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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 10, 1969

EXAMINER HEARING

IN THE MATTER OF:

Application of Tamarack Petroleum
Company, Inc. for a unit agreement,
Lea County, New Mexico.

)
)
)
) Case No. 4216
)
)

Application of Tamarack Petroleum
Company, Inc. for a waterflood
project, Lea County, New Mexico.

)
) Case No. 4217
)
)

BEFORE: Daniel Nutter, Examiner.

TRANSCRIPT OF HEARING



MR. NUTTER: Case 4216.

MR. HATCH: Case 4216. Application of Tamarack Petroleum Company, Inc. for a unit agreement, Lea County, New Mexico.

MR. KELLAHIN: If the Examiner please, Cases 4216 and 4217 both pertain to the same area and some of the testimony will be overlapping and for that reason I would like to move that they be consolidated for the purposes of the record with a separate order to be entered in the cases.

MR. NUTTER: We will call the next Case 4217.

MR. HATCH: Case 4217. Application of Tamacrack Petroleum Company, Inc. for a waterflood project, Lea County, New Mexico.

MR. NUTTER: For purposes of testimony and making the record, Cases 4216 and 4217 will be consolidated.

MR. KELLAHIN: If the Examiner please, Jason Kellahin appearing for the Applicant. We have two witnesses I would like to have sworn.

(Witnesses sworn.)

(Whereupon, Applicant's Exhibits 1 through 4 were marked for identification.)

MR. KELLAHIN: Call as our first witness Mr.

Albert Metcalfe.

ALBERT METCALFE

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Albert Metcalfe.

Q How do you spell that, Mr. Metcalfe?

A M-e-t-c-a-l-f-e.

Q By whom are you employed and in what position?

A Tamarack Petroleum Company, vice-president.

Q Have you testified before the Oil Conservation Commission and made your qualifications a matter of record?

A Yes, I have.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. NUTTER: Yes, sir, they are.

Q (By Mr. Kellahin) Mr. Metcalfe, are you familiar with the application of Tamarack Petroleum Company in Cases 4216 and 4217 presently before the Commission?

A Yes, I am.

Q Briefly, what is proposed by the Applicant in these two cases?

A We propose to form a unit, the Northeast Pearl Queen Unit in Lea County, New Mexico, for a secondary recovery by waterflooding.

Q Have you formed a unit -- entered into a unit agreement?

A Yes, sir, we have.

Q Referring to what has been marked as Exhibit No. 1 in Case 4216, would you identify that exhibit?

A That's the unit agreement for the Northeast Pearl Queen Unit, Lea County, New Mexico.

Q Is that in the form which has been approved by this Commission and by the Commissioner of Public Lands in other cases?

A Yes, it is. We have received preliminary approval from the land office.

Q Now, are there any federal lands included within the unit boundary?

A No, sir.

Q Does it all consist of state and fee lands?

A Yes.

Q Can you give the percentages of state and fee lands involved?

A There are 920 acres in the unit area of which 400 acres are fee land and 520 acres are state land.

Q Now, have all of the working interest owners agreed to this unit agreement?

A Yes, they have.

Q Referring to what has been marked as Exhibit No. 2, would you identify that exhibit, please?

A Exhibit 2 is a unit operating agreement between the working interest owners in the unit area.

Q That is the operating agreement under which this unit will be operated?

A Yes, sir, it is.

Q Is there any particular provision in the -- either of the unit or operating agreement that you want to point out to the Commission?

A Pardon me?

Q Are there any particular provisions within either one of these instruments that you want to point out to the Examiner?

A No, sir.

Q Now, have all the working interest owners agreed

to the operating agreement?

A Yes, sir.

Q Referring to what has been marked as Exhibit No. 3, would you identify that exhibit?

A Exhibit 3 are the ratification sheets by which the royalty owners and the working interest owners have agreed to be bound by these two instruments.

Q Now, as to the state lands, of course, the State of New Mexico is a royalty owner and you say you have preliminary approval from the State?

A Yes, sir.

Q What is the status of the ratifications from the other royalty owners?

A The royalty owners --

Q Are you referring to what has been marked as Exhibit No. 4 at this time?

A Yes, sir, I am. Exhibit 4 is a schedule showing the per cent royalty ownership that has ratified the agreement at this time.

In connection with that there are four royalty owners who have not signed. There are five royalty owners who have not signed, pardon me; Texaco, Jake L. Hammond, Jack McClellan, David Kite and Inez R. Reese.

