BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 26, 1968

EXAMINER HEARING

IN THE MATTER OF:	
Application of Texaco, Inc., for a waterflood project, Lea County, New Mexico.	CASE NUMBER 3788

BEFORE: ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 3788.

MR. HATCH: Case 3788, application of Texaco, Inc., for a waterflood project, Lea County, New Mexico.

MR. KELLY: Booker Kelly of White, Gilbert, Koch and Kelly, on behalf of the applicant, and I have one witness to be sworn.

(Witness sworn.)

(Whereupon, Exhibits Numbers 1-6 were marked for identification.)

MR. UTZ: Are there other appearances? You may proceed.

CARL L. WHIGHAM

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?

A My name is Carl L. Whigham, Junior. I am employed by Texaco, Incorporated, as Midland Division proration engineer located in Midland, Texas.

Q You have previously qualified as a petroleum expert in front of this Commission?

A Yes, sir.

Q Would you state what Texaco seeks by this application?

A Texaco requests authority to initiate a waterflood

project in the Vacuum Grayburg San Andres Pool in Lea County, New Mexico, by the injection of water into New Mexico State "W" NCT-1 Well Number 1. This well is located in Unit O, Section 13, Township 17 South, Range 34 East.

Q Referring to what has been marked Exhibit 1, the plat of the area, would you locate the proposed injection well on the unit?

A Exhibit 1 is a map showing a portion of the Vacuum Grayburg San Andres Oil Pool in Lea County. The various wells are colored to designate the pool in which they are completed and are producing. The project that we're requesting here is located in Section 13. Referring to the map, the southeast quarter of Section 13 is colored yellow. This is Texaco State "W" NCT-1 lease. The project area will be the west half of this quarter section.

There is no development in the east half of that quarter section. There are three wells in the west half, two completed in the Vacuum Grayburg San Andres Pool and one well, Well Number 3, which is dually completed in the Middle Penn and the North Abo Pools.

This map also shows the large Mobil State Bridges lease to the west and designates the injection wells that Mobil is using in this waterflood project.

Q So, this will be in cooperation with Mobil's unit?

A Yes, it will. It will tie in with their eighty-acre five-spot injection pattern.

Q What is the present status of the two wells on your acreage?

A Well Number 1 has been shut in for -- no, Well Number 1 is producing. Well Number 2 has been shut in for several years. Well Number 1 is currently producing just under two barrels of oil a day, average.

Q Well Number 1 is the proposed injection well?

A Yes, it is.

Q Now, going to Exhibit Number 2, which is your structure map, would you explain that to the Examiner?

A Exhibit Number 2 is a structure map contoured on top of the San Andres Reservoir with a fifty-foot contour interval. This map shows that the field is a large east-west trending anticlinal structure. The predominant drive mechanism in this field is solution gas drive, even though there has been some evidence of pressure support by water influx, but there is no pressure as evidenced in this particular area of the field.

Q Have you had any effect from the Mobil injection wells as yet?

A Our production from the one well is very low and very erratic and we don't believe that we are getting any response

thus far. However, it is expected in the near future. Mobil made an application to the Commission about two months ago for administrative approval to convert Well Number 10 down in Section 24, Unit C to water injection service and in their application we did state that they had detected response to the waterflood project in that vicinity, so we feel that we will be observing some response in the near future.

Q Going on to Exhibit Number 3, which is your production curve, will you explain that to the Examiner?

A Exhibit 3 is a production performance curve, or set of curves, where we have shown gas-oil ratio, monthly oil production and water production. The gas-oil ratio averaged around 4,000 cubic feet per barrel for several years, as shown by this curve. In recent months, the gas-oil ratio has declined.

The points on this curve were plotted to represent a yearly average and they were plotted at midyear. However, the last point was plotted to represent the gas-oil ratio during the first three months of this year. At the present time, the gas-oil ratio of the only producing well on this lease fluctuates between approximately 700 and 1300 cubic feet per barrel of oil.

The next curve down is the monthly oil production and this curve shows that the present production is about 52

barrels of oil per month. That would be from the Number 1 well, only.

