

CASE 3646: Application of TEXACO
INC. for a waterflood project,
Lea County, New Mexico.

Case No.

3646

Application, Transcript,
Small Exhibits, Etc.

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

-2-

September 15, 1967

Mr. Booker Kelly
White, Gilbert, Koch & Kelly
Attorneys at Law
Santa Fe, New Mexico

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the allowable provisions of Rule 701, it behooves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project areas, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

Your cooperation in keeping the Commission so informed as to the status of the projects and the wells therein will be appreciated.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/DSN/esr

cc: Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico

United States Geological Survey
P. O. Box 1157
Hobbs, New Mexico

Mr. Frank Irby
State Engineer Office
Capitol Building
Santa Fe, New Mexico

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

September 15, 1967

C
Mr. Booker Kelly
White, Gilbert, Koch & Kelly
Attorneys at Law
Post Office Box 787
Santa Fe, New Mexico

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Dear Sir:

Reference is made to Commission Order No. R-3314, recently entered in Case No. 3646, approving the Texaco Cotton Draw Waterflood Project, the Texaco Paduca Ray Waterflood Project, and the Texaco Paduca Jordon Waterflood Project.

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Injection into each of the fifteen wells authorized for said projects shall be through 2 3/8-inch internally plastic-coated tubing set in a packer which is to be located approximately 100 feet above the uppermost perforation. The casing-tubing annulus shall be loaded with an inhibited fluid and left open at the surface or equipped with a pressure gauge to permit detection of leaks in the tubing or in the packer.

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which the Cotton Draw project will be eligible to receive under the provisions of Rule 701-E-3 is 2058 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less. The maximum for the Paduca Ray project is 84 barrels per day and the maximum for the Paduca Jordon project is 126 barrels per day.

Please report any error in these calculated maximum allowables immediately, both to the Santa Fe office of the Commission and the appropriate district proration office.

In order that the allowable assigned to the projects may be kept current, and in order that the operator may fully benefit from

State of New Mexico
Oil Conservation Commission



STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

September 11, 1967

Re: Case No. 3646
Order No. R-3314
Applicant:

Texaco Inc.

Enclosed herewith is a copy of the above-referenced Commission order recently entered in the subject case. Letter pertaining to conditions of approval and maximum allowable to follow.

A. L. Porter, Jr.
A. L. PORTER, Jr.
Secretary-Director

Carbon copy of order also sent to:

Other _____

DOCKET NO. 26-67

DOCKET: SPECIAL HEARING - WEDNESDAY - AUGUST 30, 1967

OIL CONSERVATION COMMISSION - 9 A.M. - MORGAN HALL, STATE LAND OFFICE
BUILDING, SANTA FE, NEW MEXICO

CASE 3644: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider the revision of Paragraph (1) of Order No. R-3221, to provide that the effective date for the prohibition of surface disposal of produced water from the North Bagley-Upper Pennsylvanian, North Bagley-Middle Pennsylvanian, North Bagley-Lower Pennsylvanian, North Bagley-Wolfcamp, and Northeast Bagley-Wolfcamp Pools, Lea County, New Mexico, or within one mile thereof, be changed from November 1, 1967, to some earlier date.

NOTE: A COPY OF THIS DOCKET WAS MAILED TO ALL PRODUCERS IN THE ABOVE-MENTIONED POOLS ON AUGUST 11, 1967.

DOCKET NO. 27-67

DOCKET: EXAMINER HEARING - WEDNESDAY - SEPTEMBER 6, 1967

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Elvis A. Utz, Alternate Examiner:

CASE 3431 (Reopened and continued from the August 9, 1967 Examiner Hearing)

In the matter of Case 3431 being reopened pursuant to the provisions of Order No. R-3100 to permit Sinclair Oil & Gas Company to show cause why its W. H. Turner Well No. 1 located in Unit L of Section 29, Township 21 South, Range 37 East, Lea County, New Mexico, a dual completion in the Drinkard and Blinebry Oil Pools, should not be completed in accordance with the provisions of Rule 112-A of the Commission Rules and Regulations.

CASE 3645: Application of Skelly Oil Company for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the Lazy "J" Pennsylvanian Pool, including a provision for 80-acre spacing units for that area east of a line drawn through the centers of Sections 26 and 35, and south of a line drawn along the south line of Sections 33, 34, and 35, all in Township 13 South, Range 33 East, Lea County, New Mexico.

