

CASE 3073: Application of TEXACO  
for the creation of new oil pool  
and for special rules.

Dec. Order R-2758-A  
R-7758-B  
R-2758-B  
= 198

3,000 Ac. Case

CASE No.  
3073

Application,  
TRANSCRIPTS,  
SMALL Exhibits  
ETC.

TOCITO DOME PENNSYLVANIAN "D" POOL  
SAN JUAN COUNTY, NEW MEXICO  
BASIC RESERVOIR DATA

|                                |           |
|--------------------------------|-----------|
| Porosity                       | 9.2%      |
| Permeability                   | 148 Md    |
| Water Saturation               | 25%       |
| Oil Gravity, API               | 46        |
| Gas Gravity                    | 0.72      |
| Condensate Gravity, °API       | 64        |
| Bottom Hole Temperature, °F.   | 158       |
| Bottom Hole Pressure, Original | 3215 psia |
| Bottom Hole Pressure, 6-1-65   | 3005 psia |
| Cumulative Production, 6-1-65  |           |
| Barrels Oil                    | 343,455   |
| MCF Gas (Casinghead)           | 443,169   |
| MCF Gas (Gas Well)             | 400,219   |
| Number of Wells                |           |
| Oil                            | 11        |
| Gas                            | 5         |
| Current Production             |           |
| Oil, BOPD                      | 2608      |
| Gas Well Gas, MCFD             | 5344      |

3073

**CORE LABORATORIES, INC.**

*Petroleum Reservoir Engineering*

DALLAS, TEXAS

May 22, 1964

RESERVOIR FLUID DIVISION

Texaco Inc.  
P. O. Box 810  
Farmington, New Mexico

Attention: Mr. A. G. Waish

Subject: Reservoir Fluid Study  
Navajo "AL" No. 1 Well  
Undesignated (Tocito Dome) Field  
San Juan County, New Mexico

BEFORE EXAMINER UTZ  
OIL CONSERVATION COMMISSION  
TEXACO EXHIBIT NO. C  
CASE NO. 3073

Gentlemen:

Samples of separator liquid and vapor were collected from the subject well on May 6, 1964. These samples, together with a sample of stock tank liquid, were shipped to our Dallas laboratory for studies. The results of these studies are presented to you in this report.

The producing gas-liquid ratio measured in the field and after correction for the factors shown on page one of the report was 3290 cubic feet of separator gas at 14.7 psia and 60° F. per barrel of stock tank liquid at 60° F. In the laboratory this ratio was found to be equivalent to 3238 standard cubic feet of separator gas per barrel of separator liquid. The separator products were then physically recombined in this ratio and examined in a visual cell at the reservoir temperature of 159° F. The mixture exhibited a bubble point pressure of 5320 psig. This value is considerably above the reservoir pressure. When viewed at the reservoir pressure of approximately 3200 psig the system was found to be in two phases. Approximately 42 per cent of the system volume was liquid.

These results have been previously transmitted by telephone. The composition of the separator products and the stock tank liquids are presented on the following pages with the calculated composition of the producing

*Exhibit C*  
*Page 1*

Page Two

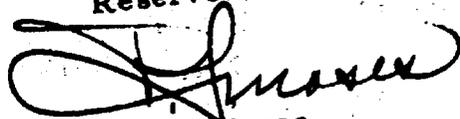
Texaco Inc.  
Navajo "AL" No. 1 Well

well stream at the time the well was tested.

It was a pleasure to perform these tests for you. Should you have any questions, please do not hesitate to contact us.

Very truly yours,

Core Laboratories, Inc.  
Reservoir Fluid Division



P. L. Moses  
Operations Supervisor

PLM:jr

Exhibit C  
Page 2

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

Company Texaco Inc. Date Sampled May 6, 1964  
 Well Navajo "AL" No. 1 County San Juan  
 Field Undesignated (Tocito Dome) State New Mexico

**FORMATION CHARACTERISTICS**

Formation Name \_\_\_\_\_  
 Date First Well Completed \_\_\_\_\_  
 Original Reservoir Pressure \_\_\_\_\_  
 Original Produced Gas-Liquid Ratio \_\_\_\_\_  
 Production Rate \_\_\_\_\_  
 Separator Pressure and Temperature \_\_\_\_\_  
 Liquid Gravity at 60° F. \_\_\_\_\_

Pennsylvanian-Barber Creek  
May 3 \_\_\_\_\_, 1964  
3214 PSIG @ 6285 Ft.  
2911 \_\_\_\_\_ SCF/Bbl  
 \_\_\_\_\_ Bbls/Day  
 \_\_\_\_\_ PSIG \_\_\_\_\_ ° F.  
 \_\_\_\_\_ ° API  
 \_\_\_\_\_ Ft. Subsea

**Datums**

Elevation \_\_\_\_\_  
 Total Depth \_\_\_\_\_  
 Producing Interval \_\_\_\_\_  
 Tubing Size and Depth \_\_\_\_\_  
 Open Flow Potential \_\_\_\_\_  
 Last Reservoir Pressure \_\_\_\_\_

**WELL CHARACTERISTICS**

5763 DF \_\_\_\_\_ Ft.  
6910 \_\_\_\_\_ Ft.  
6275-6302 \_\_\_\_\_ Ft.  
2 - 3/8 In. to 6189 Ft.  
3206 PSIG @ 6288 Ft.  
May 6 \_\_\_\_\_, 1964  
157 ° F. @ 6150 Ft.

Date \_\_\_\_\_  
 Reservoir Temperature \_\_\_\_\_  
 Status of Well \_\_\_\_\_  
 Pressure Gauge \_\_\_\_\_

**SAMPLING CONDITIONS**

1892 \_\_\_\_\_ PSIA  
2778 @ 6288 Ft. \_\_\_\_\_ PSIA  
55 \_\_\_\_\_ ° F.  
43 \_\_\_\_\_ ° F.  
 \_\_\_\_\_ ° API @ 60° F.  
962.1 \_\_\_\_\_ MSCF/Day

Flowing Tubing Pressure \_\_\_\_\_  
 Flowing Bottom Hole Pressure \_\_\_\_\_  
 Primary Separator Pressure \_\_\_\_\_  
 Primary Separator Temperature \_\_\_\_\_  
 Secondary Separator Pressure \_\_\_\_\_  
 Secondary Separator Temperature \_\_\_\_\_  
 Field Stock Tank Liquid Gravity \_\_\_\_\_  
 Primary Separator Gas Production Rate \_\_\_\_\_  
 Pressure Base \_\_\_\_\_

14.7 PSIA  
60 ° F.  
1.012  
0.724  
1.1753

Temperature Base \_\_\_\_\_  
 Compressibility Factor ( $F_{pv}$ ) \_\_\_\_\_  
 Gas Gravity (Laboratory) \_\_\_\_\_  
 Gas Gravity Factor ( $F_g$ ) \_\_\_\_\_  
 Stock Tank Liquid Production Rate @ 60° F. \_\_\_\_\_  
 Primary Separator Gas/ Stock Tank Liquid Ratio \_\_\_\_\_  
 or \_\_\_\_\_

292.5 \_\_\_\_\_ Bbls/Day  
3290 \_\_\_\_\_ SCF/Bbl  
304.0 \_\_\_\_\_ Bbls/MMSCF

Core Laboratories, Inc., Engineer  
 REMARKS:

*Exhibit 'C'*  
*Page 3*

BEFORE EXAMINER UTZ  
 OIL CONSERVATION COMMISSION  
 TEXAS EXHIBIT NO. D  
 CASE NO. 3073

EXHIBIT "D"

Economics of Development  
 And Production  
 Tociito Dome Area  
 San Juan County, New Mexico

|  | <u>80-Acre</u> | <u>160-Acre</u> |
|--|----------------|-----------------|
| <u>Estimated Production</u>              |                |                 |
| Oil, Barrels                             | 72,000         | 144,000         |
| Gas, MMCF                                | 270            | 540             |
| Estimated Productive<br>Life, Years      | 6              | 8               |
| Present Worth<br>Working Interest Income | \$162,000      | \$310,000       |
| Less Development and<br>Operating Costs  | \$142,000      | \$167,000       |
| Net Income                               | \$20,000       | \$143,000       |

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 1630 A.R. ...  
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 7000 ...  
 8000 ...

