

CASE 3647: Application of TENNECO
OIL COMPANY FOR TWO WATERFLOOD
PROJECTS, LEA COUNTY, NEW MEXICO.

Case No.

3647

Application, Transcript,
Small Exhibits, Etc.

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

September 15, 1967

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

Dear Sir:

Reference is made to Commission Order No. R-3313, recently entered in Case No. 3647, approving the Tenneco Paduca Monsanto Waterflood Project and the Tenneco Paduca Sena Waterflood Project.

Injection into each of the three authorized water injection wells shall be through 2 3/8-inch internally plastic-coated tubing set in a packer which shall be located within 100 feet of the uppermost perforation. The casing-tubing annulus shall be left open or a pressure gauge installed to permit detection of leaks in the tubing or in the packer.

As to allowable, our calculations indicate that when both of the authorized injection wells have been placed on active injection, the maximum allowable which the Paduca Monsanto project will be eligible to receive under the provisions of Rule 701-E-3 is 294 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less. The maximum for the Paduca Sena project is 84 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 allowables assigned to the projects may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behooves him to promptly

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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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

MJD

3647

PROPOSED TESTIMONY
INJECT WATER IN MONSANTO-STATE #3 & 7
AND J. D. SENA, JR. USA #1 - CO-OPERATIVE WATERFLOOD
PADUCA (DELAWARE) FIELD
LEA COUNTY, NEW MEXICO

LAWYER: Mr. Examiner, Tenneco Oil Company requests that its application to inject water in its Monsanto-State Nos. 3 and 7 and J. D. Sena, Jr. USA No. 1 be approved. This project will initiate secondary recovery in the Delaware Sand (Ramsey Zone), Paduca (Delaware) Field, Lea County, New Mexico. Tenneco testimony will be presented by myself, Mr. Booker Kelly and Mr. Michael DeMarco, Reservoir Engineer in the Midland, Texas District.

LAWYER: Mr. DeMarco, have you ever appeared before the New Mexico Oil Conservation Commission? Ans: No, Sir. Would you please qualify yourself.

ENGR: I was graduated from Marietta College, Marietta, Ohio in June, 1961 with a B. S. Degree in Petroleum. I worked for Continental Oil Company for 6 years following graduation in Louisiana, South Texas and West Texas in the capacity of a production and reservoir engineer. I have been employed with Tenneco as a Reservoir Engineer since June, 1967. I am familiar with the Paduca (Delaware) Field and the proposed co-operative waterflood between Tenneco and the Texaco-operated Cotton Draw Unit.

LAWYER: Mr. Examiner, we request that Mr. DeMarco be accepted as a qualified witness. Mr. DeMarco, will you please explain the various exhibits, supporting your testimony.

ENGR: Mr. Examiner, Exhibit 1 is a 1" = 4000' map showing the Cotton Draw Unit participating area, and also the Tenneco Monsanto-State and J. D. Sena, Jr. USA Leases. Included on the map are the ~~proposed water injection wells~~. Offsetting leases ~~are also shown~~.

Exhibit 2 is a more detailed map (1" = 2000') which shows the two subject leases and their relationship to the Cotton Draw Unit, as well as the proposed water injection wells.

Exhibits 3 - 5 are log sections of the Monsanto-State Nos. 3 and 7 and J. D. Sena No. 1. These exhibits show the top of the Delaware Sand, perforations and completion data.

Exhibits 6 - 8 are well bore diagrams of the three proposed water injection wells (will discuss pertinent data on each of the wells including latest test and cumulative production). *701 Production Mon. 1.55 - 4/14/66*
Sena - 30.53580

LAWYER: Mr. DeMarco, will you please explain where injected water is to be obtained and how it will be injected into the wells.

ENGR: Pressured salt water will be delivered to the Monsanto-State and J. D. Sena, Jr. USA lease lines from the Texaco, Inc. Cotton Draw Unit.

This water will be a mixture of produced Paduca Delaware wells and ~~brackish~~ *TEXACO SAYS FRESH!!* water from the Rustler formation at approximately 750' - 1000'.

The Rustler water source has not been developed yet from the Cotton Draw Unit. Water injection is to be through 2-3/8" OD tubing and a tension type packer set at approximately 4550' in each well. The casing-tubing annulus will be loaded with a corrosion-inhibited fluid.

LAWYER: What injection volumes and pressures are expected?

ENGR: It is anticipated that the stabilized injection rates will be 500 BWPB at approximately 1000 psi.

LAWYER: Mr. DeMarco, what is the present production of the subject leases?

ENGR: Production during July, 1967 was 4667 BO (avg. 21.5 BOPD per well) on the Monsanto-State Lease and 130 BO (avg. 2.0 BOPD per well) on the J. D. Sena, Jr. USA Lease. There are no prospects for remedial work to increase production; secondary recovery operations should be initiated as soon as possible, since this is the only method whereby economic production can be sustained.

Monsanto-St.
#1 80,508
#2 71,622
#3 78,635
#4 72,707
#5 36,321
#6 33,851
#7 39,822
Sena
#1 17,294
#2 13,241

LAWYER: Will the proposed secondary recovery project protect correlative rights and be such that it will prove economically feasible?

ENGR: Yes, sir. The proposed secondary recovery project, in conjunction with waterflood operations on the Cotton Draw Unit, will recover an additional amount of oil equal to the predicted primary recovery of the Monsanto-State and J. D. Sena, Jr. USA leases. The value of these secondary reserves is far greater than the investment required for the waterflood. The correlative rights of the mineral owners in these leases will best be protected by the initiation of the proposed secondary recovery project.

LAWYER: Mr. Examiner, this concludes Tenneco's testimony. We respectfully request that you approve our application to inject water into the Monsanto-State Nos. 3, 7 and J. D. Sena, Jr. No. 1. We feel that we have shown that all precautions will be taken to insure that injected water will enter the Delaware Sand and not be communicated with any fresh water-bearing strata. We also feel that we have shown that correlative rights will be protected and that there is economic justification for the project.

State of New Mexico
Oil Conservation Commission



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

September 11, 1967

Re: Case No. 3647
Order No. R-3313
Applicant:
Tenneco Oil Company

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

Hobbs OCC x
 Artesia OCC
 Aztec OCC
 State Engineer x

Other _____

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3647
Order No. R-3313

APPLICATION OF TENNECO OIL COMPANY
FOR TWO WATERFLOOD PROJECTS, LEA
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 6, 1967, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 11th day of September, 1967, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Tenneco Oil Company, seeks authority to institute two waterflood projects in the Paduca-Delaware Pool 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, NMPM, Lea County, New Mexico.

(3) That the wells in each of the project areas are in an advanced state of depletion and should properly be classified as "stripper" wells.

(4) That the proposed waterflood projects should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

-2-

CASE No. 3647
Order No. R-3313

(5) That the subject application should be approved and the projects should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Tenneco Oil Company, is hereby authorized to institute two waterflood projects in the Paduca- Delaware Pool by the injection of water into the Delaware Sand through the following-described three wells in Township 25 South, Range 32 East, NMPM, Lea County, New Mexico:

Tenneco Paduca Monsanto Waterflood Project

Injection wells:

Monsanto-State Well No. 3 - 660' FSL & 1980' FWL,
Section 16

Monsanto-State Well No. 7 - 330' FSL & 990' FWL,
Section 16

Tenneco Paduca Sena Waterflood Project

Injection well:

J. D. Sena, Jr., USA Well No. 1 - 2310' FSL & 1650' FWL,
Section 28

(2) That the subject waterflood projects shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(3) That monthly progress reports of the waterflood projects herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

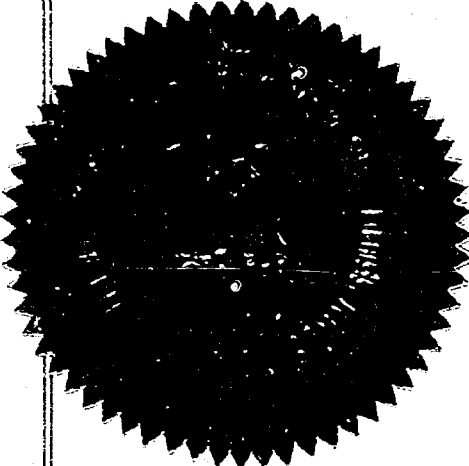
(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

-3-

CASE No. 3647
Order No. R-3313

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

A. L. PORTER, Jr., Member & Secretary

esr/

August 25, 1967

Mr. W. B. Kelly
Attorney at Law
White, Gilbert, Koch and Kelly
Box 787
Santa Fe, N. M.

Dear Mr. Kelly:

A copy of the application which you submitted on behalf of Tenneco Oil Company to the Oil Conservation Commission seeking permission to conduct secondary recovery operations by waterflooding in the Paduca (Delaware) field in Lea County, New Mexico, is gratefully acknowledged.

FEI/ma
cc-Oil Conservation Comm.

Yours truly,

S. E. Reynolds
State Engineer

By:

Frank E. Irby
Chief
Water Rights Div.

MAIN OFFICE

67 AUG 28 AM 8 06

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.