Then the lowermost curve shows the water production. It shows that the water production was about 118 barrels of water per month back in 1964, when Well Number 2 was shut in, and since that time has steadily decreased, and at the present time water production is nil on this lease.

Q What is your cumulative well production from the wells?

A Cumulative oil production from the Vacuum Grayburg San Andres Reservoir is just over two million. Correction, 200,000 barrels. It was 202,803 barrels as of June 1st, 1968.

Q Do you have a figure of primary production reserves that has been depleted?

A Yes. We feel that approximately ninety-nine per cent of the primary reserves have already been produced, so the ultimate primary recovery from this lease would be in excess of 202,000 barrels.

Q What does Texaco expect to get from the secondary recovery?

A It is felt that the secondary recovery will be approximately equal to primary recovery.

Q What amount of water will you inject?

A We propose to inject about 500 barrels of water per day into this well.

Q And at what pressures?

A Initially the pressure will be quite low, but we anticipate a maximum pressure of about 2200 p.s.i.

Q What will your source of water be?

A We will purchase injection water from Mobil Oil Corporation. They obtain their water from the Ogallala formation and also from their own production facilities they will obtain their produced water. They mix this water together. It's compatible and they'll deliver it to Texaco at the lease boundary. We'll purchase it at that point.

Q Now, going on to your sketch of the proposed injection well, would you explain the proposed installation?

A This sketch shows that the proposed injection well will be a standard conventional completion. We'll propose to inject water below a packer through two and three-eighths-inch plastic-lined tubing. We will put an inhibited fluid in the annulus and we will inject into an open hole interval from a depth of 4348 feet down to a total depth of 4680 feet.

Q Is there any fresh water in the area?

A I don't have any information regarding fresh water in the immediate area.

Q Would this installation protect any fresh water in the field?

A Yes, it would. The well has been very adequately cemented.

Q Will you have any kind of a pressure gauge on your annulus or will you keep it open?

A Yes, we will. The annulus will be corrected regularly to detect any leaks as soon as they occur. Might I point out that this sketch did differ slightly from the sketch submitted with the Application for Hearing. The first sketch that was submitted, showed that the top of the cement behind the five-and-a-half-inch casing was unknown and that the top of the cement behind the surface casing was unknown. That notation was made primarily because the temperature survey had not been run.

However, I have corrected hole sizes and the amount of cement used and calculated the fill-up, and my calculations show that the top of the cement behind the five-and-a-half-inch casing should be up into the surface casing at a depth of about 1068 feet. The same type of calculations shows that enough cement was used on the seven and five-eighths-inch surface casing to bring the cement all the way to the surface. These facts are shown on our sketch that was presented

here at the hearing.

Q Now, Exhibit Number 5 is a log of the proposed injection well, is that right?

A Yes.

Q Do you have anything you want to point out to the Examiner on that exhibit?

A We have shown the tops of the significant formations in the area. This is a Schlumberger electric log run in 1935. When this well was completed, they ran the log when they reached casing depth of 4361 and then after setting casing they ran another section to cover the open hole interval. We have designated on this log the top of the Yates at 2930, the top of the Seven Rivers at 3210 and the top of the Queen at 3840. Then in the open hole interval in another section of the log down below we show the top of the Grayburg at 4360 and the top of the San Andres at 4545.

Q Now, your Exhibit Number 5 is a list of the offset operators, is that right?

A Yes. There are four offset operators and we list their addresses. Each one of these offset operators received a copy of our Application for Hearing.

Q In your opinion, will the granting of this application prevent waste by allowing Texaco to produce oil

and gas that would otherwise be left in place?

A Yes.

Q In your opinion will the granting of this application have any adverse effect on correlative rights of other operators?

A No, it won't.

Q Were Exhibits 1 through 5 prepared by you or under your supervision?

A Yes, sir.

MR. KELLY: I move the introduction of Texaco's Exhibits 1 through 5.

MR. UTZ: How about 6?

MR. KELLY: 6 is the list of offset operators. We will introduce that, too.

MR. UTZ: Do you want to put it in?

MR. KELLY: Yes.

MR. UTZ: Exhibits 1 through 6 will be admitted into the record.