BEFORE EXAMINER UTZ  
 OIL CONSERVATION COMMISSION  
Texaco EXHIBIT NO. E  
 CASE NO. 3073

EXHIBIT "E"

Tabulation of Initial Bottom Hole Pressures  
Tocito Dome Area  
San Juan County, New Mexico

| <u>WELL</u>                   | <u>RECORDED PRESSURE</u> | <u>DATUM</u> | <u>PRESSURE CORRECTED TO 525 FEET SUBSEA</u> |
|-------------------------------|--------------------------|--------------|--|
| Pan American Navajo "N" No. 1 | 3199 psi                 | -495'        | 3207 psi                                     |
| Pan American Navajo "P" No. 1 | 3215                     | -525'        | 3215   |
| TEXACO Inc. Navajo "AL" No. 1 | 3167                     | -386         | 3206   |

Exhibit "E"

EXHIBIT "F"

Proposed Special Rules and Regulations  
for the Tocito Dome-Pennsylvanian Pool  
San Juan County, New Mexico

RULE 1.

Each well completed or recompleted in the Pennsylvanian formation within the boundary of the Tocito Dome-Pennsylvanian Pool or within one mile thereof, and not nearer to nor within the boundaries of another designated Penn. pool, shall be drilled, spaced, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2.

(a) Each gas well completed or recompleted in the Tocito Dome-Penn. Oil Pool shall be located on a tract consisting of approximately 640 acres which may reasonably be presumed to be productive of gas from said Pool, and which shall comprise a single governmental section of the United States Public Lands Survey. For purposes of these Rules, a unit consisting of between 632 and 645 surface contiguous acres shall be considered a standard gas unit. Nothing contained herein shall be construed as prohibiting the drilling of a gas well on each quarter section in the 640-acre unit.

~~In order to facilitate the leasing of odd lot acreage by the State, Wells may be drilled on non-standard spacing units as exceptions to Rule 2(a) after notice and hearing and where the following provisions are complied with:~~

- (1) The non-standard unit consists of contiguous quarter-quarter sections or lots.
- (2) The entire non-standard unit may reasonably be presumed to be productive of gas from said pool.
- (3) The applicant presents proof of the fact that all offset operators, and all operators owning interests in the section in which any part of the non-standard unit is situated and which acreage is not included in the non-standard unit were notified by registered mail of his intent to form a non-standard gas unit.
- (4) The allowable assigned to any such non-standard gas proration unit shall bear the same ratio to a standard allowable in said pool as the acreage in the unit bears to 640 acres.

RULE 3.

(a) Each oil well completed or recompleted in the Tocito Dome-Penn. Oil Pool shall be located on a unit containing approximately 160 acres, which may reasonably be presumed to be productive of oil from said pool, and which consists of a single governmental quarter section. For purposes of these Rules, a unit consisting of between 158 and 162 surface contiguous acres shall be considered a standard unit. Nothing contained herein shall be construed as prohibiting the drilling of an oil well on each of the Quarter-quarter sections in the 160-acre unit.

(b) ~~In order to facilitate the leasing of odd lot acreage by the Navajo Tribe,~~ Wells may be drilled on the following non-standard spacing units as exceptions to Rule 3 (a) after notice and hearing and where the following provisions are complied with:

- (1) On non-standard 120-acre unit comprising three governmental quarter-quarter sections lying within a governmental quarter section and contiguous by common bordering sides; or
- (2) On a non-standard 80-acre unit comprising two governmental quarter-quarter sections lying within a governmental quarter section and contiguous by a common bordering side, or
- (3) On a non-standard 40-acre unit comprising a single governmental quarter-quarter section.
- (4) The entire non-standard unit may reasonably be presumed to be productive of oil from said pool.
- (5) The applicant will furnish proof of the fact that all of the offset operators were notified by registered mail of his intent to form such non-standard unit.

(c) A standard proration unit shall be assigned a 160-acre proportional factor of 4.77 for allowable purposes.

(d) The allowable assigned to any such non-standard oil proration unit shall bear the same ratio to a standard allowable in said pool as the acreage in the unit bears to 160 acres.

(e) In order to make interference tests the District Supervisor shall have authority to approve, without notice and hearing and without administrative approval by the Secretary-Director, application by operators to shut in one of the wells completed in said pool and to transfer its allowable to any other completed well or wells on the same basic lease, or on leases with identical ownership; which are producing from said pool. Provided, however, that such allowable transfer shall be limited to a period not to exceed six (6) months.

RULE 4.

(a) Each well, oil or gas, completed or recompleted in the Tocito Dome-Penn. Pool shall be located no closer than 510 feet to any quarter section line and each such well shall be located within 150 feet of the center of the ~~well or well~~ of any quarter section. Any well drilled and producing from the Tocito Dome-Penn. Pool prior to the effective date of this Order at a location conforming to the well location requirements in effect at the time the well was drilled shall be considered to be located in conformance with this Rule.

(b) The Secretary-Director shall have authority to grant an exception to Rule 4 (a) without notice and hearing when the application has been filed in due form and the Secretary-Director determines that good cause exists for granting such exception. However, such an unorthodox location, if approved, may necessitate an allowable adjustment.

Applicant shall furnish all offset operators a copy of the application to the Commission, and the applicant shall include with his application a list of the names and addresses of all such operators together with a stipulation that proper notice has been given said operators at the addresses listed. The Secretary-Director of the Commission shall wait at least 20 days before approving any such unorthodox location, and only in the absence of objection from an offset operator may such application be approved.

RULE 5.

A well in the Tocito Dome-Penn. Oil Pool shall be classified as a gas well if it has a gas-liquid ratio of 20,000 cubic feet of gas per barrel of liquid hydrocarbons, or more. A well in said pool shall be classified as an oil well if it has a gas-liquid ratio of less than 20,000 cubic feet of gas per barrel of liquid hydrocarbons. The simultaneous dedication of any acreage to both an oil well and a gas well is strictly prohibited.

RULE 6.

The gas-liquid ratio limitation for the Tocito Dome-Penn. Oil Pool shall be 4,000 cubic feet of gas per barrel of liquid hydrocarbons produced.

RULE 7.

Any oil well in the Tocito Dome-Penn. Oil Pool which has 160 acres dedicated to it shall be permitted to produce an amount of gas determined by multiplying the top unit oil allowable for said pool by the limiting gas-liquid ratio for the pool (4,000). In the event there is more than one oil well on a 160-acre oil proration unit, the operator may produce the allowable assigned to the 160-acre unit from said wells in any proportion.

Any gas well in the Tocito Dome-Penn. Oil Pool shall be permitted to produce that amount of gas obtained by multiplying the top unit oil allowable for the pool by 4,000 by a fraction, the numerator of which is the number of acres dedicated to the particular gas well and the denominator of which is 160. In the event there is more than one gas well on a 640-acre gas proration unit, the operator may produce the

amount of gas assigned to the unit from said wells in any proportion.

RULE 8.