- CASE 3646: Application of Texaco Inc. for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Delaware Sand through 12 wells in the Cotton Draw Unit Participating Area and through 3 wells on off-setting leases in Sections 10, and 28, Township 25 South, Range 32 East, Paduca-Delaware Pool, Lea County, New Mexico.
- CASE 3647: Application of Tenneco Oil Company for two waterflood projects, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute two waterflood projects by the injection of water into the Delaware Sand through two wells on its State Monsanto Lease, in Section 16, and through one well on its J. D. Sena, Jr. Lease, in Section 28, both in Township 25 South, Range 32 East, Paduca-Delaware Pool, Lea County, New Mexico.
- CASE 3648: Application of Tenneco Oil Company for a dual completion, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its Jicarilla "A" Well No. 8 located in Unit H of Section 17, Township 26 North, Range 5 West, Rio Arriba County, New Mexico, in such a manner as to permit the production of Tapacito-Gallup oil and Basin-Dakota gas through tubing, and the casing-tubing annulus, respectively, by means of a cross-over assembly.
- CASE 3649: Application of Texas Pacific Oil Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its Ella Drinkard Well No. 2 located in Unit E of Section 25, Township 22 South, Range 37 East, Lea County, New Mexico, in such a manner as to produce oil from an undesignated Ellenburger pool and from another undesignated pool, either pre-Ellenburger or Granite Wash, through parallel strings of tubing.
- CASE 3650: Application of Albert Gackle for down-hole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle production from the Jalmat and South Eunice Pools in the well-bore of his Esmond "B" Well No. 3 located in Unit H of Section 33, Township 22 South, Range 36 East, Lea County, New Mexico, with the assignment of a single allowable to said commingled production.

CASE 3635 (Corrected Notice):

Case 3635, Application of Cities Service Oil Company for an Exception to Order No. R-3221, Chaves County, New Mexico, was heard by the Commission on August 16, 1967. This notice is being given and the case will be re-opened to correct the location of one of the surface pits which were the subject of the hearing. The correct location of said pit is Unit E of Section 2, Township 14 South, Range 31 East, Chaves County, New Mexico, rather than Unit L of Section 2 as previously advertised.

CASE 3651: Application of Olen F. Featherstone for the creation of a new pool and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Permo-Pennsylvanian pool for his Mobil-State Well No. 1 located in Unit E of Section 32, Township 14 South, Range 35 East, Lea County, New Mexico, and for the promulgation of special rules therefor including a provision for 80-acre proration units.

CASE 3652: Application of Depco, Inc. for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Artesia Unit Area comprising 2400 acres, more or less, of State lands in Townships 17 and 18 South, Range 28 East, Eddy County, New Mexico.

CASE 3653: Application of Depco, Inc. for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Artesia Unit Area by the injection of water into the Grayburg formation through 15 wells, Artesia Pool, Eddy County, New Mexico.

CASE 3654: Application of Mobil Oil Corporation for a waterflood expansion and for an amendment of Order No. R-1244, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its Bridges-State Waterflood Project by the conversion to water injection of its Bridges-State Wells Nos. 63 and 73 in Units K and G of Section 13; Wells Nos. 3 and 6 in Units O and E of Section 23; Well No. 47 in Unit K of Section 24; Well No. 5 in Unit C of Section 26, and Well No. 52 in Unit A of Section 27; its State G Well No. 3 in Unit G of Section 24 and State J Wells Nos. 1 and 4 in Units I and A of Section 22, all in Township 17 South, Range 34 East, Vacuum Pool, Lea County, New Mexico.

Applicant further seeks the amendment of Order No. R-1244 to provide that future operation and expansion of said project would be subject to the provisions of Rule 701-E of the Commission Rules and Regulations.

ir/

August 16, 1967

Case 3646

Texaco, Inc.
P. O. Box 3109
Midland, Texas 79701

Attn. Mr. C. L. Whigham
Division Proration Engineer.

Gentlemen:

Receipt of a copy of your application to the Oil Conservation Commission seeking to initiate secondary recovery operations in the Paduca Delaware Pool in Lea County and the attached plat of the area are hereby acknowledged.

I note that the plat of the area is the only exhibit submitted in compliance with Oil Conservation Commission Rule 701.B.

FBI/ma
cc-Oil Conservation Comm.

