BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
CONFERENCE HALL, STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
September 13, 1972

EXAMINER HEARING

IN THE MATTER OF:

Application of Tipperary Land and Exploration Corporation for a waterflood project, Lea County, New Mexico.

CASE NO. 4818

BEFORE: Daniel S. Nutter
Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: Case Number 4818.

MR. HATCH: Application of Tipperary Land and Exploration Corporation for a waterflood project, Lea County, New Mexico.

MR. KELLAHIN: Jason Kellahin, Kellahin and Fox, appearing on behalf of the Applicant. I have one witness I would like to have sworn.

* * * * *

LARRY McINTOSH

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Larry McIntosh.

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

A I'm a consultant petroleum engineer in Midland, Texas.

Q And with whom are you associated?

A I am associated with Ralph V. Viney.

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

A No, sir, I haven't.

Q For the benefit of the Examiner, would you briefly

outline your education and your experience as a petroleum engineer?

A I have a degree of Bachelors of Science, degree of Petroleum Engineering, receiving them at the University of Oklahoma, June of 1958. Following graduation, I worked with Atlantic Richfield Company until January of 1967, working as a reservoir engineer and an operations engineer. In January of 1967 I entered private consulting business and continued in that business working independently and associated with Ralph V. Viney.

Q In connection with your work at Atlantic Richfield, where did you work?

A Primarily in the Midland, Texas, office, and the west Texas area.

Q Does that have to do with operations in the State of New Mexico?

A No, sir, those did not.

Q But it was in the Permian Basin?

A Yes, sir.

Q Now, with your work as a consultant, have you done any work with Tipperary Resources?

A Yes, sir, I have.

Q Did you prepare a report in connection with the Application?

A Yes, sir, I have.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. NUTTER: Yes, they are.

Q (By Mr. Kellahin) Mr. McIntosh, what's proposed in the Application?

A Tipperary Land and Exploration Corporation is seeking authority here to institute a waterflood project in the North Bagley-Pennsylvanian Pool, specifically to inject water into the Strawn.

Q Now, would this be in the nature of a pilot waterflood project?

A Yes, it is.

Q It would not be, at this time, a full-scale water injection project?

A No, sir.

Q Now, referring to what has been marked as Applicant's Exhibit A, which is the multiple paged Exhibit containing individually numbered Exhibits, would you discuss that Application, please?

A Sir, the North Bagley-Pennsylvanian Field has been a prolific oil producer. It produced approximately 30 billion barrels of oil to date. However, for the past three years, the oil rate has been dropping in the field and it would now appear that about 70 percent

of the ultimate primary production for the field has already been recovered. It is the Applicant's feeling that it is now time to give some serious consideration to the possibility of secondary recovery in this field and for this reason the Applicant is proposing to institute a pilot waterflood that will obtain information that will help in evaluating the possibility of the waterflood in the field.

Q Now, in connection with the present state and depletion, would you say that this pool is in an advanced stage of depletion?

A Yes, it's an advanced stage, I would say more than 70 percent.

Q Is it a stripper stage?

A No, it's not in a stripper stage.

Q So, you are familiar with the Commission rules in connection with the waterflood project, are you not, which requires that they be at a stripper stage?

A Yes, sir, I am familiar with that.

Q In that connection, why is this Application being filed at the present time, rather than waiting until the pool is at a stripper stage?

A Well, sir, there are several reasons for this. One being that it does usually require extensive negotiation and study to unitize a field, and a unitized field is

the most efficient type of operation. There are only several completion factors involved in this. Most of the wells in this field are on hydraulic pumps, currently capable of handling large volumes of fluid. This is the type of pump that would be desirable in the end that water fluid is taken in this field. However, unless the likelihood of a flood becomes evident soon, it is likely that most operators will convert to rod pumping installations that are less expensive to operate; this would require a later change back to hydraulic pump and involve, what I consider, some unnecessary economic expenditure. Another reason is that at the present time there is an ample amount of produced water available in this field to conduct a pilot test to some extent. However, along with the decline in oil production, the water production is also dropping and it is possible at some future date that an ample supply of water will not be available.

Q So the present purpose of this Application is merely to obtain information for a future project, is that right?

A Yes.

Q And in the event it is not a stripper stage at the present time, a unitized form, it could readily be converted to a pressure maintenance project, could it not?

A Yes.

Q Now, refer to what has been marked as Exhibit A-1 and would you identify that, please?

A Exhibit A-1 is a lease plat showing a portion of the North Bagley field around the proposed injection well. The proposed injection well is the Tipperary Bess Well Number 1 which is located 660 feet from the north line and 1,980 feet from the east line of Section 20, Township 11 South, Range 33 East. This map also shows the wells having the "F" zone open to production. These wells are encircled on the lease plat. The Applicant is the operator of all of the wells directly offsetting this proposed injection well. I might add that each of the offset wells is equipped with an individual tank battery which will permit closed monitoring of fluid, and should add in evaluating the effectiveness of the pilot flood.

Q Now, have the royalty owners consented to utilizing the Bess Number 1 for injection purposes?

A Yes, sir, they have.

Q And the Applicant has the operator rights?