The operator of each newly completed well in the Tocito Dome-Penn. Oil Pool shall cause a gas-liquid ratio test to be taken on said well upon recovery of all load oil from the well, provided, however, that in no event shall the test be commenced \* sooner than 20 days nor later than 30 days from the date of first production. Provided further, that any well which is shut in shall be exempted from the aforesaid gas-liquid ratio test requirement so long as it remains shut in. The initial gas-liquid ratio test shall be taken in the manner prescribed by Rule 9. If the gas-liquid ratio is 20,000 cubic feet of gas per barrel of liquid hydrocarbons, or more, the operator shall not produce the well until beneficial use can be made of the gas.

RULE 9.

Gas-liquid ratio tests shall be taken on all wells in the Tocito Dome-Penn. Oil Pool, and on all wells producing from the Penn. formation within one mile of the boundaries of the Tocito Dome-Penn. Oil Pool which are not within another designated Penn. oil pool, during the months of January and July of each year. The initial gas-liquid ratio test shall suffice as the first semiannual test. Tests shall be 24-hour tests being the final 24 hours of a 72-hour period during which the well shall be produced at a constant normal rate of production. Results of such tests shall be filed on Commission Form C-116 on or before the 10th day of the following month. At least 72 hours prior to commencement of any such gas-liquid ratio tests, each operator shall file with the Aztec office of the Commission a test schedule for its wells, specifying the time each of its wells is to be tested. Copies of the test schedule shall also be furnished to all offset operators.

Special tests shall also be taken at the request of the Secretary-Director and may also be taken at the option of the operator. Such special tests shall be taken in accordance with the procedures outlined hereinabove, including notification to the Commission and offset operators.

RULE 10.

An initial shut-in pressure test shall be taken on each gas well and shall be reported to the Commission on Form C-125.

RULE 11.

Any well completed in the Tocito Dome-Penn. after the effective date of this Order shall receive an allowable only upon receipt by the Commission's Aztec Office of Commission Forms C-104, C-110, and C-116, all properly executed. The District Supervisor of the Commission's Aztec Office is hereby authorized to assign a temporary gas allowable to wells connected to a gas transportation facility during the recovery of load oil, which allowable shall not exceed the number of cubic feet of gas obtained by multiplying the daily top unit allowable for the Tocito Dome-Penn. Oil Pool by 4,000.

RULE 12.

The initial gas proration period shall be from 7 o'clock a.m. on August 1, 1964 to 7 o'clock a.m. on February 1, 1965. Subsequently, the dates 7 o'clock a.m. February the first and 7 o'clock a.m. August the first shall be known as balancing dates, and the periods of time bounded by these dates shall be known as the gas proration periods for the Tocito Dome-Penn. Oil Pool.

RULE 13.

Any gas well which has an underproduced status as of the end of a gas proration period shall be allowed to carry such underproduction forward into the next gas proration period and may produce such underproduction in addition to the allowable assigned during such succeeding period. Any allowable carried forward into a gas proration period and remaining unproduced at the end of such gas proration period shall be cancelled.

RULE 14.

Production during any one month of a gas proration period in excess of the allowable assigned to a well for such month shall be applied against the underproduction carried into such period in determining the amount of allowable, if any, to be cancelled.

RULE 15.

Any well which has an overproduced status as of the end of a gas proration period shall carry such overproduction forward into the next gas proration period, provided that such overproduction shall be compensated for during such succeeding period. Any well which has not compensated for the overproduction carried into a gas proration period by the end of such proration period shall be shut in until such overproduction is compensated for. If, at any time, a well is overproduced an amount equalling three times its current monthly allowable, it shall be shut in during that month and each succeeding month until the well is overproduced less than three times its current monthly allowable.

RULE 16.

The allowable assigned to a well during any one month of a gas proration period in excess of the production for the same month shall be applied against the overproduction carried into such period in determining the amount of overproduction, if any, which has not been compensated for.

RULE 17.

The Commission may allow overproduction to be compensated for at a lesser rate than would be the case if the well were completely shut in upon a showing after notice and hearing that complete shut in of the well would result in material damage to the well and/or reservoir.

RULE 18.

Each purchaser or taker of gas shall submit a report to the Commission on or before the 15th day of the month next succeeding the month in which the gas was purchased or taken. Such report shall be filed on either Form C-111 or Form C-114 (whichever is applicable) with the wells being listed in approximately the same order as they are listed on the oil proration schedule.

RULE 19.

Failure to comply with any provision of this Order or the Rules contained herein shall result in the immediate cancellation of allowable assigned to the affected well. No further allowable shall be assigned until all Rules and Regulations have been complied with. The District Supervisor shall notify the operator of the well and the purchaser in writing of the date of allowable cancellation and the reason therefor.

RULE 20.

All transporters or users of gas shall file gas well-connection notices with the Commission as soon as possible after the date of connection.

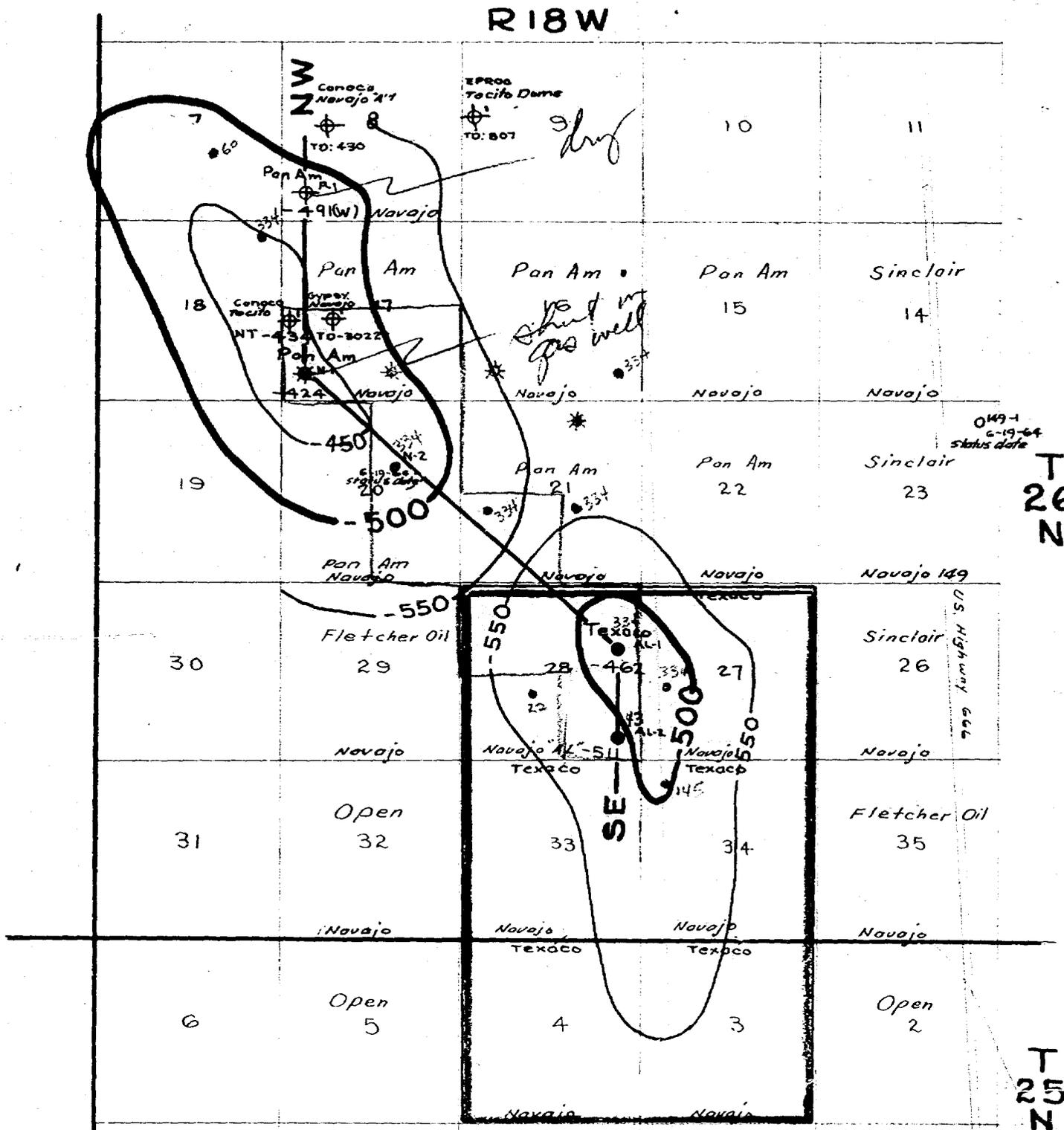
RULE 21.

