BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 11, 1965

EXAMINER HEARING

IN THE MATTER OF:

Application of Skelly Oil Company for a waterflood project, Lea County, New Mexico.

Case No. 3286

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The hearing will come to order. Case 3286.

MR. DURRETT: Application of Skelly Oil Company for a waterflood project, Lea County, New Mexico.

MR. JACOBS: Appearing for the applicant, Ronald Jacobs, Tulsa, Oklahoma, and George Selinger, Tulsa, Oklahoma. We have one witness we would like to have sworn at this time, Mr. Examiner.

(Witness sworn.)

MR. JACOBS: In the way of an opening statement, this is the application of Skelly Oil Company for permission to conduct a secondary recovery project on its Skelly Penrose "B" Unit, located in Lea County, New Mexico. The pool involved is the Langlie-Mattix Pool, and to an areal extent is the largest among the earliest-developed oil pools in southeast New Mexico.

The Oil Conservation Commission nomenclature has designated the vertical limits of the Langlie-Mattix Pool as those formations encountered between the lower 100 feet of the Seven Rivers formation and the base of the Queen. The working interest owners of the Skelly Penrose "B" Unit have agreed that in order to conserve natural resources, prevent waste, protect correlative rights and institute and consummate secondary recovery operations, the Langlie-Mattix

Pool underlying those areas should be unitized.

Skelly Oil Company is the unit operator of this unit. The question of approval of the Unit Agreement has already been before this Commission in May, and the Commission has issued Order No. R-2915 in Case 3257. The unit became effective July 1, 1965.

WILLIAM SINGLEY

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

DIRECT EXAMINATION

BY MR. JACOBS:

Q Will you please state your full name, by whom you are employed and in what capacity?

A William Singley, Junior, Senior Production Engineer for Skelly Oil Company in their Hobbs office.

Q Have you heretofore testified before this Commission as a petroleum engineer?

A I have.

Q Have you prepared certain exhibits and testimony with respect to the hearing under consideration today?

A I have.

Q Did you participate in the Engineering Committee and have you in general prepared and assisted in preparing the basic data and reservoir studies of the pool underlying this

unit?

A I have.

MR. JACOBS: Are there any questions as to his qualifications, Mr. Examiner?

MR. UTZ: No, sir.

Q First of all, Mr. Singley, what are your recommendations and conclusions with respect to the secondary recovery project in the Skelly Penrose "B" Unit?

A Well, the primary producing life of the wells inside the unit area is 90% complete and those leases in the unit area which are not, have not reached their economic limit vary from 67 to 99% complete. There can be expected a successful secondary recovery operation in this area by the injection of water into the formation and an adequate water supply is available to the southwest of the area, and in order to recover as much secondary oil as possible, a water injection project should be initiated as soon as possible.

Q I call your attention to the map that is on the board there labeled as Exhibit A. Is that the Exhibit A that was attached to the application?

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

A Yes, it is, and on that map the Skelly Penrose "B" Unit is outlined and also shows relationships to other

secondary recovery proposed units in the area. The Skelly Penrose "A" just to the east, the Langlie-Mattix Penrose Sand operated by Ambassador to the northeast, and the proposed Skelly Penrose proposed "C" Unit to the south of the Skelly "B" Unit.

(Whereupon, Applicant's Exhibit 1 was marked for identification.)

Q I call your attention to what has been marked for identification as Exhibit No. 1 in this case, and if the Examiner please, this exhibit contains a detailed report on the secondary recovery study and we will attempt to summarize the important parts from that. Attached to that exhibit also are, and labeled as attachments, are maps, graphs and other information.

Q Mr. Singley, what was the discovery well for this pool, or at least in this area, and when was it discovered?

A Skelly Oil Company Harrison "A" Well No. 1 was the initial completion in this area, and it was completed on December 4th, 1935.

Q You mentioned before that the primary life within the unit area is approximately 90% complete, or in other words, the primary, it's 90% depleted?