Yours truly

S. E. Reynolds
State Engineer

By:

Frank E. Irby
Chief
Water Rights Div.

MAIN OFFICE OCU

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PADUCA DELAWARE FIELD OPERATORS,
OFFSET OPERATORS AND OTHERS

**Perry R. Bass Inc.
1200 Ft. Worth Nat'l Bank Bldg.
Ft. Worth, Texas

*M. H. Christensen
Petroleum Life Building
Midland, Texas 79701

*Continental Oil Company
P. O. Box 460
Hobbs, New Mexico 88240

**Panther City Investment Company
Fort Worth Nat'l. Bank Building
Fort Worth, Texas

**Pauley Petroleum Inc.
10,000 Santa Monica Boulevard
Los Angeles 25, California 90067

*Tenneco Oil Company
**P. O. Box 1301
Midland, Texas 79701

*Richardson Oils Inc.
12th Floor -
Ft. Worth Nat'l Bank Bldg.
Ft. Worth, Texas 76102

*Texaco Inc.
**P. O. Box 3109
Midland, Texas 79701

Regional Oil & Gas Supervisor
United States Geological Survey
Drawer 1857
Roswell, New Mexico 88201

Commissioner of Public Lands
State of New Mexico
P. O. Box 1148
Santa Fe, New Mexico

Mr. S. E. Reynolds
New Mexico State Engineer
Santa Fe, New Mexico

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 9
CASE NO. 3646

*Offset Operator
**W.I. Owner in Cotton Draw Unit Participating Area

dearnley-meier reporting service, inc.

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

1120 SIMMS BLDG. • P. O. BOX 1092 • PHONE 243-6691 • ALBUQUERQUE, NEW MEXICO



BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 6, 1967

EXAMINER HEARING

IN THE MATTER OF:)

Application of Texaco Inc. for a)
waterflood project, Lea County,)
New Mexico.)

Case No. 3646

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: The next case is Case 3646.

MR. HATCH: Case 3646: Application of Texaco Inc. for a waterflood project, Lea County, New Mexico.

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

(Witness sworn.)

(Whereupon, Texaco's Exhibits 1 through 9 were marked for identification.)

JOHN L. MORRISON

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

DIRECT EXAMINATION

BY MR. KELLY:

Q State your name, position and employer, please.

A John L. Morrison, employed by Texaco, Incorporated in Hobbs, New Mexico.

Q Have you previously qualified by this Commission as an expert witness?

A No, I haven't.

Q Would you give the Examiner a brief resume of your background and experience?

A I graduated from New Mexico Texas Mining and

Technology; received a Bachelor of Science Degree in Petroleum Engineering, at which time I went to work for Texaco, Incorporated. I worked for them four years and am currently in the Reservoir Section in the Hobbs District at Hobbs, New Mexico.

Q Has your experience included actively working in the area involved in this application?

A Yes, I have been intimately associated with this project for somewhat over a year now.

MR. KELLY: Are those qualifications acceptable?

MR. NUTTER: Yes, they are.

Q (By Mr. Kelly) Would you briefly state what Texaco seeks by this application, referring to what has been marked Exhibit 1?

A Texaco seeks authority to initiate a waterflood project in the Paduca-Delaware Field by converting fifteen producing wells to water injection. These fifteen wells include twelve wells in a participating area in the Cotton Draw Unit and two wells on the G. E. Jordan Federal and one well on the E. F. Ray Federal "B" lease. It is requested that this proposed secondary recovery project be authorized and governed by the provisions of Rules 701, 702 and 703 of the Commission Rules and Regulations.

Q On Exhibit 1 is the Cotton Draw Unit outlined in red?

A Yes, it is outlined in red, the participating area.

Q Where are the other leases that you ask to be included in this waterflood?

A The other leases, that G. E. Jordan Federal, and ~~the~~ E. F. Ray Federal, E. F. Ray Federal "B", located in the Northeast Quarter of the Northwest Quarter, Southwest Quarter of the Northwest Quarter and the West Half of the Southeast Quarter of Section 10. These areas are also denoted by the green. The G. E. Jordan Federal lease is the Northwest Quarter of the Northwest Quarter of Section 27 and the South Half of the Northeast Quarter and the Southwest Quarter of the Northwest Quarter of Section 28, which is also denoted in green.

Q You have shown all the additional leases outlined in green, is that correct?

A That is correct.

Q Referring to what has been marked as Exhibit No. 2, what does this purport to show?

