BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
CONFERENCE ROOM, STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

August 9, 1972

EXAMINER HEARING

IN THE MATTER OF:

Application of Tenneco Oil Company for a pressure maintenance project and unorthodox locations, McKinley County, New Mexico.

Case No. 4793

BEFORE: Elvis A. Utz,
Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 4793.

MR. HATCH: Case 4793: Application of Tenneco Oil Company for a pressure maintenance project and unorthodox locations, McKinley County, New Mexico.

MR. BATEMAN: Kenneth Bateman of Santa Fe, representing the Applicant. I have one witness that I ask be sworn.

MR. UTZ: Are there other appearances in this case?

(No response)

* * * *

MICHAEL DeMARCO,

was called as a witness, and after being duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. BATEMAN:

Q Mr. DeMarco, would you state your name?

A Michael DeMarco. I am a petroleum engineer with Tenneco Oil Company located in Denver, Colorado.

Q Have you previously testified before the Commission?

A Yes, I have.

Q At that time, did you make your qualifications a matter of public record?

A Yes, I did.

MR. BATEMAN: Are the witness's qualifications accepted?

MR. UTZ: Yes, sir.

Q (By Mr. Bateman) Mr. DeMarco, would you refer to your Exhibit One, which is a map of the area in question, and tell the Examiner what you seek by this application?

A We seek authority to institute a pressure maintenance project in the South Hospah-Lower Sand Pool by the injection of water and gas into the Lower Hospah formation through three wells located at orthodox and unorthodox locations in Section 12, Township 17 North, Range 9 West, McKinley County, New Mexico.

We further seek a procedure whereby additional injection wells and expansion of the project area may be approved without the necessity of notice and hearing.

Exhibit One is a location plat which shows the Lower Hospah zone. The area outlined in yellow is the area around the wells, the Lower Hospah sand wells. The three wells colored in red are the proposed injection wells.

Q You propose a pilot program at this time, is that correct?

A Correct. We propose a short duration pilot program for the three wells, mainly to check the mechanics of gas and oil injection. We plan to expand early next year if possible.

Q What is Exhibit Two?

A Exhibit Two is a structure map contoured on the Lower

Hospah formation. It also shows the Hospah zone outlined in yellow and the three injection wells colored red. A fault system runs from the Southwest up to the Northeast, and on into the offset leases. There is a large fault also to the South, and I would like to point out that productive limits of the Lower Hospah zone on Tenneco's lease are defined by oil-water contact which is shown by the dotted line running approximately in the center of Section 12.

Q Please refer to Exhibit Number Three, and tell the Commission what that adds to your application.

A Exhibit Three is an isopach map of the Lower Hospah formation and shows the net pay above the oil-water contact. Also we would like to point out on this exhibit the line of A A Prime running from the West to the East across Tenneco's lease and on to Tesaro's lease to the East. Line B B Prime is the north-south cross section.

Q What is the average net pay in the area?

A Approximately twenty-six and a half feet. It thickens up near the fault, which can be noted on the exhibit.

Q Exhibit Four is cross section A to A Prime, is that right?

A Yes, sir. In this particular exhibit, we show the Lower Hospah sand and all of the oil-water contact throughout the lease. I would like to call your

attention to the center of the cross section and wells Hospah 24, Hospah 9, and Hospah 25, and over to the Hospah 6. These wells were completed early in the development of the field in 1967 up through 1969, and at this time, we have completed wells by drilling through the pay and setting casing through the pay and perforating the Lower Hospah interval. The oil-water contact has been defined by several cores, and the one that is shown in the Hospah Number 6, located to the east, also shows an electric log interpretation. We also would like to point out that there was later development in late 1969, and then some more additional development in late 1971. Wells were completed by drilling the top of the Lower Hospah pay and setting casing and then drilling again to the surface of the pay. This method made for better completions, and the wells held up well. I point this out because our later exhibit will show that two of the later injection wells were not completed in that manner.

Cross section B B Prime, which is Exhibit 5, is a north-south cross section which runs from the Pesaro lease down to Tenneco's lease. Hospah Well Number 8 which is the southern most productive well, and here once again we have two wells completed through the pay and then the other three wells located on here were

set on top of the Lower Hospah zone.

Q Would you combine Exhibits Six and Seven and explain them, please?

A Yes, Exhibits Six and Seven are simply well bore diagrams of the two proposed injection wells, the Hospah 33, which will be located 1,334 feet from the North line and 1,770 feet from the West line of Section 12; and the Hospah 36, located 990 feet from the North line and 1,360 feet from the East line. Both wells are completed similarly with ten and three-quarter inch surface casing set at approximately sixty feet. The seven inch producing casing was set on top of the pay, and an open hole section was drilled for oil. We also have initial completion data on each well, and the current production, the accumulative production.

Q All right, continue with Exhibit Eight, please.