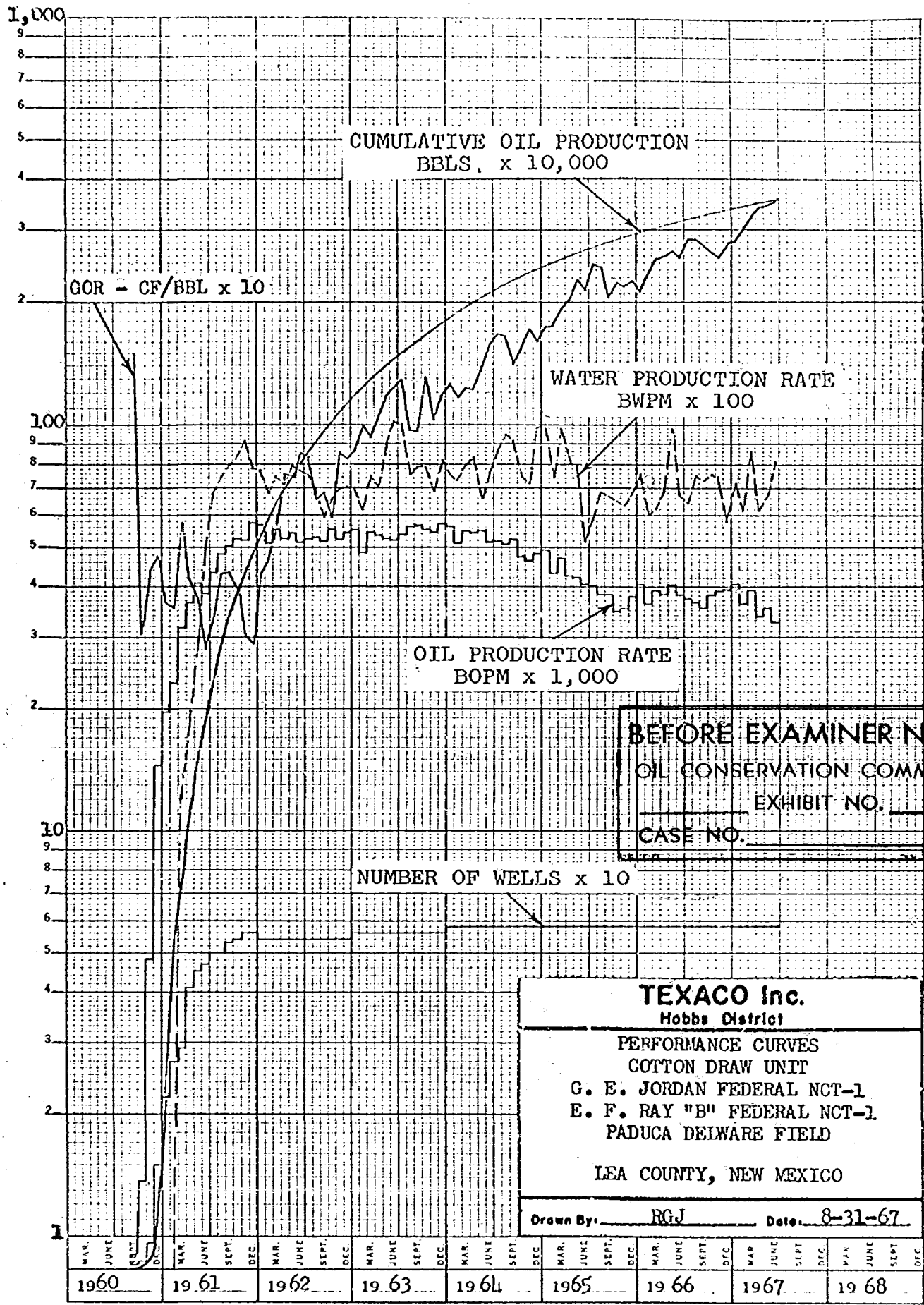
CASE 3652: Application of Depco, Inc. for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Artesia Unit Area comprising 2400 acres, more or less, of State lands in Townships 17 and 18 South, Range 28 East, Eddy County, New Mexico.

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/



BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7
CASE NO. 3646

TEXACO Inc.
Hobbs District
PERFORMANCE CURVES
COTTON DRAW UNIT
G. E. JORDAN FEDERAL NCT-1
E. F. RAY "B" FEDERAL NCT-1
PADUCA DELWARE FIELD
LEA COUNTY, NEW MEXICO
Drawn By: RGJ Date: 8-31-67

Martin Water Laboratories

P. O. BOX 1460 PHONE 943-3234
MONAHANS, TEXAS 79756

406 W. ILLINOIS PHONE MU 3-4521
MIDLAND, TEXAS 79701

RESULT OF WATER ANALYSES

TO: Mr. Roy Williams LABORATORY NO. 867124
P. O. Box 728, Hobbs, New Mexico SAMPLE RECEIVED 8-25-67
RESULTS REPORTED 8-30-67

COMPANY Texaco, Inc. LEASE Cotton Draw #65
FIELD OR POOL Cotton Draw

SECTION BLOCK SURVEY COUNTY Eddy STATE N. M.

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Raw water - taken from water well east. 8-10-67
NO. 2
NO. 3
NO. 4

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES				
	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0068			
pH When Sampled				
pH When Received	7.0			
Total Alkalinity as CaCO ₃	50			
Supersaturation as CaCO ₃	-			
Undersaturation as CaCO ₃	8			
Total Hardness as CaCO ₃	1,600			
Calcium as CaCO ₃	1,144			
Magnesium as CaCO ₃	456			
Sodium and/or Potassium	322			
Sulfate as SO ₄	1,910			
Chloride as NaCl	309			
Iron as Fe	14.0			
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Dissolved Solids at 100° C.				
Total Solids at 100° C.				
Total Solids, Calculated	3,050			
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen, Winkler				
Hydrogen Sulfide	0.0			
Resistivity, ohms/m at 60° F.	4.40			
Suspended Oil				

All Results Reported As Parts Per Million (mg/l)

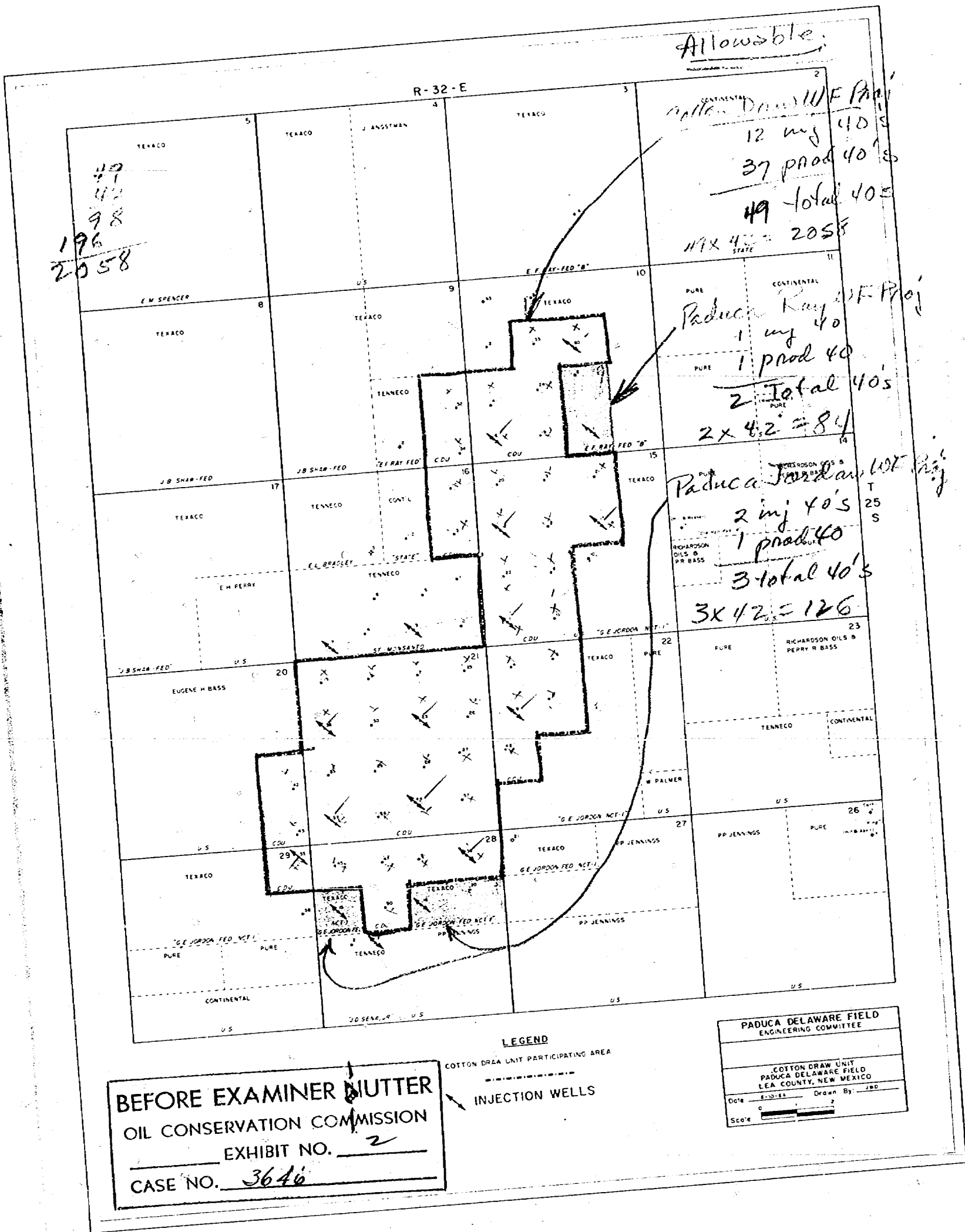
Additional Determinations And Remarks Please feel free to contact us for any details or discussions concerning the above results.

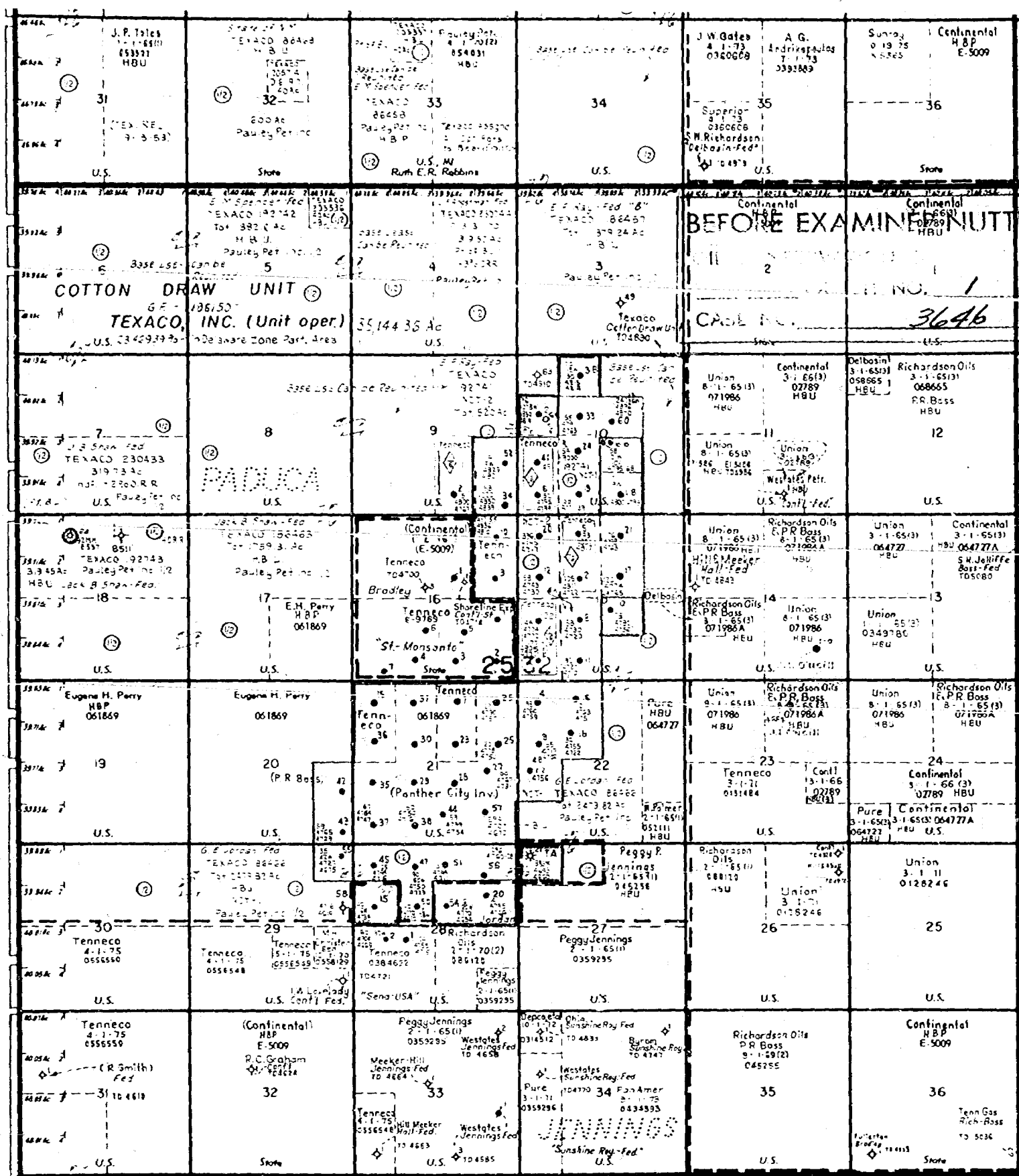
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 6
CASE NO. 3646

Form No. 1

1cc: Mr. W. S. Bouldin
1cc: Mr. Don Metcalfe
4cc: Pauley Petroleum, Midland

BY Waylan C. Martin, M. A.





