BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 28, 1959

EXAMINER HEARING

IN THE MATTER OF:

Vase 1610

DEARNLEY - MEIER & ASSOCIATES
GENERAL LAW REPORTERS
ALBUQUERQUE NEW MEXICO
Phone CHapel 3-6691

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 28, 1959

EXAMINER HEARING

IN THE MATTER OF:

Application of Wood River Oil & Refining Company, Inc., for an amendment of Order No. R-1352. Applicant, in the above-styled cause, seeks an amendment of Order No. R-1352, to provide that the unorthodox well locations for well Nos. 8 and 9 of the Wills Water Flood Project, Rhodes Pool, Lea County, New Mexico, be 1135 feet from the South line and 1315 feet from the West line of Section 35, and 1135 feet from the South line and 20 feet from the West line of Section 35 respectively, both in Township 26 South, Range 37 East.

BEFORE:
Mr. Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The next case will be Case 1610.

MR. PAYNE: Case 1610. "Application of Wood River Oil & Refining Company, Inc., for an amendment of Order No. R-1352."

MR. McKENNA: Mr. Examiner, Thomas McKenna of McKenna and Summer, Santa Fe, appearing for the applicant, Wood River Oil & Refining Company. I have one witness, Mr. C. C. Chapin.

(Witness sworn.)

C. C. CHAPIN

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

DIRECT EXAMINATION

BY MR. McKENNA:

Q Will you state your name, please?

A C. C. Chapin.

Q C-h-a-p-i-n, is that correct?

A Yes, sir.

Q What is your address, Mr. Chapin?

A Wichita, Kansas.

Q What is your occupation?

A Manager of Production Department, Wood River Oil & Refining Company.

Q Have you testified before this Commission on previous occasions?

A Yes, sir.

Q Mr. Chapin, did you prepare the application, was the application prepared at your direction which is involved in this matter?

A Yes, sir.

Q Can you tell the Examiner the particular relief that you request and the purpose of the application?

A In our application dated February 10th we assumed our

tract of land was 2640 feet from the North line to the South line. In staking our locations recently we found out it was only 2390 feet from the North line to the South line. That brought about the necessity of changing the location of injection wells No. 8 and 9 to 180 feet south of our original application, move it 180 feet south.

Q Is the purpose of this application to request an amendment of Order No. R-1352 previously entered by the Commission in this matter, being the Wills Water Flood Project, is that correct?

A Yes, sir.

Q So it may be put out definitely, what will now, what is the south location for Well No. 8?

A We wish it to be 1135 feet from the South line, now.

Q By way of refreshing your memory, you are right, go ahead, sir, I am sorry. Give the complete location.

A We want No. 8 to be 1135 feet from the South line and 1315 feet from the West line of Section 35, Township 26 South, Range 37 East, Lea County.

Q And will you tell the Examiner the desired new location for Well No. 9?

A We seek to have injection well No. 9, 1135 feet from the South line and 20 feet from the West line of Section 35, Township 26 South, Range 37 East, Lea County.

Q And so far as is necessary, your request is for the

approval of such locations as an unorthodox location, is that correct?

A Yes, sir.

Q Can you tell the Examiner the quarter subdivision or legal subdivision in which these two wells as now requested will be located?

A They both will be in Subdivision D.

Q And Subdivision D would be the Northwest Quarter of the Northwest Quarter of Section 35?

A Yes, sir.

Q 26 South, 27 East? A 37 East.

Q 37 East? A Yes.

MR. McKENNA: I have two exhibits which I would like to have identified, Exhibits 1 and 2 of Wood River, Oil & Refining Company.

(Whereupon the documents above referred to were marked Applicant's Exhibits Nos. 1 & 2, for identification.)

Q I hand you what has been marked as Applicant's Exhibits 1 and 2. Will you tell the Examiner what they purport to be, please?

A These are the surveyor's plats showing the location of injection wells No. 8 and 9 on our Wills Flood in Section 35, Township 26, Range 37, Lea County.

Q And is it true that those exhibits reflect the

proposed or desired locations?

