BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
October 9, 1968

EXAMINER HEARING

IN THE MATTER OF:

Application of Sinclair Oil & Gas Company for a waterflood expansion, Eddy County, New Mexico.

Case No. 3885

BEFORE: Elvis A. Utz; Examiner.

TRANSCRIPT OF HEARING

(Whereupon, Applicant's Exhibits One through Seven, inclusive, were marked for identification.)

MR. UTZ: Case 3885.

MR. HATCH: Case 3885, application of Sinclair Oil & Gas Company for a waterflood expansion, Eddy County, New Mexico.

MR. KELLY: Booker Kelly of White, Gilbert, Koch and Kelly, Santa Fe, New Mexico on behalf of the applicant. I have one witness and ask that he be sworn.

(Witness sworn.)

MR. KELLY: Mr. Examiner, when the application was filed, it was before the name change which was effective on October 1st. We would ask that the order to be issued on this case be in the name of Sinclair Oil Corporation and, also, the exhibits are marked under the old name and I ask that the record show that they are exhibits on behalf of Sinclair Oil Corporation.

R. M. ANDERSON

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

DIRECT EXAMINATION

BY MR. KELLY:

Q Would you state your name, position and employer, please?

A R. M. Anderson, Regional Regulatory Engineer, Sinclair Oil Corporation, Midland, Texas.

Q And you have previously qualified as an expert Petroleum Engineer before this Commission?

A Yes, sir.

Q Would you briefly state, referring to Exhibit One, what Sinclair seeks by this application?

A Exhibit One is an area map of a portion of the Grayburg-Jackson Pool.

The acreage colored light blue is acreage owned by Sinclair. The wells with the little arrows on them are current water injection wells and several of Sinclair's waterflood projects are shown on this area map.

The particular lease which is the subject of our application today to expand an existing waterflood project: subject lease, our Turner "B", as in "Boy", lease occupies the southern 160 acres in Section 17, Township 17 South, Range 31 East, the southern 160 acres and the northwest quarter of the southwest quarter of the section, a total of 200 acres in Section 17. The lease occupies all of Section 20 immediately south of 20, and the south half of Section 30 immediately west of Section 29.

Previously, the Commission approved a waterflood

project for the northern portion of the lease. Today, we're asking that we be permitted to expand this project by converting twelve additional water injection wells. Those twelve wells were listed in our application and were included in the exhibits sent to the Commission of which I have duplicates here today.

Q Well, will the expanded waterflood project cover the balance of the Turner "B" lease?

A Yes. The requested expansion is to extend the project throughout the entire remaining portion of the Turner "B" lease.

Q Now, referring to what has been marked as Exhibit Number Two, will you explain its significance to the Examiner?

A Exhibit Two shows the formation that each well in the expansion portion of the Turner "B" lease is producing from. The wells that are colored red are Grayburg-Jackson Pool wells which is the formation being flooded. The wells colored green are Fren Pool wells. The yellow colored is Cedar Lake-Abo wells and the blue colors are Pennsylvanian gas wells that are in this immediate area of this expansion.

Q Now, do you have an exhibit which shows the actual pattern and the actual injection wells?

A Yes.

Q Proposed injection wells?

A Yes, sir. Exhibit Three reflects the proposed

waterflood pattern. It's an eighty acre five-spot, and the twelve additional injection wells that we've recommended today are a continuation of that same eighty acre five-spot pattern. They include the southernmost two injection wells in Section 20 which is Well 44 and Well 46. That is the two northernmost wells of our expansion project. And in going south from Wells 44 and 46, we'll say Well 47, Well 50, 54, 55, 61, 64, 66, a dry hole, Well Number 68, and proceeding over to the west, Section 30, we see another dry hole, Well 76 and Well 56. Those are to be the twelve additional injectors.

Q Now, will this new injection pattern actually be injecting water into same zone as the original waterflood in the upper part of Turner "B"?

A Well, it will be injecting it into the same common source of supply which is the Grayburg-San Andres reservoirs of the Grayburg-Jackson field. However, as you go south and as my Exhibit Five, my structure map will show, why, we are on a dipping portion of the anticline, the southern portion of the anticline, and different sands are developing as we go south from what it developed in the north.