LEGEND:

- DELAWARE SAND
- ⊙ PADUCA DEVONIAN GAS
- COTTON DRAW UNIT PARTICIPATING AREA

PADUCA DELAWARE FIELD
LEA COUNTY, NEW MEXICO

Scale: 1" = 4000'

8-30-67
FMR

SUMMARY OF RECOMMENDATIONS

That TEXACO Inc. be permitted to initiate secondary recovery operations in the Paduca Delaware Field by converting 15 producing wells to water injection. The wells to be converted are:

<u>Lease Name</u>	<u>Well No.</u>	<u>Unit</u>	<u>Sec.</u>	<u>TWSP</u>	<u>Rge</u>
Cotton Draw Unit	1	M	15	25	32
	6	M	10	25	32
	9	E	22	25	32
	12	E	15	25	32
	17	G	15	25	32
	23	G	21	25	32
	36	E	21	25	32
	37	M	21	25	32
	44	O	21	25	32
	55	A	29	25	32
	56	A	28	25	32
	60	G	10	25	32
G.E. Jordan Fed. NCT-I	15	E	28	25	32
	16	G	28	25	32
E.F. Ray 'B' Fed. NCT-I	1	O	10	25	32

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.

8⁵/₈" casing set at
397 feet w/325 sx. cmt.
circulated.

*wire line
500 B/D / 1000 ft*

*electric
cable
tension*

Packer set approximately
100 feet above top per-
foration.

*Wln Rod
All 2-75-31
Rustless 900-1000
best with, well
also 16 in. pipe
produced well*

2 7/8

4¹/₂" casing set at 4778 feet.
Cemented w/150 sx.
Top of cement 3952 feet
by temperature survey.

*injected
fluid*

Delaware

Perforated: 4610-4654 feet

Total well depth: 4784 feet.

DIAGRAMMATIC SKETCH - INJECTION WELL
(TYPICAL WELL)

BEFORE EXAMINER NUTTER

OIL CONSERVATION COMMISSION

EXHIBIT NO. 5

CASE NO. 3646

PADUCA DELAWARE FIELD
COTTON DRAW UNIT NO. 37
LEA COUNTY, NEW MEXICO
7-20-67

TEXACO
INC.

PETROLEUM PRODUCTS

DOMESTIC PRODUCING DEPARTMENT
MIDLAND DIVISION



P. O. BOX 3109
MIDLAND, TEXAS 79701

August 8, 1967

Case 3646
REQUEST FOR HEARING
PADUCA DELAWARE POOL
LEA COUNTY, NEW MEXICO

Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Attn: Mr. A. L. Porter, Jr.

Gentlemen:

MAIN OFFICE

'67 AUG 9 PM 1 24

At the next examiner hearing before the New Mexico Oil Conservation Commission in Santa Fe, it is requested that the application of Texaco Inc. be considered to initiate secondary recovery operations by waterflooding in the Paduca Delaware Pool in Lea County, New Mexico. An order will be requested permitting Texaco Inc. to convert 12 producing wells in the Cotton Draw Unit participating area, 2 wells on Texaco's G. E. Jordan Federal NCT-1 Lease and 1 well on Texaco's E. F. Ray Federal "B" NCT-1 Lease to injection wells.

This proposed project will be a part of a cooperative water-flood project with Texaco Inc. operating the Cotton Draw Paduca Delaware participating area and its individually operated leases and with Tenneco Oil Company operating their S. D. Sena, Jr. and State Monsanto Leases.

At the hearing requested by this letter Texaco Inc. will seek approval to convert the following listed wells to injection service:

Cotton Draw Unit Well No. 1-	Cotton Draw Unit Well No. 44
Cotton Draw Unit Well No. 6-	Cotton Draw Unit Well No. 55
Cotton Draw Unit Well No. 9-	Cotton Draw Unit Well No. 56
Cotton Draw Unit Well No. 12-	Cotton Draw Unit Well No. 60
Cotton Draw Unit Well No. 17-	G. E. Jordan Fed. NCT-1 No. 15
Cotton Draw Unit Well No. 23-	G. E. Jordan Fed. NCT-1 No. 16
Cotton Draw Unit Well No. 36	E. F. Ray "B" Fed. NCT-1 No. 1
Cotton Draw Unit Well No. 37	

The proposed project area covered by the application will therefore be comprised of the Cotton Draw - Paduca Delaware participating area on which are presently located 12 proposed injection wells and 37 producing wells and 3 injection wells outside of, but adjacent to, the participating area. The Paduca Delaware Field is comprised of portions of Sections 9, 10, 15, 16, 20, 21, 22, 27, 28 and 29; T-25

DOCKETED
Date 8-23-67

County, New Mexico. Attached is a plat showing the proposed injection wells requested in the subject hearing and three additional injection wells that Tenneco will request by separate application.

It is planned to inject produced salt water from the Paduca Delaware producing wells and brackish water from a source not yet developed in Section 10 and Section 21, T-25-S, R-32-E, within the limits of the Paduca Delaware Pool. The water source not yet developed is expected to yield water from the Rustler formation. It is currently planned to inject water initially at the rate of approximately 500 barrels per day per injection well at an initial pressure not exceeding 1000 psi.

Attached is a list of the operators in the Paduca Delaware Pool, working interest owners in the Paduca Delaware participating area, adjacent lessees and others, all of which are receiving a copy of this application for hearing.

Yours very truly,



C. L. Whigham
Division Proration Engineer

CLW:jl
Attach.

cc: Attached List

DOCKET MAILED

Date_____

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

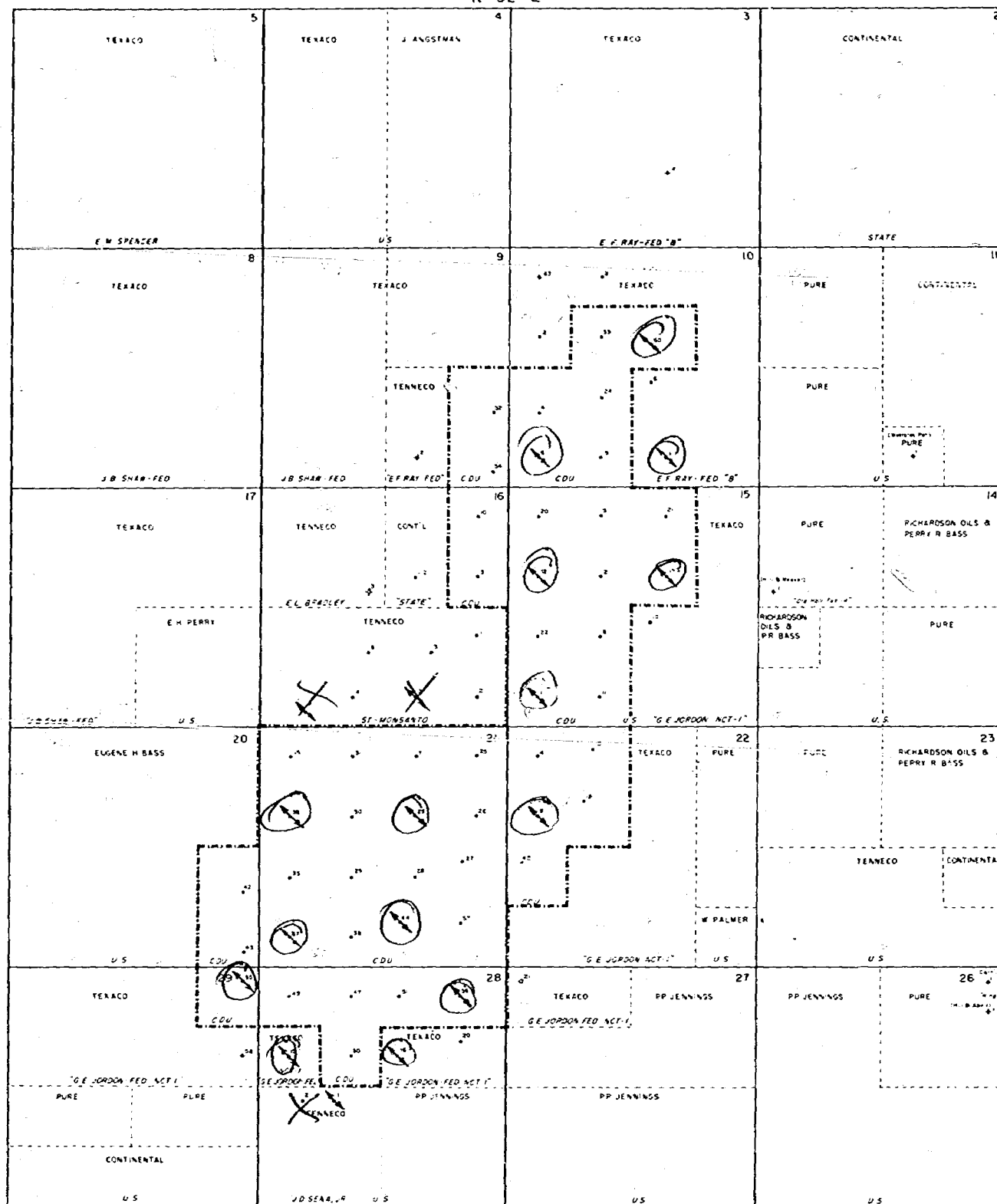
Commissioner of Public Lands
State of New Mexico
P. O. Box 1148
Santa Fe, New Mexico

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

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

Case 3646

R-32-E



T
25
S

LEGEND

COTTON DRAW UNIT PARTICIPATING AREA

INJECTION WELLS

PADUCA DELAWARE FIELD ENGINEERING COMMITTEE	
COTTON DRAW UNIT PADUCA DELAWARE FIELD LEA COUNTY, NEA MEXICO	
Drawn By	280
Scale	0 1 2

Can 3644

WHITE, GILBERT, KOCH & KELLY
ATTORNEYS AT LAW
P. O. BOX 787
SANTA FE, NEW MEXICO 87501

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE
OF NEW MEXICO

APPLICATION OF TENNECO OIL COMPANY FOR
PERMISSION TO CONDUCT SECONDARY RECOVERY
OPERATIONS BY WATER FLOODING THE DELAWARE
SAND (RAMSEY ZONE) OF THE PADUCA (DELAWARE)
FIELD, LEA COUNTY, NEW MEXICO, UNDERLYING
ITS MONSANTO STATE AND J.D. SENA, JR. U.S.A.
LEASES LOCATED IN SECTION 16 and SECTION 28
TOWNSHIP 25 SOUTH, RANGE 32 EAST, LEA COUNTY
NEW MEXICO.