A Yes, this coincides with our application, revised application, yes, sir.

Q Can you state whether or not you prepared these exhibits or whether or not they were prepared at your direction?

A They were, yes, sir.

Q Prepared at your direction, is that correct, sir?

A Yes, sir.

MR. McKENNA: Mr. Examiner, I would like to have these submitted in evidence.

(The documents previously marked Applicant's Exhibits Nos. 1 & 2 were offered in evidence by counsel for the Applicant.)

MR. UTZ: Without objection they will be received.

Q Mr. Chapin, do you see anything in connection with your application that would be violative of the principles of conservation and the prevention of waste?

A No, I do not.

Q And would it be your testimony that this application is in keeping with correlative rights?

A Oh, yes, sir.

Q And the basis of your application is to request the amendment of the previous order as to Wells 8 and 9, is that correct?

A Yes, sir.

MR. McKENNA: That's all I have, Mr. Examiner.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Chapin, have you sent copies of Exhibits 1 and 2 to the Hobbs office for their file?

A Yes, sir.

MR. UTZ: Are there any other questions of the witness?

BY MR. PAYNE:

Q Mr. Chapin, this does not change your original water flood project in any respect here, does it?

A No, not at all, sir. We just got these two wells too far north to make equal distribution.

Q And it was necessary for you to have another hearing since the well location was spelled out in the original order?

A Yes, sir.

MR. UTZ: Any other questions? If not, the witness may be excused.

(Witness excused.)

MR. UTZ: Is that all you have?

MR. McKENNA: Yes, sir.

MR. UTZ: Any statement to be made in this case? If not, the case will be taken under advisement and the hearing is adjourned.

STATE OF NEW MEXICO)
:
COUNTY OF BERNALILLO)

I, JOSEPH A. TRUJILLO, 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 7th day of August, 1959.

Joseph A. Trujillo
Notary Public-Court Reporter

My Commission Expires:
Oct 5 1960

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1610, heard by me on Aug. 5, 1959.

Examiner
New Mexico Oil Conservation Commission

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE NO. 1610

TRANSCRIPT OF HEARING

DEARNLEY - MEIER & ASSOCIATES
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March 11, 1959

Page

NEW MEXICO OIL CONSERVATION COMMISSION

Mabry Hall

Santa Fe, NEW MEXICO

REGISTER

HEARING DATE Examiner March 11, 1959 TIME: 9:00 a.m.

NAME:	REPRESENTING:	LOCATION:
Hiram W. Keith	Wood River.	Kermit, Texas
Thomas F. McKenna	" "	Santa Fe.
J. C. Hostetler	" "	Monahans, Tex
C C Chapin	" "	Wichita Kan.
H. N. Rhodes	British American	Denver, Colo.
Burns H. Errebo	" "	Albuquerque
John Yuronka	T. P. Coal & Oil Co.	Midland, Texas.
John Hampton	Great Western Drlg	MIDLAND
Wm. S. Davis	Humble	Midland
Robert H Vick	Amerada	Ft. Worth.
J. D. Chester	"	"
James T. Jennings	"	Roswell
Frank E. Irby	State Engr. Office	Santa Fe
Sim Christy	Hervey, Dow & Hinkle	Roswell
Nancy Royal	[illegible] Reporting	Santa Fe
[illegible]	[illegible]	MIDLAND TEX

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

Application of Wood River Oil & Refining Company, Inc., for an order authorizing a pilot water flood project, for capacity allowables for wells in said project, and for approval of five unorthodox locations. Applicant, in the above-styled cause, seeks an order authorizing it to institute a pilot water flood project in the Rhodes Pool in Lea County, New Mexico. Applicant proposes to inject water into the Lower Yates formation through six wells located in Section 35, Township 26 South, Range 37 East. Applicant also seeks approval of unorthodox locations for five of its proposed injection wells. Applicant further seeks capacity allowables for wells within the project.

CASE NO. 1610

BEFORE:

Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: The Hearing will come to order, please. First case on the docket this morning will be Case 1610.