Allowables to wells whose classification has changed from oil to gas or from gas to oil as the result of a gas-liquid ratio test shall commence on the first day of the month following the month in which such test was reported, provided that a plat (Form C-128) showing the acreage dedicated to the well and the location of all wells on the dedicated acreage have been filed.

RULE 22.

The vertical limits of the Tocito Dome-Penn. Oil Pool shall be the Penn. formation.

• Red wells & shut-ins  
 Drawn from July 1955 sheet



- LEGEND**
- ⊕ Dry hole
  - \* Gas Well, Paradox-Penn.
  - Oil Well, Paradox-Penn.
  - Outline of spaced area
  - Location
  - NT Not Tested
  - 434 Top of Barker Creek
  - 419(W) Tested water

TEXACO INC.  
 DENVER COLORADO  
**TOCITO DOME PENNSYLVANIAN FIELD**  
 CONTOURED ON TOP OF BARKER CREEK ZONE  
 C.I. = 50'  
 SCALE: 1"=4000'  
**EXHIBIT "A"**

CORE LABORATORIES, INC.  
Petroleum Reservoir Engineering  
DALLAS, TEXAS  
May 22, 1964

RESERVOIR FLUID DIVISION

Texaco Inc.  
P. O. Box 810  
Farmington, New Mexico  
Attention: Mr. A. G. Walsh

Subject: Reservoir Fluid Study  
Navajo "AL" No. 1 Well  
Undesignated (Tocito Dome) Field  
San Juan County, New Mexico

Gentlemen:

Samples of separator liquid and vapor were collected from the subject well on May 6, 1964. These samples, together with a sample of stock tank liquid, were shipped to our Dallas laboratory for studies. The results of these studies are presented to you in this report.

The producing gas-liquid ratio measured in the field and after correction for the factors shown on page one of the report was 3290 cubic feet of separator gas at 14.7 psia and 60° F. per barrel of stock tank liquid at 60° F. In the laboratory this ratio was found to be equivalent to 3238 standard cubic feet of separator gas per barrel of separator liquid. The separator products were then physically recombined in this ratio and examined in a visual cell at the reservoir temperature of 159° F. The mixture exhibited a bubble point pressure of 5320 psig. This value is considerably above the reservoir pressure. When viewed at the reservoir pressure of approximately 3200 psig the system was found to be in two phases. Approximately 42 per cent of the system volume was liquid.

These results have been previously transmitted by telephone. The composition of the separator products and the stock tank liquids are presented on the following pages with the calculated composition of the producing

Exhibit C  
Page 1

Texaco Inc.  
Navajo "AL" No. 1 Well

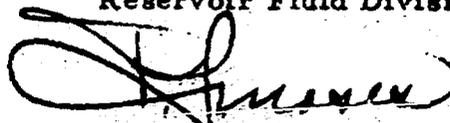
Page Two

well stream at the time the well was tested.

It was a pleasure to perform these tests for you. Should you have any questions, please do not hesitate to contact us.

Very truly yours,

Core Laboratories, Inc.  
Reservoir Fluid Division



P. L. Moses  
Operations Supervisor

PLM:jr

Exhibit C  
Page 2

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
**DALLAS, TEXAS**

|   |                                 |
|---|---------------------------------|
| Company <u>Texaco Inc.</u>              | Date Sampled <u>May 6, 1964</u> |
| Well <u>Navajo "AL" No. 1</u>           | County <u>San Juan</u>          |
| Field <u>Undesignated (Tocito Dome)</u> | State <u>New Mexico</u>         |

**FORMATION CHARACTERISTICS**

|                                    |                                   |
|------------------------------------|-----------------------------------|
| Formation Name                     | <u>Pennsylvanian-Barber Creek</u> |
| Date First Well Completed          | <u>May 3, 1964</u>                |
| Original Reservoir Pressure        | <u>3214 PSIG @ 6285 Ft.</u>       |
| Original Produced Gas-Liquid Ratio | <u>2911 SCF/Bbl</u>               |
| Production Rate                    | _____ Bbls/Day                    |
| Separator Pressure and Temperature | _____ PSIG _____ ° F.             |
| Liquid Gravity at 60° F.           | _____ ° API                       |
| Datum                              | _____ Ft. Subsea                  |

**WELL CHARACTERISTICS**

|                         |                         |                        |
|-------------------------|-------------------------|------------------------|
| Elevation               | <u>5763 DF</u>          | Ft.                    |
| Total Depth             | <u>6910</u>             | Ft.                    |
| Producing Interval      | <u>6275-6302</u>        | Ft.                    |
| Tubing Size and Depth   | <u>2 - 3/8</u>          | In. to <u>6189</u> Ft. |
| Open Flow Potential     | _____                   | MMSCF/Day              |
| Last Reservoir Pressure | <u>3206 PSIG @ 6288</u> | Ft.                    |
| Date                    | <u>May 6</u>            | , 19 <u>64</u>         |
| Reservoir Temperature   | <u>157</u>              | ° F. @ <u>6150</u> Ft. |
| Status of Well          | _____                   |                        |
| Pressure Gauge          | _____                   |                        |

**SAMPLING CONDITIONS**

|  |                        |                |
|--|------------------------|----------------|
| Flowing Tubing Pressure                        | <u>1892</u>            | PSIA           |
| Flowing Bottom Hole Pressure                   | <u>2778 @ 6288 Ft.</u> | PSIA           |
| Primary Separator Pressure                     | <u>55</u>              | PSIG           |
| Primary Separator Temperature                  | <u>43</u>              | ° F.           |
| Secondary Separator Pressure                   | _____                  | PSIG           |
| Secondary Separator Temperature                | _____                  | ° F.           |
| Field Stock Tank Liquid Gravity                | _____                  | ° API @ 60° F. |
| Primary Separator Gas Production Rate          | <u>962.1</u>           | MSCF/Day       |
| Pressure Base                                  | <u>14.7</u>            | PSIA           |
| Temperature Base                               | <u>60</u>              | ° F.           |
| Compressibility Factor ( $F_{pv}$ )            | <u>1.012</u>           |                |
| Gas Gravity (Laboratory)                       | <u>0.724</u>           |                |
| Gas Gravity Factor ( $F_g$ )                   | <u>1.1753</u>          |                |
| Stock Tank Liquid Production Rate @ 60° F.     | <u>292.5</u>           | Bbls/Day       |
| Primary Separator Gas/ Stock Tank Liquid Ratio | <u>3290</u>            | SCF/Bbl        |
| or   | <u>304.0</u>           | Bbls/MMSCF     |

Core Laboratories, Inc., Engineer

REMARKS:

*Exhibit "C"*  
*Page 3*

EXHIBIT "D"

Economics of Development  
And Production  
Tocito Dome Area  
San Juan County, New Mexico

|   | <u>80-Acre</u> | <u>160-Acre</u> |
|---|----------------|-----------------|
| <u>Estimated Production</u>             |                |                 |
| Oil, Barrels                            | 72,000         | 144,000         |
| Gas, MMCF                               | 270            | 540             |
| Estimated Productive<br>Life, Years     | 6              | 8               |
| Present Worth                           |                |                 |
| Working Interest Income                 | \$162,000      | \$310,000       |
| Less Development and<br>Operating Costs | \$142,000      | \$167,000       |
| Net Income                              | \$20,000       | \$143,000       |