No. 3647

A P P L I C A T I O N

Comes now TENNECO OIL COMPANY and for its application states:

1. It is the owner and operator of certain oil and gas leases within the
above described area located in Lea County, New Mexico.

2. Applicant seeks approval of the Commission to conduct secondary recovery
operations by water flooding the Ramsey Zone of the Paduca (Delaware) field under-
lying its Monsanto State and J. D. Sena U.S.A. leases, comprising respectively
the S $\frac{1}{2}$ Section 16 and the SW $\frac{1}{4}$ Section 28, Township 25 South, Range 32 East, Lea
County, New Mexico.

3. Applicant intends to operate the proposed water flooding in conjunction
with Texaco's proposed secondary recovery operation in its Cotton Draw Unit
participating area.

4. Applicant will inject water into the Ramsey Zone of the Delaware sand
at an average depth of 4621 feet through the following wells:

Monsanto State Nos. 3 and 7
J. D. Sena, Jr. U.S.A. No. 1

An injection rate of 500 barrels of water per day is anticipated at approximately
1000 pounds per square inch.

5. Attached hereto and made a part hereof are the following exhibits:

1. Plat showing the Paduca (Delaware) Field and the
location of all other wells within a radius of two
miles from the proposed injection wells.
2. Plat showing the two leases involved in relation to
the Cotton Draw Unit.
3. Log sections of the three proposed injection wells.

DOCKET MAILED

Date 8-23-67

WHITE, GILBERT, KOCH & KELLY
ATTORNEYS AT LAW
P. O. BOX 787
SANTA FE, NEW MEXICO 87501

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4. Well bore diagrams of the three proposed injection wells including completion and production data

5. A list of all off-set operators.

6. Applicant believes waterflooding the above mentioned formation will economically recover substantial quantities of oil which cannot be recovered by primary recovery methods. In the interest of conservation and the prevention of waste and the protection of correlative rights, and to secure the greatest ultimate recovery of oil from this zone the application should be granted.

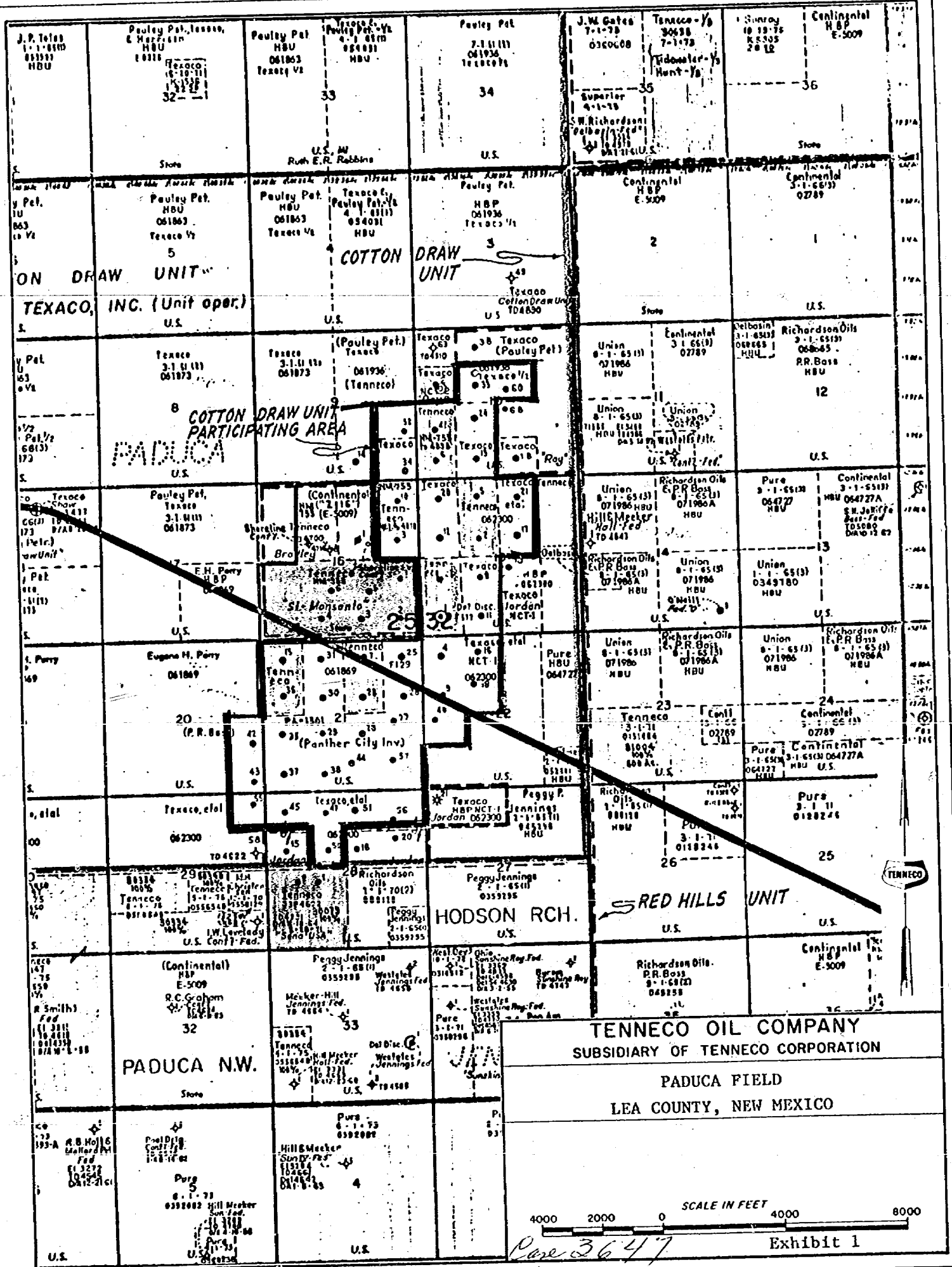
7. A copy of this application complete with all attachments has been sent to the State Engineer, Capitol Building, Santa Fe, New Mexico.

WHEREFORE Applicant prays that after public hearing as required by law this application be granted in its entirety.

J. D. MOON

WHITE, GILBERT, KOCH & KELLY

By M B Kelly
Attorneys for Penneco Oil Company



Page 3647

Exhibit 1

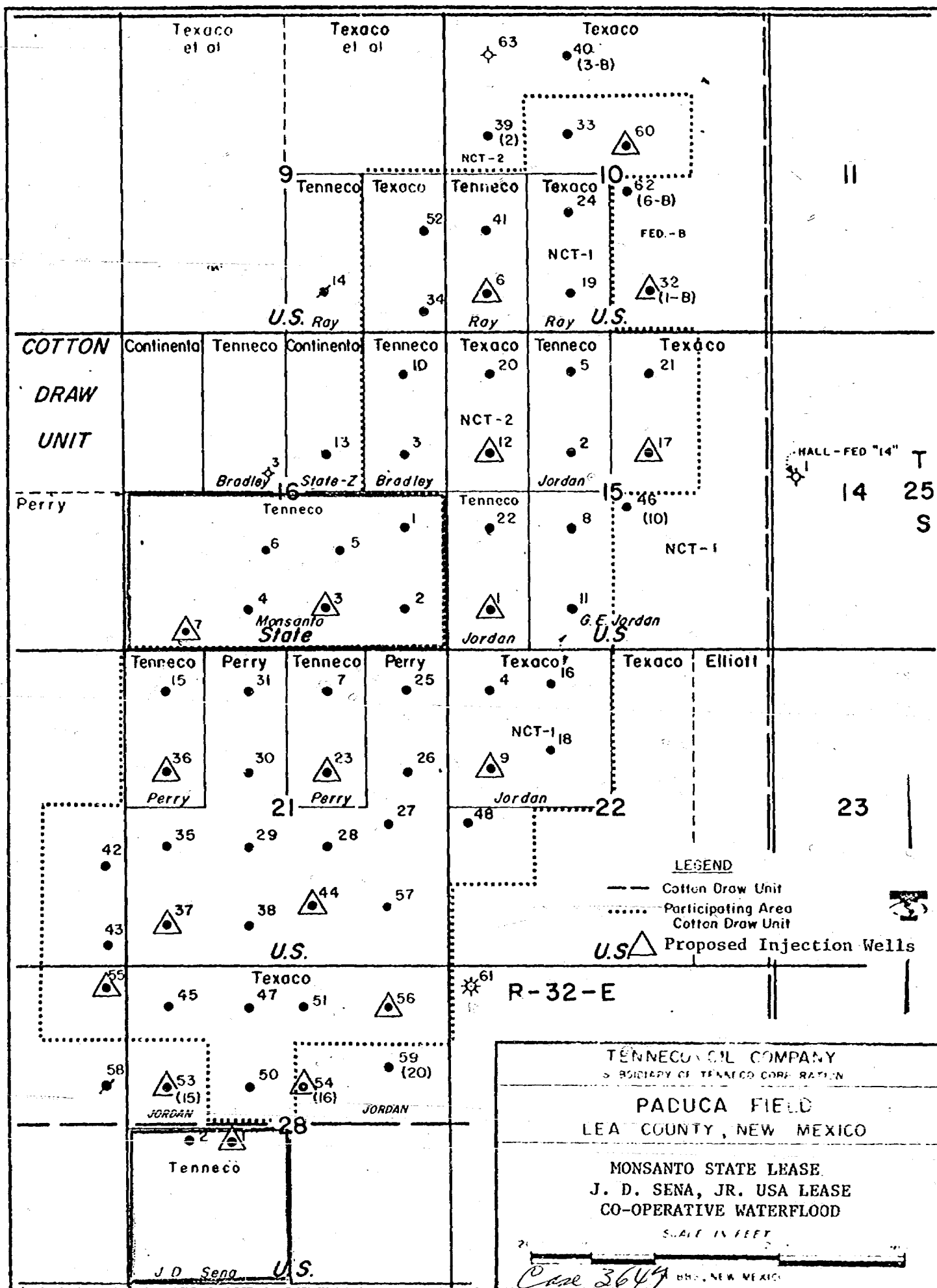
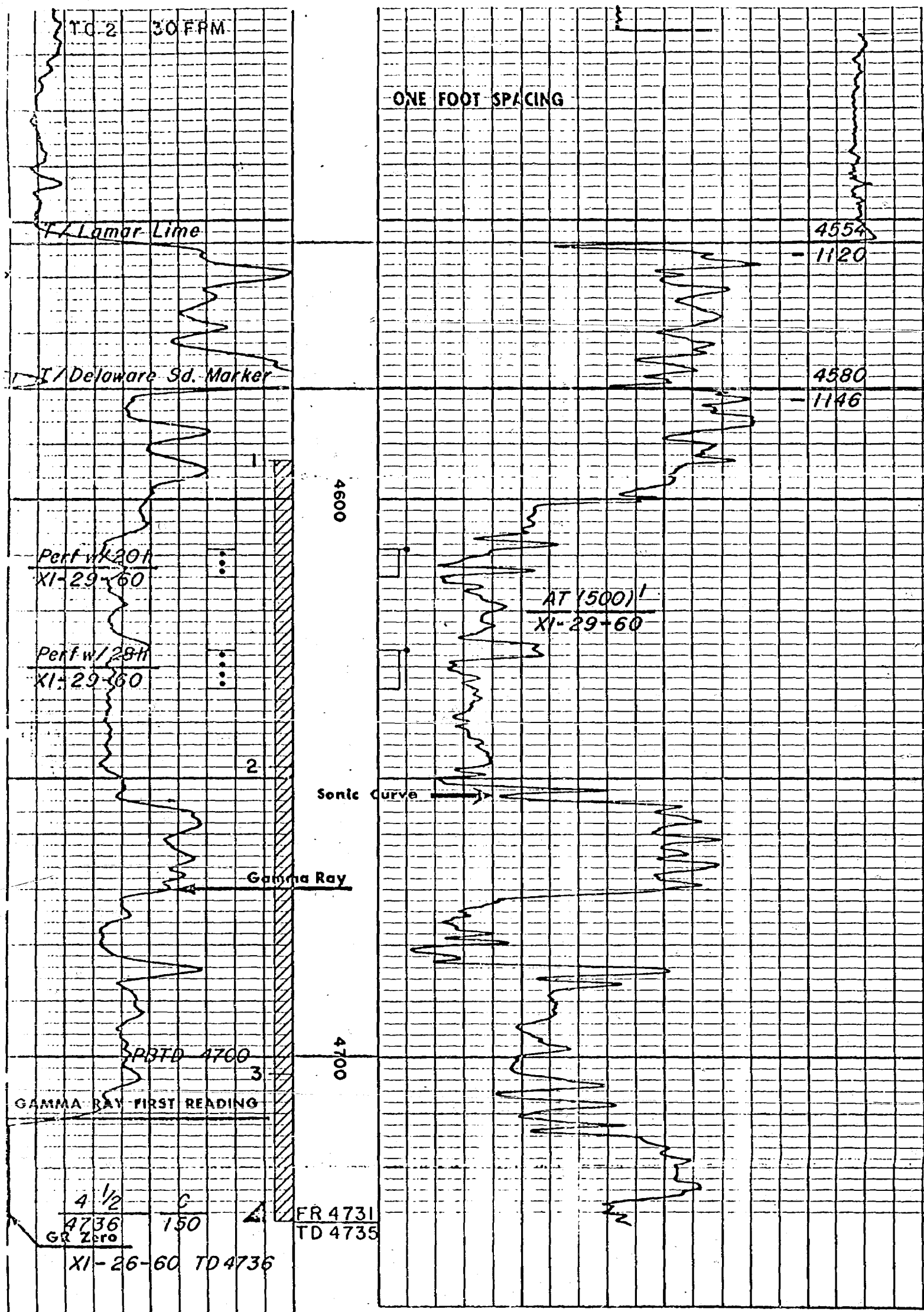