A Exhibits Eight and Nine are log sections of the Hospah Number 33 and the Hospah 36, respectively, they are gamma ray density logs, and in the case of the Hospah 36, the log was from a depth of 1,589 feet, and the top of the Lower Hospah sand was encountered at 1,624 feet. The method used was to correlate between the other wells that had been drilled earlier, and from these estimates, it was estimated that we would reach the base of the Upper Hospah at 1,591 feet. They shut

down and found by correlation that they still had some thirty-five feet of additional pay to drill.

Q What are the rock and fluid properties?

A Exhibit Ten is a table listing the rock and fluid properties, and as you will note, the rock is excellent. We find pay approximately 1,625 feet with an average gross thickness of 105 feet, and an average net pay of twenty-six feet, with a porosity of twenty-seven and a half percent, and an average water saturation of forty percent, and a permeability of 1,100 milidarcies. We own 286 productive acres on lease, however within the confines of the 286 acres, there are over 9,000,000 barrels of oil in place. Also, with the excellent rock properties, I might point out that the fluid properties are less than ideal. We have an initial reservoir temperature of eighty degrees, including gravity of twenty-four degrees API. There was essentially no solution gas initially, and the initial formation volume was 1.04.

We have a formation volume factor of approximately 1.0075, however by the addition of less than 100 cubic feet of gas per barrel of oil, it has increased to 1.0445.

Now, this doesn't sound like a large increment in numbers, but when you are dealing with approximately

8,000,000 barrels of reservoir oil, this amount of swelling can improve recovery considerably.

Also you will note on Exhibit Twelve 593 PSIG, which is close to the initial reservoir pressure. The viscosity was reduced from fifty-five down to approximately thirty-four, and this in turn improves the mobility ratio from 180 to approximately ten. This allows for the water behind to move the oil in a much more efficient manner.

We estimate that primary recovery by pressure depletion will be approximately one and a half million barrels of oil, or sixteen percent of the oil in place. By the addition of the ten percent gas saturation, we can improve recovery and obtain an additional twenty percent of the oil in place, or an ultimate recovery of thirty-six percent of the oil in place.

Q Would you briefly describe how the injection wells will be completed?

A The injection wells will be completed by setting-- as you will note in Exhibits Four and Seven, tubing was run approximately one joint above the casing shield, and the gas and water will be injected simultaneously down the tube.

Q What is the source of the fluid and the gas?

A The water will be obtained from the Lower Hospah zone.

The gas will come from the Dakota formation.

Q Do you have anything further to add?

A No, except that we would make the drilling of the unorthodox well subject to approval from the offset operator, since we do not have their approval in hand.

Q Now, if this application is approved, will it tend to protect correlative rights and prevent waste?

A Yes, and recover an additional 1.9 million barrels of oil.

Q And you are also asking for an administrative procedure for approving additional wells to be converted or drilled as injection wells?

A Yes, sir.

Q Were Exhibits One through Twelve prepared by you or under your direction?

A Yes, they were.

MR. BATEMAN: I move for the introduction of Exhibits through Twelve.

MR. UTZ: Without objection, Applicant's Exhibits One through Twelve will be entered into the record of this case.

(Whereupon Applicant's Exhibits One through Twelve were admitted in evidence.)

MR. BATEMAN: I would like to point out too the Commissioner that agreement with Tesaro for a lease line has

not been reached at the moment, but we would request approval subject to that agreement or acquisition of that agreement.

I have no further questions.

* * * *

CROSS EXAMINATION

BY MR. UTZ:

Q The Lower Hospah has not been unitized as yet, has it?

A No, this is all one basic lease.

Q So all that is necessary would be your lease line agreement?

A That is correct, yes. The Upper Hospah overlaps into the South half of Section 12, and that is a separate lease from the Hospah lease.

Q Which wells are you asking authorization to re-complete?

A Hospah Wells 33 and 36.

Q Just the two?

A Yes, sir.

Q Didn't you ask for three?

A Well, the proposed location, five feet from the North line and 2,950 feet from the East line.

Q What was that again?

A Five feet from the North line and 2,950 feet from the East line of Section 12.

Q Will they all be open hole completions?

A Yes, sir, we believe that's the best way to go.

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

* * * *

CROSS EXAMINATION

BY MR. McGRATH:

Q What are you going to do about the rest of your wells? You are going to have more line wells to protect, aren't you?

A Yes, sir. We have a tentative agreement worked up with Tesaro, we are having a little difference of opinion with them at this time, but we have gone over to them and have pointed out the benefits, and they are quite interested. If we can resolve some minor difficulties, we believe they would approve, and the expansion would be subject to their cooperation.

MR. McGRATH: That's all I have.

MR. UTZ: Any further questions?

(No response)

MR. UTZ: If not, the witness may be excused.

(Witness excused)

MR. UTZ: Any statements in this case?

(No response)

MR. UTZ: Case 4793 will be taken under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, RICHARD E. McCORMICK, a Certified Shorthand 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.

Richard E. McCormick
CERTIFIED SHORTHAND REPORTER

4793
8-9-92

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