A Exhibit 2 indicates the participating area of the Cotton Draw Unit with the injection wells as proposed in this

application.

Q How many wells, producing wells are there in the area now?

A There are 57 producing wells in the area in which we seek permission.

Q How many injection wells do you propose?

A We propose to convert 15 of these producing wells to injection. Twelve of them will be inside the participating area that I have mentioned and three on the leases, on the two leases outside the participating area.

Q What is the spacing pattern that you are planning to use?

A We have a combination inverted nine-spot and five-spot, the inverted five-spot being on the flank, the southern flank of the reservoir.

Q You have prepared a structure map that is shown as Exhibit 3 of this area?

A Yes, this structure map denotes that the Paduca-
Delaware field is dipping approximately 50 feet per mile to the southeast. This reservoir is bounded on the west and on the north by a permeability barrier and on the east and the south by a water-oil contact.

Q Are the limits of the reservoir pretty well

defined?

A Yes, the limits are defined.

Q Now, going to Exhibit 4, would you explain that to the Examiner?

A Exhibit 4 is a tabulation of the wells which we seek to convert to water injection. The lease name is indicated in the first column with a well number and location in the following columns: The total depth that the well was drilled to, the plugback total depth after completion, the size of surface casing, the depth at which it was set and number of sacks of cement used to run this string, the top of the cement on the surface string on all wells this cement was circulated. The production casing is shown in the next column, which primarily all of them are four and a half and five and a half-inch casing with the depth at which the casing was set noted in the next column and the amount of cement used. The top of the cement is noted in the next column in all instances except where denoted by the figure one or determined from temperature surveys, these figures which are denoted by the footnote one are calculated tops.

The perforations are given in the next two columns, the top and the bottom, and should be noted that

in all the wells which we intend to convert to injection that casing was run through the entire pay interval and are perforated. The next to the last column is the current producing status of the well, the "F" denotes a flowing well and the "P" is artificial pumping well. The last column is the elevation in this well.

Q Have you prepared an exhibit that shows a typical installation for these injection wells?

A Yes. The Exhibit 5, I believe, is the diagrammatic sketch of the proposed injection well. Now, we haven't set out a sketch for each individual well as each completion is similar in that this one can be used for each well. We intend to run plastic-coated tubing with a tension type packer set approximately 100 feet above the Delaware interval and protect the casing behind the tubing with an inhibited fluid and again, I say that this is representative of any of the fifteen wells in which we want to convert to injection.

Q You said that you would have plastic-coated tubing?

A Right.

Q Do you feel that the installation you have shown here will protect against migration of fluids to other zones?

A Yes, I do.

Q Now, what is the source of your water?

A We have a partially developed water source located in Section 2, Township 25 South, Range 32 East.

MR. NUTTER: 32 East?

A I believe that's right. Let me check that. 31 East. That we have developed for some deep drilling activity. This water source is coming from the Rustler zone about 900 to 1,000 feet. This will be fresh water, which will be also injected with the produced water from the Delaware sand that we're now experiencing.

Q You have prepared an Exhibit No. 6 that shows the analysis of the water that you will be getting from there, that produced water?

A This is an analysis of the water from the wells located in Section 2 as previously mentioned. We have intentions of drilling a test well in Section 21 of the participating area of the Cotton Draw Unit such that we might possibly develop a water source more adjacent to our ownerships and will not have to transport this water, which is located about five miles to the northwest of the unit. This analysis indicates a reasonably fresh water although

total solids are somewhat higher than would be considered satisfactory for a potable water in my opinion.

Q Now, is there any concern about polluting fresh water in the area or is there any fresh water that could be polluted in the area?

A Well, to our knowledge we have drilled one water well and participating area of the Cotton Draw Unit, but it only has a capacity of about 750 barrels a day. This is also from the Rustler zone but such a limited quantity we have reason to doubt that large amounts of fresh water do exist; however, these intervals are protected with the completions or the type of completions that were utilized in the development of this field.

Q Now, you sent a copy of this application to the State Engineer's office, didn't you?

A Yes, we did.

Q And received an acknowledgment of receipt of that?

A That's correct.

MR. KELLY: Does the Commission's file reflect anything from the State Engineer's office?

