

CASE NO.

4791

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CASE NO.

4792

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MISSING.

Ref

CASE 4793: Appli. of TENNECO OIL  
CO. FOR PRESSURE MAINTENANCE &  
UNORTHODOX LOCATIONS.

Case Number  
4793

Application

Transcripts

Small Exhibits

ETC.

BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
CONFERENCE ROOM, STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO

August 9, 1972

EXAMINER HEARING

IN THE MATTER OF:

Application of Tenneco Oil Company  
for a pressure maintenance project  
and unorthodox locations,  
McKinley County, New Mexico.

Case No. 4793

BEFORE: Elvis A. Utz,  
Examiner

TRANSCRIPT OF HEARING

dearnley, meier & mc cormick

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1 MR. UTZ: Case 4793.

2 MR. HATCH: Case 4793: Application of Tenneco  
3 Oil Company for a pressure maintenance project and unorthodox  
4 locations, McKinley County, New Mexico.5 MR. BATEMAN: Kenneth Bateman of Santa Fe,  
6 representing the Applicant. I have one witness that I ask  
7 be sworn.

8 MR. UTZ: Are there other appearances in this case?

9 (No response)

10 \* \* \* \*

11 MICHAEL DeMARCO,12 was called as a witness, and after being duly sworn, testified  
13 as follows:14 DIRECT EXAMINATION15 BY MR. BATEMAN:

16 Q Mr. DeMarco, would you state your name?

17 A Michael DeMarco. I am a petroleum engineer with Tenneco  
18 Oil Company located in Denver, Colorado.

19 Q Have you previously testified before the Commission?

20 A Yes, I have.

21 Q At that time, did you make your qualifications a matter  
22 of public record?

23 A Yes, I did.

24 MR. BATEMAN: Are the witness's qualifications  
25 accepted?

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1 MR. UTZ: Yes, sir.

2 Q (By Mr. Bateman) Mr. DeMarco, would you refer to your  
3 Exhibit One, which is a map of the area in question,  
4 and tell the Examiner what you seek by this application?

5 A We seek authority to institute a pressure maintenance  
6 project in the South Hospah-Lower Sand Pool by the  
7 injection of water and gas into the Lower Hospah  
8 formation through three wells located at orthodox and  
9 unorthodox locations in Section 12, Township 17 North,  
10 Range 9 West, McKinley County, New Mexico.

11 We further seek a procedure whereby additional  
12 injection wells and expansion of the project area may  
13 be approved without the necessity of notice and hearing.

14 Exhibit One is a location plat which shows the  
15 Lower Hospah zone. The area outlined in yellow is the  
16 area around the wells, the Lower Hospah sand wells.  
17 The three wells colored in red are the proposed injection  
18 wells.

19 Q You propose a pilot program at this time, is that correct?

20 A Correct. We propose a short duration pilot program  
21 for the three wells, mainly to check the mechanics of  
22 gas and oil injection. We plan to expand early next  
23 year if possible.

24 Q What is Exhibit Two?

25 A Exhibit Two is a structure map contoured on the Lower

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1 Hospah formation. It also shows the Hospah zone  
 2 outlined in yellow and the three injection wells  
 3 colored red. A fault system runs from the Southwest  
 4 up to the Northeast, and on into the offset leases.  
 5 There is a large fault also to the South, and I would  
 6 like to point out that productive limits of the Lower  
 7 Hospah zone on Tenneco's lease are defined by oil-water  
 8 contact which is shown by the dotted line running  
 9 approximately in the center of Section 12.

10 Q Please refer to Exhibit Number Three, and tell the  
 11 Commission what that adds to your application.

12 A Exhibit Three is an isopach map of the Lower Hospah  
 13 formation and shows the net pay above the oil-water  
 14 contact. Also we would like to point out on this  
 15 exhibit the line of A A Prime running from the West  
 16 to the East across Tenneco's lease and on to Tesaro's  
 17 lease to the East. Line B B Prime is the north-south  
 18 cross section.

19 Q What is the average net pay in the area?

20 A Approximately twenty-six and a half feet. It thickens  
 21 up near the fault, which can be noted on the exhibit.

22 Q Exhibit Four is cross section A to A Prime, is that right?

23 A Yes, sir. In this particular exhibit, we show the  
 24 Lower Hospah sand and all of the oil-water contact  
 25 throughout the lease. I would like to call your



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1 attention to the center of the cross section and wells  
2 Hospah 24, Hospah 9, and Hospah 25, and over to the  
3 Hospah 6. These wells were completed early in the  
4 development of the field in 1967 up through 1969, and  
5 at this time, we have completed wells by drilling  
6 through the pay and setting casing through the pay and  
7 perforating the Lower Hospah interval. The oil-water  
8 contact has been defined by several cores, and the  
9 one that is shown in the Hospah Number 6, located to  
10 the east, also shows an electric log interpretation.  
11 We also would like to point out that there was later  
12 development in late 1969, and then some more additional  
13 development in late 1971. Wells were completed by  
14 drilling the top of the Lower Hospah pay and setting  
15 casing and then drilling again to the surface of the  
16 pay. This method made for better completions, and the  
17 wells held up well. I point this out because our later  
18 exhibit will show that two of the later injection wells  
19 were not completed in that manner.

20 Cross section B B Prime, which is Exhibit 5, is a  
21 north-south cross section which runs from the Pesaro  
22 lease down to Tenneco's lease. Hospah Well Number 8  
23 which is the southern most productive well, and here  
24 once again we have two wells completed through the  
25 pay and then the other three wells located on here were

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1 set on top of the Lower Hospah zone.

2 Q Would you combine Exhibits Six and Seven and explain  
3 them, please?

4 A Yes, Exhibits Six and Seven are simply well bore  
5 diagrams of the two proposed injection wells, the Hospah  
6 33, which will be located 1,334 feet from the North  
7 line and 1,770 feet from the West line of Section 12;  
8 and the Hospah 36, located 990 feet from the North line  
9 and 1,360 feet from the East line. Both wells are  
10 completed similarly with ten and three-quarter inch  
11 surface casing set at approximately sixty feet. The  
12 seven inch producing casing was set on top of the pay,  
13 and an open hole section was drilled for oil. We also  
14 have initial completion data on each well, and the  
15 current production, the accumulative production.

16 Q All right, continue with Exhibit Eight, please.

17 A Exhibits Eight and Nine are log sections of the Hospah  
18 Number 33 and the Hospah 36, respectively, they are  
19 gamma ray density logs, and in the case of the Hospah  
20 36, the log was from a depth of 1,589 feet, and the  
21 top of the Lower Hospah sand was encountered at 1,624  
22 feet. The method used was to correlate between the  
23 other wells that had been drilled earlier, and from  
24 these estimates, it was estimated that we would reach  
25 the base of the Upper Hospah at 1,591 feet. They shut

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1 down and found by correlation that they still had some  
2 thirty-five feet of additional pay to drill.

3 Q What are the rock and fluid properties?

4 A Exhibit Ten is a table listing the rock and fluid  
5 properties, and as you will note, the rock is excellent.  
6 We find pay approximately 1,625 feet with an average  
7 gross thickness of 105 feet, and an average net pay  
8 of twenty-six feet, with a porosity of twenty-seven and  
9 a half percent, and an average water saturation of  
10 forty percent, and a permeability of 1,100 milidarcies.  
11 We own 286 productive acres on lease, however within  
12 the confines of the 286 acres, there are over 9,000,000  
13 barrels of oil in place. Also, with the excellent  
14 rock properties, I might point out that the fluid  
15 properties are less than ideal. We have an initial  
16 reservoir temperature of eighty degrees, including  
17 gravity of twenty-four degrees API. There was  
18 essentially no solution gas initially, and the initial  
19 formation volume was 1.04.