Exhibit 2

TENNECO OIL COMPANY
 MONSANTO STATE No. 3
 PADUCA (DELAWARE) FLD.
 LEA CO., NEW MEXICO



XI-2-60

4609-4614

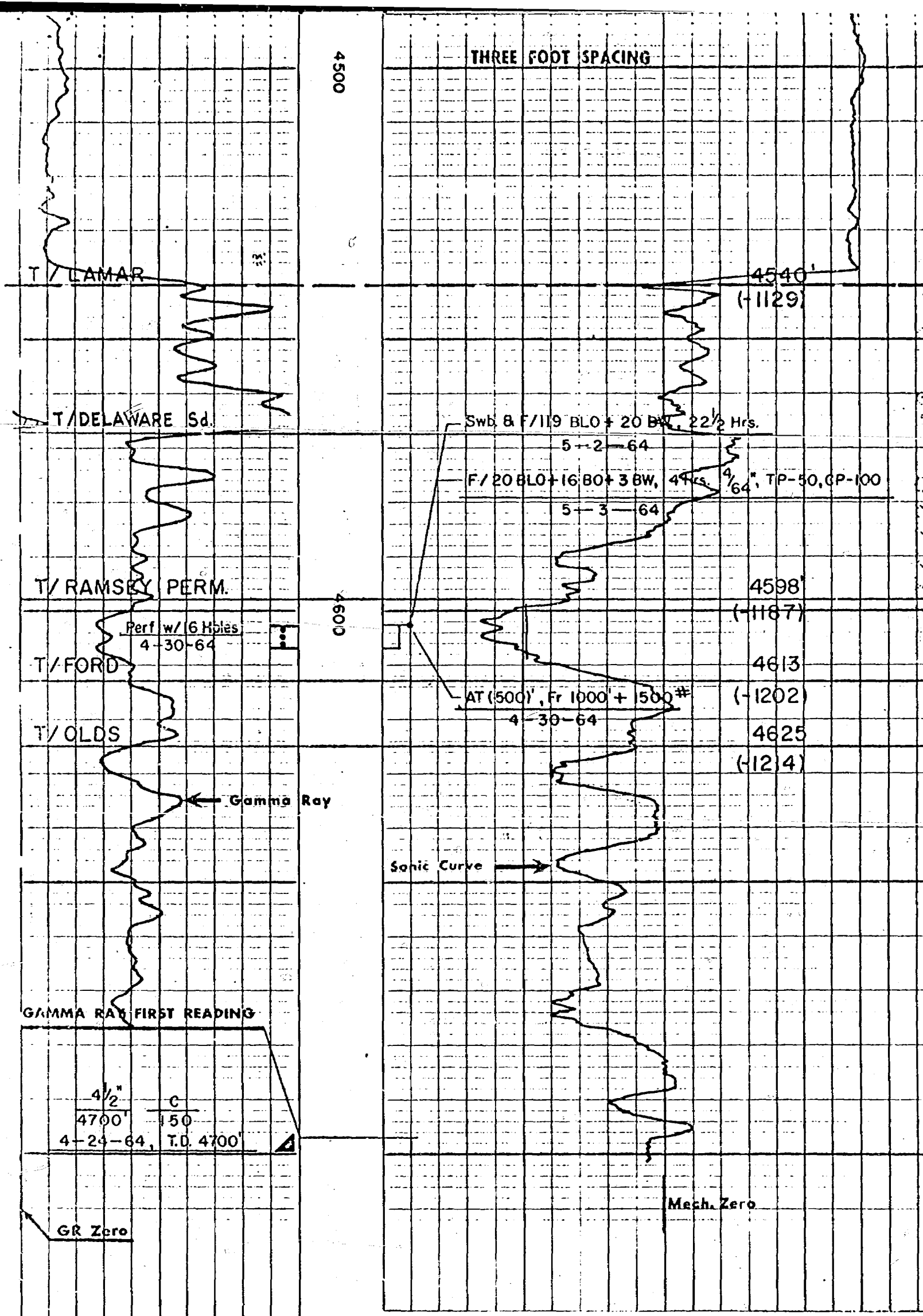
4627-4634

F/38.4 BO (1 1/4/64 ck.) in 17 3/4 hrs.

40° API Grav.

3647

Exhibit 3



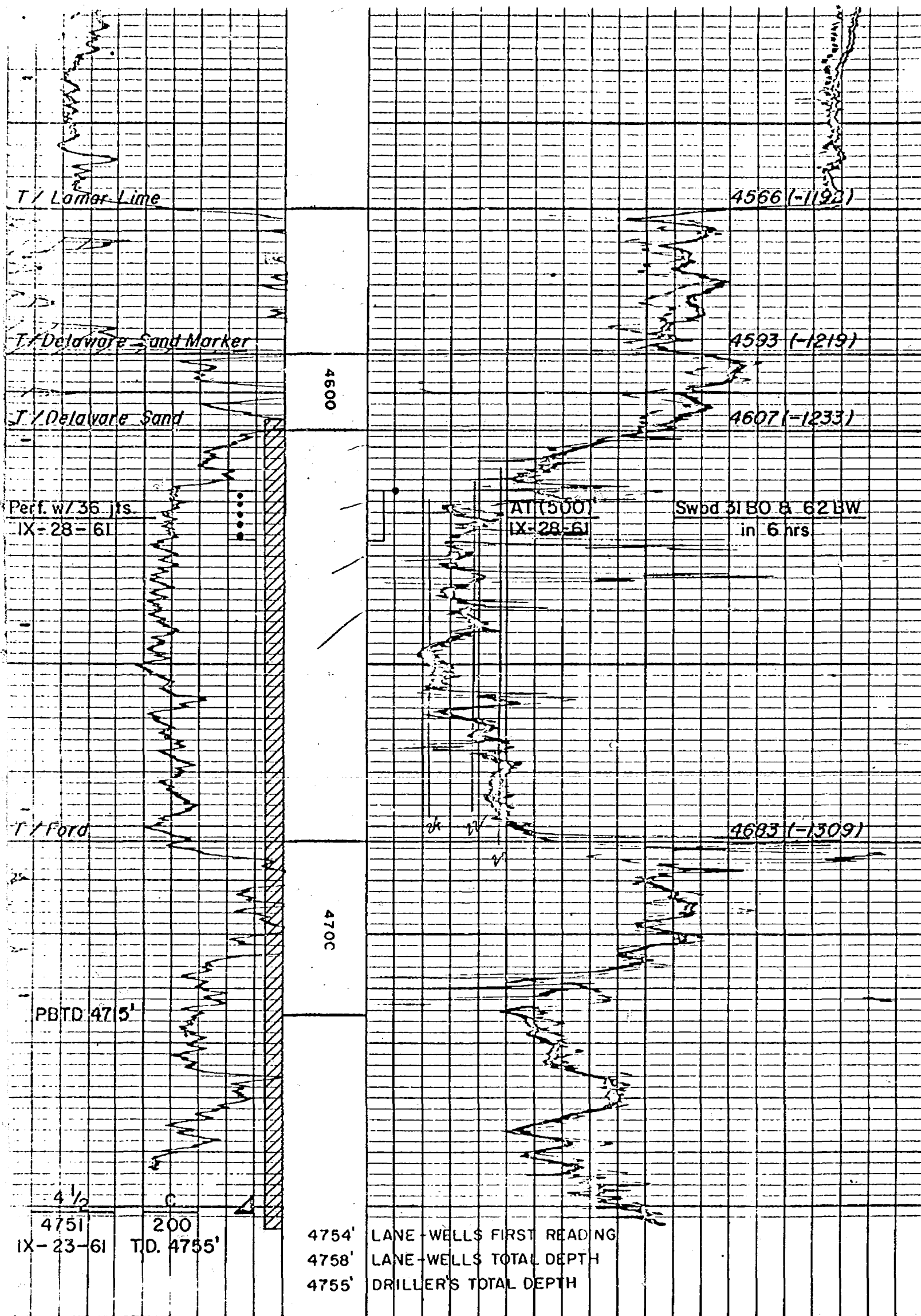
TENNECO OIL COMPANY 5-4-64
 MONSANTO STATE No. 7 4603'-07'
 PADUCA (DELAWARE) FLD.
 LEA CO., NEW MEXICO

F/138 BO + 14 BW, 25 1/2 Hrs., 16/64\" CK.
 GOR 596, TP-275, CP-1000

T 3 R 3 R.