A That's correct.

Q Do you have an estimate of the ultimate primary

recovery from this unit?

A The ultimate primary recovery should be 1,717,780 barrels. On May 1st, 1965 the cumulative production was 1,550,398 barrels, leaving 167,382 barrels of remaining primary oil to be produced.

Q The present allowable for the producing wells and the present capabilities of production is in what range?

A Well, the present allowables for the individual wells in the area range from one barrel a day to eight barrels per day; six of the wells have already been shut in or temporarily abandoned as completing their economic life and two wells have been plugged and abandoned and one well is classified an associated gas well. In June the actual production from these wells, from the 61 wells inside the unit area was 165 barrels per day, which is slightly less than three barrels per day, was the average production.

Q Does this unit and does the proposed project cover the entire pool?

A No, it doesn't. The entire pool is quite large and in order to form a unit where you could have some control over the injection and also be able to come up with an equitable formula for the various working interest owners in the area, it was decided that the pool would be unitized in several different projects.

Skelly has coordinated the unitization of this particular project, the Penrose "B", and we are coordinating two other projects in the immediate area of the Skelly Penrose "A" Unit and the Skelly Penrose "C" Unit which I have previously pointed out on the map.

Q Are there additional units adjacent to the Skelly Penrose "B" Unit which are not operated or proposed to be operated by Skelly?

A Yes, sir, Ambassador is operating the Langlie-Mattix Penrose Sand Unit, and they have been injecting water for over a year in that area. Also Humble has had a pilot waterflood in their State "M" lease, which is directly north of the Penrose "B" Unit. Humble is now expanding their pilot and will, eventually their water injection will border the Penrose "B" Unit to the north.

Q Do the various operators of these various projects and units contemplate cooperative agreements between the units for injection?

A Yes, at the present time we are working on finalizing a cooperative pressure maintenance agreement with Humble for the State "M" lease Ambassador with the Langlie-Mattix and a cooperative agreement by the Penrose "B" and the proposed Penrose "A" Unit.

Q Do you have any pilot flood information which has

given you data and experience which allows you to state that you believe that the project will be successful?

A Yes. Skelly and Ambassador and Humble have started a pilot waterflood area in 1953, and attachment two of the handout shows where the location of the pilot area is, and it is on the boundary between the Skelly Penrose "A" Unit, the northeast boundary, and Ambassador's unit there.

There was a pilot operation going on in this area here. It was deemed a success by all those concerned, Skelly, Ambassador; and Ambassador unitized and they are presently expanding, and Skelly is initiating action on the Penrose "A" and "B" Units based on the findings of this pilot. From this information the best estimates are that the range of secondary recovery should be roughly equal to the primary recovery for that area.

Q What is the pay formation and at what depths is it found in this area, Mr. Singley?

A The pay formation in the area here, both the Penrose "A" and the Penrose "B" Units is the Penrose sand, which is a lower member of the Queen formation, and it's found from depths 3423 feet to 3701 feet. The average top of the Penrose sand in this unit area is 3580 feet.

Q What geological feature constitutes the trap for the oil in this area?

A Well, the oil reservoir is generally contained in a northwest trending anticlinal stratigraphic trap, which is broken by small saddles in the area which give little local highs.

Q Do you have any information as to the reservoir and rock characteristics of the pay formation?

A There was one core analysis in this area, and from that one analysis the following average values were given: for the rock porosity of 9.92%, residual oil saturation, 10.42%; total water saturation, 40.40, with a permeability of 1.12 millidarcies.

Q What is the primary driving mechanism at the present time in the Penrose sand?

A The primary driving mechanism is a solution gas and it produces approximately 36 degrees API gravity oil.

Q I call your attention to attachment number five on the Exhibit 1. What is that attachment?

A Attachment number five is a structure map on the top of the Queen sand, and it was drawn by Skelly's Geological Department.

Q What is shown by attachment six?