20 We have a formation volume factor of approximately  
21 1.0075, however by the addition of less than 100 cubic  
22 feet of gas per barrel of oil, it has increased to  
23 1.0445.

24 Now, this doesn't sound like a large increment in  
25 numbers, but when you are dealing with approximately

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1 8,000,000 barrels of reservoir oil, this amount of  
2 swelling can improve recovery considerably.

3 Also you will note on Exhibit Twelve 593 PSIG,  
4 which is close to the initial reservoir pressure.  
5 The viscosity was reduced from fifty-five down to  
6 approximately thirty-four, and this in turn improves  
7 the mobility ratio from 180 to approximately ten. This  
8 allows for the water behind to move the oil in a much  
9 more efficient manner.

10 We estimate that primary recovery by pressure  
11 depletion will be approximately one and a half million  
12 barrels of oil, or sixteen percent of the oil in place.  
13 By the addition of the ten percent gas saturation, we  
14 can improve recovery and obtain an additional twenty  
15 percent of the oil in place, or an ultimate recovery  
16 of thirty-six percent of the oil in place.

17 Q Would you briefly describe how the injection wells will  
18 be completed?

19 A The injection wells will be completed by setting--  
20 as you will note in Exhibits Four and Seven, tubing was  
21 run approximately one joint above the casing shield,  
22 and the gas and water will be injected simultaneously  
23 down the tube.

24 Q What is the source of the fluid and the gas?

25 A The water will be obtained from the Lower Hospah zone.

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1 The gas will come from the Dakota formation.

2 Q Do you have anything further to add?

3 A No, except that we would make the drilling of the  
4 unorthodox well subject to approval from the offset  
5 operator, since we do not have their approval in hand.

6 Q Now, if this application is approved, will it tend to  
7 protect correlative rights and prevent waste?

8 A Yes, and recover an additional 1.9 million barrels of  
9 oil.

10 Q And you are also asking for an administrative procedure  
11 for approving additional wells to be converted or  
12 drilled as injection wells?

13 A Yes, sir.

14 Q Were Exhibits One through Twelve prepared by you or  
15 under your direction?

16 A Yes, they were.

17 MR. BATEMAN: I move for the introduction of  
18 Exhibits through Twelve.

19 MR. UTZ: Without objection, Applicant's Exhibits  
20 One through Twelve will be entered into the record of this  
21 case.

22 (Whereupon Applicant's Exhibits One through Twelve  
23 were admitted in evidence.)

24 MR. BATEMAN: I would like to point out too the  
25 Commissioner that agreement with Tesaro for a lease line has

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1 not been reached at the moment, but we would request  
2 approval subject to that agreement or acquisition of  
3 that agreement.

4 I have no further questions.

5 \* \* \* \*

6 CROSS EXAMINATION

7 BY MR. UTZ:

8 Q The Lower Hospah has not been unitized as yet, has it?

9 A No, this is all one basic lease.

10 Q So all that is necessary would be your lease line  
11 agreement?

12 A That is correct, yes. The Upper Hospah overlaps into  
13 the South half of Section 12, and that is a separate  
14 lease from the Hospah lease.

15 Q Which wells are you asking authorization to re-complete?

16 A Hospah Wells 33 and 36.

17 Q Just the two?

18 A Yes, sir.

19 Q Didn't you ask for three?

20 A Well, the proposed location, five feet from the North  
21 line and 2,950 feet from the East line.

22 Q What was that again?

23 A Five feet from the North line and 2,950 feet from the  
24 East line of Section 12.

25 Q Will they all be open hole completions?

1 A Yes, sir, we believe that's the best way to go.

2 MR. UTZ: Are there any other questions of this  
3 witness?

4 \* \* \* \*

5 CROSS EXAMINATION

6 BY MR. McGRATH:

7 Q What are you going to do about the rest of your wells?  
8 You are going to have more line wells to protect, aren't  
9 you?

10 A Yes, sir. We have a tentative agreement worked up with  
11 Tesaro, we are having a little difference of opinion  
12 with them at this time, but we have gone over to them  
13 and have pointed out the benefits, and they are quite  
14 interested. If we can resolve some minor difficulties,  
15 we believe they would approve, and the expansion would  
16 be subject to their cooperation.

17 MR. McGRATH: That's all I have.

18 MR. UTZ: Any further questions?

19 (No response)

20 MR. UTZ: If not, the witness may be excused.

21 (Witness excused)

22 MR. UTZ: Any statements in this case?

23 (No response)

24 MR. UTZ: Case 4793 will be taken under advisement.

25

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1 STATE OF NEW MEXICO )  
 2 COUNTY OF BERNALILLO } SS

3  
 4 I, RICHARD E. McCORMICK, a Certified Shorthand  
 5 Reporter, in and for the County of Bernalillo, State of  
 6 New Mexico, do hereby certify that the foregoing and attached  
 7 Transcript of Hearing before the New Mexico Oil Conservation  
 8 Commission was reported by me; and that the same is a true  
 9 and correct record of the said proceedings to the best of  
 10 my knowledge, skill and ability.

11  
 12 *Richard E. McCormick*  
 13 CERTIFIED SHORTHAND REPORTER  
 14  
 15  
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 24  
 25

I do hereby certify that the foregoing is  
 a complete and correct report of the  
 the hearing held on 8-9-72 at 4593  
 heard by me on 8-9-72  
*Richard E. McCormick*  
 New Mexico Oil Conservation Commission



dearnley, meier &amp; mc cormick

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25I N D E XWITNESSPAGE

MICHAEL DeMARCO

Direct Examination by Mr. Bateman

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Cross Examination by Mr. Utz

11

Cross Examination by Mr. McGrath

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Exhibit #1 Location plat

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Exhibit #2 Structure map

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Exhibit #3 Isopach map

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Exhibit #4 Cross section

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Exhibit #5 Cross section

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Exhibit #6 Well bore diagrams

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Exhibit #7 Well bore diagrams

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Exhibit #8 Log sections

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Exhibit #9 Log sections

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Exhibit #10 Table

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8

Exhibit #12

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9



## OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO  
P. O. BOX 2088 - SANTA FE  
87501

GOVERNOR  
BRUCE KING  
CHAIRMAN  
LAND COMMISSIONER  
ALEX J. ARMIJO  
MEMBER  
STATE GEOLOGIST  
A. L. PORTER, JR.  
SECRETARY - DIRECTOR

September 8, 1972

Mr. Ken Bateman  
White, Koch, Kelly & McCarthy  
Attorneys at Law  
Post Office Box 787  
Santa Fe, New Mexico

Re: Case No. 4793  
Order No. R-4389  
Applicant:  
Tenneco Oil Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.  
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x  
Artesia OCC             
Aztec OCC x

Other State Engineer Office



## OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO  
P. O. BOX 2088 - SANTA FE  
87501

November 28, 1972

GOVERNOR  
BRUCE KING  
CHAIRMAN

LAND COMMISSIONER  
ALEX J. ARMJO  
MEMBER

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

Mr. Ken Bateman  
White, Koch, Kelly & McCarthy  
Attorneys at Law  
Post Office Box 787  
Santa Fe, New Mexico

Re: Case No. 4793  
Order No. R-4389-A  
Applicant:  
Tenneco Oil Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced  
Commission order recently entered in the subject case.

