BEFORE THE

Oil Conservation Commission

SANTA FE, NEW MEXICO

January 19, 1956

IN THE MATTER OF:

CASE NO. 993

TRANSCRIPT OF PROCEEDINGS

ADA DEARNLEY AND ASSOCIATES

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ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 19, 1956

IN THE MATTER OF:	
Application of Humble Oil & Refining Company and Gulf Coast Western Oil Company for an order granting permission to expand an existing water flooding project. Applicants, in the above-styled cause, seek an order granting them permission to enlarge the secondary recovery program by water flooding, as originally approved by Order R-137-A, presently being operated in Section 34, Township 22 South, Range 37 East, Penrose Skelly Pool, Lea County, New Mexico. Applicant's desire to convert four additional wells to injection wells, said wells being Humble Oil & Refining Company's State "H" No. 2, SE/4 SW/4 in Section 27; Gulf Coast Western Oil Company's F. S. Glier No. 3, NW/4 NE/4 Section 33; Gulf Coast Western Oil Company's F. S. Glier No. 2, SE/4 NE/4 Section 33; Humble Oil & Refining Company's State "H" No. 3, NW/4 NW/4 Section 34, all in Township 22 South, Range 37 East, Penrose Skelly Pool, Lea County, New Mexico.	Case No. 993

BEFORE:

Honorable John F. Simms, Jr.,
Mr. E. S. (Johnny) Walker,
Mr. William B. Macey.

TRANSCRIPT OF HEARING

MR. HINKLE: If the Commission please, I am Clarence Hinkle appearing on behalf of the Humble Oil and Refining Company. Case No. 993 is the application of the Humble Oil and Refining Company and the Gulf Coast Western Oil Company to expand an existing water flood project which was

originally approved by the Commission Under Order R-179 and R-179-A. The proposed expansion is by coverting four additional wells to injection wells. In connection with the notice that was published in this case, I wish to call the attention of the Commission to an error which occurred in the publication. The publication refers to the former order as Order R-137 (a), whereas it should have been R-179 and R-179-A. However, I don't think the error is material in this case. We have one witness. I would like to have Leon Crittenden sworn.

LEON CRITTENDEN,

having first been duly sworn, testified as follows:

BY MR. HINKLE.

Q State your name.

A Leon Crittenden.

Q Are you a graduate engineer, Mr. Crittenden?

A That is correct.

Q From what school? A Rice Institute.

Q What degree?

A Bachelor of Science in Chemical Engineering.

Q What year did you graduate? A 1944.

Q Have you practiced your profession as an engineer since your graduation?

A I have.

Q What has been the extent of your experiences and employment?

A I am a supervising petroleum engineer in charge of water flooding for Humble in the West Texas-New Mexico area.

Q You have made then, a study of water flood projects in West Texas and New Mexico? A I have.

Q Are you familiar with the application of the Humble and the Gulf Coast Western Oil Company in this particular case? A Yes.

Q Mr. Crittenden, refer to Humble's Exhibit No. 1 and tell the Commission what this shows.

A Exhibit No. 1 is a plat of the flood area. The existing water injection wells are identified with a solid circle and include two wells on the Gulf Coast Western T. O. May Lease in Section 34, the Northeast quarter of 34; one injection well in the Southeast quarter of 34 on the Gulf Coast Western-Humble State H Lease; there are two existing water injection wells on the Skelly H. O. Simms Lease in the Southwest quarter of Section 34 and Humble has one injection well, Humble State H 7 in the Northwest quarter of Section 34. The additional injections wells proposed are identified by the dotted circles and are located on the Gulf Coast Western Lease in the Northeast of Section 33. The Humble State H Lease in the Northwest quarter of Section 34 and the Humble State H lease in the Southwest quarter of Section 27.

Q Does this plat Exhibit No. 1 also show the ownership of the oil and gas leases in the area? A It does.

Q Was that plat prepared either by you or under your direction?

A It was.

Q Explain to the Commission what the proposal of the Humble and the Gulf Coast Western is with respect to expanding this water flood.

A Humble would convert the Humble State H 3 Well and the Humble State

H 2 Well to water injection at such time as offsetting injection wells are supplied on the Rowen Lease to the north and the Gulf Coast Western Lease to the west. We understand that Gulf Coast Western desires to convert their Glier 2 and 3 wells in the Northeast quarter of Section 33.

Q Has the Gulf Coast Western joined with the Humble in this application?

A They have.

Q Do you have, or have you prepared any information with regard to the water flood data, water that has been injected so far on the Humble Leases?

A Exhibit 2 is a production data graph for the Humble State H lease. The water injection was initiated in December of '53, of 1953, and effective January 1st, of 1956, 124,000 barrels of water had been injected into the Humble New Mexico State H 7 Well. As shown by this data graph, there was a slight increase in oil production on the Humble Lease in September of 1954. This increase resulted from a sand oil fracture treatment of Humble New Mexico State H 1 and is not considered to be the result of water flooding. We anticipate that approximately five hundred thousand barrels per injection well will be required to fill up the reservoir void and provide appreciable results with flooding.