MR. HATCH: We have a copy of a letter here. Excuse me, this is a letter, receipt of a copy of your

application to the Oil Conservation Commission seeking to initiate secondary recovery operations in the Paduca-Delaware Pool in Lea County, and the attached plat of area are hereby acknowledged. I note that the plat of the area is the only exhibit submitted in compliance with the Rule 701-B.

MR. KELLY: It might be appropriate to mention that the next scheduled case is a Tenneco application which is really a part of this waterflood, and my application had all of the exhibits which give all the information that was necessary and those were sent to the State Engineer's office. I received a letter of acknowledgment from Mr. Irby. Apparently there is nothing in the Commission's files but he has been fully informed and given all the exhibits, so I don't know what else to say, but he apparently did not send his normal letter to the Commission.

MR. NUTTER: I see. In other words, when you sent the Texaco application in you attached all the exhibits for the Texaco and the Tenneco?

MR. KELLY: No, just the Tenneco, but I think they will reflect everything that, they reflect the casing programs and source of the water and injection pressures and everything that's covered under the rules and it is the same area, and he did acknowledge receipt of that.

MR. NUTTER: Did you send the State Engineer's office other exhibits than the plat?

MR. KELLY: On Texaco?

MR. NUTTER: On the Texaco application.

MR. KELLY: No, I was not involved in that phase of the preparation of the case. I only actually prepared the Tenneco application.

MR. NUTTER: On your letter of application which shows a carbon copy to the State Engineer was from Whigham in Midland?

THE WITNESS: I think it has --

MR. NUTTER: All that was attached to that was the plat?

MR. KELLY: Yes, Mr. Nutter, that was the extent of the application, as I have discovered. I think some of the information, as required under the rule, is furnished in the letter itself. My point is, if he acknowledged that he acknowledged receipt of the Tenneco application, which is basically the same pool, and has basically the same thing that Texaco gave.

MR. NUTTER: Anyway, the State Engineer's office is aware of this hearing?

MR. KELLY: Yes.

Q (By Mr. Kelly) Do you feel that your water source both from produced water and from water off the lease will be sufficient to take care of your injection volumes?

A Yes, I do. The area in which we intend to develop our water source will require additional development but we feel that sufficient water is available.

Q What is your anticipated injection rate?

A Five hundred barrels per day per well maximum pressure of 1,000 psi.

Q That should be pretty standard, it won't increase?

A Right.

Q Exhibit No. 7 is your production figures. Could you briefly go through that for the Examiner?

A Yes. Exhibit 7 shows various performance curves within the Paduca-Delaware field in the area in which we are interested. The oil production rate shown in barrels of oil per month and current rate, I believe is approximately 1,091 barrels per month. The number of wells in the project area, as stated previously, are 57 producing wells and one well that is temporarily shut-in so far, total of 58 wells. Water production shown; cumulative oil as of July 1st is approximately 3.6 million barrels from

this area. Gas-oil ratio has been increasing and is currently averaging approximately 3525 standard cubic feet per stock tank barrel.

MR. NUTTER: Which is the gas-oil ratio curve here, Mr. Morrison?

Q (By Mr. Kelly) That's the jagged line just below cumulative production, is that right?

A Yes, sir, that is correct.

MR. NUTTER: Okay.

Q Have you sand fracked many of these wells recently?

A Yes, we had a continual program of stimulation since approximately 1965, as denoted on the production decline curve there has been somewhat of an increase from the normal decline as experienced in '64 and '65 and this increase has been attributed to the sand oil fracks that we have been doing in this field.

Q What is your average production per well?

A Our average production is 19 barrels per well per day.

Q Are any of the wells capable of reaching the top allowable presently set by the Commission?

A No, sir.

Q You have prepared as Exhibit 8 a log which will stand as a typical log for all your injection wells?

A Yes, sir. This log is one of the Cotton Draw Unit Well No. 37. This well is located in Section 21 in the Southwest Quarter of the Southwest Quarter --

Q Is that log representative of all the other logs?

A Yes, this is a very typical or similar log of all wells within the field.

Q What does Texaco estimate the success of this project will be as far as the percentage of oil recovered as against primary?

A We anticipate recovery ninety to one hundred percent of the ultimate primary from secondary operations.

Q Now, Exhibit 9 is the list of all the offset operators and you have sent copies of the application to them, is that right?

A Yes, we have sent this notice to the operators within the participating area of the Cotton Draw Unit, offset operators, which includes Tenneco, the U.S.G.S., the State Engineer and the State Land Office.