Very truly yours,

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

ALP/ir

Copy of order also sent to:

Hobbs OCC x  
Artesia OCC         
Aztec OCC x

Other State Engineer Office

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. 4793  
Order No. R-4389

APPLICATION OF TENNECO OIL COMPANY  
FOR A PRESSURE MAINTENANCE PROJECT  
AND UNORTHODOX LOCATIONS, MCKINLEY  
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on August 9, 1972, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 7th day of September, 1972, 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 a pressure maintenance project in the South Hospah-Lower Sand Pool by the simultaneous injection of water and gas into the Lower Hospah formation through two wells located in Section 12, Township 17 North, Range 9 West, McKinley County, New Mexico.

(3) That the applicant further seeks the designation of the project area and the promulgation of special rules and regulations governing said project.

(4) That initially the project area should comprise only the following-described area:

MCKINLEY COUNTY, NEW MEXICO  
TOWNSHIP 17 NORTH, RANGE 9 WEST, NMPM  
Section 12: NW/4 and W/2 NE/4

(5) That a pressure maintenance project, designated the Tenneco Lower Hospah Pressure Maintenance Project, comprising the above described area is in the interest of conservation and should result in greater ultimate recovery of oil, thereby preventing waste.

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CASE NO. 4793  
Order No. R-4389

(6) That an administrative procedure should be established whereby said project area may be expanded for good cause shown and whereby additional wells in the project area may be converted to water injection.

(7) That special rules and regulations for the operation of the Tenneco Lower Hospah Pressure Maintenance Project should be promulgated and, for operational convenience, such rules should provide certain flexibility in authorizing the production of the project allowable from any well or wells in the project area in any proportion, provided that no well in the project area which directly or diagonally offsets a well on another lease producing from the same common source of supply should be allowed to produce in excess of top unit allowable for the South Hospah-Lower Sand Pool until such time as the well has experienced a substantial response to water injection. When such a response has occurred, the well should be permitted to produce up to two times top unit allowable for the South Hospah-Lower Sand Pool. Production of such well at a higher rate should be authorized only after notice and hearing.

IT IS THEREFORE ORDERED:

(1) That the applicant, Tenneco Oil Company, is hereby authorized to institute a pressure maintenance project in the South Hospah-Lower Sand Pool, McKinley County, New Mexico, to be designated the Tenneco Lower Hospah Pressure Maintenance Project, by the simultaneous injection of water and gas into the open-hole interval opposite the Lower Hospah formation through the following-described two wells in Section 12, Township 17 North, Range 9 West, NMPM, McKinley County, New Mexico:

Hospah Well No. 33 - 1,340 feet from the North line and  
1,710 feet from the West line;

Hospah Well No. 36 - 900 feet from the North line and  
2,630 feet from the East line.

(2) That the aforesaid injection wells shall be equipped with 2 7/8-inch tubing set in packers, said packers being located within 100 feet of the casing shoe. Further, that the casing tubing annulus shall be filled with an inert fluid and the annulus equipped with a pressure gauge to facilitate detection of leakage in the tubing or packer.

(3) That Special Rules and Regulations governing the operation of the Tenneco Lower Hospah Pressure Maintenance Project, McKinley County, New Mexico, are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS  
FOR THE  
TENNECO LOWER HOSPAH PRESSURE MAINTENANCE PROJECT

-3-

CASE NO. 4793  
Order No. R-4389

RULE 1. The project area of the Tenneco Lower Hospah Pressure Maintenance Project, hereinafter referred to as the Project, shall comprise the area described as follows:

McKINLEY COUNTY, NEW MEXICO  
TOWNSHIP 17 NORTH, RANGE 9 WEST, NMPM  
Section 12: NW/4 and W/2 NE/4

RULE 2. The allowables for the Project shall be the sum of the allowables of the several wells within the project area, including those wells which are shut-in, curtailed, or used as injection wells. Allowables for all wells shall be determined in a manner hereinafter prescribed.

RULE 3. Allowables for injection wells may be transferred to producing wells within the project area, as may the allowables for producing wells which, in the interest of more efficient operation of the Project, are shut-in or curtailed because of high gas-oil ratio or are shut-in for any of the following reasons: pressure regulation, control of pattern or sweep efficiencies, or to observe changes in pressures or changes in characteristics of reservoir liquids or progress of sweep.

RULE 4. The allowable assigned to any well which is shut-in or which is curtailed in accordance with the provisions of Rule 3 which allowable is to be transferred to any well or wells in the project area for production, shall in no event be greater than its ability to produce during the test prescribed by Rule 6, below, or greater than the current top unit allowable for the pool during the month of transfer, whichever is less.

RULE 5. The allowable assigned to any injection well on a 40-acre proration unit shall be top unit allowable for the South Hospah-Lower Sand Pool.

RULE 6. The allowable assigned to any well which is shut-in or curtailed in accordance with Rule 3, shall be determined by a 24-hour test at a stabilized rate of production, which shall be the final 24-hour period of a 72-hour test throughout which the well should be produced in the same manner and at a constant rate. The daily tolerance limitation set forth in Commission Rule 502 I (a) and the limiting gas-oil ratio (2,000 to 1) for the pool shall be waived during such tests. The project operator shall notify all operators offsetting the well, as well as the Commission, of the exact time such tests are to be conducted. Tests may be witnessed by representatives of the offsetting operators and the Commission, if they so desire.

RULE 7. The basic allowable assigned to each producing well in the Project shall be equal to the well's ability to produce or to top unit allowable for the pool, whichever is less. Wells capable of producing more than top unit allowable may also

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Order No. R-4389

receive transfer allowable, provided however, that no producing well in the project area which directly or diagonally offsets a well on another lease producing from the same common source of supply shall receive an allowable or produce in excess of two times top unit allowable for the pool. Each producing well shall be subject to the limiting gas-oil ratio (2,000 to 1) for the pool.

RULE 8. Every four months the project operator shall submit to the Commission a Pressure Maintenance Project Operator's Report, on a form prescribed by the Commission, outlining thereon the data required, and requesting allowables for each of the several wells in the Project as well as the total project allowable based upon the pool's depth bracket allowable and the market demand percentage in effect. The aforesaid Pressure Maintenance Project Operator's Report shall be filed in lieu of Form C-120 for the Project.

RULE 9. The Commission shall, upon review of the report and after any adjustments deemed necessary, calculate the allowable for each well in the Project for the next two succeeding months in accordance with these rules. The sum of the allowables so calculated shall be assigned to the Project and may be produced from the wells in the Project in any proportion except that no well in the Project which directly or diagonally offsets a well on another lease producing from the same common source of supply shall produce in excess of two times top unit allowable for the pool.

RULE 10. The conversion of producing wells to injection, the drilling of additional wells for injection, and expansion of the project area shall be accomplished only after approval of the same by the Secretary-Director of the Commission. To obtain such approval, the project operator shall file proper application with the Commission, which application, if it seeks authorization to convert additional wells to injection or to drill additional injection wells shall include the following:

(1) A plat showing the location of proposed injection wells, all wells within the project area, and offset operators, locating wells which offset the project area.

(2) A schematic drawing of the proposed injection wells which fully describes the casing, tubing, perforated interval, and depth showing that the injection of gas or water will be confined to the Lower-Hospah formation.

(3) A letter stating that all offset operators to the proposed injection wells have been furnished a complete copy of the application and the date of notification.