A Yes, sir, that is true.

Q Now, referring to what has been marked as Exhibit 2, would you identify that, again, please?

A Exhibit 2 is a portion of the gammaray acoustic log

that was run on the Bess Number 1 that shows the producing intervals of the wells. This well is perforated in 14 or more porosity zones ranging in depth from 9,308 feet to 10,179 feet. Also shown on this log is the Applicant's designation of the various porosity zones in the Strawn formation. The Applicant proposes to inject initially into the "F" zone, which is the lowermost producing zone in this well. This well is approximately 15 feet below the next porosity zone.

Q The well is currently producible, is it not?

A Yes, that is right.

Q And how much oil has it recovered?

A Exhibit Number 3 shows the production history on this well. The well was completed back in December of 1967 and through July of this year it had accumulated oil production of 329,816 barrels of oil. As the curve shows, it has been declining for the past two and one-half years and the present producing rate on the well is only about 27 percent of its top producing rate.

MR. NUTTER: And what was that?

THE WITNESS: It's approximately 2,700 barrels per month, or about 90 barrels per day. This is for June.

A From the projection that I show on the Exhibit there

down to the estimated economic limit of 200 barrels of oil per month, I would estimate this well to have an ultimate production of 384,800 barrels of oil. In other words, in my opinion, this well has already recovered more than 85 percent of its ultimate primary production.

Q Now, you already discussed Exhibit Number 4; would you turn to Exhibit Number 5, please and discuss that Exhibit?

A Mr. Kellahin, Exhibit Number 4 is a graph and I haven't covered it in detail.

Q Discuss Exhibit Number 4, then, I was looking at 5 here.

A Exhibit Number 4 is quite similar to Exhibit Number 3 in that it is also a production graph. This graph is a plot of the combined production of the Bess Number 1 and the nine offsetting wells in the pilot area. These wells, which are colored on the map insert, are the ones most likely to be affected by water injection into the Bess Number 1. The combined performance of the wells in the pilot area is very similar to that of the Bess Number 1. The ten wells combined production to July of this year was in excess of 3,000,000 barrels. I estimate ultimate production to be 3,786,400.

Q Now, is that based on the institution of this waterflood, or is that the primary production?

A That's the primary, estimate of the primary recovery under present conditions.

Q Now, referring to Exhibit Number 5, will you discuss that Exhibit, please?

A Exhibit 5 is a diagramatic sketch of the proposed completion for the proposed injection well, the Bess Number 1. The Applicant proposes to set a packer between the E and F zones of the Strawn and inject produced water from the field down the tubing. As I previously mentioned, there are only about 15 feet of vertical separation between the top of the porosity in the "F" zone and the bottom of the porosity in the E zone. For this and other reasons, the Applicant would desire permission to inject into other zones in this well, if the possibility of communication should develop between these zones. If this communication should develop, the Applicant would want to move a packer above the E zone and inject into both zones.

Q Now, are all those wells open and flowing wells?

A Yes.

Q Some of the zones are open, in other words?

A Yes, most of them are. I might add that it's the desire of the Applicant, in this case, to conduct this pilot flood zone so long as it is needed to obtain

positive results, either good or bad, about the floodability of it. We do not think that this is going to be of a long duration, the test. We propose not to internally coat the tubing at this time, unless it is required.

Q Now, you are injecting produced water, are you not?

A Yes, sir, that's true.

Q And you have a later Exhibit covering that?

A Yes, I do.

Q Now, in connection with your proposed completion, would it be possible for you to fill the casing tubing annulus with a fluid?

A No, we cannot fill it. This, we find in the wells in the field, and this well in particular will take fluid on a vacuum, and we cannot completley fill the casing.

Q Do you propose to use any pressure on injection?

A No, sir, we do not think it will be required, and until it appears that it will just be impossible, we will not use pressure.

Q Now, what volume of water do you propose to inject?

A We don't have individual tests on this F zone on which to predict the rate that would be used, but on a comparison with other intervals that were drill stem tested, we would estimate about 1,400 barrels of water daily, and it's produced from the field, from the

various zones.

Q But not from this well?

A No, sir.

Q How can you insure the Commission that there is no communication?

A It is the desire of the Applicant, of course, to insure himself that there is no communication here and they propose to periodically run radioactive tracer surveys on this well to see that communication is not occurring. I'm sure they would be agreeable to furnishing the Commission of copies of these surveys and also being at the period that the Commission might specify.

Q Now, referring to what has been marked as Exhibit 6 of Exhibit A, would you identify that Exhibit?

A Exhibit 6 is a copy of the water analysis that was recently collected from the field gathering line at a location near the Bess Number 1 and this should be representative of the water that's going to be used for injection purposes.

Q That is the source of water you are going to use, is it not?

A This was taken from the water line on the field gathering system at a location very close to the Bess Number 1 and this is where the water would come

off of and would be injected.

Q Now, the analysis would indicate that this water came from the Bess Number 1, is that correct?

A No, sir, that should be corrected. It did not actually come from the Bess Number 1, it was very close to the location, but it's actually the produced water from the field.

MR. NUTTER: From a number of wells?