Q Do you have an opinion as to whether the granting of this application will prevent waste by producing otherwise unobtainable hydrocarbons in the area?

A Yes. Approval of this application will prevent waste.

Q Do you have any opinion as to the effect it will have on correlative rights?

A Yes, by granting of this application there will be --

Q No adverse effect?

A Right, on the correlative rights.

Q Were Exhibits 1 through 9 prepared under your supervision?

A Yes, they were.

MR. KELLY: We move the introduction of Exhibits 1 through 9.

MR. NUTTER: Texaco's Exhibits 1 through 9 will be admitted in evidence.

(Whereupon, Texaco's Exhibits 1 through 9 were offered and admitted in evidence)

MR. KELLY: That's all we have on direct, Mr. Examiner.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Morrison, I presume that all of these wells have approximately at least 500 or 600 feet of cement above the

uppermost perforations, would this be correct?

A Yes, I believe so.

Q And the surfact pipe in each case was cemented with a cement circulated to the surface?

A Yes, sir.

Q Most of the wells have four and a half-inch pipe, and I presume that this tubing that you show on Exhibit No. 5 will be two-inch tubing?

A Yes, sir, two and three-eighths.

Q And will be plastic-coated?

A Yes, sir.

Q And those packers are going to be set approximately a hundred feet above the uppermost perforation?

A Yes.

Q Now, on this water source there is no shallow fresh water in this area, is there?

A Not to our knowledge.

Q If you are going to be injecting at the rate of 500 barrels per day per well that's going to mean 7,000 or 8,000 barrels of water per day for the project as a whole, including the Tenneco wells in the next case?

A Yes, sir.

Q And you said that you would develop additional

sources of water. Can you get that much water out of these Rustler wells down there?

A Yes, sir. The two wells that we have drilled in Section 2, as I have previously mentioned, have not been tested to capacity but we have produced in the neighborhood of 1500 to 2,000 barrels a day out of each of the wells. So we feel that they're, sufficient capacity will be found.

Q And you have acquired sufficient water rights to develop these wells?

A This is outside of the declared water basin and since we feel that we have the water rights in view of the lease agreements.

Q I didn't know anything was outside of a basin any more.

A Yes, it is.

MR. KELLY: I guess that's why he didn't appear.

Q (By Mr. Nutter) Let me check these figures with you, Mr. Morrison. You said that you got approximately 3.6 millions of primary to date?

A Yes.

Q And the average well production is 19 barrels per day?

A Yes.

Q And you anticipate 80 to 90 percent of primary?

A 90 to 100 percent.

Q 90 to 100?

A Yes, sir.

Q Is there any chance that these leases which are outside of the participating area will be brought into the participating area?

A No, sir.

Q So each of these leases, now the waterflood project allowable will be assigned to the wells in the participating area, then each of these separate leases will stand on its own as far as the waterflood allowable, you understand that?

A Yes, sir.

Q Until such time as they would be included in the participating area, but you don't think that they ever will be?

A There may be some misunderstanding about the participating area. The area outlined in red is termed the participating area of the Cotton Draw Unit. This was, this area was formed in the development of this field and it's not a secondary unit inasmuch as now the project area for which we are asking includes the area outside the

participating area.

Q Well, it would be the project area as far as the waterflood project is concerned but as far as the assignment of allowables across lease lines, this can't be done unless it's unitized or in a participating area of some sort or covered by other arrangement?

A Right.

Q Now, the leases within the participating area, and I presume there is more than one lease in there?

A Yes, sir.

Q Are they consolidated for purposes of secondary recovery?

A Yes, sir, that's right.

Q But the green ones are not consolidated with the ones inside the red?

A That is correct.

MR. NUTTER: Are there any other questions of Mr. Morrison? He may be excused.

(Witness excused.)

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

MR. KELLY: Nothing further.

MR. NUTTER: Does anyone have anything they wish to offer in Case 3646? We will take the case under advisement.

I N D E X

<u>WITNESS</u>	<u>PAGE</u>
JOHN L. MORRISON	
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<u>EXHIBIT</u>	<u>MARKED</u>	<u>OFFERED AND ADMITTED</u>
Texaco's Nos. 1 through 9	2	15

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 September, 1967.

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 hearing of Case No. 3646 heard by me on 9/6, 1967.