-5-

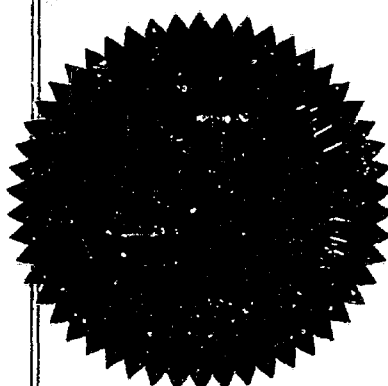
CASE NO. 4793  
Order No. R-4389

The Secretary-Director may approve the proposed injection wells if, within 20 days after receiving the application, no objection to the proposal is received. The Secretary-Director may grant immediate approval, provided waivers of objection are received from all offset operators.

Expansion of the project area may be approved by the Secretary-Director of the Commission administratively when good cause is shown therefor.

(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

*Bruce King*  
BRUCE KING, Chairman

*Alex J. Armijo*  
ALEX J. ARMIJO, Member

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

S E A L

dr/



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. 4793  
Order No. R-4389-A

APPLICATION OF TENNECO OIL COMPANY  
FOR A PRESSURE MAINTENANCE PROJECT  
AND UNORTHODOX LOCATIONS, MCKINLEY  
COUNTY, NEW MEXICO.

NUNC PRO TUNC ORDER

BY THE COMMISSION:

It appearing to the Commission that Order No. R-4389, dated September 7, 1972, does not correctly state the intended order of the Commission as stated below.

IT IS THEREFORE ORDERED:

(1) That Rule 8 on Page 4 of Order No. R-4389 is hereby corrected to read in its entirety as follows:

"RULE 8. Each month the project operator shall submit to the Commission a Pressure Maintenance Project Operator's Report, on a form prescribed by the Commission, outlining thereon the data required, and requesting allowables for each of the several wells in the Project as well as the total project allowable based upon the pool's depth bracket allowable and the market demand percentage factor in effect. The aforesaid Pressure Maintenance Project Operator's Report shall be filed in lieu of Form C-120 for the Project."

(2) That Rule 9 on Page 4 of Order No. R-4389 is hereby corrected to read in its entirety as follows:

"RULE 9. The Commission shall, upon review of the report and after any adjustments deemed necessary, calculate the allowable for each well in the Project for the next succeeding month in accordance with these rules. The sum of the allowables so calculated shall be assigned to the Project and may be produced from the wells in the Project in any proportion except that no well in the Project which directly or diagonally offsets a well on another lease producing from the same common source of supply shall produce in excess of two times top unit allowable for the pool."

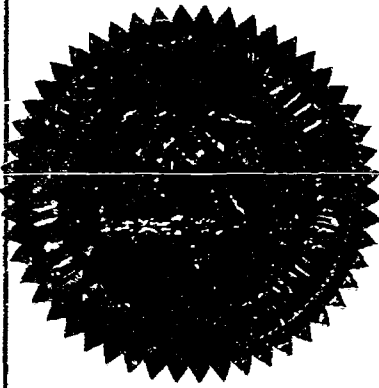
-2-

Case No. 4793

Order No. R-4389-A

(3) That this order shall be effective nunc pro tunc as of September 7, 1972.

DONE at Santa Fe, New Mexico, this 27th day of November, 1972.



STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

*Bruce King*  
BRUCE KING, Chairman

*Alex J. Adams*  
ALEX J. ADAMS, Member

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

S E A L

dr/

(Case 4790 continued from Page 1)

for the Dublin-Elzenburger Gas Pool, Lea County, New Mexico, including a provision for 640-acre spacing units. Applicant further seeks approval of a 480-acre non-standard unit in said pool comprising the S/2, S/2 of NE/4 and E/2NW/4 of Section 12, Township 26 South, Range 37 East, to be dedicated to its Tenneco Federal Well No. 1 located in Unit N of said Section 12.

CASE 4791: Application of Monsanto Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Burton Flat Deep Unit Area comprising 5,808 acres, more or less, of Federal, State, and Fee lands in Township 20 South, Range 28 East, and Township 21 South, Range 27 East, Eddy County, New Mexico.

CASE 4792: Application of David Fasken for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Walker Draw Unit Area comprising 7,040 acres, more or less, of Federal, State, and Fee lands in Sections 8, 9, 10, 15, 16, 17, 20, 21, 22, 28, and 29, Township 23 South, Range 23 East, Eddy County, New Mexico.

CASE 4793: Application of Tenneco Oil Company for a pressure maintenance project and unorthodox locations, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a pressure maintenance project in the South Hospah-Lower Sand Pool by the injection of water and gas into the Lower Hospah formation through three wells located at orthodox and unorthodox locations in Section 12, Township 17 North, Range 9 West, McKinley County, New Mexico.

Applicant further seeks a procedure whereby additional injection wells and expansion of the project area may be approved without the necessity of notice and hearing.

CASE 4794: Application of Green & Michaelson Producing Company for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests from the surface of the ground down to and including the Devonian formation underlying the N/2 of Section 2, Township 19 South, Range 23 East, Eddy County, New Mexico, to be dedicated to a wildcat Devonian well to be drilled at a standard location in the NE/4 of said Section 2.

Also to be considered will be the costs of drilling said well, a charge for the risk involved, a provision for the allocation of actual operating costs, and the establishment of charges for supervision of said well.

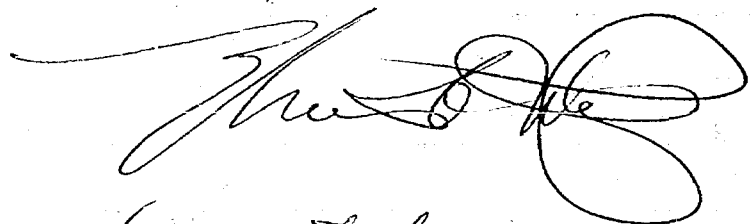
CASE 4760: (Readvertised)

Application of Anadarko Production Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks to institute a waterflood project by the injection of water into the

4793  
Heard 8-9-72  
Rec. 8-11-72

Grant Denno's request for  
a pressure maintenance project  
for the N/2 12 17 N - 9W, 70th  
So. Hospah - Lower Hospah  
zone. Also grant permission  
for 2 injection conversions &  
1 WSL for an injection con-  
version.

Denno - Hospah # 33 1340/N + 1710/W 12  
" " # 36 900/N - 2630/E 12  
" Locator 5'/N + 2950/E 12



Injection thru tubing & under a  
packer into open hole of Lower  
Hospah.

Grant Denno's request  
for other aug. & prod.  
wells in the project.



Elev: 7066' KB (12' AGL)

10 3/4", 32.75#, H-40 CSG. @61'  
Cmt'd w/70 sx. Cmt Circ.

Top Cmt. 1264'

2 7/8", 6.5#, J-55 tbg. on tension  
pkr. @ approx. 1625'

7", 20#, K-55 Csg. @ 1647'  
Cmt'd w/125 sx.  
Pay: Lower Hospah Sand  
1648' - 60' (Open Hole)

TD: 1660'

STATE EXAMINER LUTZ  
CONSERVATION COMMISSION  
EXHIBIT NO. 6  
4793  
by Applicant  
Hearing Date Aug. 9, 1972

Init. Stim: Completed Naturally  
Init. Pot.: 9-14-69 - Pmp'd 156 B0  
0 Wtr., GTSTM in 24 hrs.  
Recent Test: 7-11-72 - Pmp'd 41 BOPD,  
252 BWPD  
Cum. Prod: 7-1-72 - 46,032 B0,  
207,589 BW

TENNECO OIL COMPANY

South Hospah Lower Sand Field  
McKinley County, New Mexico

Hospah No. 33  
Proposed Gas-Water Injection Well  
1340' FNL & 1710' FWL, Section 12  
T17N, R9W,

Exhibit 6

A.L.S.