MR. PAYNE: Case 1610. Application of Wood River Oil & Refining Company, Inc., for an order authorizing a pilot water flood project, for capacity allowables for wells in said project, and for approval of five unorthodox locations.

MR. McKENNA: Morning, Mr. Examiner and gentlemen. My name is Thomas Seth McKenna, lawyer from Santa Fe, and I am representing Wood River Oil & Refining Company. I believe we only have one witness, Mr. Keith.

(Witness sworn.)

H I R A M W. K E I T H, a witness, called by and on behalf of the Applicant, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY: MR. McKENNA:

Q Would you state your name, please, sir.

A My name is Hiram W. Keith.

Q And where do you live, Mr. Keith?

A I live at Kermit, Texas.

Q And by whom are you employed and in what capacity?

A I am employed by the Wood River Petroleum Company as a petroleum engineer.

Q Have you testified previously before this Commission?

A No.

Q Will you please state your education and your experience in your field for the Commission.

A My first experience in the oil business started in 1946 in Groesbeck, Texas. I was employed by Pan American Oil Company as a roustabout. I was graduated from the University of Oklahoma in 1949. Upon completion of my graduation I was

employed by the Texas Company in Illinois, and at that time in Illinois I was employed as an area engineer, water flood engineer and did water flooding engineering work and was associated with some fifteen water flood projects. After that I was transferred, and from 1949 to 1956 I worked in Illinois, Kentucky, and Indiana, and I was transferred to Oklahoma where I was associated with two more water floods in connection with the Texas Company. After that I was transferred to the division office where I was employed as a reservoir engineer for two years. After that I, in February of 1957, last year, I resigned the Texas Company and was employed by Wood River Oil Company and since that time I have worked in the North Scarborough water flood as a water flood engineer.

Q Where is this North Scarborough water flood located?

A The North Scarborough water flood is located in Winkler County, Texas, adjacent to the proposed flood that we have proposed here.

MR. McKENNA: Mr. Examiner, I move that this witness' qualifications be accepted.

MR. NUTTER: What will be your job with the proposed water flood that we have here this morning?

A As a water flood engineer. In other words, we will be expanding our water flood across the state line from Texas.

MR. NUTTER: His qualifications are acceptable.

Q (By Mr. McKenna) As you stated, you are in charge

of the identical water flood across the state line?

A That's right.

Q The North Scarborough for Wood River?

A That's right.

Q And you will be in charge of this project if approved?

A From an engineering standpoint, yes.

Q Can you tell the Examiner your particular acquaintance with the proposed water flood now before this Commission?

A Well, since I have been working with this flood for a year in the North Scarborough, naturally we kept, or observed the offset leases and looked for other possible properties to flood, and in the process of this, why I have studied the subsurface and structural and all pertinent things that would be relative to a prospective flood, and visited the leases from time to time to see how they are coming along and if progress was being made.

Q And you are particularly acquainted with the land involved and the area involved in this proposed water flood?

A Very definitely. I am out there anywhere from three to four times a week.

Q Now, if I remember correctly, Mr. Witness, and correct me if I am wrong, there are two leases involved in this proposed water flood: Las Cruces 050107 (b) and 050107 (a), is that correct?

A That's right.

Q Do you recall what the two leases have recovered from

primary production?

A As of --

Q As of January, so to speak, 1st, 1959?

A As of January 1st, 1959, the two leases recovered, cumulative, 416,666 barrels of oil from a total of six wells, six producing wells.

Q How many active wells do you now have in this area involved?

A There are now two. I mean, one active well, the A No. 2 Well, which the December state data showed it was producing 155 barrels during the month and no water. Just the one well.

Q And this proposed project is located in Section 34 and 35 of Township 26 South, Range 37 East, Lea County, is that correct?

A Right.

Q Particularly involving Lot 1 of Section 34 in the NE/4 NE/4 of Section 34; Lots 2, 3, and 4, in the N/2 NW/4; NW/4 NE/4 of Section 35, is that correct, sir?

A That's right.

Q Is it your opinion that the reservoir is now in a late stage of primary depletion?

