BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 7, 1970

EXAMINER HEARING

IN THE MATTER OF:	
Application of Wood, McShane and Thams-Colorado for an unorthodox oil well location and waterflood expansion, Lea County, New Mexico.	Case No. 4288

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: Call next case, 4288.

MR. HATCH: Case 4288. Application of Wood, McShane and Thams-Colorado for an unorthodox oil well location and waterflood expansion, Lea County, New Mexico.

MR. KELLAHIN: If the Examiner please, Jason Kellahin, Kellahin and Fox, Santa Fe, appearing for the Applicant.

I have one witness I would like to have sworn.

(Witness sworn).

(Whereupon, Applicant's Exhibit A was marked for identification).

JOE B. McSHANE, 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 Joe B. McShane, Jr.

Q Mr. McShane, are you one of the partners in Wood, McShane and Thams-Colorado?

A Yes, I am.

Q Are you a petroleum engineer?

A Yes, I am.

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

A Yes, I have.

Q Subsequent to that time, have you been registered as a professional engineer in the State of New Mexico?

A Yes, sir. I was registered as a petroleun production engineer in the State of New Mexico several years ago.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. NUTTER: Yes, they are.

Q (By Mr. Kellahin) Mr. McShane, briefly, what is proposed by the Applicant in the case before the Commission at this time?

A The application by Wood, McShane and Thams-Colorado to the Oil Conservation Commission of New Mexico is for the approval of an unorthodox well location to be used for production purposes.

The subsequent conversion of produced wells to water injection and the administrative procedure for further development of additional producing wells.

Q For the benefit of the Examiner, would you

briefly review the current status of the Langlie-Mattix Pool waterflood on the "M" State Lease?

A Yes, sir, I will. The "M" State Lease was acquired by Wood, McShane and Thams-Colorado from Humble Oil and Refining on December 1, 1969. That is to say, the operating rights were acquired.

There are now twenty-one active producing wells in the Queen Sand waterflood area on the "M" State Lease. During November, 1969, these wells produced **seventy-nine** hundred thirty-three barrels of oil; seventeen thousand eight hundred fifty-one barrels of water.

The attached plat, Exhibit No. 2 --

Q That is attached to what has been marked as Exhibit A, is it not?

A Yes. Exhibit No. 2 provides that each of the producing well locations, three figures; the upper left-hand figure is the oil production in barrels per day. The upper right-hand figure is the water production in barrels per day and the lower figure at the bottom is the cumulative oil production -- both primary and secondary -- to December 1, 1969.

Also, there are nineteen active injection wells in the Queen Sand on the "M" State Lease. During October,

1969, these wells took one hundred four thousand ninety-eight barrels of injection water at an average well head pressure of fifteen hundred PSI.

Shown on Exhibit 3, at each of the injection well locations, in the upper left-hand, the water injection for the month of October; the upper right-hand, the well head pressure average during the month of October, 1969, and the lower figure or the bottom figure is the cumulative water injected into that well since the waterflood began.

I would like to point out that thirty-one of these active wells, both producers and injectors, are completed through perforations in two and seven-eighths casing cemented through the pay section. Slim hole or 1.9 O. D. tubing is used in both injection wells and producers.

Q Now, would you review the proudction and injection history of this waterflood program?

A Humble Oil and Refining Company began water injection into six wells on the 19th of November, 1963, as a pilot waterflood operation.

These wells numbered twenty-three, twenty-six, twenty-eight, thirty-one and thirty-seven and thirty-eight

were authorized for conversion to injection by the Oil Conservation Commission, Case No. 2879, Order No. R-2556. If I may, these wells are shown on Exhibit No. 1, somewhat in the center of the plat, and they have been -- the triangle casing on the well location has been filled in with orange.

This double 5-spot was the pilot area for this flood. The flood was expanded in 1965, after approval by the Oil Conservation Commission in Case 3219, Order No. R-2891.

The present eighty-acre 5-spot flood pattern is shown on the plat, Exhibit 1, with each 5-spot outlined in orange. I would like to point out that some of these 5-spots, of course, are not exactly eighty acres because of the spacing of the wells and the location of injectors.