Elev :7019' KB (12' AGL)

10 3/4", 32.75#, H-40 csg. @ 68'  
cmt'd w/60sx cmt. circ.

Top Cmt. 1225'

BEFORE EXAMINER UTZ  
OIL CONSERVATION COMMISSION

EXHIBIT NO. 7

4793

Presented by Applicant  
Hearing Date AUG. 9, 1972

2 7/8", 6.5#, J-55 tbg. on tension  
pkr. @ approx. 1600'

7", 20#, K-55 csg. @ 1624'  
cmt'd. w/125 sx.

Pay: Lower Hospah Sand  
1624' - 35' (Open Hole)

T D: 1635'

Init. Stim: Completed Naturally  
Init. Pot: 9-9-69 - Pmp'd 96 BO  
0 wtr., GTSTM in 24 Hrs.  
Recent Test: 6-15-72 - Pmp'd 17 BOPD  
224 BWPD  
Cum Prod: 7-1-72 - 27,869 BO,  
179,398 BW

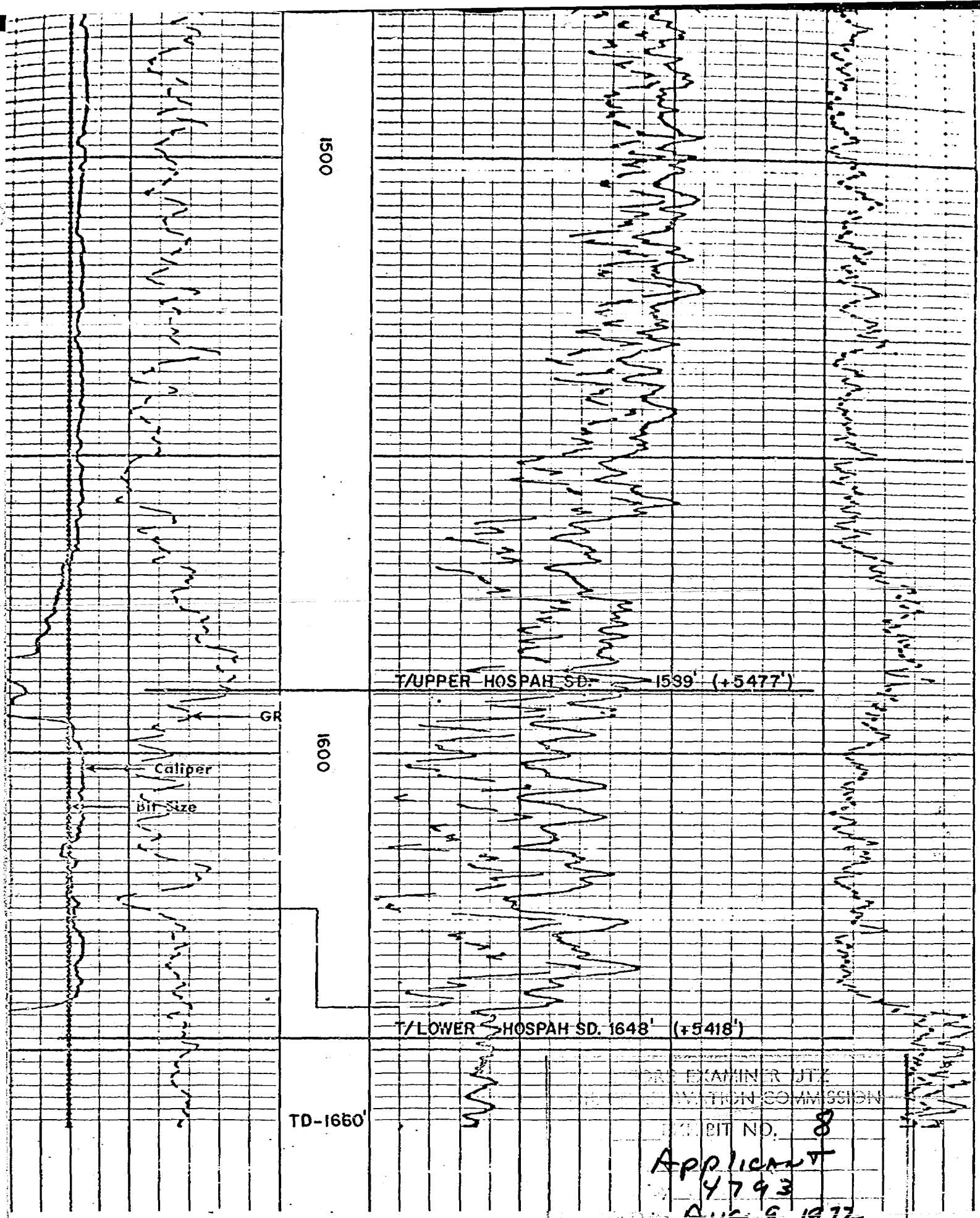
TENNECO OIL COMPANY

South Hospah Lower Sand Field  
McKinley County, New Mexico

Hospah No. 36  
Proposed Gas - Water Injection  
Well  
900' FNL & 2630' FEL, Section 12  
T17N, R9W

Exhibit 7

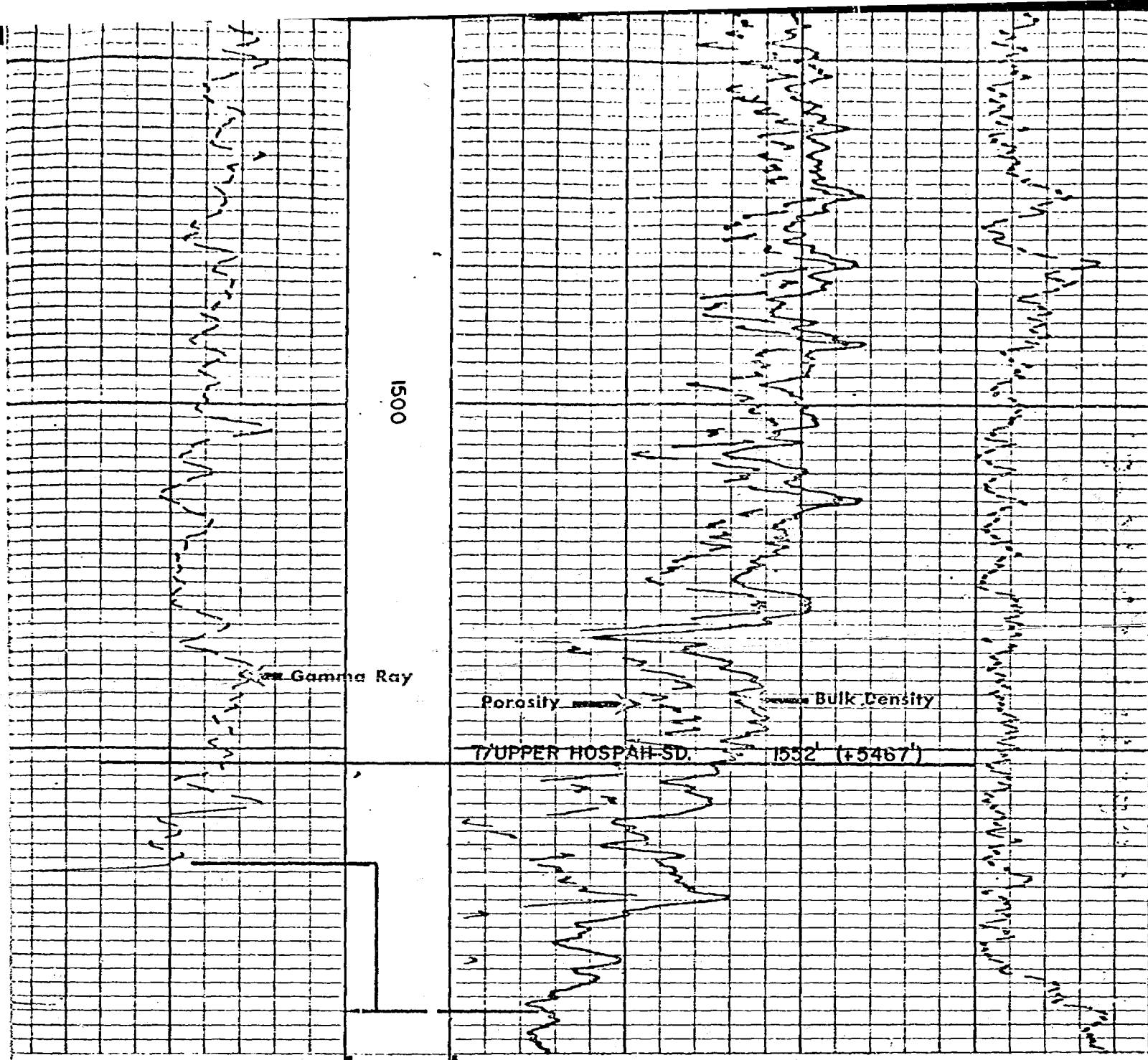
A.L.S.