James H. Hester, Examiner
 New Mexico Oil Conservation Commission

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 6, 1967

EXAMINER HEARING

IN THE MATTER OF:

Application of Tenneco Oil Company)
for two waterflood projects, Lea)
County, New Mexico.)

Case No. 3647

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: We will call next Case 3647.

MR. HATCH: Application of Tenneco Oil Company
for two waterflood projects, Lea County, New Mexico.

MR. KELLY: Booker Kelly on behalf of the
Applicant, Tenneco. I have one witness. I ask that he be
sworn.

(Witness sworn.)

(Whereupon, Tenneco's Exhibits
1 through 9 were marked
for identification.)

MICHAEL DeMARCO

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 My name is Michael DeMarco and I am a reservoir
engineer with Tenneco Oil Company in Midland, Texas.

Q Have you previously qualified as an expert
witness before this Commission?

A No, sir.

Q Would you give the Examiner a brief resume of

your educational and professional background?

A I received a B.S. Degree in Petroleum in 1961 from Marietta College in Marietta, Ohio and was employed by Continental Oil Company at that time and worked for Continental for six years in South Louisiana and South Texas and West Texas, and I have been employed with Tenneco since June 1st, 1967. I am familiar with the Paduca-Delaware area and the proposed waterflood and cooperative waterflood between Tenneco and Texaco.

Q Has part of your actual work for Tenneco been work in this field?

A Yes.

MR. KELLY: Are the witness's qualifications acceptable?

MR. NUTTER: Yes, they are. Would you spell your name?

THE WITNESS: D-e M-a-r-c-o.

Q (By Mr. Kelly) Would you briefly state what Tenneco seeks by the application?

A We seek to inject water into the Monsanto-State Nos. 3 and 7 wells and the J. D. Sena No. 1 well. The Monsanto-State No. 3 is located in the Southwest Quarter of the Southeast Quarter of Section 16, Township 25 South,

Range 32 East. The Monsanto-State No. 7 is located in the Southwest Quarter of the Southwest Quarter of Section 16, Township 25, South, Range 32, East. The J. D. Sena, Jr. No. 1 is located in the Northeast Quarter of the Southwest Quarter of Section 28, Township 25 South, Range 32 East, 1 located on Exhibit 2 as outlined in yellow.

Q For purposes of identification, the Exhibit No. 1 is the two-mile plat required by the Commission?

A That is correct.

Q The Exhibit 2 shows the leases and injection wells and producing wells?

A The leases, injection wells and producing wells and their relationship to the Cotton Draw Unit Participating Area.

Q Now Tenneco will cooperate with Texaco and they will cooperate with each other on this program?

A Yes, we will cooperate on a lease line basis.

Q You will have the same spacing as Texaco?

A That is correct.

Q And injection pressures and volumes will be -- will they be identical also?

A We anticipate that we will be injecting at about 500 barrels of water a day, 1,000 psi, until such time as

we reach fillup, at which time we will stabilize conditions.

Q Exhibit 3.

A Exhibit 3 - 5 are log sections of the subject proposed water injection wells and Exhibit No. 3 is, they're all similar; in other words, the logs of this area are very similar, as mentioned in the Texaco testimony, and we have marked the marker pays, the Lamar lime, the top of the Delaware Sand and the top of the subject sand the Ramsey Zone in which we will be injecting water. Perforations are also shown on these plats.

Q Now, you have prepared diagrammatic sketches of your three injection wells, is that correct?

A That is correct, Exhibits 6 through 8; and Exhibit 6 will give us a general idea of each one of these wells. We have 8-5/8ths-inch casing set at the surface and the cement was circulated in all cases and our production casing is 4-1/2-inch and set at approximately 4700 feet. We have shown the plug-back depth and the perforations. The top of the cement in all cases is approximately 500 feet, 500 to 700 feet above the Total Depth.

In this diagram we propose to set 2-3/8ths-inch plastic-coated tubing on a packer approximately 50 to 100 feet above the perforations and we will load the annulus with

inhibited fluid.

Q Do you feel the installation you have described will protect from migration of fluid into other zones?

A Yes, sir.

Q Is the installation that you have shown here basically similar or basically identical with the installation proposed by Texaco?

A That's correct. Most all of these wells were completed similarly with 4-1/2-inch casing and the tubing packer arrangement will be similar.

Q What would be the source of your water?