A Very definitely, it is.

Q And what is this reservoir, Mr. Witness?

A You mean the name of the reservoir?

Q Yes, please.

A The reservoir we are referring to is what we call the Penn Bennett. We refer to it as the Penn Bennett. Some people refer to it as the Lower Yates. It is the lower portion sand section in the Yates, or immediately above the Seven Rivers.

Q And as a result of your studies of this reservoir, have you reached any conclusion as to the necessity for secondary recovery?

A Yes, sir, I have. It is my honest opinion that if secondary recovery operations are not instigated, that we stand to lose a considerable amount of oil in the ground.

Q And is it your testimony that this secondary recovery program as proposed is necessary in the interest of conservation and prevention of waste?

A Yes.

Q What do you believe will be recovered by virture of this secondary recovery program?

A I believe we can anticipate at least as much if not more additional oil than was recovered by primary, which was 416,666, as I previously mentioned.

Q Now, Mr. Witness, I notice that you have in your possession a copy of the application which was submitted to the Conservation Commission. Will you go ahead and explain to the Examiner in detail the proposed plan?

A We propose to drill first our two water supply wells, which we propose to use the same water source as we are using

in our North Scarborough flood, which will be the Santa Rosa formation. Now, the water sand occurs from a depth 420 to 550, and we propose to drill two water supply wells; equip those wells with turbine pumps and determine first if we have water supply, then we plan to drill six injection wells as located on the map shown here on irregular spacing. The pattern will be 40-acre five spot injection, which will be conforming to the primary pattern, other than we are going to have to drill inside for injection wells.

Now, the injection wells, we plan to drill those in this manner, by drilling through the producing formation of the Penn Bennett, which is to be some 3380 feet, forty feet below that center casing, five and a half inch casing, and cement that with 525 sacks of cement, run centralizers and float your float column on the bottom joint, go in and perforate the Penn Bennett with four shots per foot and leave the float shoe in and the float collar in. We plan on setting eight and five-eighths for surface pipe at 600 feet, which conforms to the Texas regulations, and cement that with circulated cement to the surface on our surface pipe and that will protect any fresh water sand from recharging with gas or anything else.

Q Where did you say you would set that eight and five-eighths --

A Six hundred feet.

Q Mr. Witness, do you know, from your plans, the range

in depth and perforations?

A You mean the formation? Well, the top of the Penn Bennett is usually found in an average of 3280 to 3270, and the thickness of the Penn Bennett ranges from thirteen to thirty feet, for an average of approximately twenty feet. Now, I believe that answers the question.

Q And I believe in the application you stated that you desire to flood the Lower Yates formation through perforations which range in depth from 3235 to 3310 is that correct?

A That's right.

Q Now, the water that will be used is fresh water?

A That is correct, Santa Rosa formation fresh water.

Q Now, Mr. Witness, some of the injection wells are, so to speak, unorthodox in view of the rule of this Commission, and please check me carefully, and I refer to injection wells 6, 7, 9, 10, and 11. Well No. 6 is located in Lot 3 of Section 35, Well No. 7 in Lot 4, Section 35; No. 9 in Lot 4, Section 35; No. 10 in the NW/4 NW/4 Section 35, and No. 11 in the NE NW, all in 26 South, 37 East, is that correct?

A That's correct.

Q And it is part of your application, asking approval for these unorthodox locations?

A That's right.

Q How many wells will be on the lease, to recapitulate, Mr. Witness, after you have drilled the injection wells?

A When the injection wells should be completed, we will have a total of twelve wells, six will be injection wells and six will be producing wells.

Q What is the total number of acreage involved in the flood?

A Our lease will require, as shown on the map, 290 acres.

Q Is it then your testimony, or would you view it as a, in your opinion, as a large flood program, or what?

A No. In fact, it is just a relatively, I consider it a relatively small area, inasmuch as it is just an expansion or addition to our present flooding operations.

Q In Texas?

A In Texas.

Q Mr. Witness, can you tell the Examiner the reservoir characteristics of the Penn Bennett sand?

