the initial rate, the injection rate, and pressure would be?

A We anticipate the initial rate of injection of approximately 200 barrels per day, the well head pressure, on the order of 1200 pounds. This information is based on the experience of the other operators in the area and their rates and pressures.

Q That was 1200 pounds, PSI?

A Yes.

Q At the well head?

A Yes.

Q After your fillup is reached in this reservoir, would your injection rate reduce or change?

A Yes, sir, it will have to be reduced because our withdrawal which will probably be -- it's all according to how much water is being produced with the oil. Chances are they will have to be injection rates which will have to be reduced after fillup.

Q Are there any logs or courses of this reservoir immediately available?

A Not in the immediate area, no. There is very little data available today of the engineer work on it. As far as our recovery is concerned, we anticipate we will recover 1.25 times



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our primary production.

Q Is that 1.25 oil that you would not otherwise recover except in a similar program to this?

A Yes, sir, this oil could not be recovered by primary methods.

Q You notified the State Land Office and State Engineers Office of your application?

A Yes, sir. Exhibit No. 8 is a letter to the State Land Office notifying them of this application, and Exhibit No. 9 is a letter to the State Engineers Office notifying them of the application.

Q The letters which you mentioned from Cursey & Company and SPH offering no objections to this --

> MR. LOSEE: Will they be marked Exhibits 10 and 11? MR. NUTTER: They will be marked.

Q (by Mr. Losee) Will this program promote conservation and prevent waste of natural resources?

A Yes, sir.

Q With the exception of the correspondence which are Exhibits 9 through 11, were the other exhibits prepared by you or under your supervision?

A Yes, sir, they were prepared by me and Mr. Davenport, with Western Development Company, together.

MR. LOSEE: The Applicant would move for the introduction of Exhibits Nos. 1 through 11, Applicant's Exhibits 1 through



ll be admitted in evidence.

MR. NUTTER: Applicant's Exhibits Nos. 1 through 11 will be admitted in evidence.

Q (by Mr. Losee) Mr. Porter, do you have anything else to explain to the Examiner?

A Yes, sir. I would like to re-emphasize the fact that we had very little reservoir data, practically none, available to us. From the performances of the floods in the area, we feel that, from the other flooding in the same zones in the area, we feel that this area will waterflood successfully. The recoveries have been fairly good, and based upon that, we offer this as being probably a successful waterflood. I believe that is Applicant's case.

MR. NUTTER: Does anyone have any questions from Mr. Porter?

MR. MORRIS: Yes.

CROSS EXAMINATION

BY MR. MORRIS:

Q Mr. Porter, does Western Development Company or Waterflood Associates or Yates have any present intentions of expanding the flood from Section 14 into the surrounding sections?

A Yes, sir, we do. We plan an expansion program as soon as we have the pesults from this present pattern.

Q Which way will that flood be expanded?

A It is planned to expand in all directions, to include



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this immediate area, the wells in Section 11, 12, 13, 14, 23, 34, and 15, eventually.

Q If the flood is expanded in that manner, will you attempt to conduct operations on acreage that is not under lease to either Waterflood Associates or Hondo, or Western-Yates or the present application in this case?

A We would attempt to do that.

Q Would you attempt to obtain an operating agreement or form a unit including all of the acreage in that that would be a normal sort of expansion from this area, or would you expand the flood on your own acreage?

A We expect to expand the flood to acreage of all the operators in here. Either we may purchase their interests or they may do it on the cooperative basis with us, or possibly some of them don't want to operate their own waterflood. We may operate for them. We do not plan to do it as a one-unit. We plan to do it on a cooperative, using lease-line agreements and balance the flood on cross-lease lines.

Q As I understand your application, Mr. Porter, you wish to be subject to the provisions of the Rule 701, including the allowable provision?

A Yes, sir.

Q That rule will also govern the expanding of the project area?

A I believe the rule reads it may be expanded by adminis-



trative moves or otherwise, on certain conditions or by hearing. The chances are that we will come back for further hearing for expansion.

Q Mr. Porter, I hand you this document and ask you if this is the letter from Mr. Irby,dated February 2, that you referred to in **y**our direct examination?

A Yes, sir, it is.

Q Mr. Losee, do you have any objection to this being made a part of the record?

MR. LOSEE: I have no objection.

MR. MORRIS: That is all I have.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Porter, in expanding this flood, on each operation as currently laid out, have you made special provisions protecting any violations in royalty ownership?

A Yes, sir. We will, by our lease line agreement, whereby we balance our flood out across lease lines, by offsetting injection wells with producers on royalty owners. They would be protected just as the operators will be by that.

Q In other words, in payment, his royalty would be there. There is actually not going to be transferred any monies or funds, just that you anticipate for a given amount of oil pushed across the line, it will reciprocate oil pushed back from the other line?



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ALBUQUERQUE, PHONE 243. A Yes, sir, that is the only way you can economically flood across the lease line. You could, of course, drill wells right down the line. That would be very uneconomical, and this is the accepted practice in waterflooding everywhere that they do it.