(Whereupon, Exhibit Numbers 1-6 were offered and admitted in evidence.)

CROSS EXAMINATION

BY MR. UTZ:

Q How long has the Number 2 Well been abandoned?

A Since June, 1964. We have tested that well

periodically, Mr. Utz. It makes a trace of oil and several barrels of water a day. Periodically we go out and test the well.

Q Where is the nearest injection well to this well? This does -- Let me preface that, first, with this question: This does offset a Mobil waterflood, does it not?

A Yes, sir.

Q And where is the nearest injection well to the Number 2 Well?

A The Mobil State Bridges Well Number 63 direct west offset from the Number 2 Well is the nearest injection well.

Q How long has it been injecting water?

A Since October, 1967. At that time that well, Well Number 63 and its diagonal offset to the northeast which would be Well Number 73, were both converted to injection service.

Q Well, it hasn't been taking water for very long, then?

A No, sir.

Q Less than a year?

A Yes, sir, that's correct.

Q But you still don't have any response?

A No, sir.

Q You say the Phillips reported in Unit C that their

well in Unit C of Section 34 did have some response?

A I mentioned the application by Mobil Oil Corporation, dated April 26th, 1968, where they advised the Commission that they had purchased Well Number 10 in Section 24 from Phillips Petroleum Corporation and they requested authority to convert that well to injection service.

In their application, they advised that they had detected a response in that vicinity. They state that Well Number 9 offsets the Santa Fe Well Number 10 to the north and Bridges State Number 19 offsets the well to the west. They state that both of these producers have experienced substantial response to the waterflood program as evidenced by well tests set out on attached Form C116.

Q Where would they have gotten response from, what injection well, any idea?

A Yes. Exhibit Number 1 shows that several wells along the southern boundary of Section 14 in Section 13 are on injection. Also, the well in the northeast corner of Section 23. So there has been substantial injection around the northwest quarter of Section 24.

There is also an injection well directly southwest of the Santa Fe Number 10 Well. That injection well is Number 20.

Q So, it would appear that the reason you don't have any response to your Number 2 Well is, there just hasn't been enough water put in there?

A Yes, sir, up in that vicinity.

Q Did I hear you state that you would reinject produced water at such time as it is produced?

A Yes.

Q Your tubing, I believe, does show that it will be plastic-coated tubing?

A Yes, it is.

Q With fluid in the annulus, and what are you going to do with the annulus to the surface, pressure gauge or leave it open?

A More than likely a pressure gauge will be installed. Until a pressure gauge is installed, it will be left open and observed periodically.

MR. UTZ: Are there any other questions of the witness? The witness may be excused.

(Witness excused.)

MR. UTZ: Any statements in this case? The case will be taken under advisement.

I N D E X

E X H I B I T S

NUMBER	MARKED FOR IDENTIFICATION	OFFERED AND ADMITTED IN EVIDENCE
Exhibits 1 through 6	2	10

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 5th day of July, 1968

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1971

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3788, heard by me on June 26, 1968

New Mexico Oil Conservation Commission

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE , NEW MEXICO

Hearing Date JUNE 26, 1968 **TIME:** 9 A.M.

NAME	REPRESENTING	LOCATION
Gordon D. Ryan	Pan Am. Pet. Corp	Fort Worth
DAVID G WIGHT	PAN AM. PET. CORP.	FORT WORTH
N [illegible]	RW Byram	S F
C 7 Oatman	The Superior Oil Co.	Austin, Tex
Terry Clay	The Superior Oil Co.	Midland, Tex
Walter Palmer	Tenneco Oil Co.	Midland, Texas
Richard S. Morris	Montgomery firm	Santa Fe
Harry F. Schram	Hanson Oil Co	Roswell
Booker Kelly	[illegible] Kelly	S. F
CARL L. WHIGHAM	TEXACO	MIDLAND
WV Kastler	GULF OIL Corp	Roswell NM
J H Hoover	—	—
Jason Kellahin	Kellahin & Fox	Santa Fe
R. L Jones Jr	Getty oil	Midland, Texas
J W Graham	Kewanee Oil Co.	Tulsa, Okla
R D Allison	Kewanee Oil Co	Tulsa, Okla