A Yes, sir, I can. The Penn Bennett formation is located on a, it might be considered a stratographic trap. It is indicated on the west edge of the bisymmetrical anticline running north and south. The structure plunges approximately 180 feet to the west and on the eastern edge of the pool, the productive limits are dominated by permeability conditions, whereas on the western edge we suspect a very inactive water drive, water table would be correct. Now, the formation is, the sand characteristics, it is a very soft fragile brown silty sand, and it usually comes in two sections. The zone is separated by thin dense dolomite

section, and runs anywhere from four to six feet. Now, as far as the porosity and permeability -- Well, first, it is estimated in this 290 acres that we have requested, that 235 of those are productive. Now, the average porosity is 21.3 per cent; average horizontal permeability, 30.3 millidarcies. Estimated connate water content, 35 per cent. Gravity of oil 37 degrees API. Estimated original reservoir pressure, 1250. Bottom hole temperature, 95 degrees Fahrenheit, viscosity of oil, gas free, 5.4 centerpoise. Estimated original GOR 400 to 1. Now, I would like to point out here that this reservoir data is just for the Bennett. Now, the Yates, if they consider the entire Yates, the Yates is going to have a higher GOR on account of the upper zones, the stringers up in there are gas, and these wells, a lot of them, I say a lot of them, five of the six wells were completed producing from the entire Yates section, which includes the Penn Bennett and the Upper Yates, but in our flooding program, our injection wells were primarily to flood the Penn Bennett, and we set them all in the North Scarborough field.

Q Do you know what the estimated present reservoir pressure is?

A I would estimate around a hundred pounds.

Q Mr. Witness, can you tell the Examiner how you propose to isolate the producing formation?

A Well, I believe I explained that a while ago, through the casing program by setting through and perforating only the Penn

Bennctt section, or those zones which we are flooding now. In the producing wells, why we don't plan to isolate the Penn Bennett, but we are isolating our flood from the original point.

Q And this same completion method has been used in your offset North Scarborough pool, is that correct?

A Yes, sir, we found it to be very successful there.

Q Do you have any idea, or can you express any opinion as to the compatibility of the injection and produced water?

A No, that would be difficult, since the leases haven't produced water, and we had a water table, but that has been very hard to define. It is very hard to run any chemical analysis to find the compatibility of the two waters. However, I can say this, we have had flooding for four and a half years in the North Scarborough field, and some of the wells have had the break-through point and we haven't noticed any adverse effect in those wells from injection of the fresh water in the Penn Bennett section.

Q In addition, your application asks for full capacity allowables, is that correct?

A Yes.

Q Have you reached any conclusion as to the economic necessity of that?

A I believe it is necessary in this--I am not too familiar with the rest of the state, but in this particular instance, I think it is, in that we are setting on the state line and we have flooding operations with full capacity allowables in Texas, which

is going to be detrimental if we don't have it in New Mexico in that particular adjoining area. In other words, I think it could be correlated to some of your primary allowables where you have fields across the state line when you try to make those the same on both sides of the state line.

Q And as you state, you do have full capacity allowables in the North Scarborough field?

A We have full capacity allowables in the North Scarborough field.

Q Now, Mr. Witness, do you believe that this proposed project is necessary for the greatest ultimate recovery of oil and that it will prevent waste in keeping with the principles of conservation?

A I do, because--and I forgot to mention the reservoir characteristics of the pool--it has been produced primarily by gas drive, and which we know isn't a very efficient method of production from an overall standpoint, and I believe we can reduce the oil saturation in the reservoir by secondary recovery methods.

MR. McKENNA: I believe that's all, Mr. Examiner.

MR. NUTTER: Are there any questions of this witness?

MR. PAYNE: Yes.

MR. NUTTER: Mr. Payne.

CROSS EXAMINATION

BY: MR. PAYNE:

Q Mr. Keith, in the Railroad Commission Order that

approved your water flood in Texas, does it actually contain a provision that all wells in the project will be allowed to produce at capacity?