Now, the northern portion of the lease, the Turner "AB" lease and the Turner "B" lease which is shown on Exhibit Three has Premier sand and Jackson sands, Mattix sands and

various sands comingled in the well bores. However, the principal sand, the main sand that we're going to flood on this expansion is the Premier sand. We have singled it out even though it's open in the wells to the north that are under flood now.

We feel it's not too well developed from a permeability and porosity standpoint and was not too effective in contributing to the production of the lease. So what we're going to do and as we'll see on the next exhibit, the schematic diagrams, we're going to isloate in the injection wells, the Premier sands when we expand down into this area.

Q Now, what is the present status of the proposed injection wells? You have mentioned two of them are dry holes. Are the rest of them presently in production?

A Yes, sir. The rest of them are presently producers.

Q And what is the average of their daily rate of production?

A Well, the average daily production of all the wells in the expansion area, including the producing wells, is somewhat less than ten barrels per day per well.

Q As far as your estimates of primary production, what is the cumulative production from these wells at this

time?

A Cumulative production. Now, this is in the expansion area which is from that line of wells which has -- there are two northernmost wells that we're asking, Wells 44 and 46. Forty-three, 44, 45, 46 from that line of wells, which is the bottom line of wells in Section 12, and down into Section 29 and in the southern half of Section 30, which I will define at this time as the expansion area. The cumulative production from those wells is about a million and a half barrels of oil from all of the wells.

Q Would you say that the primary production is pretty well depleted now, pretty well along the way towards depletion?

A Yes. We estimate that there's approximately 237,000 barrels of remaining primary which will make an ultimate primary of some one million, six hundred and fifty thousand barrels. So with that small amount of remaining primary, relative amount, we feel that we are in the late stages of primary depletion in this expansion area.

Q Then the proposed injection wells would be reaching the advanced stage of depletion and reaching the classification of stripper wells in the near future?

A I haven't made any calculations with regard to

the twelve injections wells, but I have with regard to all wells, and all wells are nearing the state, the economic limit. The decline is rather flat, so it will be a considerable amount of time before we get to the economic limit, but the wells are poor producers at this time.

Q You have an estimate as to the total production that you would expect on secondary recovery?

A Yes. We anticipate that we will increase the ultimate recovery from the expansion area by approximately one and a half million barrels of oil.

Q Just about what your production is now as primary?

A Yes, just about what the present cumulative production is. We should get the remaining primary, plus another million and a half barrels, which would contribute to the secondary recovery of waterflood operations.

Q Now, turning to your next exhibit which is a diagrammatic sketch of the twelve injection wells, would you explain the proposed installations?

A Yes. I have shown on the diagrammatic sketch the lease and well number and the exact footage location of each of the proposed injection wells as shown on the top, above each well, and I have shown the casing, the cement,

the size casing, size tubing, and I have shown, with dashed lines, the approximate location of the packers, tubing packers that will be run in each well and, in some cases, I have shown approximate location of a bridge plug which will be used in the initial stages of the flood to plug off and block off, temporarily, other productive zones that are open in the well bore at this time.

Q The tubing that you have shown there, will that be plastic coated?

A It will be plastic lined tubing and the annulus, tubing casing annulus will be filled with corrosion inhibited fluid and there will be provisions at the surface for installing a pressure gauge.

Q Now, is there any fresh water in the area?

A Fresh water in this area is very spotty. Several operators in the past have attempted waterflood projects using locally found water, but they have been very unsuccessful and their water has been very limited in quantity and in amounts, so the fresh water is not plentiful. There are small amounts, erratically found, that are good, primarily, for water for stock or something like this.

Q Do you feel that the installations you have shown on Exhibit Number Four will protect any fresh water in

this area and also protect migration of fluids to other zones?

A Yes, sir. Using tubing packers and having the annulus filled with corrosion inhibited fluid and pressure gauges on the surface, I believe any leaks on the tubing will be readily detected and can be immediately repaired before migration of water whether it occurs around that area or not.

Q Now, what is the source of the water that you will be injecting?

A The principal source will be fresh water from the Ogallala Formation. Sinclair, several years ago, obtained water rights on the Caprock for flooding this particular acreage and in other acreage that we're flooding with this water. So the principal water, at least, initially, will be fresh water.