EXHIBIT "E"

Tabulation of Initial Bottom Hole Pressures  
Tocito Dome Area  
San Juan County, New Mexico

| <u>WELL</u>                         | <u>RECORDED<br/>PRESSURE</u> | <u>DATUM</u> | <u>PRESSURE CORRECTED<br/>TO 525 FEET SUBSEA</u> |
|-------------------------------------|------------------------------|--------------|--|
| Pan American<br>Navajo "N" No. 1    | 3199 psi                     | -495'        | 3207 psi   |
| Pan American<br>Navajo "P" No. 1    | 3215                         | -525'        | 3215   |
| TEXACO Inc.<br>Navajo "AL"<br>No. 1 | 3167                         | -386         | 3206   |

EXHIBIT "F"

Proposed Special Rules and Regulations  
for the Tocito Dome-Pennsylvanian Pool  
San Juan County, New Mexico

RULE 1.

Each well completed or recompleted in the Pennsylvanian formation within the boundary of the Tocito Dome-Pennsylvanian Pool or within one mile thereof, and not nearer to nor within the boundaries of another designated Penn. pool, shall be drilled, spaced, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2.

(a) Each gas well completed or recompleted in the Tocito Dome-Penn. Oil Pool shall be located on a tract consisting of approximately 640 acres which may reasonably be presumed to be productive of gas from said Pool, and which shall comprise a single governmental section of the United States Public Lands Survey. For purposes of these Rules, a unit consisting of between 632 and 645 surface contiguous acres shall be considered a standard gas unit. Nothing contained herein shall be construed as prohibiting the drilling of a gas well on each quarter section in the 640-acre unit.

(b) ~~In order to facilitate the leasing of odd lot acreage by the Mineral Sublessee,~~ Wells may be drilled on non-standard spacing units as exceptions to Rule 2(a) after notice and hearing and where the following provisions are complied with:

- (1) The non-standard unit consists of contiguous quarter-quarter sections or lots.
- (2) The entire non-standard unit may reasonably be presumed to be productive of gas from said pool.
- (3) The applicant presents proof of the fact that all offset operators, and all operators owning interests in the section in which any part of the non-standard unit is situated and which acreage is not included in the non-standard unit were notified by registered mail of his intent to form a non-standard gas unit.
- (4) The allowable assigned to any such non-standard gas proration unit shall bear the same ratio to a standard allowable in said pool as the acreage in the unit bears to 640 acres.

RULE 3.

(a) Each oil well completed or recompleted in the Tocito Dome-Penn. Oil Pool shall be located on a unit containing approximately 160 acres, which may reasonably be presumed to be productive of oil from said pool, and which consists of a single governmental quarter section. For purposes of these Rules, a unit consisting of between 158 and 162 surface contiguous acres shall be considered a standard unit. Nothing contained herein shall be construed as prohibiting the drilling of an oil well on each of the Quarter-quarter sections in the 160-acre unit.

~~(b) In order to facilitate the leasing of odd lot acreage by the Navajo Tribe,~~ wells may be drilled on the following non-standard spacing units as exceptions to Rule 3 (a) after notice and hearing and where the following provisions are complied with:

- (1) On non-standard 120-acre unit comprising three governmental quarter-quarter sections lying within a governmental quarter section and contiguous by common bordering sides; or
- (2) On a non-standard 80-acre unit comprising two governmental quarter-quarter sections lying within a governmental quarter section and contiguous by a common bordering side, or
- (3) On a non-standard 40-acre unit comprising a single governmental quarter-quarter section.
- (4) The entire non-standard unit may reasonably be presumed to be productive of oil from said pool.
- (5) The applicant will furnish proof of the fact that all of the offset operators were notified by registered mail of his intent to form such non-standard unit.

(c) A standard proration unit shall be assigned a 160-acre proportional factor of 4.77 for allowable purposes.

(d) The allowable assigned to any such non-standard oil proration unit shall bear the same ratio to a standard allowable in said pool as the acreage in the unit bears to 160 acres.

(e) In order to make interference tests the District Supervisor shall have authority to approve, without notice and hearing and without administrative approval by the Secretary-Director, application by operators to shut in one of the wells completed in said pool and to transfer its allowable to any other completed well or wells on the same basic lease, or on leases with identical ownership; which are producing from said pool. Provided, however, that such allowable transfer shall be limited to a period not to exceed six (6) months.

RULE 4.

(a) Each well, oil or gas, completed or recompleted in the Tocito Dome-Penn. Pool shall be located no closer than 510 feet to any quarter section line and each such well shall be located within 150 feet of the center of ~~the well or SE<sub>1</sub>~~ of any quarter section. Any well drilled and producing from the Tocito Dome-Penn. Pool prior to the effective date of this Order at a location conforming to the well location requirements in effect at the time the well was drilled shall be considered to be located in conformance with this Rule.

(b) The Secretary-Director shall have authority to grant an exception to Rule 4 (a) without notice and hearing when the application has been filed in due form and the Secretary-Director determines that good cause exists for granting such exception. However, such an unorthodox location, if approved, may necessitate an allowable adjustment.

Applicant shall furnish all offset operators a copy of the application to the Commission, and the applicant shall include with his application a list of the names and addresses of all such operators together with a stipulation that proper notice has been given said operators at the addresses listed. The Secretary-Director of the Commission shall wait at least 20 days before approving any such unorthodox location, and only in the absence of objection from an offset operator may such application be approved.

RULE 5.

A well in the Tocito Dome-Penn. Oil Pool shall be classified as a gas well if it has a gas-liquid ratio of 20,000 cubic feet of gas per barrel of liquid hydrocarbons, or more. A well in said pool shall be classified as an oil well if it has a gas-liquid ratio of less than 20,000 cubic feet of gas per barrel of liquid hydrocarbons. The simultaneous dedication of any acreage to both an oil well and a gas well is strictly prohibited.

RULE 6.

The gas-liquid ratio limitation for the Tocito Dome-Penn. Oil Pool shall be 4,000 cubic feet of gas per barrel of liquid hydrocarbons produced.

RULE 7.

Any oil well in the Tocito Dome-Penn. Oil Pool which has 160 acres dedicated to it shall be permitted to produce an amount of gas determined by multiplying the top unit oil allowable for said pool by the limiting gas-liquid ratio for the pool (4,000). In the event there is more than one oil well on a 160-acre oil proration unit, the operator may produce the allowable assigned to the 160-acre unit from said wells in any proportion.

Any gas well in the Tocito Dome-Penn. Oil Pool shall be permitted to produce that amount of gas obtained by multiplying the top unit oil allowable for the pool by 4,000 by a fraction, the numerator of which is the number of acres dedicated to the particular gas well and the denominator of which is 160. In the event there is more than one gas well on a 640-acre gas proration unit, the operator may produce the

amount of gas assigned to the unit from said wells in any proportion.

RULE 8.

The operator of each newly completed well in the Tocito Dome-Penn. Oil Pool shall cause a gas-liquid ratio test to be taken on said well upon recovery of all load oil from the well, provided, however, that in no event shall the test be commenced \* sooner than 20 days nor later than 30 days from the date of first production. Provided further, that any well which is shut in shall be exempted from the aforesaid gas-liquid ratio test requirement so long as it remains shut in. The initial gas-liquid ratio test shall be taken in the manner prescribed by Rule 9. If the gas-liquid ratio is 20,000 cubic feet of gas per barrel of liquid hydrocarbons, or more, the operator shall not produce the well until beneficial use can be made of the gas.