Q Then it is too early to really determine whether or not the water flooding is going to be effective.

A That is correct.

Q What was your source of information in preparing this plat, Exhibit No. 2?

A It was prepared from our company records.

Q Was it prepared by you under your direction?

A Under my direction.

Q Have you made a study of the well completions or conversions in this area for injection purposes? A I have.

Q In what formation is the water being injected?

A Water is being injected into the Queen Sand and we have supplied Exhibits No. 3 and 4 to show the section in which we are injecting water. Exhibit No. 3 is a gamma ray neutron log in Humble New Mexico State H Number 1. Exhibit No. 4 is a gamma ray neutron log in Humble State H No. 7. The two logs were necessitated to show the entire section. We weren't able to log the slim hole below the injection string in Humble State H 7, but the log did go far enough to give our correlations on the top of the Yates, Seven Rivers, Queen and Penrose sands. Actually, our wells are completed, or this No. 7 well is completed for injection into Penrose portion of the Queen. This State H 1 log shows the typical completion in that area. In most instances the wells were completed with casing set near the top of the Queen. In our initial investigations we examined a number of cable tool reports and available gas oil ratio information and it appeared to us that there were some sand stringers in the upper part of the Queen which were possibly gas bearing and for that reason we set pipe in our injection well in this H 7 well near the top of the Penrose Sands. In drilling that well, we used an air drilling technique and the first free oil was encountered below the four inch injection string.

Q Have you obtained waivers from any of the offset owners that might be affected by this proposed expansion?

A We have obtained waivers from Rowen Oil Company Warren Petroleum

Company and Skelly. We rquested a waiver from Donglade and Glower. That waiver has not as yet been received.

Q I hand you Humble's Exhibit No. 5 and ask you to state to the Commission what that is?

A That is a waiver covering the proposed expansion of the existing flood area. The waiver had been executed by Rowen Oil Company.

Q Now, are Exhibits 6 and 7 identical, except for the signers?

A They are.

Q And they are waivers by what companies?

A Skelly Oil Company and Warren Petroleum Company.

Q Now, under these waivers they consent to approve or voice no objection to your proposed expansion, is that right?

A That is right.

MR. HINKLE: I would like to offer into evidence at this time Exhibits 1 through 7.

MR. MACEY: Is there any objection? If there is no objection the exhibits will be received.

Q Now, do you have any reason to believe that this water flood will not be effective?

A The data we have indicates that it will be effective.

Q And what is your source at the present time of water supply that is being injected into the Queen Formation?

A We are injecting fresh water obtained from a lease water well.

Q Would you propose to continue the injection of fresh water into the

Queen Formation in the event it is expanded to any considerable extent?

A In the event that the flood is expanded over a sizeable area, a source of salt water for injection would be desirable.

Q Is it the intention of Humble to provide such a supply in the event that this initial pilot water flood proves successful.

A We would desire to work with theother operators in developing possibly a co-operative source of salt water.

Q Is it your opinion that this extension by converting these four additional wells will increase the efficiency of the water flood project as it now exists?

A In my opinion, yes. The areas adjacent to the existing five spots will become unbalanced as water is injected and it is therefore desirable to close in an additional area and counteract this unbalanced condition.

Q Have you made any estimate of what might be expected in the way of additional recoveries from this area in the event the water flood is successful?

A I estimate that the water flood recovery should approximate 75 per cent of primary recovery.

Q Is there anything additional you wish to tell the Commission with respect to this project?

A I don't think of anything.

MR. HINKLE: That is all.

MR. MACEY: Are there any questions of the witness?

MR. NUTTER: I would like to ask a couple of questions here.

CROSS EXAMINATION

BY MR. NUTTER:

Q What is your average injection pressure at the present time?

A Injection pressures in various wells range from a minimum of 80 pounds to a maximum of 800 pounds. That is effective December first.

Q You mean that the range of average injection pressure per well is that wide? A Yes, sir.

Q I wonder if you could give me those pressures, what the average pressure is for each one.

MR. HINKLE: Pardon me, are those pressures shown on Exhibit 2?

A No, they are not. The Gulf Coast Western T. O. May No. 1 had an injection pressure of 700 pounds during November of 1955. That is the most recent data we have available.

The Gulf Company's Western T. O. May No. 4 had an injection pressure of 700 pounds, the Gulf Coast Western Humble New Mexico State H had an injection pressure of 700 pounds, the Humble New Mexico State H 7 had an injection pressure of 450 pounds, the Skelly H. O. Simms 9, had an injection pressure of 800 pounds. That reflects October data for the Skelly well. Skelly H. O. Simms had an injection pressure of 80 pounds during October.

Q It would appear then that the new wells which you plan to instigate into this water flooding program will be in the high pressure area rather than down in this 80 pound area?