SANDSTONE POROSITY — %		CORRECTION	
26	16	6	4 2 0 GRAMS/CC.
GRAIN DENSITY 2.65 GRAMS CC			
CALIPER		DEPTHS	
HOLE DIAM. IN INCHES			
COMPANY	TENNECO OIL COMPANY	Rm	-- @ -- "F
WELL	HOSPAH #33	BHT	TLTM "F
FIELD	HOSPAH		
COUNTY	MC KINLEY	STATE	NEW MEXICO
		SCHL. FR	1644'
		SCHL. TD	1645'
		DRLR TO	1647'
		Elev:	
		KB	7065.5'
		DF	7064'
		GL	7054'

CALIBRATION DATA

EXHIBIT 8



EXAMINER UTZ  
 INFORMATION COMMISSION  
 EXHIBIT NO. 9  
4793  
 APPLICANT  
 Hearing Date Aug 9, 1972

COMPANY TENNECO OIL COMPANY  
 WELL HOSPAH #36  
 FIELD HOSPAH  
 COUNTY MC KINLEY STATE NEW MEXICO

Rm -- @ -- °F  
 BHT TLTM °F

SCHL. FR 1588'  
 SCHL. TD 1589'  
 DRLR TD 1589'  
 Elev:  
 KB 7018.5'  
 DF 7017.5'  
 GL 7007'

CALIBRATION DATA

EXHIBIT 9



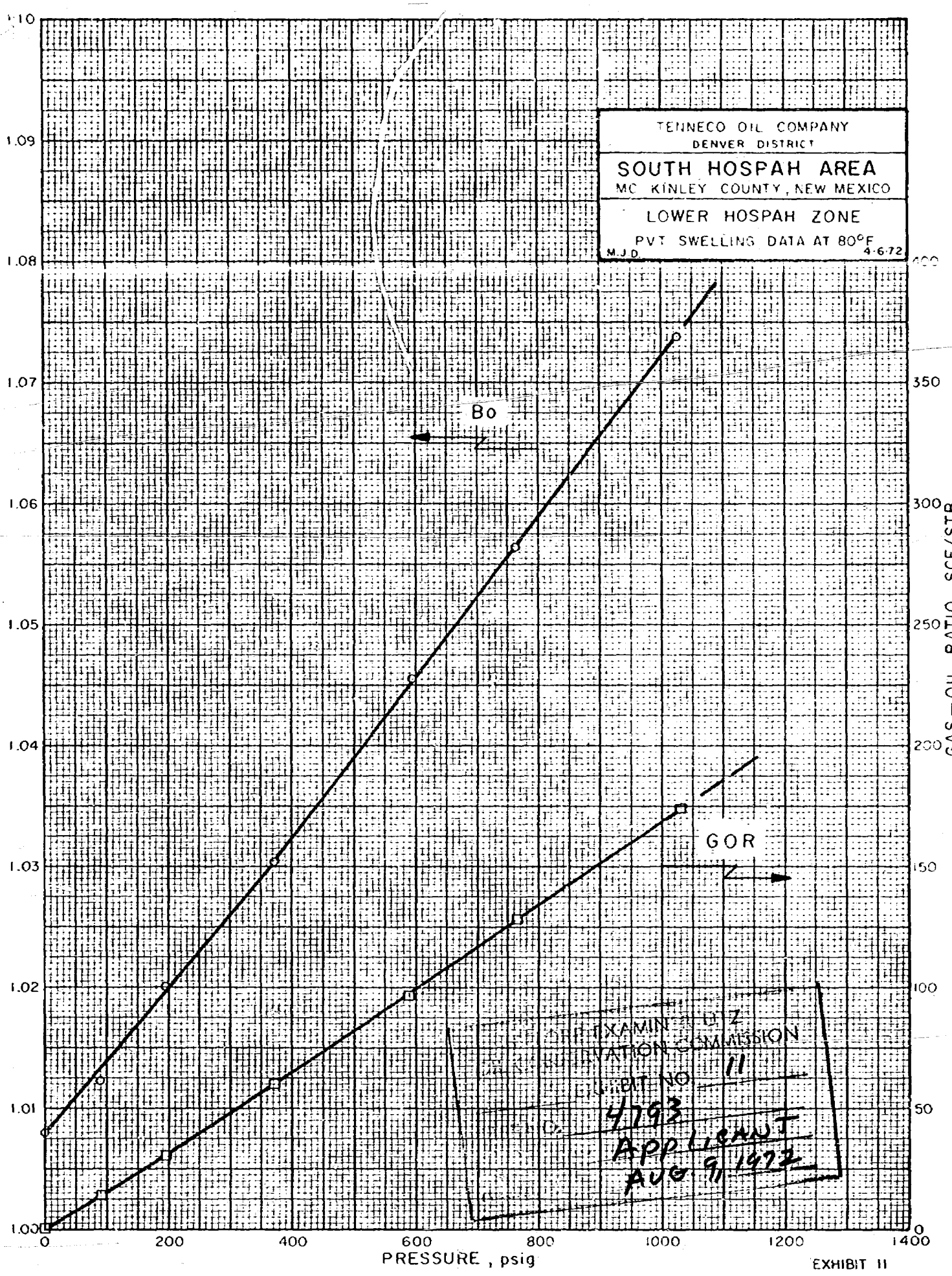
TABLE I  
TENNECO OIL COMPANY HOSPAH LEASE  
SOUTH HOSPAH (LOWER HOSPAH SAND) FIELD  
ROCK AND FLUID PROPERTIES

Average Depth to Sand, Ft.	1625
Average Gross Formation Thickness, Ft.	105
Average Porosity, %	27.5
Average Water Saturation, %	40
Average Air Permeability, md.	1100
Productive Area, Acs.	286
Average Net Pay, Ft.	25.7
Productive Volume, Ac-Ft.	7350
Initial Oil-in-place, STBO/Ac-Ft.	1242
Initial Oil-in-place, MSTBO	9129
Initial Reservoir Pressure, psig	600
Initial Reservoir Temperature, °F	80
Crude Viscosity @ 80 °F, cp	55
Crude Gravity @ 60 °F, °API	24
Initial Formation Volume Factor, Boi	1.04