Q There is no pooling of monies or transferring of monies in the unitization?

A No, sir.

Q The water that Cisco Pipeline Company has offered you, is it fresh water?

A No, sir, it is not. It is mildly salty. I don't have the figures with me. It is salty. I don't know the exact content of salt.

Q Now, does Cisco Water System furnish the water at the present time for the Artesia pools?

A Yes, sir, it furnishes to three that I know of, belonging to the Graridge Corporation.

Q And the salty water is compatible with Graridge Corporation?

A Yes, sir.

Q Caprock is offering a fresh water supply?

A It is not what you would call palatable water; however, it is a better quality than Cisco's.

Q Would it be compatible with your needs, in your opinion?

A Yes, sir. In my opinion, it will be.



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Q Now, you have given, on Exhibit 6, the casing program for eight wells, being six injection wells and two closed producing wells. Are the casing programs on the wells which are outside these two five-spots similar?

A Yes, sir. I did not include that as a part of the exhibit; however, I do have Waterflood Associates casing program before me here. They are similar.

Q You do not anticipate, on any of the producing wells, any particular revision of the present casing program is going to be necessary?

A No, sir. I don't anticipate any. There is a possibility that on the injection wells, we may have to cement liners if we want to inject peripheral, one zone at a higher rate than the other. However, the producing wells should be very good as they are.

Q These three pays you will be flooding are included in this open hole interval. Have each of these injection wells, are some of the wells going to have to be deepened to hit the third pay?

A Yes, sir. Now, we do not have a log. We plan to run logs on key wells in the area, several wells, in order to gain more information as to the extent of the different sands and which ones are open in this well and when we do that, we will determine whether or not the wells need to be deepened.

Q As far as your present plans are concerned for these



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ALBUQUERQUE, N. M. PHONE 243-6691 six injection wells, you will inject down casing, with the exception of two wells which do not have cement behind the 8 5/8 inch?

We feel like the surface weight will be sufficient, Q with the two strings of casing and the two cement jobs. However, as additional steps, we are willing to go ahead and put liners -pardon me, not liners, but packers, and tubing into the wells where the 5/8 surface is, that is the 8 5/8, or it is not cemented if the Commission requires.

MR. NUTTER: Are there any further questions?

REDIRECT EXAMINATION

BY MR. LOSEE:

ର Mr. Porter, going back to the type of cooperative flood that you proposed, when you say that you are going to balance the wells, is it your intention in both the proposed application and the expansion of this flood, that wells will be balanced so that a lease will have a like number of producing and injection wells or if it is on a 40-acre lease, that 40-acre lease will be common with the lease adjoining, so that each of the lessees, as well as all the operators, will receive a like share of the oil that they are now receiving from the primary source?

А Well, where we have one 40-acre tract, we intend to unitize it to an adjoining 40-acre tract in order that the interest holder in the well will be based upon a participating fact in the forty acres. By balancing, I mean that along the lease



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line, you will have an injection well on one side of the line, offsetting a producing well on the other side, and in the next one, it will be just the opposite; you will have an injection well on this side and a producer offsetting the injection well on the other side, whereby, oil from this injection well will be pushed across, the balance by similar push from the other side.

Q Under this program, each of the royalty owners would receive their proportionate share of oil recovered from this type flood?

A Yes, sir. He would receive the oil coming from the wells he has interest in.

MR. LOSEE: That is all.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Porter, this Exhibit No. 14, which is a state lease, seems to be divided into single leases. Do you know anything about the beneficiary, as far as the State Land Office is concerned, for each of the state lands?

A Yes, Mrs. Ray checked that just a little while ago, and everything in Sections 14, 13 -- the west half of 13, is the same beneficiary, being the University.

Q That was 14, 13, the west half of 13; how about 15? Did you go into that with her?

A No, sir, I didn't check that.

Q So, actually, even though those are separate leases



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the beneficiary in these two and a half sections are identical? A Yes, sir.

Q And the Cursey No. 40 will be unitized with the Waterflood in the Southeast of the Southeast of 14?

A Yes, sir. That is our plan.

MR. NUTTER: Are there any further questions? Mr. Porter, you may be excused.

(Witness excused.)

Does anyone have anything they wish to offer in Case 2493?

MR. ASTON: As an interest holder under the lease originally, which were sold to Waterflood Associates, I would like to commend them for the diligence with which they approached the area agreement, which I think is a stronger approach toward correlative rights. This has not always been the case in some of the past waterfloods, and we wish to concur with them on their application.

MR. NUTTER: If there is nothing else to be offered in this case, we will take the case under advisement and adjourn the Hearing.

(Hearing adjourned at 12:00 o'clock.)

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ALBUQUERQUE, N. M PHONE 243.6691 STATE OF NEW MEXICO)) ss. COUNTY OF BERNALILLO)

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

NOTARY PUBLIC

My Commission Expires:

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