A We will obtain our water from Texaco. It will be delivered to our lease line, as was mentioned in the previous testimony. Texaco will be supplying Rustler fresh water and produced Delaware brackish water and this will be delivered to our lease line. We don't anticipate developing an additional source for ourselves.

Q How many producing wells will you have?

A We have on the Monsanto-State lease, at the present time we have seven producing wells and we will be converting two of them to injection, so that leaves five wells. We will have one additional producing well on the J. D. Sena lease.

Q What is your present production on both of these leases?

A For July 1967, production on the Monsanto-State lease was 4667 barrels of oil, approximately twenty-one and a half barrels of oil per day per well average. On the Sena lease it was 130 barrels of oil or an average of two barrels.

Q The Sena lease?

A Sena, yes, sir.

MR. NUTTER: 120 for the month?

THE WITNESS: 130 for the month.

MR. NUTTER: That would be an average of four per day, then?

THE WITNESS: Two barrels per day per well.

MR. NUTTER: I see, per well?

THE WITNESS: Yes, per well figures.

Q (By Mr. Kelly) Would you go over again briefly Monsanto --

A The production was 4667 barrels of oil for the month of July and that was an average of twenty-one and a half barrels of oil per day per well.

Q That is just about identical with the Texaco experience, is that right?

A Yes, it is. Cumulative production to 1-1-67

on the Monsanto lease was 414,466 barrels of oil, and the Sena was 30,535.

Q What is Tenneco's opinion as to the success of this secondary recovery project?

A We feel that we'll recover about 90 to 100 percent of ultimate primary on secondary.

Q Do you have an opinion as to the effect as far as prevention of waste on the granting of this application?

A We feel that by secondary recovery operations we will prevent waste and protect the correlative rights of the mineral owners on these leases and it will best be protected by secondary recovery.

MR. KELLY: At this time I move the introduction-- We have an exhibit here that shows the mailing to all offset operators. That has been done?

A Yes, including the Commissioner and the State Engineer.

MR. KELLY: I, myself, mailed the application to the State Engineer, so it's just a matter in this record, and received acknowledgment from him. I move the introduction of the Exhibits 1 through 9.

MR. NUTTER: Tenneco's Exhibits 1 through 9 will be admitted in evidence.

(Whereupon, Tenneco's Exhibits
1 through 9 were offered and
admitted in evidence.)

MR. KELLY: That's all we have.

CROSS EXAMINATION

BY MR. NUTTER:

Q My Exhibit 2 doesn't show the Monsanto-State No. 1 well here. It does appear on Exhibit 1, is that well there or not?

A Yes, it is.

Q It's in the Northeast of the Southeast, right?

A It is on Exhibit No. 2, it may be a little faded there. It's in the Northeast of the Southeast Quarter.

Q So this Monsanto lease will have five producing wells and two injection wells on it?

A That's correct. You'll notice on Exhibit No. 1, No. 7 well is blotted out. This dark line across here is a seismic group shot that our company has been running and happened to be on the county map when we shot a picture of it and that's why the No. 7 well is in the Southwest Quarter of the Southwest Quarter.

Q It's right under that line?

A Yes, sir.

Q You realize, of course, that each of these two

waterfloods will stand on its own as far as the allowable is concerned?

A Yes, sir.

Q You mentioned that you were going to acquire your water for the injection from Texaco and Texaco testified that they were planning to reinject the produced water. What would you do with the produced water, deliver it to Texaco?

A We will commingle the produced with the water we get from Texaco.

Q Will you deliver it to Texaco to pressure up?

A We will probably deliver it to Texaco.

MR. NUTTER: Are there any further questions of Mr. DeMarco? He may be excused.

(Witness excused.)

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

MR. KELLY: Nothing.

MR. NUTTER: Does anyone have anything further they wish to offer in Case 3647? We will take the case under advisement.

I N D E XWITNESSPAGE

MICHAEL DeMARCO

Direct Examination by Mr. Kelly

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Cross Examination by Mr. Nutter

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EXHIBITSMARKEDOFFERED AND
ADMITTED

Tenneco's 1 through 9

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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 28th day of September, 1967.

Ada Dearnley
 NOTARY PUBLIC

My Commission Expires:

June 19, 1971.

I do hereby certify that the foregoing is a true and correct record of the hearing held in the County of Bernalillo, State of New Mexico, on the 28th day of September, 1967, at 3:47 p.m.
Ada Dearnley
 Notary Public
 New Mexico Oil Conservation Commission