BEFORE EXAMINER UTZ  
OIL CONSERVATION COMMISSION  
EXHIBIT NO. 10  
FILE NO. 4793  
Submitted by APPLICANT  
Hearing Date AUG. 9, 1972

Exhibit 10

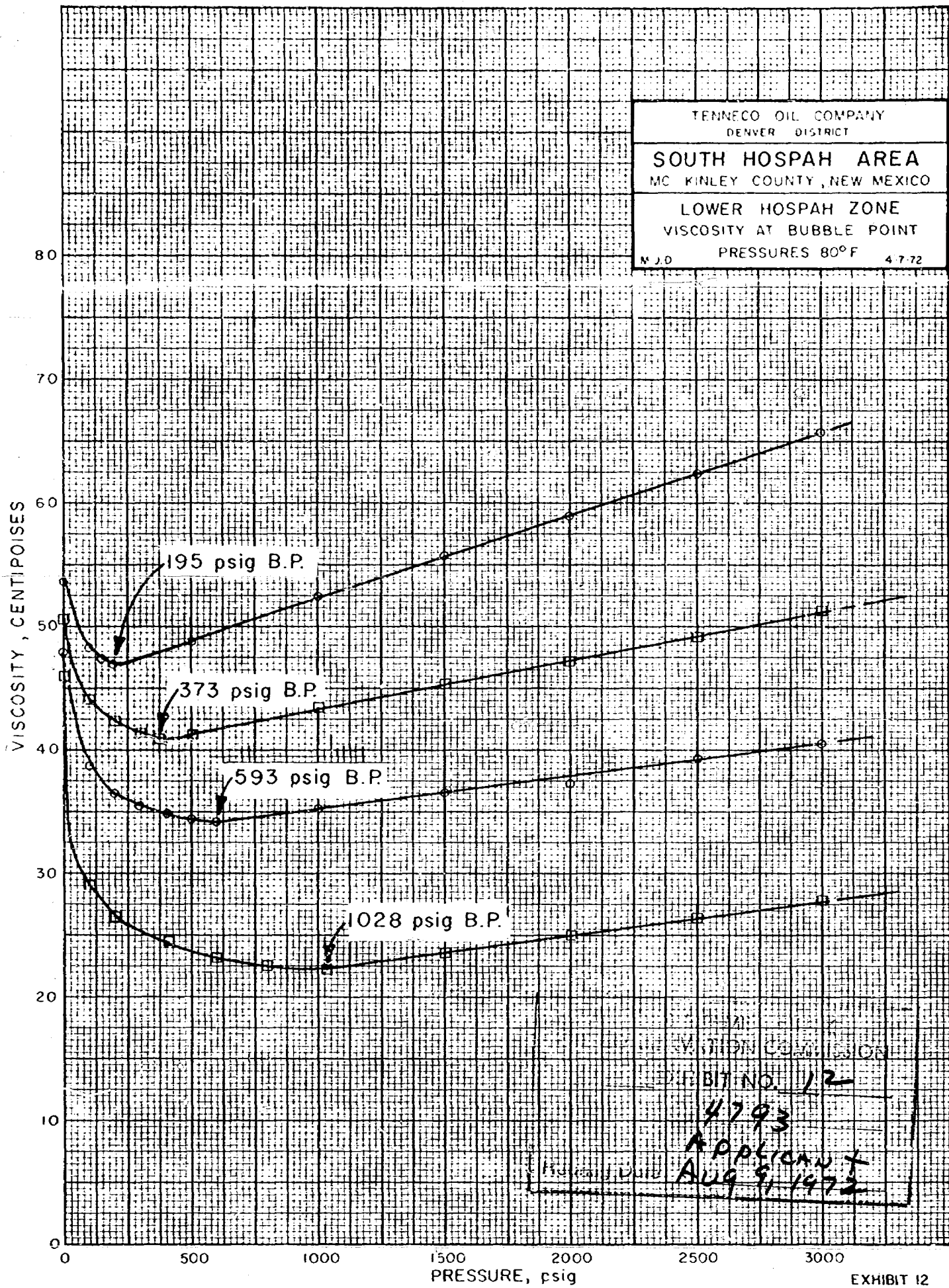
RELATIVE VOLUME,  $B_o$



TENNECO OIL COMPANY  
DENVER DISTRICT  
SOUTH HOSPAH AREA  
MC KINLEY COUNTY, NEW MEXICO  
LOWER HOSPAH ZONE  
PVT SWELLING DATA AT 80°F  
M.J.D. 4-6-72

PRESSURE, psig

EXHIBIT 11



/dr

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. 4793

Order No. R-4389

APPLICATION OF TENNECO OIL COMPANY  
FOR A PRESSURE MAINTENANCE PROJECT  
AND UNORTHODOX LOCATIONS, MCKINLEY  
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on August 9, 1972  
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this September day of August, 1972, 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 a pressure maintenance project in the  
South Hospah-Lower Sand Pool by the simultaneous injection of  
water and gas into the Lower Hospah formation through <sup>two</sup> ~~three~~ wells  
located at ~~orthodox and unorthodox locations~~ in Section 12,  
Township 17 North, Range 9 West, McKinley County, New Mexico.

(3) That the applicant further seeks the designation of the project area and the promulgation of special rules and regulations governing said project.

(4) That initially the project area should comprise only the following-described area:

McKINLEY COUNTY, NEW MEXICO  
TOWNSHIP 17 NORTH, RANGE 9 WEST, NMPM  
Section 12: NW/4 ECLD 1/2 NE/4

(5) That a pressure maintenance project, designated the Tenneco Lower Hospah Pressure Maintenance Project, comprising the above described area is in the interest of conservation and should result in greater ultimate recovery of oil, thereby preventing waste.

(6) That an administrative procedure should be established whereby said project area may be expanded for good cause shown and whereby additional wells in the project area may be converted to water injection.

(7) That special rules and regulations for the operation of the Tenneco Lower Hospah Pressure Maintenance Project should be promulgated and, for operational convenience, such rules should provide certain flexibility in authorizing the production of the project allowable from any well or wells in the project area in any proportion, provided that no well in the project area which directly or diagonally offsets a well on another lease producing from the same common source of supply should be allowed to produce in excess of top unit allowable for the South Hospah-Lower Sand Pool until such time as the well has experienced a substantial response to water injection. When such a response has occurred, the well should be permitted to produce up to two times top unit allowable for the South Hospah-Lower Sand Pool. Production of such well at a higher rate should be authorized only after notice and hearing.

IT IS THEREFORE ORDERED:

(1) That the applicant, Tenneco Oil Company, is hereby authorized to institute a pressure maintenance project in the South Hospah-Lower Sand Pool, ~~in its~~

~~lease~~, McKinley County, New Mexico, to be designated the Tenneco

Hower Hospah Pressure Maintenance Project, by the simultaneous injection of water and gas into <sup>the open-hole interval opposite the</sup> ~~the~~ Lower Hospah formation through the following-described <sup>two</sup> ~~three~~ wells in Section 12, Township 17 North, Range 9 West, NMPM, McKinley County, New Mexico:

Hospah well no. 33 - 1340 feet from the North line  
and 1710 feet from the West line;  
Hospah well no. 36 - 900 feet from the North line and  
2630 feet from East line.