A Attachment number six is what is a typical log for this Langlie-Mattix area. This is Skelly Harrison "B" Well No. 10, and it's roughly typical of all the wells in the area.

Q What is your proposed plan of development for the flood project?

A Well, the proposed plan is a five-spot pattern. This field in this area was developed on a regular 40-acre spacing except for the south end of the unit where there were several undrilled, there are two undrilled locations, and so by going to an 80-acre five-spot pattern we'd be converting roughly half the wells to injection. We feel that we can get a quick response and the only modification of this may be in the general south end of the area where there are some undeveloped locations, there may be some deferment of injection for the time being in order to delay the cost on infill drilling.

Q This proposed injection pattern is shown on attachment 7, is that correct?

A That is correct, with diagrammatic sketches of the injection wells shown on attachment number eight.

Q I notice number eight, we also had, did we not, the diagrammatic sketches which were labeled as Exhibit B to the application?

A That is correct.

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

Q They are the same, are they not, except there were

two additional wells that are shown in attachment eight?

A Yes, that is correct. On the original application two wells were inadvertently left out and we now include those on attachment number eight. They were one of the wells which was to be drilled and one of the plugged and abandoned wells which is to be reentered.

Q So that the attachment eight now shows all the proposed injection wells?

A Yes, there are thirty-three wells.

Q What volume of water do you anticipate injecting in this project and at what pressure?

A We anticipate injecting 9,000 barrels of water per day at a maximum injection pressure of 1845 pounds. We believe initially that this water will go in at some pressure less than that, a thousand pounds, but after fillup the pressure should roughly approach 1845 pounds. This information was taken from our analysis of the pilot waterflood area just to the east. This volume approaches 275 barrels per day per injection well.

Q What is the supply source of this injection water?

A The Penrose "B" Unit will purchase water from Skelly's Jal water system. Skelly is developing a water source to the south and west of this area, approximately eight miles, in order to furnish water to the several units that Skelly is

planning to operate,mainly the Penrose "A" and the Penrose "C" in addition to these, plus this water will be used possibly by some of the other secondary recovery units in the area. The water itself will be a Seven Rivers water with Capitan Reef water added when the volumes are in excess of what the Seven Rivers can furnish.

Q Do you also anticipate the possibility of using or reinjecting produced water?

A Yes. Well, certainly, when the water becomes breakthrough and we get sufficient water to reinject, we will inject the water.

Q I call your attention to the application filed in this matter, paragraph one, it describes the unit, is that correct?

A That is correct.

Q And in paragraph four there are listed the wells and the location of the wells which are being sought for injection purposes?

A Correct.

Q There are thirty wells that are to be converted to injection and there's two reentries of old abandoned holes and one well to be drilled, is that right?

A That is right.

Q Have you furnished the State Engineer a copy

of this application and the attachments to that application?

A Yes.

Q Do you recommend that the Commission enter its order allowing Skelly Oil Company as unit operator permission to conduct secondary recovery operations in this unit?

A I do.

Q In your opinion will the granting of such an order and the institution of such a secondary recovery project be in the interest of conservation and be protective of correlative rights?

A That is correct.

MR. JACOBS: That's all we have, Mr. Examiner. We would offer Exhibit one and ask that the application be made a part of the record. We also have available here the logs of some of the wells, injection wells that we have available. We do not have all of them available. We have some six or seven wells at the present time, logs available. If you would like we could introduce those as an exhibit.

MR. UTZ: Probably a good idea.

MR. JACOBS: We ask that they be marked as Exhibit 2 and we will offer those also.

(Whereupon, Applicant's Exhibit No. 2 was marked for identification and Exhibits 1 and 2 were offered in evidence.)

MR. UTZ: Without objection, Exhibits 1 and 2 will be accepted into the record of this case.

(Whereupon, Applicant's Exhibits 1 and 2 were admitted in evidence.)

CROSS EXAMINATION

BY MR. UTZ:

Q I believe your application, which you requested be made a part of this record, states that you will operate under Rule 701, is that correct?