Q Have you contacted all of those individuals or companies?

A Yes, we have. All of those have agreed to sign the unit agreement, but we have not received a ratification sheet at this time. We are in the process of purchasing the Inez R. Reese interest so we will own that entirely.

We anticipate that before the effective date of this unit all of the royalties will be signed with the exception of one Helen M. Crow, who we have been unable to locate.

Q How much interest does she own?

A She owns 1.17188 interest in tract number 6.

Q What percentage is covered by tract number 6?

A Our tract number 6 is a 40-acre tract. It is the northwest quarter of the southwest quarter of Section 24.

Q That's the only one you have been unable to contact, is that correct?

A That's correct.

Q Who is designated as the unit operator?

A Tamarack Petroleum Company.

Q Were Exhibits 1 through 4 prepared by you or under your supervision?

A Yes, they were.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibits 1 through 4 inclusive.

MR. NUTTER: Tamarack's Exhibits 1 through 4 will be admitted in evidence.

MR. KELLAHIN: That's all I have of this witness.

CROSS EXAMINATION

BY MR. NUTTER:

Q Now, Mr. Metcalfe, as I understand you, all working interest has been signed?

A Yes, sir.

Q And all royalty interest with the exception of about five there you mentioned have been signed?

A Yes, sir.

Q All of them have agreed that they will sign it with the exception of this Mrs. or Miss, whichever, Helen Crow, and you haven't been able to locate her; but prior to the effective date of the unit you expect to have everyone else signed?

A That's correct.

MR. NUTTER: I believe that's all. Are there any other questions of Mr. Metcalfe? He may be excused.

(Witness excused.)

(Whereupon, Applicant's Exhibits
1 and 2 were marked for
identification.)

MR. KELLAHIN: We call Mr. Williamson.

ROY C. WILLIAMSON, JR.

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Roy C. Williamson, Jr.

Q What business are you engaged in, Mr. Williamson?

A I am petroleum consultant.

Q What firm are you associated with?

A Bailey, Sikes, Williamson and Runyan, Incorporated.

Q Have you testified before the Oil Conservation
Commission and made your qualifications a matter of record?

A Yes, I have.

MR. KELLAHIN: Are the witness' qualifications
acceptable?

MR. NUTTER: Yes, they are.

Q (By Mr. Kellahin) Mr. Williamson, in connection
with your work as consulting engineer, have you done any
work for Tamacrack Petroleum Company in connection with

their proposed Pearl Queen Unit and waterflood project?

A Yes, I have.

Q What did you do in connection with this proposal?

A We have prepared an engineering study and a parameter study and a proposed plan of operations for conducting waterflood operations in the proposed unit.

Q Now referring to what has been marked as Exhibit No. 1 in Case 4217, is that the parameter study to which you referred?

A That is correct.

Q Would you go through the various portions of that exhibit and discuss them, please?

A Yes. The letter itself merely outlines the unit area and a description of the zones that will be considered for a waterflooding. The zones in this area in the Queen formation are normally designated as zones 1 through 7. There are only three of these that will be considered in this waterflood project.

These are zones 4, 5, and 7. On the third sheet of the parameter study we have a table which outlines the various parameters describing the proposed unit area. Might point out that the cumulative production from the proposed unit area as of 2-1-'69 was 653,723 barrels.

The producing rate shown in the columns 8 and 9 for the six-month period ending 2-1-'69 averaged 3,380 barrels per month from the unit area. We have a remaining primary reserve as of 2-1-'69 of 34,036 barrels. We estimate that the ultimate recovery under waterflood operation, in other words incremental waterflood recovery, will be 1,218,000 barrels. This is a slight change from the numbers we had talked about. I made a new calculation.

Q Now, would you consider this area to be at an advanced stage of depletion at the present time?

A Yes, I would.

Q Do you feel that it lends itself to secondary recovery by water injection?

A Yes, it does by means of success of other similar formation units in the area.

Q As you have completed your discussion of Exhibit No. 1, would you identify the other sheets that are attached to that exhibit?

A Right. We have figure number 1 which is an outline of the proposed unit which shows the tract numbers. Figure number 2 is a net effective pay isopach map of the fourth zone; figure number 3 is an effective pay isopach of the fifth zone; figure 4 is the effective pay isopach

of the seventh zone.

Q Now referring to what has been marked as Exhibit No. 2, would you identify that exhibit, please, and discuss it?