Q But, in general, it has been developed on an eighty-acre 5-spot?

A That is correct and that is its current condition.

Q Now, do you have some information on the production and injection rates?

A Yes, I do. A tabulation showing oil and gas and water production, along with injection rates and

pressures by months from November, 1963 through November, 1969, is presented as Exhibit No. 4.

The additional injection, or should we say the commencing of waterflooding in this lease was November, 1963. So, this tabulation provides monthly records for the life of the flood.

Exhibit No. 5 is a group of curves plotted from the above data on semi-log paper. This data provides the production and injection history of the lease for the life of the flood.

I apologize for the appearances of this curve. We were unable to obtain the original of this on the short notice that we had from Humble, so, therefore, we have made a copy of a copy. I believe that it's legible, however.

Q Now, have you made a study of the wells surrounding the proposed new injection well?

A Yes, sir. Referring again to Exhibit No. 1, a study of the four wells, number twenty-seven, twenty-eight, thirty-eight and thirty-nine -- excuse me. Let me refer to Exhibit No. 6.

The Exhibit No. 6 shows the proposed well location, No. sixty-three, and the four surrounding wells. Well number sixty-three is shaded in orange. The study of

the four wells surrounding the proposed new producer, No. sixty-three, has been made to provide information about primary and secondary recoveries to date.

Primary recovery from these four wells to 1-1-1964 was eighty thousand, eight hundred ninety-seven barrels. The extrapolated future primary from 1-1-64 to economic limit was thirty thousand, one hundred and twenty barrels; resulting in an ultimate primary from the four wells of one hundred eleven thousand seventeen gross barrels.

This is equal to approximately twenty-seven thousand seven hundred fifty barrels per well or 36.5 barrels per acre foot.

Q Did you have any core information available to you?

A None of these four wells were cored. However, a nearby well, No. 19 was cored, and the core data is provided. The average net pay thickness was 19.0 feet. The average net pay porosity was 13.3 percent. The average measured water saturation was 39.5 percent. The estimated water saturation was 35.0 percent. The estimated oil saturation 65.0 percent.

Q Were you able to correlate your log core

information with the logs available to you?

A Yes. Well No. 19 was logged and the other four wells mentioned above were logged. There was good correlation between logs and a net pay thickness was picked from this correlation.

Q So, your information you just gave as to pay thickness, porosity, water saturation, and so forth, is your judgement of what you would find at the location of the No. 63 well?

A Yes, sir, to the best of our current ability.

Q Have you made a calculation of the stock tank oil in place in that area?

A Based on the above data, the calculations indicate the original stock tank oil in place to be 422 barrels per acre foot. The ultimate primary recovery is calculated to be 36.5 barrels per acre foot or 8.6 percent of the original stock tank oil in place.

Assuming that secondary recovery will be equal to one times ultimate primary recovery, the eighty-acre flood pattern now in operation would recover a total of one hundred eleven thousand barrels primary and secondary oil per eighty-acre 5-spot.

Q What are the future plans of the Applicant in

this case in the event this applications is approved?

A Future plans have been developed based on certain assumptions. The 8.6 percent of original stock tank oil in place primary recovery would suggest that the primary recovery well density of forty acres was not adequate.

Solution gas drive reservoirs of this type should be expected to recover approximately fifteen percent of the original stock tank oil in place. If the calculated ultimate primary recoveries, based on fifteen percent of the original stock tank oil in place would indicate an effective drainage of 57.3 percent of forty acres or 22.9 net acres.

If, through infield drilling and forty-acre 5-spot, the calculated primary of fifteen percent and secondary equal to primary could be produced, then an eighty-acre tract would produce one hundred ninety-one thousand five hundred twenty barrels. This would be an additional recovery of eighty thousand five hundred twenty barrels. If a secondary recover of more than one to one could be achieved, then a substantial increase would occur in the additional recovery.

Q Now, how will you propose to complete your

producing wells? I note some of the wells in the pool are presently slim hole completions. Will you continue with that?