THE WITNESS: Yes, sir, that's right.

Q (By Mr. Kellahin) Now, on the basis of this analysis, would you consider this water highly corrosive?

A I would classify it as being moderately corrosive. I'm informed that in pulling wells in the field that they find that there is not extensive corrosion on the tubular downhole line in these cases and in this field, and for this reason they are not proposing to internally coat the tubing at this time, unless it is required.

Q Now, for a short period of water injection, do you think that would cause any problems?

A No, sir, I don't believe it would.

Q Was Exhibit A, consisting of six separate Exhibits, prepared by you or under your supervision?

A Yes, sir.

MR. KELLAHIN: At this time I'd like to offer

Exhibit A in evidence.

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

(Whereupon, Applicant's Exhibit A was marked and received into evidence)

MR. KELLAHIN: That completes the Direct Examination.

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CROSS-EXAMINATION

BY MR. NUTTER:

Q Mr. McIntosh, now, you mentioned you were going to conduct tracer surveys to see if there was communication. What will you be measuring, communication between F zone and this well and what?

A I'm talking about communication behind a pipe in this well just to see that we are confining it.

Q Well, you won't be producing the other zones, however, will you?

A No.

Q So how would you know?

A Well, by lowering a tool into the hole and injecting and measuring to see if it comes up behind the pipe.

Q And so, if you have any radioactivity behind the pipe and above the perforation there, you wouldn't be measuring for communication between any other wells?

A No.

Q In fact, all the wells offering this are completed in this F zone?

A Yes.

Q Now, you mentioned that this well is making 2,700 barrels a day and your Exhibit Number 4 shows the rate of production from wells that would be offsetting the Bess Number 1. Now, what's the current rate of production there, about 25,000 barrels a day for all of them?

A This is the monthly rate, yes, sir. It's been 25,000 barrels a month.

Q And how many wells does that represent?

A That includes the Bess Number 1 and nine additional wells, or ten wells.

Q So the average production is about 2,500 barrels a month?

A Yes.

Q What's the high and what's the low, as far as productivity of these offsetting wells?

A I believe in June, 1972, the low rate was from the Kay 1, 1,940 barrels. The high rate appears from the Eva Com 1, 3,141 barrels. The reducing rate is fairly uniform in the Bess.

Q The Bess well there is producing a little over 100

barrels a day?

A That's right.

Q Well, in accordance with the definition of a waterflood in the Commission Rules and Regulations, this could not be classified as a bona fide waterflood?

A Not if you consider it as being a stripper well, sir. If you considered it an advanced stage of completion, it is an advanced stage of completion, considering that the wells, most of them, are capable of 400 or 500 barrels a day, initially; where they are now 80 or 90 barrels a day, on the average.

Q The bottom-hole pressures here are down below the bubble point of the reservoir, I'm sure, aren't they?

A I do not have any recent pressures on the wells in the field. However, the gas-oil ratio field situation is increasing and there is evidence that it is now well below the bubble point.

Q This may be unimportant, I don't know. What is the acreage dedicated to the offsetting wells, do you know?

A These are all 80 acre tracts.

Q Well, do you know how the 80 runs? That might be important in defining what a project area would be, whether you have an offset or not.

A Sir, I don't have that information myself.

Q Well, both plats are on file and we can assert what the

dedicated acreage to each well is. It would depend on how they run as to whether a well would be offsetting the 80 that the injection well is on.

What are you proposing to call this now, a pilot injection project or a pilot waterflood project?

A Sir, we would like to call it anything that's required to get it approved. It is, in essence, it's a pilot waterflood in that we propose to evaluate the floodability of the Pennsylvanian reservoir in the North Bagley field.

Q Although it doesn't meet the qualifications of a waterflood under the Commission's definition?

A That's right.

Q Well, whether it's a pressure maintenance or a waterflood, it might make a difference here.

A As I say, we would be glad to call it a pressure maintenance.

Q Now, if the injection project is successful, you intend to unitize the area and expand it, is this it?

A That's right.

Q Maybe at that time it could be determined what the project could rightfully be called?

A Yes, sir. I would suspect that by the time studies could be conducted that the field probably will be qualified under the stripper clause, by that time. I

feel that the pilot flood is definitely needed to give them the information that they need to see if the flood is feasible there.

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

(No response.)

MR. NUTTER: He may be excused.

(Witness excused.)

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

MR. KELLAHIN: No.

MR. NUTTER: Does anyone have anything they wish to offer in Case 4818?

(No response.)

MR. NUTTER: Take the Case under advisement and recess the Hearing until 1:30 o'clock.)

(Whereupon, the Hearing was recessed until 1:30 o'clock P.M.)

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, JOHN DE LA ROSA, a 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.

John De La Rosa
COURT REPORTER

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I N D E X

E X H I B I T S

APPLICANT'S:	OFFERED	ADMITTED
Tipperary Land & Exploration Corp.		
Exhibit A	5	15
Exhibit A-1	8	15
Exhibit A-2	9	15
Exhibit A-3	9	15
Exhibit A-4	10	15
Exhibit A-5	10	15
Exhibit A-6	13	15