A Yes. Exhibit 2 is a proposed plan of operation for the proposed Northeast Pearl Queen Unit. We have outlined here the proposed injection wells, the zones into which we plan to inject, the estimated injection rate and the actual location of the well.

The first well is the -- known as the Gulf B of No. 2. We will inject into the five and seven zone. We estimate 150 barrels of water per day; it is located in unit J. of Section 23.

These are all in Township 29 South, Range 35 East. The second proposed injection well is the Texaco Hammond No. 1. We will inject into zone 5; estimate 75 barrels of water per day; it's located in unit B. of Section 23.

Next injection well is Texaco Hammond No. 2; inject into zones 5 and 7; estimate 150 barrels per day; it's located in unit G. of Section 23.

Next well is Texaco Hammond A. No. 1; zones 5 and 7; estimate 125 barrels per day injection; it's

located in unit E. of Section 24. Next injection well Texaco Moran No. 1; inject into zones 5 and 7; estimate 125 barrels of water per day; it's located in unit A. of Section 22.

Next proposed injection well Union State No. 2, zones 4 and 5; estimate 150 barrels of water per day; it's located in unit K. of Section 15. There are two current injection wells in the area which have been approved by this Commission. They are the Cabot-Carbon No. 2 in zone 5; estimate 350 barrels of water per day; located in unit P. of Section 15.

The other current injection well Texaco Moran No. 2, zones 4, 5 and 7; 350 barrels of water per day. It's located in unit H. of Section 22.

Q Now, is the Applicant presently injecting water into the Cabot-Carbon No. 2 and Texaco Moran No. 2 Wells?

A Yes.

Q Has there been any response from this injection up at the present time?

A We feel there has been some response either from this injection or from adjacent injections in Shell's East Pearl Queen Unit.

Q Now referring to figure one of Exhibit 2, would you identify that exhibit?

A Yes. Figure one outlines the proposed Northeast Pearl Queen Unit. It is colored in yellow. The current injection wells are designated by the blue dots which are the Cabot-Carbon No. 2 and Texaco Moran No. 2 in the proposed injection wells that we mentioned before are designated by a red dot.

Q Now, do you have any cooperative injection program with leases lying outside the unit area?

A No. There is no proposed cooperative injection because of the fact there is no development to the north, west or south of the unit area and the East Pearl Queen Unit is already under injection.

We do not contemplate any official cooperative injection program.

Q What is the injection program to the east?

A It is essentially a five-spot pattern.

Q Now --

MR. NUTTER: That would be to the west, I think?

THE WITNESS: West.

MR. KELLAHIN: West.

Q (By Mr. Kellahin) Who is the operator of that?

A Shell.

Q Now, you do not have a five-spot pattern as appears by your figure one, do you?

A No, we do not. Due to the well locations and protecting the producing ability of the best wells, we were not able to incorporate a five-spot pattern. We have essentially an abbreviated line drive pattern.

Q Based on your examination of this area, in your opinion will this be an effective injection pattern for the Pearl Queen formation?

A Yes, it will.

Q Now referring to figure two of Exhibit 2, would you discuss that exhibit?

A Yes. This figure, again, is the net effective pay isopach map for zone 4 showing the current injection well which is the Texaco Moran No. 2, designated by the blue dots and the proposed injection well, the Union State No. 2 designated by the red dot.

Q The next exhibit?

A Figure No. 3 is the net effective pay isopach

map for the zone 5, again showing the current injection wells in blue and the proposed injection wells in red. Figure 4 is again the net effective pay isopach map for zone 7 showing the current injection wells in blue, the proposed in red.

Q Now, turning to the series of exhibits, B-5 through -- figures five through ten, what are those?

A These are the diagrammatic sketches of the proposed injection wells. We have outlined information relating to the surface casing, the depth at which the casing is set, the sacks of cement utilized, which was circulated to the surface.

We also show that the injection tubing will be plastic-lined, show our estimated setting of the packer; we show the current perforations; we show the setting of the oil casing -- oil string casing and the amount of cement used to cement this casing.

We also have shown the estimated top of the cement on the oil string. Since this is a diagrammatic sketch the location of where the top of the cement is appears that we would have cement up in the surface casing, but that is not the case on this exhibit.

We have a top of the cement at 3701 and we show our estimated packer setting at 4891. So, we are well above our proposed packer setting and this will be the format on the other wells also.

Q Is there any surface water in this area to your knowledge?

A There is some water, apparently, all above a depth of 100 feet below the surface.

Q So, your surface string would fully protect the water zones, is this correct?