A If they are in the flood area. In other words, there are some leases that haven't been -- We don't operate or haven't been flooded. They don't have capacity allowable. When we get the flood permit then we usually set up, like the lease, for instance, the lease went from ten barrels up to two hundred barrels in one month, and we will go to the Railroad Commission and tell them that, and they will give us a full capacity allowable. In other words, it is just a matter of informing them what it is and they assign us capacity allowable on that two hundred barrels a day for the lease.

Q In other words, they have what we consider comparable to an administrative procedure for allowing capacity allowables for wells that have had a considerable response to the flood?

A That's right, but it is just a matter of -- all we do is just write a letter and then they answer back, and we inform our pipeline and so forth.

Q I was just wondering if you were aware of the fact that the New Mexico Commission has never approved a pilot water flood project in the very same order capacity allowables were approved for wells in the project.

A Well, I wouldn't consider this a pilot flood.

Q It is a pilot flood in New Mexico, isn't it?

A It is all the same pool and everything. In other words, it is just an extension of the flood. Now, the Rhodes field and the North Scarborough are very definitely the same field, and just because the state line is there, from your standpoint, I guess you would look at it as a pilot flood; from our standpoint, we don't. We have been operating it for four and a half years. We originated the pilot flood in 1956, which we have six injection wells, and now got to the point where we produce three hundred thousand barrels from the flood.

Q Would you be satisfied with an order which provides that when a well has a substantial response from the flood and you so advise us, we would administratively approve capacity allowables for such wells, providing the response was substantial?

A Would that mean that we would have to have a hearing, or would it --

Q No, administrative approval by the Secretary Director upon being satisfied that the wells had received the substantial response.

A I think that would be the same as we have in Texas, if it were handled in that method.

MR. McKENNA: We would be satisfied.

MR. PAYNE: That's all, Mr. Examiner.

MR. McKENNA: Mr. Examiner, I have a couple of exhibits which I would like to have marked for identification, and if there is no objection, have them admitted in evidence.

One is a map showing the under water district in New Mexico by way of showing that this is not in any declared basin. Mark that as Wood River's Exhibit No. 1.

MR. NUTTER: What is the source of this exhibit, Mr. McKenna?

MR. McKENNA: That was received yesterday from the State Engineer's Office.

MR. NUTTER: Is this an exhibit or a map that was prepared by the State Engineer's office?

MR. McKENNA: Yes, sir, it is.

MR. NUTTER: This map has been identified as Exhibit No. 1 in Case 1610.

MR. McKENNA: I would like to move it be admitted in evidence.

MR. NUTTER: Is there objection to the introduction of applicant's Exhibit No. 1 in evidence in this case? The exhibit consists of two maps, is that correct?

MR. McKENNA: Two maps, that is correct. Mr. Examiner, the offsetting lease is owned by the Texas Company, and I have here in my possession a telegram sent to Wood River Oil and Refining Company from the Texas Company stating that they have no objection to the proposed water flood project. I would like to mark this as Exhibit No. 2 for identification, and if there are no objections, I respectfully move it be admitted in evidence.

MR. NUTTER: Is there objection to the introduction

of Applicant's Exhibit No. 2 in Case 1610? If not, the exhibit will be received.

MR. McKENNA: I believe that concludes our case.

MR. NUTTER: Are there any questions of the witness?

QUESTIONS BY MR. FISCHER:

Q Mr. Keith, did you state the primary drive, mechnical drive of this formation was solution gas drive or solution gas?

A Solution gas. You mean what kind of recovery?

Q Primary recovery mechanism .

A The primary recovery mechanism was solution gas.

Q At the present time are your leases in Texas developed to the stage where, say, your production or injection is right up against the state line? Is there any zone in between? Would there be any zone between the lease in New Mexico and the lease in Texas where wells are not presently being flooded or affected by the flood?

A No, there wouldn't be, as shown on the map, on that exhibit. It will be one continuous flood. Those wells shown south of the state line have already been drilled and have water injection in them. The 15 and 16, they are on the Scarborough "A", are fairly new injection wells, and they haven't enough cumulative to affect the wells north of there, but we expect and anticipate in two months --

Q That would be your Scarborough "O" up against the line?