A Yes, it is.

Q Nowhere have I found yet what type of tubing you intend to inject through, is that plastic coat internally?

A We intend to inject through J3535 tubing internally plastic coat under a packer, which the packer will also be plastic coated. The bottom of the packer will also be protective coated. The injection lines running to the tubing will also have an internal coating.

Q Is the unit description as well as the well names, numbers and location on your application correct all the way through?

A To the best of my knowledge.

Q How about the last three wells listed on your application? Do you have the numbers for those yet?

A No, we do not. We numbered only those wells which

we are producing at the present time. When we go to convert these to injection, then they will be numbered at that time.

Q But it is your request that we approve those?

A Yes, those locations, at this time.

MR. UTZ: Any other questions of the witness?

MR. IRBY: Yes, sir. Frank Irby, State Engineer's Office.

BY MR. IRBY:

Q Mr. Singley, in response to my letter, you forwarded me an analysis of the water in both the Seven Rivers and the reef section.

A Yes, sir.

Q This analysis is dated October 12, 1964, under the British American Yates Sand Unit supply well. Opposite hydrogen sulphide, the analysis states that it's present but it doesn't give any indication whether it is small or large or what amount there might be of hydrogen sulphide. Can you give me an answer to that?

A I cannot give a definite percent in there from this well. I know we have made a general study in the area and it is our estimate that it will be in excess of the amount of hydrogen sulphide that is in the Seven Rivers water, which is 338.

Q It will be in excess?

A Yes.

Q I don't see on here what these values are. Is this parts per million?

A I cannot state definitely. Mr. Case always before has given it in milligrams per liter, is the way he refers to his.

Q Is this going to be a closed system?

A Yes. Most definitely it will be a closed system. We figure one of the ways to prevent this hydrogen sulphide from being more corrosive than it is is to keep the system oxygen free.

Q As I understand it, both of these water sources are contemplated sources?

A Yes, sir.

Q If water is to be taken from another source, will the Commission and our office both be notified and permission obtained to use the different water?

A Yes, sir. It will, and also let me state further, these are estimates of the samples we can get now. Of course, when we complete the wells there's a possibility that the water source will have slightly different characteristics than these present here. This is the best information we have available and it's our opinion that the water source will have close to these characteristics, but when we complete the

wells you will be furnished an analysis of the water when we complete the water supply wells.

Q Is this the flood in which you are conducting a pilot operation now with Santa Rosa water?

A No, sir. The pilot operation I pointed out on the map is the one that is being conducted with Santa Rosa water at this time. It's on attachment two.

MR. IRBY: Thank you. That's all the questions I have.

MR. UTZ: Any other questions of the witness? The witness may be excused.

(Witness excused.)

MR. JACOBS: That's all the testimony we have.

MR. UTZ: Are there any other statements to be made in this case? The case will be taken under advisement.

I N D E X

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, 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; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 26th day of August, 1965.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3284 heard by me on 8-11, 1965.

, Examiner
New Mexico Oil Conservation Commission

SKELLY OIL COMPANY

P. O. Box 1650
TULSA, OKLAHOMA 74102

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MAIL OFFICE OCC

PRODUCTION DEPARTMENT
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ROBERT G. HILTZ, MGR. JOINT OPERATIONS
GEORGE W. SELINGER, MGR. CONSERVATION

July 12, 1965

Re: Skelly Penrose "B" Unit
Lea County, New Mexico

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

We are attaching, in triplicate, our application for permission to conduct a waterflood project on our Skelly Penrose "B" Unit, Lea County, New Mexico, by the injection of fluid into the Langlie-Mattix Pool underlying said unit.

Will you please set this matter down for Examiner hearing in the early part of August, which we assume will be August 11, 1965.

Yours very truly,

RJJ:br
Attach.

cc-State Engineer's Office
P. O. Box 1079
Santa Fe, New Mexico w/ attach.