A No, sir. We would propose that the new producer, No. 63 and others that would follow, would be drilled and completed using four and a half, five and a half or seven inch production casing.

This would allow the production of large volumes of fluid usually encountered in waterflood production. An additional benefit of the new wells would be the ability to use standard completion techniques and standard down hole equipment as well as normal procedures for protection against scale and corrosion.

Q Now, on the conversion of your producing wells to water injection, how will they be completed?

A The existing producers will be converted to water injection wells through coated 1.9 O. D. tubing and packer. The anular space would be filled with treated water.

Q A pressure gauge at the surface?

A Yes. This is the same technique used on the present injection wells.

Q Now, referring again to Exhibit No. 6, does that show the proposed location of future wells in the forty-acre

pattern?

A Yes, sir, it does. Exhibit No. 6 shows existing wells both producers and injectors connected by blue lines and the areas generally enclosed would be the forty-acre 5-spots.

The circles inside of each of the areas would be the approximate location and number of future producing wells.

Q Now, at the present time, it is your intention only to drill the No. 63 well and gather data and information on the basis of that before you go into any further expansion; is that correct?

A Yes, sir; that is correct. As you can see by this testimony, the situation has not proven. It is proposed and the first well will be used as a guide in economics and feasibility for future wells.

Q Now, for that purpose, do you ask that the Commission include in its order an administrative procedure for further expansion of this program by the drilling of the additional wells?

A Yes, sir, we do. The No. 63 well, should it perform as we expect, would certainly lend credence to the expansion of the additional wells on the project and

it is estimated that if the proposed forty-acre flood pattern were fully developed, it would produce an additional seven hundred sixty-five thousand barrels of gross oil.

This additional oil is based on a one to one recovery. That is, secondary equal to primary.

Q Now, just for the information of the Examiner, what is the source of water you are presently injecting in this flood?

A Our water source is the lower San Andres reservoir below forty-four hundred feet.

Q Is the water being treated?

A Yes, the water is being treated.

Q All your injection is through internally coated tubing; is that correct?

A Yes, sir; that is correct.

Q Do you recycle the water that is being produced?

A All produced water is being recycled.

Q In your opinion, will there be sufficient water available for the continued expansion of this project as you propose?

A Yes, sir, there is.

Q Would you summarize briefly the proposal that

has been made by the Applicant in this case?

A In summary, it is estimated that the proposed forty-acre flood pattern will produce an additional seven hundred sixty-five thousand barrels of gross oil. This seven hundred sixty-five thousand barrels of oil is not otherwise recoverable.

Thereby, the New Mexico Oil Conservation Commission will prevent waste by approval of this application.

Q Would you give the precise location of the No. 63 well you propose to drill?

A Yes, sir. The No. 63 well location is twenty-seven hundred forty feet from the south line and twelve hundred eighty feet from the east line of Section 30, Township 22 South, Range 37 East.

Q After the completion of this well, will you convert the numbers twenty-seven and thirty-nine wells to injection?

A It is planned when wells numbers twenty-seven and thirty-nine reach, should we say, subeconomic production conditions, that they will be converted to water injection, thereby providing a forty-acre 5-spot around the No. 63 location.

Q Now, you also ask for an adminstrative procedure

for conversion of producing wells to injection or from injection to production, whether the wells have received a response from the waterflood project or not; is that correct?

A Yes, sir, that is.

Q That would be an exception of the present rules of the Commission?

A Yes, it is a request for an exception.

Q Was Exhibit A, together with Exhibit Numbers two through six inclusively, prepared by you or under your supervision?

A Yes, sir, they were.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibit A.

MR. NUTTER: Applicant's Exhibit A will be admitted in evidence.

MR. KELLAHIN: That completes the presentation, Mr. Nutter.

MR. NUTTER: Are there any questions of this witness? He may be excused.

(Witness excused).

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

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

MR. NUTTER: Does anyone have anything they wish to offer in Case 4288? We will take the case under advisement.

I N D E X

E X H I B I T S

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.

Glenda Burks
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. 4288 heard by me on 4/7, 1970.

Examiner
New Mexico Oil Conservation Commission