A That's right.

Q And one and two, are they affected by the flood?

A That's what I say, the new injection wells have been put in recently and they have had no time to affect one and two, that's one of the reasons we would like to begin flooding operations as soon as feasible, to maintain a balance flood and not have part of the property flooded out.

Q And in this lease in New Mexico, you will begin flooding your entire lease?

A That's right. We don't want a pilot food because we have already proven to our own satisfaction and I believe we can prove that pretty well, that flooding of the Penn Bennett section is very successful and we see no reason for a pilot flood.

Q What I am getting at, there will be no further expansion of this?

A We don't anticipate any, and if some other operator comes along side from the present data it doesn't indicate there will be any expansion. I wll put it this way, I mean, that is all speculative.

Q Do you have the same purchaser in Texas and New Mexico for your oil?

A No, we don't.

Q Who is your purchaser in New Mexico at the present time?

A In New Mexico?

MR. McKENNA: Is the witness competent to answer that?

A I really am not, that's out of my line really.

MR. FISCHER: All right, that's all.

MR. PORTER: Is there anyone that is competent?

MR. McKENNA: He doesn't know for sure.

MR. NUTTER: Any further questions?

MR. PAYNE: Yes.

MR. NUTTER: Mr. Payne.

QUESTIONS BY MR. PAYNE:

Q Mr. Keith, you say this is not in a declared water basin, is that correct?

A That's right.

Q Could you give me the locations where you propose to drill the two water wells?

A I believe they are located on Exhibit 1, and are shown by asterisk 1 and the other by asterisk 2 by the No. 2 Well. No. 1 well, we put our injection plant in there, that is the reason we put it there, by our injection plant.

MR. McKENNA: Mr. Witness, the fresh water supply well will be located in Lot 3 of Section 35, and the No. 2 on the Northwest, Northwest Quarter of Section 35?

A That would be accurate, yes.

MR. PAYNE: That's all.

QUESTIONS BY MR. NUTTER:

Q Mr. Keith, the area that is commonly referred to as the Rhodes storage area, or gas storage, is somewhere in this general neighborhood, is it not?

A It is my understanding it stops at Section 35, that's my information, the top of Section 35, and I believe that storage is in the Upper Yates, isn't it? I am not too familiar with the storage, but as I understand it, it is in the Upper Yates, and it was, the bottom of the storage was at the top of Section 35, that line there.

Q And the gas storage as far as you know is in the Upper Yates and you will be flooding the Penn Bennett member, which is the Lower Yates?

A Now, those wells are still producing. I mean, the one well is still producing from the entire Yates section, but we are not in the gas storage project.

Q Now, the one well that you stated was still producing is the No. 2 Well?

A Yes, sir.

Q On your Wills "A" Lease.

A "A" Lease.

Q Which is the well that's got the minus 261 just below the designation of the well?

A That's right, that's the subsea top.

Q What is the status of the No. 4 and No. 5 on that lease, and the No. 1 and 3 on the other lease?

A Three is still on the "A" Lease. They are all TA or shut in. They still have the surface equipment. I say the surface equipment, the flow equipment with the exception of "B" 1 which they have removed all surface equipment.

Q Do you expect that after this flood gets in progress that all six of these well will be activated as producing wells?

A As soon as we complete our injection wells and have our water injection system and our plant set up, we plan to go in and clean up these wells. They never have been cleaned up; clean up the wells and put pumping equipment and electrify them.

Q That's all six of them?

A Yes, all six producing wells.

Q Could you give us the footage description that you propose for the unorthodox locations of the No. 6, 7, 9, 10, and 11, please?

A That would be on the next exhibit there.

Q Those footages are given with the application then?

A Yes, sir.

Q Is No. 5 and unorthodox location, Mr. Keith?

A It is, according to the 40 acres. That's 330 from the South lease line.

Q It is 330?

A Yes, sir.

Q Then that would not be an unorthodox location according

to the Rules of the New Mexico Commission?