However, we are using all the produced salt water from the floods to the north of us and we'll undoubtedly continue to use the produced salt water which isn't really too salty. It's not bad water at all, so we'd use every bit of it for reinjection and we'll continue to do that on this project, too, use a minimum amount of fresh water.

Q Now, what do you expect your volumes of injection to the wells will be?

A We anticipate we will inject about 300 barrels of water per well per day. This is a little bit less than what we have used up in some of the flooding operations to the north, but here, we're going to isolate, for the first time, one zone and concentrate on just putting water into it, and it should take less water per well in order to flood the one zone.

Q Do you have an estimate of your expected pressures?

A Well, I would say that they would be comparable to pressures that we have experienced on the other floods, somewhere around 500 pounds.

Q All right. Is there anything else you want to mention on Exhibit Number Four?

A No, sir.

Q Now, turning to your structure map, Exhibit Number Five, explain that to the Examiner.

A Structure map is drawn on top of the Grayburg. The contour intervals are fifty foot intervals. We are going down structure as go south, so we have about 250 foot of dip per mile in a southerly direction across the expansion area. The premier sands that we're going to flood is the lowest productive sand that has been found in the Grayburg

that is close to the top of the San Andres Formation, but I believe that this structure map reflects the dip that flooded the Premier sand, also.

Q What is the drive mechanism in this reservoir?

A It is a solution gas drive reservoir.

Q What is the present GOR ratio in your experience in these wells?

A The present GOR, expansion area, is about 500 to one.

Q And how about your water production?

A Water production is about twenty-five per cent of the total flood production.

Q So on a ten barrel per day average, you have about two and a half barrels of water per day?

A Yes, that's right.

Q Now, I believe you furnished logs on all but two wells when you submitted your application, is that correct?

A Yes, sir. The Commission files should have logs on ten of the twelve wells.

Q And Exhibits Numbers Six and Seven are the logs of the other two wells, is that correct?

A That is correct.

Q In your opinion, will the granting of this

application promote the effective and efficient production of hydrocarbons that would otherwise be left in place?

A Yes, sir. In my opinion, the granting of this application will be the only way that this additional recovery can be realized from this property, the million and a half present.

Q In your opinion, will the granting of this application have any adverse affect on the correlative rights of any operators in the area?

A No, sir, it will not.

Q Were Exhibits One through Seven prepared by you or under your supervision?

A Yes, sir.

MR. KELLY: We move the introduction of Sinclair's Exhibits One through Seven.

MR. UTZ: One through Six, wasn't it?

MR. KELLY: Six and Seven are the logs of the two wells that were not furnished with the application.

MR. UTZ: Without objection, Exhibits One through Seven will be entered into the record of this case.

(Whereupon, Applicant's Exhibits Numbers One through Seven, inclusive, were admitted in evidence.)

MR. KELLY: Mr. Examiner, I would also like to enter as Exhibits in this case, the ten logs that were submitted with the application so that the record would be clearer on it.

MR. UTZ: Ten of them? The Exhibit Seven has ten parts?

MR. KELLY: Of Exhibit Eight, ten parts. Exhibit Six and Seven are the individual logs.

MR. UTZ: Oh, all right. Let's see. Where are those logs? After ten or twelve cases, you get to where you have a lot of paper.

Now, there are ten logs, and you want those marked Exhibit Seven?

MR. KELLY: Exhibit Eight.

MR. UTZ: I'll get it, yet.

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

MR. KELLY: That's all we have on direct examination.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Anderson, the locations shown on Exhibit Four, to the best of your knowledge, are correct, the foot locations?

A Yes, sir.

Q Did you give some kind of an average well producing capacity on these extension wells?

A Yes. The extension area, at the present time, is averaging less than ten barrels per well per day.

Q All your injection will be on the packer through a plastic coated tubing?

A Yes, sir.

Q And reinject your produced water?

A And reinject produced water both from this expansion area and from the rest of the lease to the north.

MR. UTZ: Are there other questions? He may be excused. Any statements in this case? The case will be taken under advisement.

I N D E X

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, Charlotte J. Macias, 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.

Charlotte J. Macias
Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3885, heard by me on Oct. 9, 1968.

Examiner
New Mexico Oil Conservation Commission