Exhibit 4

4C



TENNECO OIL COMPANY
 J. D. SENA U. S. A. NO. 1
 PADUCA (DELAWARE) FLD.
 LEA COUNTY, NEW MEXICO

II-29-61	Swbd 124 80 & 248 BW
4618-4627	24 hrs.

Elev. 3435' KB (10' AGL)

Annulus Loaded With
Corrosion Inhibited
Fluid

8-5/8", 24#, J-55 csg. @
356', Cmt'd. W/240 sx. Cmt. Circ.

T/Cmt. @ 4050'

Seating Nipple

2-3/8", 4.7#, J-55 tbg. on tension
Pkr. @ 4550'

4606' - 54'
Pay: Delaware Sd. (Ramsey Zone)
Perfs: 4609' - 14' & 4627' - 34'

PBTD: 4700'

4-1/2", 9.5#, J-55 csg. @ 4736'
Cmt'd. W/150 sk. T/Cmt. @ 4050'

TD: 4736'

Init. Stim: Ac/500 gals.

Init. Pot.: 12-2-60 - F/14/64" ck. 38.4B0,
0-wtr. in 17-3/4 hrs., TP-325,
CP-65

Recent Test: 5-16-67 - F/12/64" ck. 13BOPD,
1BWPD, 4200GOR, TP 210

Cum. Prod: 1-1-67 - 78,635 B0, 7,463 BW,
117,931 MCFG

TENNECO OIL COMPANY
SUBSIDIARY OF TENNECO CORPORATION

PADUCA FIELD
LEA COUNTY, NEW MEXICO

MONSANTO-STATE NO. 3

PROPOSED WATER INJ. WELL

660' FSL & 1980' FEL, Sec. 15
T-25-S, R-32-E Exhibit 6

Case 3647

Elev. 3411' KB (10' AGL)

Annulus Loaded With
Corrosion Inhibited
Fluid

8-5/8", 24#, J-55 csg. @ 361'
Cmt'd. W/250 sx. Cmt. Circ.

T/Cmt. @ 3950'

2-3/8", 4.7#, J-55 tbg. on tension
Pkr. @ 4550'

Seating Nipple

4600 - 09'
Pay: Delaware Sd. (Ramsey Zone)

Perfs: 4603' - 07'

PBTD: 4656'

4-1/2", 9.5#, J-55 csg. @ 4700'
Cmt'd. W/150 sx. T/Cmt. 3950'

TD: 4700'

Init. Stim.: Ac/500 gals. Frac. W/1000 gals.
ref. oil & 1500# sd.

Init. Pot.: 5-5-64 - F/16/64" ck. 138BOPD,
14BWP, 596 GOR, TP 275, CP 1000

Recent Test: 5-8-67 - F/14/64" ck. 11BOPD,
7BWP, 3070 GOR, TP 300

Cum. Prod.: 1-1-67 - 38,822 BO, 9740 BW,
85,444 MCFG

TENNECO OIL COMPANY
SUBSIDIARY OF TENNECO CORPORATION

PADUCA FIELD
LEA COUNTY, NEW MEXICO

MONSANTO-STATE NO. 7
PROPOSED WATER INJ. WELL

330' FSL & 990' FWL, Sec. 16,
T-25-S, R-32-E

Exhibit 7

Elev. 3374' (9' AGL)

Annulus Loaded With
Corrosion Inhibited
Fluid

8-5/8", 32#, H-40 csg. @
359'. Cmt'd. W/200 sx. Cmt. Cir.

T/Cmt. @ 4000'

Seating Nipple

2-3/8", 4.7#, J-55 tbg. on tension
Pkr. @ 4550'

4618' - 81'

Pay: Delaware Sd. (Ramsey Zone)

Perfs: 4618' - 27'

PBTD: 4715'

4-1/2", 9.5#, J-55 csg. @ 4751'
Cmt'd. W/200 sx. T/Cmt. @ 4000'

TD: 4755'

Init. Stim.: Ac/500 gals. M. A.

Init. Pot.: 12-20-61 - P 25BOPD, 31BWPD

Recent Test: 5-16-67 - P 3BOPD, 27BWPD, 1810GOR

Cum. Prod.: 1-1-67 - 17,294 BO, 53,217BW
18,297 MCFG

TENNECO OIL COMPANY
SUBSIDIARY OF TENNECO CORPORATION

PADUCA FIELD
LEA COUNTY, NEW MEXICO

J. D. SENA, JR. USA NO. 1
2310' FSL & 1650' FWL, Sec. 28
T-25-S, R-32-E

PROPOSED WATER INJ. WELL
Case 3647 Exhibit 8

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

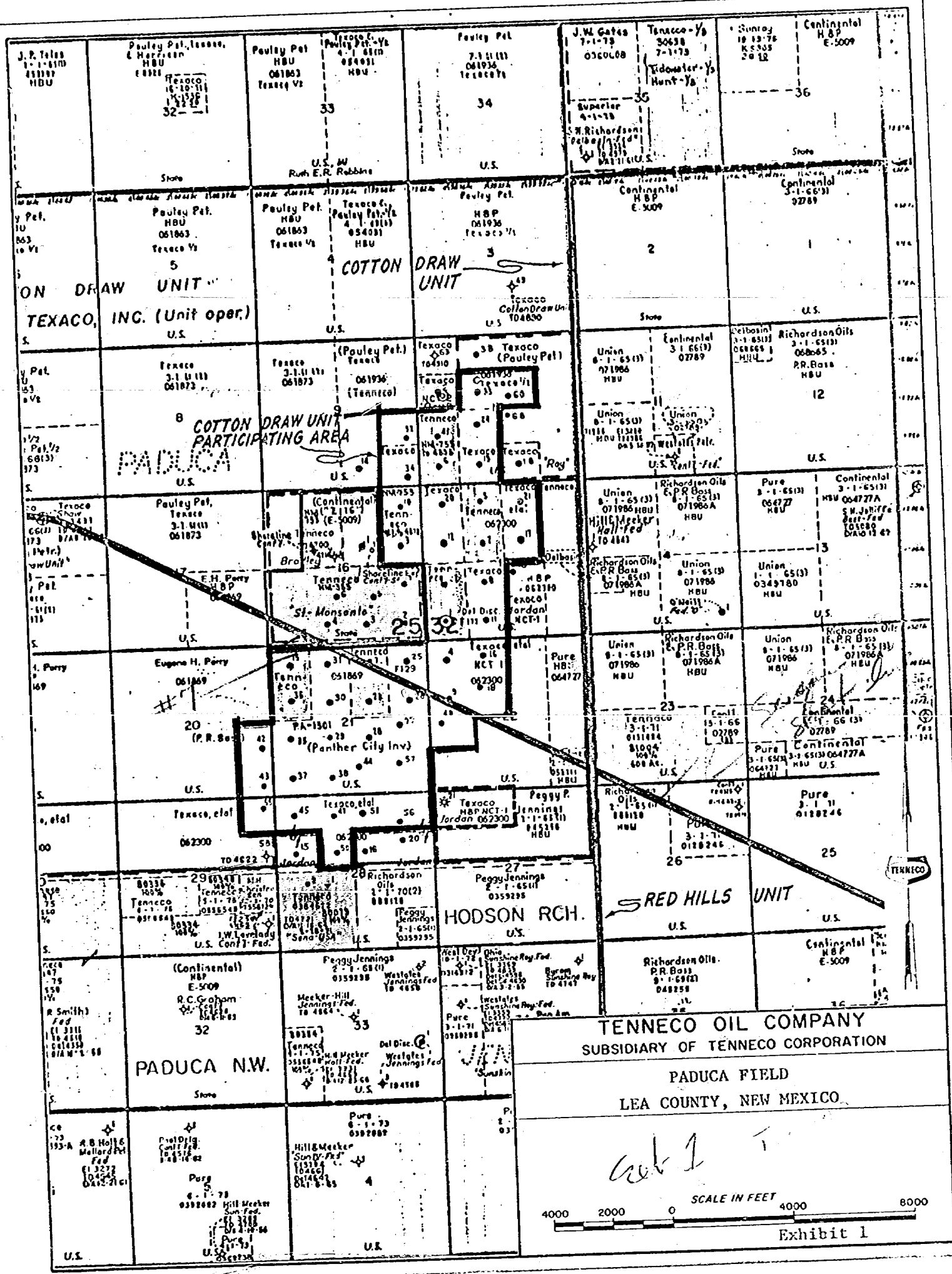
*Texaco Inc.
**P. O. Box 3109
Midland, Texas 79701