RULE 9.

Gas-liquid ratio tests shall be taken on all wells in the Tocito Dome-Penn. Oil Pool, and on all wells producing from the Penn. formation within one mile of the boundaries of the Tocito Dome-Penn. Oil Pool which are not within another designated Penn. oil pool, during the months of January and July of each year. The initial gas-liquid ratio test shall suffice as the first semiannual test. Tests shall be 24-hour tests being the final 24 hours of a 72-hour period during which the well shall be produced at a constant normal rate of production. Results of such tests shall be filed on Commission Form C-116 on or before the 10th day of the following month. At least 72 hours prior to commencement of any such gas-liquid ratio tests, each operator shall file with the Aztec office of the Commission a test schedule for its wells, specifying the time each of its wells is to be tested. Copies of the test schedule shall also be furnished to all offset operators.

Special tests shall also be taken at the request of the Secretary-Director and may also be taken at the option of the operator. Such special tests shall be taken in accordance with the procedures outlined hereinabove, including notification to the Commission and offset operators.

RULE 10.

An initial shut-in pressure test shall be taken on each gas well and shall be reported to the Commission on Form C-125.

RULE 11.

Any well completed in the Tocito Dome-Penn. after the effective date of this Order shall receive an allowable only upon receipt by the Commission's Aztec Office of Commission Forms C-104, C-110, and C-116, all properly executed. The District Supervisor of the Commission's Aztec Office is hereby authorized to assign a temporary gas allowable to wells connected to a gas transportation facility during the recovery of load oil, which allowable shall not exceed the number of cubic feet of gas obtained by multiplying the daily top unit allowable for the Tocito Dome-Penn. Oil Pool by 4,000.

RULE 12.

The initial gas proration period shall be from 7 o'clock a.m. on August 1, 1964 to 7 o'clock a.m. on February 1, 1965. Subsequently, the dates 7 o'clock a.m. February the first and 7 o'clock a.m. August the first shall be known as balancing dates, and the periods of time bounded by these dates shall be known as the gas proration periods for the Tocito Dome-Penn. Oil Pool.

RULE 13.

Any gas well which has an underproduced status as of the end of a gas proration period shall be allowed to carry such underproduction forward into the next gas proration period and may produce such underproduction in addition to the allowable assigned during such succeeding period. Any allowable carried forward into a gas proration period and remaining unproduced at the end of such gas proration period shall be cancelled.

RULE 14.

Production during any one month of a gas proration period in excess of the allowable assigned to a well for such month shall be applied against the underproduction carried into such period in determining the amount of allowable, if any, to be cancelled.

RULE 15.

Any well which has an overproduced status as of the end of a gas proration period shall carry such overproduction forward into the next gas proration period, provided that such overproduction shall be compensated for during such succeeding period. Any well which has not compensated for the overproduction carried into a gas proration period by the end of such proration period shall be shut in until such overproduction is compensated for. If, at any time, a well is overproduced an amount equalling three times its current monthly allowable, it shall be shut in during that month and each succeeding month until the well is overproduced less than three times its current monthly allowable.

RULE 16.

The allowable assigned to a well during any one month of a gas proration period in excess of the production for the same month shall be applied against the overproduction carried into such period in determining the amount of overproduction, if any, which has not been compensated for.

RULE 17.

The Commission may allow overproduction to be compensated for at a lesser rate than would be the case if the well were completely shut in upon a showing after notice and hearing that complete shut in of the well would result in material damage to the well and/or reservoir.

RULE 18.

Each purchaser or taker of gas shall submit a report to the Commission on or before the 15th day of the month next succeeding the month in which the gas was purchased or taken. Such report shall be filed on either Form C-111 or Form C-114 (whichever is applicable) with the wells being listed in approximately the same order as they are listed on the oil proration schedule.

RULE 19.

Failure to comply with any provision of this Order or the Rules contained herein shall result in the immediate cancellation of allowable assigned to the affected well. No further allowable shall be assigned until all Rules and Regulations have been complied with. The District Supervisor shall notify the operator of the well and the purchaser in writing of the date of allowable cancellation and the reason therefor.

RULE 20.

All transporters or users of gas shall file gas well-connection notices with the Commission as soon as possible after the date of connection.

RULE 21.

Allowables to wells whose classification has changed from oil to gas or from gas to oil as the result of a gas-liquid ratio test shall commence on the first day of the month following the month in which such test was reported, provided that a plat (Form C-128) showing the acreage dedicated to the well and the location of all wells on the dedicated acreage have been filed.

RULE 22.

The vertical limits of the Tocito Dome-Penn. Oil Pool shall be the Penn. formation.

TOGITO DOME PENNSYLVANIAN "D" POOL  
 SAN JUAN COUNTY, NEW MEXICO  
 BASIC RESERVOIR DATA

|                                |           |
|--------------------------------|-----------|
| Porosity                       | 9.2%      |
| Permeability                   | 148 Md    |
| Water Saturation               | 25%       |
| Oil Gravity, API               | 46        |
| Gas Gravity                    | 0.72      |
| Condensate Gravity, °API       | 64        |
| Bottom Hole Temperature, °F.   | 158       |
| Bottom Hole Pressure, Original | 3215 psia |
| Bottom Hole Pressure, 6-1-65   | 3005 psia |
| Cumulative Production, 6-1-65  |           |
| Barrels Oil                    | 343,455   |
| MCF Gas (Casinghead)           | 443,169   |
| MCF Gas (Gas Well)             | 400,219   |
| Number of Wells                |           |
| Oil                            | 11        |
| Gas                            | 5         |
| Current Production             |           |
| Oil, BOPD                      | 2608      |
| Gas Well Gas, MCFD             | 5344      |

|                               |
|-------------------------------|
| BEFORE EXAMINER UTZ           |
| OIL CONSERVATION COMMISSION   |
| Pan Am's EXHIBIT NO. <u>3</u> |
| CASE NO. <u>3073</u>          |

8-11-65

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

CASE No. 3073  
Order No. R-2758-A

APPLICATION OF TEXACO INC. FOR THE  
CREATION OF A NEW OIL POOL AND FOR  
SPECIAL TEMPORARY POOL RULES, SAN  
JUAN COUNTY, NEW MEXICO.

NUNC PRO TUNC ORDER

BY THE COMMISSION:

It appearing to the Commission that due to clerical error and omission Order No. R-2758 dated August 3, 1964, does not correctly state the intended order of the Commission,

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations for the Tocito Dome-Pennsylvanian "D" Oil Pool promulgated by Order No. R-2758 are hereby amended by addition of the following:

RULE 10. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 9 without notice and hearing when an application has been filed setting forth the facts and circumstances justifying the exception and he determines such action is necessary to prevent waste or protect correlative rights.

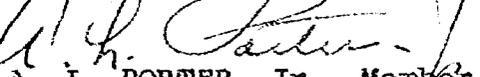
(2) That this order shall be effective nunc pro tunc as of August 3, 1964.

DONE at Santa Fe, New Mexico, this 30th day of September, 1964.

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

  
JACK M. CAMPBELL, Chairman

  
E. S. WALKER, Member

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

esr/

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. 3073  
Order No. R-2758  
NOMENCLATURE

APPLICATION OF TEXACO INC. FOR THE  
CREATION OF A NEW OIL POOL AND FOR  
SPECIAL TEMPORARY POOL RULES, SAN  
JUAN COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 1, 1964, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 3rd day of August, 1964, 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 the creation of a new oil pool for Pennsylvanian production and the establishment of temporary pool rules, including a provision for 160-acre oil well spacing and a GOR limitation of 4000 to 1.
- (3) That the applicant also seeks the establishment of an administrative procedure whereby interference tests could be conducted and allowables transferred.
- (4) That a new oil pool for Pennsylvanian production should be created and designated the Tocito Dome-Pennsylvanian "D" Oil Pool; that said pool was discovered by the Texaco Inc. Navajo

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CASE No. 3073  
Order No. R-2758

Tribal AL Well No. 1 located in Unit H of Section 28, Township 26 North, Range 18 West, NMPM, San Juan County, New Mexico.