A I think rather than reflecting the particular area some of those injection pressures probably reflect the need for clean out work. Some of those wells were shot initially then produced for a number of years and then were placed on injection without complete clean out. I understand the Gulf Coast Western

is planning to perform some clean out work in the immediate future on their lease.

Q What are your average injection volumes on those various wells?

A Those volumes range from 31 barrels per day on the Gulf Coast Western T. O. May Number 1, to 162 barrels per day in the Skelly H. O. Simms 8.

Q I wonder if you can give me those figures for each of the wells please?

A All right, Gulf Coast Western T. O. May No. 4, 37 barrels per day. Gulf Coast Western State H 1 forty barrels per day. Humble New Mexico State H 7, 134 barrels per day. Skelly H. O. Simms 9, 93 barrels per day.

Q How about the Skelly H. O. Simms Number 8?

A 162 barrels per day.

Q Have you started getting any appreciable returns on the water as yet?

A From the standpoint of volume we have. The Gulf Coast Western has experienced some water production, but I don't think in terms of barrels per day it's been very high.

Q Well, at the time when you will start getting large amounts of water back, what are the plans for the use of that water after it's been returned. Will you recycle it into the water flood or will it be disposed of?

A I think that would depend on the character of the water and whether it can be made suitable for injection along with the existing source of injection water.

Q What is the depth of your water well that is producing this fresh water at this time?

A Our well is about 226 feet. In that range.

Q However, you anticipate using a salt water well later on?

A Eventually if the flood proves itself, and it can be worked out, we would like to enter into some co-operative water system utilizing salt water.

Q And this salt water, if it is not recycled will be disposed of in a disposal well, undoubtedly?

A I think we will cross that bridge when we get there and the disposal of that water will be worked out depending on the characteristics.

MR. NUTTER: I believe that is all.

MR. MACEY: Anyone else have a question of the witness?

BY MR. MANKIN:

Q I believe I have some questions. Has there been any results as yet, marked results as to oil production?

A Not as reflected in the reports we have received from the other operators and not in our own production, but Gulf Coast Western, I believe, recently has noted to a limited extent production increase in the area.

Q That was the result of recent increases in water input, was it not?

A They feel that, I believe, that it results from the overall injection program.

Q Did they not recently add considerable amount of water to some of their wells as a result of additional equipment?

A They recently installed a triplex injection pump permitting the use of a somewhat higher injection pressures and higher injection rates?

Q As a result of that, have they not noted some very good results just recently?

A That, as I said, I haven't seen any actual reports on it, but I understand in talking with them, that they have experienced some increase.

MR. MANKIN: Thank you.

MR. MACEY: Anyone else have a question of the witness? If nothing further the witness may be excused.

(Witness Excused)

MR. HINKLE: We have nothing further.

MR. MACEY: Anyone else have anything further.

MR. HANSON: I would like to state we favor the application, of course, and since the discussion has come up on the possible increase of oil, the first 15 days of this month we have an average of about 23 barrels a day increase on the seven wells that we considered that might be affective. The only thing we can credit that to would be possibly the overall flood with the additional possible effect of having installed some new equipment but only started its operation on December 20 in which we have increased the injection of the water about three times and the pressure from 700 pounds to 1100 pounds on the three input wells. Also wish to confirm the statement made by the witness that we are contemplating rather immediate cleaning out of our injection well. We feel that probably we are carrying much heavier pressure than necessary if the well cleaned out.

MR. NUTTER: Do you have any idea when it will be that you can stop using the fresh water and start using the salt water?

MR. HANSON: Personally I do not. We will have to leave that to the engineers. Probably, that will be when we have more evidence of the success

of the overall venture and possibly the addition of other input wells might be necessary and other additional acreage.

MR. HINKLE: In answer to your question as to when salt water might be used, I think that on behalf of Humble we can state that as soon as it is evident that this is successful and the other operators are willing, which they are going to be of course, as soon as we have shown it is going to be successful to expand the area, then the logical thing to do would be to get all the operators together and get a common source of supply and a common pumping unit for the whole area. I think that as a practical matter is what will happen in this particular case.

MR. MACEY: Does anyone have anything further in this case?

MR. SELINGER: On behalf of the Skelly Oil Company, as the record indicates, we gave the applicant a waiver for the expansion program. As the Commission well knows we are a member of the initial water flooding project. We would urge the Commission's approval in the expansion of such a program with the cooperation of all the interested parties as a conservation move of the highest type. We feel that the Commission should therefore approve the expansion application.

MR. MACEY: Anyone else? If nothing further, we will take the case under advisement.

C E R T I F I C A T E

STATE OF NEW MEXICO,)
: ss
COUNTY OF BERNALILLO.)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the Oil Conservation Commission for the State of New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

WITNESS MY HAND, this, the 25th day of January, A.D., 1956.

Ada Dearnley
Court Reporter.