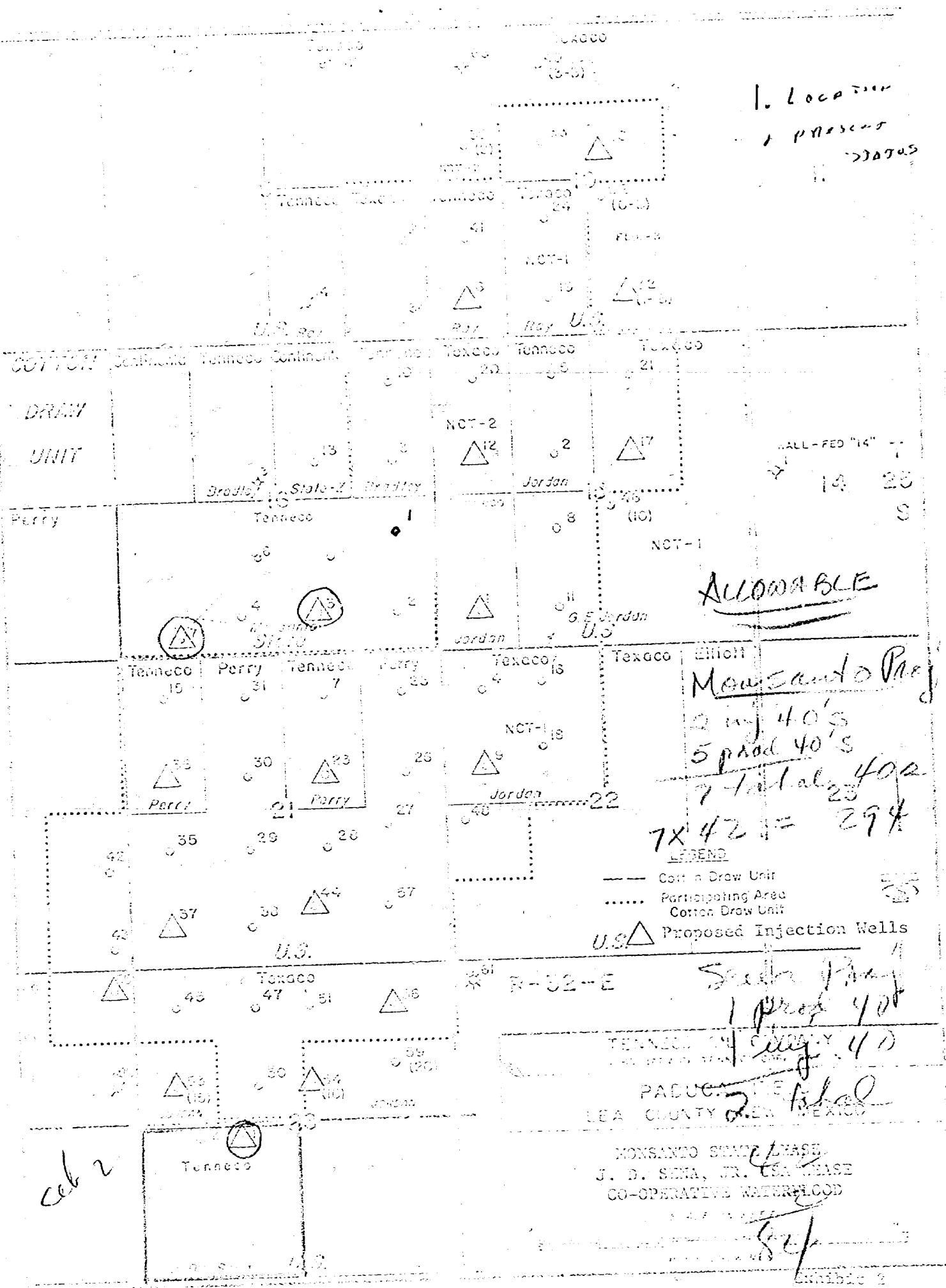
Regional Oil & Gas Supervisor
United States Geological Survey
Drawer 1857
Roswell, New Mexico 88201

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

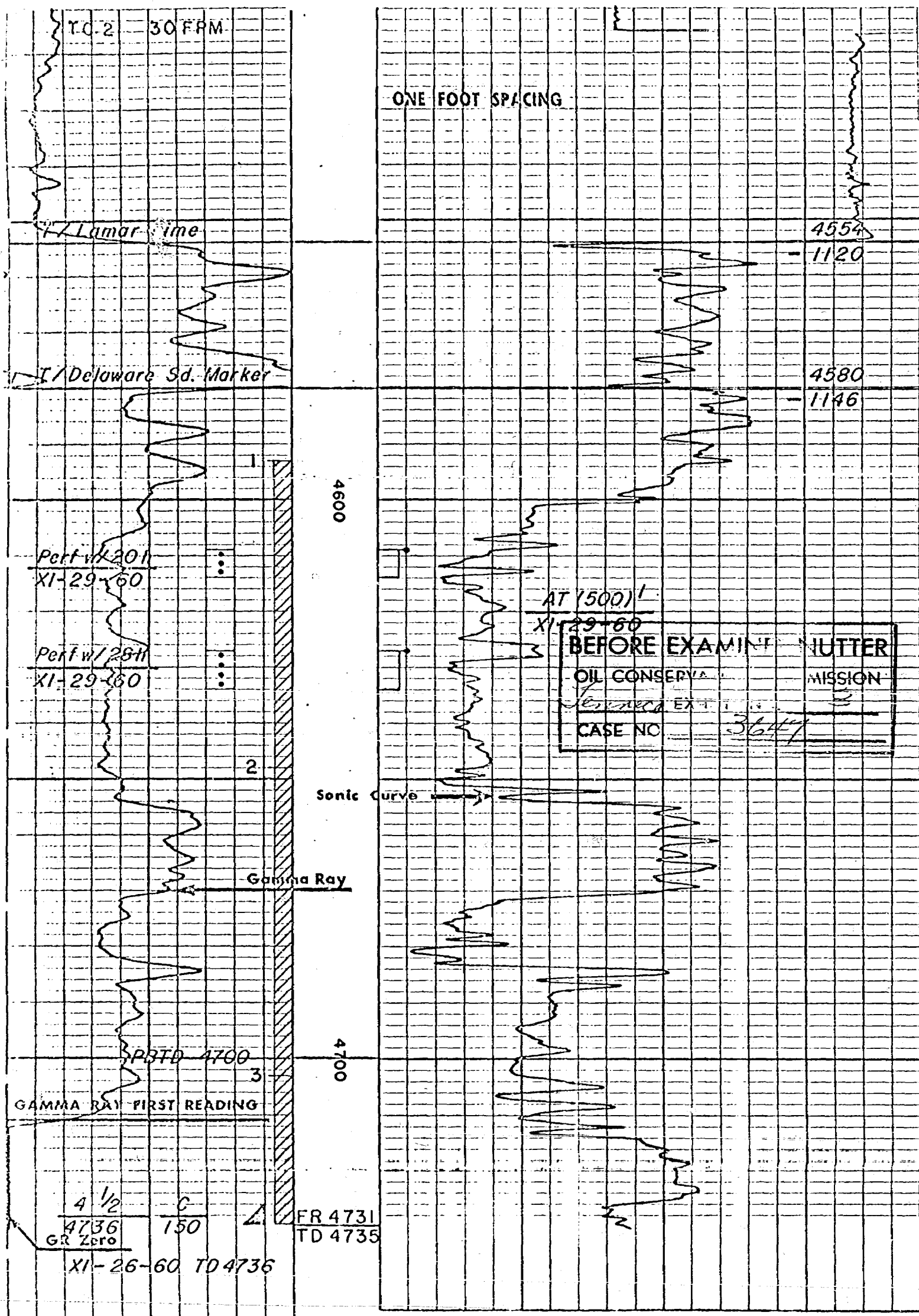
Mr. S. E. Reynolds
New Mexico State Engineer
Santa Fe, New Mexico