(5) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, temporary special rules and regulations providing for 160-acre oil well spacing and 320-acre gas well spacing should be promulgated for the Tocito Dome-Pennsylvanian "D" Oil Pool.

(6) That the temporary special rules and regulations should provide for limited well locations in order to assure orderly development of the pool and protect correlative rights.

(7) That the temporary special rules and regulations should provide for a limiting gas-oil ratio of 2000 to 1 and the classification of a well with a gas-oil ratio of 20,000 to 1, or more, as a gas well in order to allow each operator in the pool the opportunity to use his just and equitable share of the reservoir energy.

(8) That due to the possibility of premature water encroachment and resulting waste, the temporary special rules and regulations should establish an oil well factor of 2.77 for allowable purposes.

(9) That due to the possibility of premature water encroachment and resulting waste, the temporary special rules and regulations should establish the following formula for computing gas well allowables:

Normal unit allowable x 2000 x 2.77 x 2

(10) That in order to prevent undue dissipation of the reservoir energy and waste of oil and gas, the temporary special rules and regulations should prohibit the flaring or venting of gas within a reasonable time after the issuance of this order.

(11) That the temporary special rules and regulations should be established for a one-year period in order to allow the operators in the subject pool to gather reservoir information to establish the area that can be efficiently and economically drained and developed by one well.

CASE No. 3073  
Order No. R-2758

(12) That an administrative procedure should be established whereby the operators in the Tocito Dome-Pennsylvanian "D" Oil Pool would be permitted to conduct interference tests and to transfer allowables among producing wells on the same lease during the temporary one-year period in order to facilitate the gathering of information pertinent to reservoir characteristics.

(13) That this case should be reopened at an examiner hearing in July, 1965, at which time the operators in the subject pool should be prepared to appear and show cause why the Tocito Dome-Pennsylvanian "D" Oil Pool should not be developed on 40-acre oil well spacing and 160-acre gas well spacing.

IT IS THEREFORE ORDERED:

(1) That a new pool in San Juan County, New Mexico, classified as an oil pool for Pennsylvanian production, is hereby created and designated the Tocito Dome-Pennsylvanian "D" Oil Pool, consisting of the following-described area:

TOWNSHIP 26 NORTH, RANGE 18 WEST, NMPM

Section 17: S/2  
Section 20: E/2  
Section 21: SW/4  
Section 28: N/2 and SE/4

(2) That temporary Special Rules and Regulations for the Tocito Dome-Pennsylvanian "D" Oil Pool are hereby promulgated, as follows:

SPECIAL RULES AND REGULATIONS  
FOR THE  
TOCITO DOME-PENNSYLVANIAN "D" OIL POOL

RULE 1. Each well completed or recompleted in the Tocito Dome-Pennsylvanian "D" Oil Pool or in the Pennsylvanian formation within one mile of said pool, and not nearer to or within the limits of another designated Pennsylvanian pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each oil well shall be located on a standard 160-acre unit comprising a governmental quarter section or on a non-standard unit consisting of less than 160 acres comprising a governmental quarter-quarter section or lot or governmental quarter-quarter sections or lots contiguous by common bordering sides and lying within a governmental quarter section.

**RULE 3.** Each gas well shall be located on a standard 320-acre unit comprising a governmental half section or on a non-standard unit consisting of less than 320 acres comprising a governmental quarter-quarter section or lot or governmental quarter-quarter sections or lots contiguous by common bordering sides and lying within a governmental half section.

**RULE 4.** All wells shall be located within 150 feet of the center of a governmental quarter-quarter section.

**RULE 5.** The Secretary-Director of the Commission may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon. All operators offsetting the proposed unorthodox location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the unorthodox location within 20 days after the Secretary-Director has received the application.

**RULE 6.** A standard oil proration unit (158 through 162 acres) shall be assigned a 160-acre proportional factor of 2.77 for allowable purposes. The allowable assigned to a non-standard oil proration unit shall bear the same ratio to a standard oil proration unit allowable as the acreage in such non-standard unit bears to 160 acres.

**RULE 7.** The limiting gas-oil ratio shall be 2000 cubic feet of gas for each barrel of oil produced; a well with a gas-oil ratio of 20,000 to 1, or more, shall be classified as a gas well.

**RULE 8.** A standard gas proration unit (316 through 324 acres) shall be assigned an allowable in accordance with the following formula:

$$\text{Normal unit allowable} \times 2000 \times 2.77 \times 2$$

The allowable assigned to a non-standard gas proration unit shall bear the same ratio to a standard gas proration unit allowable as the acreage in such non-standard unit bears to 320 acres.

**RULE 9.** No gas shall be flared or vented on or after November 1, 1964, provided however, that any well completed in the

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CASE No. 3073  
Order No. R-2758

subject pool after August 31, 1964, shall be given 60 days in which to make beneficial use of the produced casinghead gas.

**IT IS FURTHER ORDERED:**

(1) That any well presently drilling to or completed in the Pennsylvanian formation within the Tocito Dome-Pennsylvanian "D" Oil Pool or within one mile of said pool that will not comply with the well location requirements of Rule 4 is hereby granted an exception to the requirements of said rule. The operator shall notify the Aztec District Office of the Commission in writing of the name and location of the well on or before August 15, 1964.

(2) That the allowable provisions of this order shall be effective August 15, 1964; that any operator desiring to dedicate more than 40 acres to an oil well or more than 160 acres to a gas well presently drilling to or completed in the Tocito Dome-Pennsylvanian "D" Oil Pool shall file a new Form C-116 and a new Form C-128 with the Commission on or before August 15, 1964.

(3) That the Secretary-Director of the Commission is hereby authorized to approve interference tests and the transfer of allowables to wells on the same lease or, if in a unitized area, to wells in the same participating area, provided however, that any such authorization shall be limited to a period of six months, but may be renewed. No transfer well shall be permitted to receive, in addition to its own allowable, more than 50 per cent of one top unit allowable for the Tocito Dome-Pennsylvanian "D" Oil Pool.

To obtain administrative approval for interference tests and the transfer of allowable, the operator shall submit in triplicate a request for such authority describing in detail the proposed method of conducting such tests and transferring the allowable. The application shall be accompanied by a plat showing thereon all Pennsylvanian wells within a radius of two miles of the proposed shut-in well(s) and the transfer well(s). The plat shall also identify each lease or participating area as to ownership or operating rights. The application shall include evidence that all offset operators to the shut-in well(s) and the transfer well(s) have been furnished a complete copy of the application. It shall also be accompanied by Form C-116 for each shut-in well, showing the results of a pre-shut-in test to determine the amount of allowable to be transferred. The transferred allowable shall not exceed the volume of oil produced during the last 24 hours of a 72-hour period during which the well shall be produced at a constant rate.

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CASE No. 3073  
Order No. R-2758

The Commission and offset operators to both the shut-in well(s) and the transfer well(s) may witness such tests if they so desire and shall be notified of the tests at least 48 hours prior to the commencement thereof.