A I thought you had to go on center 40's.

Q No, 330 is acceptable.

A I didn't know.

Q I thought from the map it was closer than 330 feet.

A No, sir, it is 330.

Q Mr. Keith, you mentioned that the Penn Bennett is composed of two separate sands separated by a thin string of dolomite. What is the member that lies directly above the Penn Bennett and directly below the Penn Bennett?

A There is a thick dolomite section above and below both, which some people call the dolomite section above the fingers. It is just kind of a field name. Five-finger dolomite, and immediately below would be the top of the formation.

Q Are these two members that bind the upper and lower limits of the Penn Bennett?

A Very definitely.

Q So that the water you put in the Penn Bennett will be confined to that strata then?

A Yes, sir.

Q Have you made any calculations, Mr. Keith, as to the amount of water which will be required to achieve fillup on this 298-acre water flood that you are proposing here?

A Yes, sir, on a per well basis, it will require from one hundred ten thousand to one hundred forty thousand per well.

That is based on volumetric data and also on our experience in the North Scarborough field.

Q What rates of injection do you think will be necessary in order to obtain this fillup satisfactorily?

A We propose to inject 300 barrels a day.

Q In each well?

A Yes, sir, per well. A total of 1800 barrels.

Q Can you indicate Mr. Keith, the wells which are currently being used as water injection wells on the acreage directly south of the proposed water flood?

A Yes, sir, they have the same circle on them that your wells up here that we propose, or they are in parenthesis.

Q Is No. 15 a water injection well?

A Yes, sir.

Q Sixteen?

A Yes, sir.

Q Fourteen, nine, two, eight, five, ten, and four?

A Five isn't, that's an error, and four isn't. In other words, it is on five-spot 20-acres, with the exception of 15 and 16, which are slightly off location.

Q Mr. Keith, in the event that you leave the entire interval perforations opened in the producing wells, and this is probably a zone--that is, the Upper Yates is probably a zone that is depleted or near depletion, is there any possibility of the water flood oil that is produced from the Penn Bennett being

lost into these other sections?

A No, we are going to leave them opened. As I said before, the Yates and the Penn Bennett both are very fragile sand, and we plan to set a liner in the producing wells, just hung, not cemented, to set the bottoms of the liner in the, what I refer to as the five finger dolomite above the Penn Bennett to prevent caving from coming back into the formation. As long as we maintain our production and keep our production level down and our flood level down, I don't see why there should be any oil or water escaping back into the outer zones.

Q What would happen in the event one of your wells was shut in and fluid levels did rise in the well?

A In this particular area, the Upper Yates is much tighter than the Penn Bennett and it would take considerably more than hydrostatic head to inject into the Upper Yates what we would have in our well. That's all it would be, the hydrostatic head, while the well was shut down.

MR. NUTTER: Are there any further questions of Mr. Keith?

MR. PORTER: I have one.

MR. NUTTER: Mr. Porter.

QUESTIONS BY MR. PORTER.

Q This question has no bearing on the case. What is the spacing in Texas, the proration, is it 40?

A Here it is diagonally 20's. You mean statewide?

Q No, in this particular pool.

A In this particular case it is diagonally 20.

Q Is that the spacing that the wells are drilled on at present in Texas, 20's?

A Our lease was developed on that, yes.

MR. NUTTER: 40 in New Mexico?

A Yes, sir.

MR. PORTER: Thank you, that's all.

MR. NUTTER: Any further questions of Mr. Keith? If there are no further questions, the witness may be excused. Do you have anything further, Mr. McKenna?

MR. McKENNA: I have not.

MR. NUTTER: Does anyone have anything they wish to offer in Case 1610? If there is nothing further, we will take the case under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, Jospeh A. Trujillo, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me in Stenotype and that the same was reduced to typewritten transcript by me and contains a true and correct record of said hearing, to the best of my knowledge, skill and ability.

DATED this 13th day of March, 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Joseph A. Trujillo
NOTARY PUBLIC

My Commission Expires:

October 5, 1960

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1610, heard by me on 3-11, 1959.

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