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



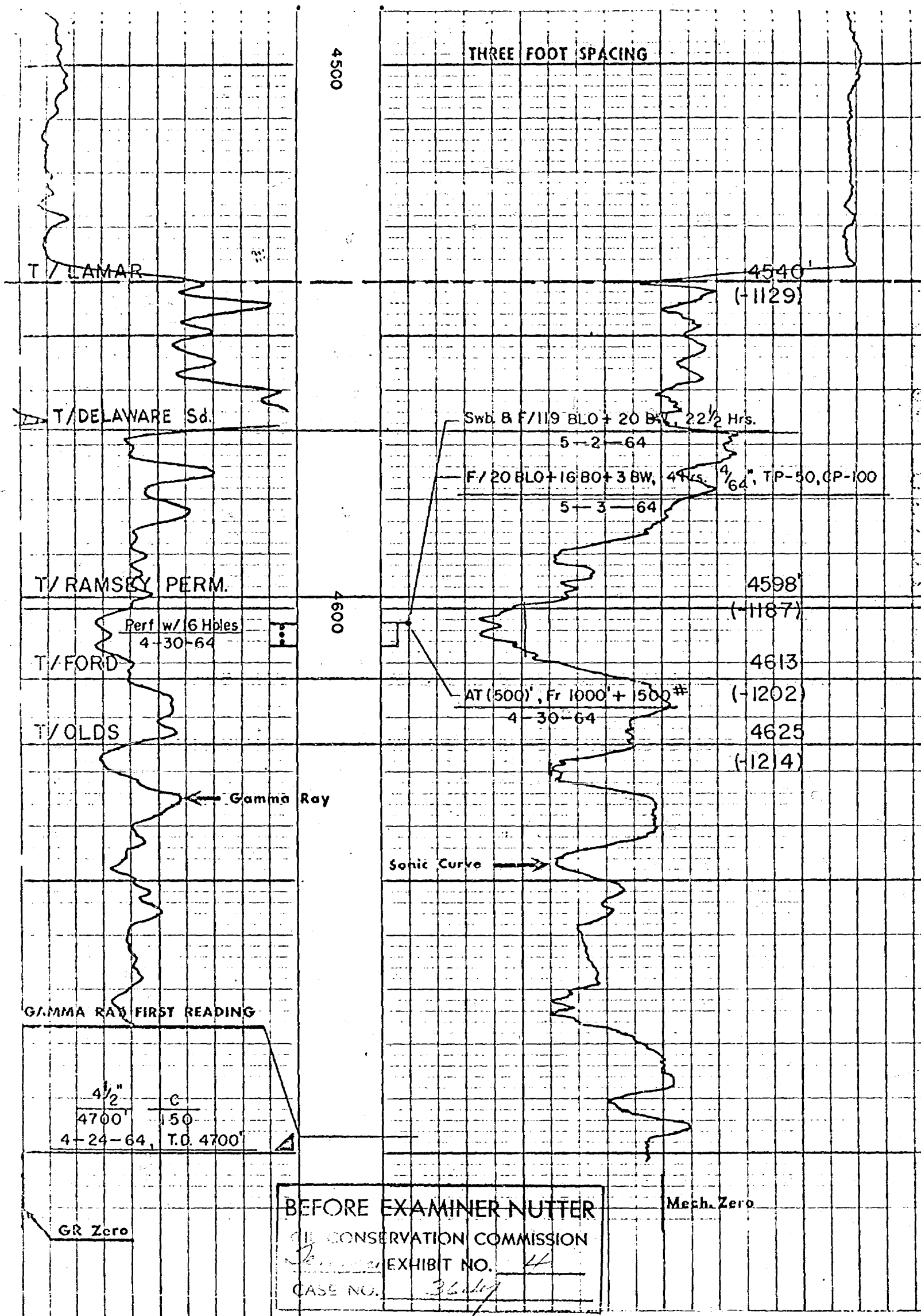


TENNECO OIL COMPANY
 MONSANTO STATE No.3
 PADUCA (DELAWARE) FLD.
 LEA CO., NEW MEXICO



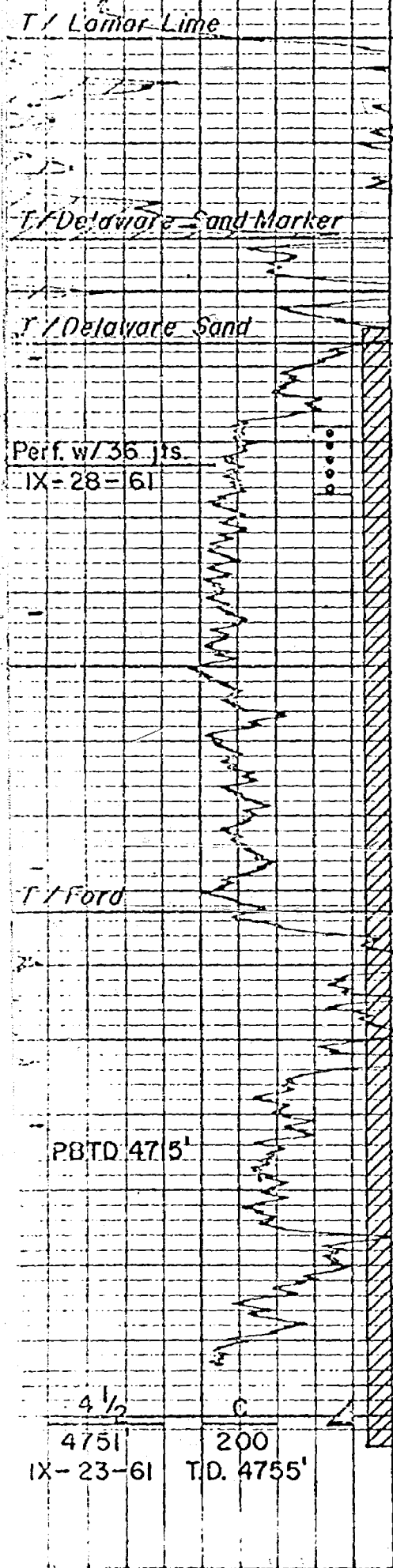
XI-2-60
 4609-4614
 4627-4634

F/38.4 BO (14/64 ck.) in 17 3/4 hrs.
 40° API Grav.



TENNECO OIL COMPANY 5-4-64
MONSANTO STATE No.7 4603'-07'
PADUCA (DELAWARE) FLD.
LEA CO., NEW MEXICO

F/138 BW + 14 BW, 25 1/2 Hrs., 1 1/2" Ck.
GOR 596, TP-275, CP-1000



4600

4700

4566 (-1193)

4593 (-1219)

4607 (-1233)

AT (500)
IX-28-61

Swbd 31 BO & 62 BW
in 6 hrs.

4583 (-1309)

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 5
3647

4754' LANE-WELLS FIRST READING
4758' LANE-WELLS TOTAL DEPTH
4755' DRILLER'S TOTAL DEPTH

TENNECO OIL COMPANY
J. D. SENA U.S.A. NO. 1
PADUCA (DELAWARE) FLD.
LEA COUNTY, NEW MEXICO

11-29-61 Swbd 124 BO & 248 BW
4618-4627 24 hrs.

5 1072

PLAN, SECTION (1) (2) (3)

200' 100' 100'
21.5' BPD
30' 100'
2' BPD

8-5/8", 24#, J-55 csg. @
4550', Cmt'd. W/240 sk. Cmt. Circ.

will be
stamped from
T-4000
production
will be delivered
to T-4000
indicated
fluid

T/Cmt. @ 4050'

log rate 800 BPD
1000' from

2 1/2" J. Casteri chd
Wg

914,000 Mammals
30,535' Sec

Seating Nipple

2-3/8", 4.7#, J-55 tbg. on tension
Pkr. @ 4550'

Pay: Delaware SG. (Ramsey Zone)
Paris: 4609' - 14' & 4627' - 34'

4-1/2", 9.5#, J-55 csg. @ 4736'
Cmt'd. W/150 sk. T/Cmt. @ 4050'

ED: 4736'

Init. Seis: Ac/500 gals.

Init. Prod: 12-2-66 - 7/14/64¹ cr. 36,400,
0-sec. in 17-3/4 hrs., TP-325,
CP-05

Sec. 13: 5-16-67 - 7/12/64¹ cr. 13,000,
1000, 420,000, TP 110

Comm. Prod: 1-1-67 - 76,655 BO, 7,400 BBL,
117,931 MCFG

TENNECO OIL COMPANY
SUSIDIARY OF TENNECO CORPORATION

BARCOA FIELD
LEA COUNTY, NEW MEXICO

WONSANTO-STATE NO. 3

PROPOSED WATER INJ. WELL

600' FSL & 1980' FSL, Sec. 13
T-25-S, R-32-N Exhibit 6

elev. 111' (131' base)

6-5/8", 24#, J-55 csg. @ 361'
Cmt'd. W/250 sx. Cmt. Circ.

T/Cmt. @ 3950'

2-3/8", 4.7#, J-55 tbg. on tension
Pkr. @ 4550'

Seating Nipple

4600 - 09'
Pay: Delaware Sd. (Ramsey Zone)

Perfs: 4603' - 07'

PEPD: 4636'

4-1/2", 9.5#, J-55 csg. @ 4700'
Cmt'd. W/150 sx. T/Cmt. 3950'

TD: 4760'

Init. Stim.: Ac/500 gals. Pmac. W/1000 gals.
ref. oil & 1500W ad.

Test. Pkgs: 5-6-64 - P/16/64" (R. 1250000,
145000, 590 GOR, TP 275, CT 1000

Recent Test: 5-8-67 - P/14/64" (R. 115000,
71000, 100 GOR,

Cmt. Prod.: 1-1-67 - 35,622 LG, 5740 G.
65,444 NORG

YENNECO OIL COMPANY
SUBSIDIARY OF YENNECO CORPORATION

PADUCA FIELD
LEA COUNTY, NEW MEXICO

MONSANTO-STATE NO. 7
PROPOSED MINER INS. WELL

330' PSL & 990' PSL, Sec. 16,
T-25-S, R-32-E

Exhibit 7

2-1/2", 3.5#, J-55 csg. @ 4751'
Cmt'd. W/200 ex. Cmt. Cnr.

T/Cmt. @ 4000'

Seating Nipple

2-3/8", 4.7#, J-55 tbg. on tension
Pkr. @ 4550'

4618' - 81'

Pay: Delaware Sd. (Rensley Zone)

Perfs: 4618' - 27'

PBTD: 4715'

4-1/2", 9.5#, J-55 csg. @ 4751'
Cmt'd. W/200 ex. T/Cmt. @ 4000' ✓

TD: 4755'

Init. Stim.: Ac/500 gals. M. A.

Init. Prod.: 12-20-61 - P 2580PD, 3180PD

Recort Test: 5-16-67 - P 380PD, 2780PD, 18100CR

Cnr. Pkr.: 1-1-67 - 17,294 BO, 53,217EN
10,297 MCFG

TENNECO OIL COMPANY
SUBSIDIARY OF TENNECO CORPORATION

PAQUA FIELD
LEA COUNTY, NEW MEXICO

M. D. SMITH, JR. USA NO. 1
2310' FSL @ 1850' TEL, Sec. 23
T-23-S, R-32-E

PROPOSED WATER INJ. WELL
Exhibit 8

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

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

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3646
Order No. R-3314

APPLICATION OF TEXACO INC.
FOR A WATERFLOOD PROJECT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 6, 1967, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 11th day of September, 1967, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Texaco Inc., seeks permission to institute three waterflood projects in the Paduca-Delaware Pool by the injection of water into the Delaware Sand through 12 wells in the Cotton Draw Unit Participating Area, through one well on its E. F. Ray Fed. "B" Lease in Section 10, and through two wells on its G. E. Jordan Fed. NCT-1 Lease in Section 28, all in Township 25 South, Range 32 East, NMPM, Lea County, New Mexico.

(3) That the wells in each of the project areas are in an advanced state of depletion and should properly be classified as "stripper" wells.

(4) That the proposed waterflood projects should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

-2-

CASE No. 3646

Order No. R-3314

(5) That the subject application should be approved and the projects should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Texaco Inc., is hereby authorized to institute three waterflood projects in the Paduca-Delaware Pool by the injection of water into the Delaware Sand through the following-described fifteen wells in Township 25 South, Range 32 East, NMPM, Lea County, New Mexico:

Texaco Cotton Draw Waterflood Project

Injection wells:

Cotton Draw Unit Well No. 60 - Unit G - Section 10
Cotton Draw Unit Well No. 6 - Unit M - Section 10
Cotton Draw Unit Well No. 12 - Unit E - Section 15
Cotton Draw Unit Well No. 17 - Unit G - Section 15
Cotton Draw Unit Well No. 1 - Unit M - Section 15
Cotton Draw Unit Well No. 36 - Unit E - Section 21
Cotton Draw Unit Well No. 23 - Unit G - Section 21
Cotton Draw Unit Well No. 37 - Unit M - Section 21
Cotton Draw Unit Well No. 44 - Unit O - Section 21
Cotton Draw Unit Well No. 9 - Unit E - Section 22
Cotton Draw Unit Well No. 56 - Unit A - Section 28
Cotton Draw Unit Well No. 55 - Unit A - Section 29

Texaco Paduca Ray Waterflood Project

Injection well:

E. F. Ray Fed. "B" Well No. 1 - Unit O - Section 10

Texaco Paduca Jordon Waterflood Project

Injection wells;

G. E. Jordon Fed. "NCT-1" Well No. 15 - Unit E -
Section 28
G. E. Jordon Fed. "NCT-1" Well No. 16 - Unit G -
Section 28

-3-

CASE No. 3646

Order No. R-3314

(2) That the subject waterflood projects shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

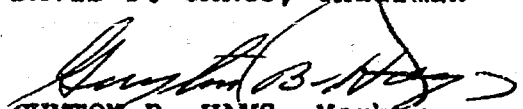
(3) That monthly progress reports of the waterflood projects herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

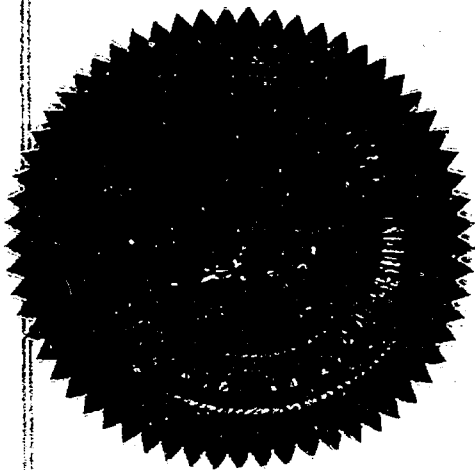
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


DAVID F. CARGO, Chairman


GUXTON B. HAYS, Member


A. L. PORTER, Jr., Member & Secretary



esr/

CASE 3648: Application of TENNECO
OIL CO. for a DUAL COMPLETION,
RIO ARriba COUNTY, NEW MEXICO.