(2) That the aforesaid ~~water~~ injection wells shall be equipped with <sup>2 3/8</sup> ~~2 1/2~~-inch tubing set in ~~packers~~ <sup>said packers being</sup> ~~said packer~~ <sup>located within 100 feet of the casing shoe.</sup> being set at approximately \_\_\_\_\_ feet. Further, that the casing tubing annulus shall be filled with an inert fluid and the annulus equipped with a pressure gauge to facilitate detection of leakage in the tubing or packer.

(3) That Special Rules and Regulations governing the operation of the Tenneco Lower Hospah Pressure Maintenance Project, McKinley County, New Mexico, are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS  
FOR THE

TENNECO LOWER HOSPAH PRESSURE MAINTENANCE PROJECT

RULE 1. The project area of the Tenneco Lower Hospah Pressure Maintenance Project, hereinafter referred to as the Project, shall comprise the area described as follows:

McKINLEY COUNTY, NEW MEXICO  
TOWNSHIP 17 NORTH, RANGE 9 WEST, NMPM  
Section 12: SW 1/4 and W 1/2 NE 1/4.

RULE 2. The allowables for the Project shall be the sum of the allowables of the several wells within the project area, including those wells which are shut-in, curtailed, or used as injection wells. Allowables for all wells shall be determined in a manner hereinafter prescribed.

RULE 3. Allowables for injection wells may be transferred to producing wells within the project area, as may the allowables for producing wells which, in the interest of more efficient operation of the Project, are shut-in or curtailed because of high gas-oil ratio or are shut-in for any of the following reasons: pressure regulation, control of pattern or sweep efficiencies, or to observe changes in pressures or changes in characteristics of reservoir liquids or progress of sweep.

RULE 4. The allowable assigned to any well which is shut-in or which is curtailed in accordance with the provisions of Rule 3 which allowable is to be transferred to any well or wells in the project area for production, shall in no event be greater than its ability to produce during the test prescribed by Rule 6, below, or greater than the current top unit allowable for the pool during the month of transfer, whichever is less.

RULE 5. The allowable assigned to any injection well on a 40-acre proration unit shall be top unit allowable for the South Hospah-Lower Sand Pool.

RULE 6. The allowable assigned to any well which is shut-in or curtailed in accordance with Rule 3, shall be determined by a 24-hour test at a stabilized rate of production, which shall be the final 24-hour period of a 72-hour test throughout which the well should be produced in the same manner and at a constant rate. The daily tolerance limitation set forth in Commission Rule 502 I (a) and the limiting gas-oil ratio (2,000 to 1) for the pool shall be waived during such tests. The project operator shall notify all operators offsetting the well, as well as the Commission, of the exact time such tests are to be conducted. Tests may be witnessed by representatives of the offsetting operators and the Commission, if they so desire.

RULE 7. The basic allowable assigned to each producing well in the Project shall be equal to the well's ability to produce or to top unit allowable for the pool, whichever is less. Wells capable of producing more than top unit allowable may also receive transfer allowable, provided however, that no producing well in the project area which directly or diagonally offsets a well on another lease producing from the same common source of supply shall receive an allowable or produce in excess of two times top unit allowable for the pool. Each producing well shall be subject to the limiting gas-oil ratio (2,000 to 1) for the pool.

*every four*  
RULE 8. Each month the project operator shall, within three days after the normal unit allowable for Southeast New Mexico has been established, submit to the Commission a Pressure Maintenance Project Operator's Report, on a form prescribed by the Commission, outlining thereon the data required, and requesting allowables for each of the several wells in the Project as well as the total project allowable. *based upon the pool's depth bracket allowable and the* The aforesaid Pressure Maintenance Project Operator's Report shall be filed in lieu of Form C-120 for the Project.

RULE 9. The Commission shall, upon review of the report and after any adjustments deemed necessary, calculate the allowable for each well in the Project for the next <sup>two</sup> succeeding months in accordance with these rules. The sum of the allowables so calculated shall be assigned to the Project and may be produced from the wells in the Project in any proportion except that no well in the Project which directly or diagonally offsets a well on another lease producing from the same common source of supply shall produce in excess of two times top unit allowable for the pool.

*market demand permitting in effect*



RULE 10. The conversion of producing wells to injection, the drilling of additional wells for injection, and expansion of the project area shall be accomplished only after approval of the same by the Secretary-Director of the Commission. To obtain such approval, the project operator shall file proper application with the Commission, which application, if it seeks authorization to convert additional wells to injection or to drill additional injection wells shall include the following:

(1) A plat showing the location of proposed injection wells, all wells within the project area, and offset operators, locating wells which offset the project area.

(2) A schematic drawing of the proposed injection wells which fully describes the casing, tubing, perforated interval, and depth showing that the injection of gas or water will be confined to the Lower-Hospah formation.

(3) A letter stating that all offset operators to the proposed injection wells have been furnished a complete copy of the application and the date of notification.

The Secretary-Director may approve the proposed injection wells if, within 20 days after receiving the application, no objection to the proposal is received. The Secretary-Director may grant immediate approval, provided waivers of objection are received from all offset operators.

Expansion of the project area may be approved by the Secretary-Director of the Commission administratively when good cause is shown therefor.

(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.

draft

(JW)

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. 4793  
Order No. R-4389-A

APPLICATION OF TENNECO OIL COMPANY  
FOR A PRESSURE MAINTENANCE PROJECT  
AND UNORTHODOX LOCATIONS, MCKINLEY  
COUNTY, NEW MEXICO.

NUNC PRO TUNC ORDER

BY THE COMMISSION:

It appearing to the Commission that Order No. R-4389, dated  
September 7, 1972, does not correctly state the intended order  
of the Commission ~~XXXXXXXXXX~~ as stated below.

IT IS THEREFORE ORDERED:

(1) That RULE 8 ~~XX~~ on Page 4  
of Order No. R-4389 is hereby corrected to read in its entirety  
as follows:

"RULE 8. Each month the project operator shall submit to  
the Commission a Pressure Maintenance Project Operator's Report,  
on a form prescribed by the Commission, outlining thereon the  
data required, and requesting allowables for each of the several  
wells in the Project as well as the total project allowable  
based upon the pool's depth bracket allowable and the market  
demand percentage factor in effect. The aforesaid Pressure  
Maintenance Project Operator's Report shall be filed in lieu  
of Form C-120 for the Project."

(2) That Rule 9 on Page 4 of Order No. R-4389 is hereby  
corrected to read in its entirety as follows:

"RULE 9. The Commission shall, upon review of the report  
and after any adjustments deemed necessary, calculate the  
allowable for each well in the Project for the next succeeding  
month in accordance with these rules. The sum of the allowables  
so calculated shall be assigned to the Project and may be pro-  
duced from the wells in the Project in any proportion except  
that no well in the Project which directly or diagonally off-  
sets a well on another lease producing from the same common  
source of supply shall produce in excess of two times top unit  
allowable for the pool."

-2-

Case No. 4793  
Order No. R-4389-A

(3) That this order shall be effective nunc pro tunc as of  
September 7 , 1972.

DONE at Santa Fe, New Mexico, this \_\_\_\_\_ day of November,  
1972.

Tenneco & Tesoro =

Gas - water injection project -

Hospah lease - lower Hospah zone

Sec 12 - T 17 N R 9 W

McKinley -

→ 3 wells - which - gas  
- water  
= future expansion =

Tesoro =

= Pool =

lower Hospah formation

Booker Kelly