A That is correct.

Q Will your cementing and casing program on your oil string fully protect any producing zones?

A Yes, it will.

Q Are the perforations as shown on these exhibits present perforations in these wells?

A Yes. We show the present perforations in two cases. We have some proposed perforations on the Texaco Hammond A. No. 1. We estimate proposed perfs in the five zone at 4940 to 4959. And in the Union State No. 2 we estimate additional perforations at the top of the five zone which is estimated to occur at 4970. We do not have

a log at this time that logs this zone, although the records show the well was drilled below the top of the five zone.

Q Now in each case you will be injecting through plastic-lined tubing under a packer and through perforations, is that correct?

A That is correct.

Q Will you fill the casing tubing annulus with an inert fluid?

A Yes. I think that is correct.

Q Will you install a pressure gauge or leave the annulus open at the surface?

A We will install a pressure gauge to observe any leakage that might occur.

Q Now, the next six pages of Exhibit No. 2, are those logs of the injection wells?

A That is correct. We have there shown the current perforated intervals and the sand designations in the right margin.

Q Now, I believe you have testified as to the rate of water injection in the individual wells. What pressure do you anticipate you will encounter on this?

A We anticipate that a maximum surface pressure of

2500 pounds will be required.

Q Does that agree with the experience on the Shell waterflood project?

A That is correct.

Q What is your source of water?

A The source of water is a water line jointly owned by Shell, Gulf and Tamarack, which supplies an Ogallala water from a source of approximately seven miles to the northeast of the proposed unit area.

Q That water is presently available, is that correct?

A That is correct.

Q And the line is already in?

A That is correct. It is supplying water to other units in the area currently.

Q Will you reinject produced water?

A Yes, we will.

Q Were Exhibits 1 and 2 prepared by you or under your supervision?

A Yes, they were.

Q I believe you testified, Mr. Williamson, that you would anticipate an additional oil recovery of what figure?

A Approximately 1,218,000 barrels of oil. This represents a recovery of approximately two to one of the expected primary recovery.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibits 1 and 2.

MR. NUTTER: Tamaracks Exhibits 1 and 2 in Case 4217 will be admitted in evidence.

MR. KELLAHIN: That's all I have on direct examination.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Williamson, that figure 1,218,000 does not appear on table number 1 as such?

A No. This was not included in the parameter study; it was not to be utilized in forming the unit. This was arrived at by an engineering study that we performed earlier in the unit area.

Since some of the injection wells preclude actually ultimate recovery from a particular tract, it was not felt that this would be representative of true equity in a unit.

Q How does the recovery compare by these three zones in here? I presume zone number five has contributed

more oil than any other area?

A Zone five is the major zone, yes.

Q That is the zone that will have eight injection wells affecting it?

A That is correct.

Q Whereas zone seven is going to require five?

A Right.

Q Little zone four there is only going to need two injection wells?

A That is correct.

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

One more question, Mr. Williamson.

Q (By Mr. Nutter) This rate of 350 barrels per day, that has been the past injection rate into the Cabot-Carbon No. 2 and Texaco Moran No. 2. Will that be the future rate of injection also?

A It will probably be reduced after we have the other wells capable of injecting.

Q Actually, this was utilized as a means of getting rid of water until you got this waterflood going?

A Right. That is correct. This is produced water that is being disposed of.

Q I note that all the other injection rates are considerably less than that. So, these will probably be tailored to that rate also?

A Right; so we can get an orderly advance of our flood front.

Q I see.

MR. NUTTER: If there are no further questions of the witness, he may be excused again.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Kellahin?

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

MR. NUTTER: Does anyone have anything they wish to offer in Cases 4216 and 4217? If not, we will take the cases under advisement and call Case 4181.

I N D E X

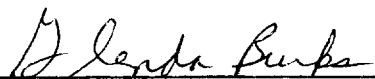
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STATE OF NEW MEXICO)
) ss
 COUNTY OF BERNALILLO)

I, GLENDA BURKS, Court Reporter 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; and that the same is a true and correct
 record of the said proceedings to the best of my knowledge,
 skill and ability.



 Notary Public

My Commission Expires:

March 12, 1973

I do hereby certify that the foregoing is
 a complete record of the proceedings in
 the Examiner hearing of Case No. 4216-17
 heard by me on 9/10, 1969.


 _____ Examiner
 New Mexico Oil Conservation Commission

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 _____ Examiner
 New Mexico Oil Conservation Commission