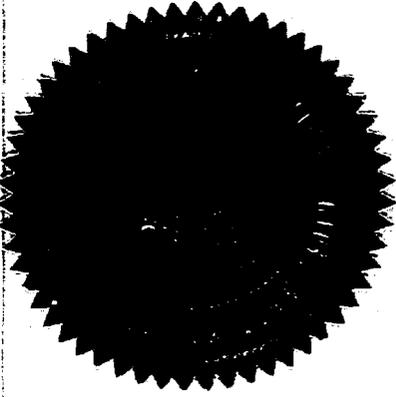
The Secretary-Director of the Commission may grant approval of the interference tests and transfer of allowable upon receipt of waivers from all offset operators or upon expiration of a 20-day waiting period, provided no offset operator has objected to the proposed test and transfer.

(4) That this case shall be reopened at an examiner hearing in July, 1965, at which time the operators in the subject pool may appear and show cause why the Tociito Dome-Pennsylvanian "D" Oil Pool should not be developed on 40-acre oil well spacing and 160-acre gas well spacing.

(5) 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

  
*Jack M. Campbell*  
JACK M. CAMPBELL, Chairman

*E. S. Walker*  
E. S. WALKER, Member

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

esr/

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. 3073  
Order No. R-2758-C

APPLICATION OF TEXACO INC. FOR THE  
CREATION OF A NEW OIL POOL AND FOR  
SPECIAL TEMPORARY POOL RULES, SAN  
JUAN COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on August 11, 1965, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 16th day of August, 1965, 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 by Order No. R-2758, as amended by Orders Nos. R-2758-A and R-2758-B, temporary Special Rules and Regulations were promulgated for the Tocito Dome-Pennsylvanian "D" Oil Pool, San Juan County, New Mexico, establishing 160-acre oil well spacing and 320-gas well spacing for a one-year period.

(3) That pursuant to the provisions of Order No. R-2758, this case was reopened to allow the operators in the subject pool to appear and show cause why the Tocito Dome-Pennsylvanian "D" Oil Pool should not be developed on 40-acre oil well spacing and 160-acre gas well spacing.

(4) That the Special Rules and Regulations promulgated by Orders Nos. R-2758, R-2758-A, and R-2758-B have afforded and will

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CASE No. 3073  
Order No. R-2758-C

afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the oil and gas in the pool.

(5) That to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, the Special Rules and Regulations promulgated by Orders Nos. R-2758, R-2758-A, and R-2758-B should be continued in full force and effect.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the Tocito Dome-Pennsylvanian "D" Oil Pool promulgated by Orders Nos. R-2758, R-2758-A, and R-2758-B are hereby continued in full force and effect until further order of the Commission.

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

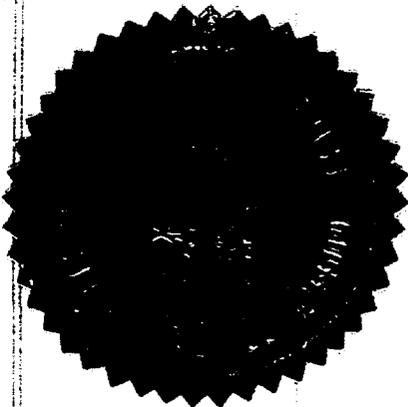
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

  
JACK M. CAMPBELL, Chairman

  
CLAYTON B. HAYS, Member

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



esr/

DRAFT  
JMD/esr

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

CF Subj. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

CASE No. 3073

Order No. R-2758-C

APPLICATION OF TEXACO INC. FOR THE  
CREATION OF A NEW OIL POOL AND FOR  
SPECIAL TEMPORARY POOL RULES, SAN  
JUAN COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on  
August 11, 1965, at Santa Fe, New Mexico, before Examiner  
Elvis A. Utz.

NOW, on this \_\_\_\_\_ day of August, 1965, 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 by Order No. R-2758, ~~dated August 3, 1964~~, as  
amended by Orders Nos. R-2758-A and R-2758-B, ~~dated September 30,~~  
~~1964, and March 5, 1965, respectively~~, temporary Special Rules  
and Regulations were promulgated for the Tocito Dome-Pennsylvanian  
"D" Oil Pool, San Juan County, New Mexico, establishing 160-acre  
oil well spacing and 320-acre gas well spacing for a one-year  
period.

(3) That pursuant to the provisions of Order No. R-2758,  
this case was reopened to allow the operators in the subject pool  
to appear and show cause why the Tocito Dome-Pennsylvanian "D"

CASE No. 3073  
Order No. R-2758-C

Oil Pool should not be developed on 40-acre oil well spacing and 160-acre gas well spacing, ~~or such other spacing as may seem proper.~~

(4) That the Special Rules and Regulations promulgated by Orders Nos. R-2758, R-2758-A, and R-2758-B have afforded and will afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the oil and gas in the pool.

(5) That to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, the Special Rules and Regulations promulgated by Orders Nos. R-2758, R-2758-A, and R-2758-B should be continued in full force and effect.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the Tocito Dome-Pennsylvanian "D" Oil Pool promulgated by Orders Nos. R-2758, R-2758-A, and R-2758-B are hereby continued in full force and effect until further order of the Commission.

(2) 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

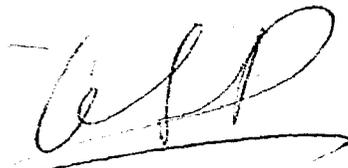
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9/23/64

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO



CASE No. 3073  
Order No. R-2758-A

APPLICATION OF TEXACO INC. FOR THE  
CREATION OF A NEW OIL POOL AND FOR  
SPECIAL TEMPORARY POOL RULES, SAN  
JUAN COUNTY, NEW MEXICO.



NUNC PRO TUNC ORDER

BY THE COMMISSION:

It appearing to the Commission that due to clerical error and omission Order No. R-2758 dated August 3, 1964, does not correctly state the intended order of the Commission,

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations for the Tocito Dome-Pennsylvanian "D" Oil Pool promulgated by Order No. R-2758 are hereby amended by addition of the following:

RULE 10. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 9 without notice and hearing when an application has been filed setting forth the facts and circumstances justifying the exception and he determines such action is necessary to prevent waste or protect correlative rights.

(2) That this order shall be effective nunc pro tunc as of August 3, 1964.

DONE at Santa Fe, New Mexico, this \_\_\_\_\_ day of September, 1964.

GOVERNOR  
JACK M. CAMPBELL  
CHAIRMAN

State of New Mexico  
**Oil Conservation Commission**



LAND COMMISSIONER  
E. S. JOHNNY WALKER  
MEMBER

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO

July 9, 1964

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

Daniel S. Nutter  
Oil Conservation Commission  
Box 2088  
Santa Fe, New Mexico

Re: Case No. 3073

Dear Dan:

The pool name for subject case should be "Tocito Dome-Pennsylvanian D Oil Pool", if the case is approved.

This conforms to Pan American, Texaco and Kendrick log interpretation.

Yours very truly

*A. R. Kendrick*

A. R. Kendrick  
Engineer, District #3

ARK:ks

1964 JUL 10 PM 1:29  
MAIN OFFICE OIC

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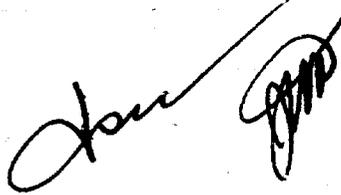
JMD/esr

(2)

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

CF Subj. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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



CASE No. 3073

Order No. R- 2158

NOMENCLATURE



APPLICATION OF TEXACO INC. FOR THE  
CREATION OF A NEW OIL POOL AND FOR  
SPECIAL TEMPORARY POOL RULES, SAN  
JUAN COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on  
July 1, 1964, at Santa Fe, New Mexico, before Examiner  
Elvis A. Utz.

NOW, on this 1 day of July, 1964, 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 the creation of  
a new oil pool for Pennsylvanian production and the establishment  
of temporary pool rules, including a provision for 160-acre <sup>oil well</sup> spac-  
ing and a GOR limitation of 4000 to 1.

(3) That the applicant <sup>also</sup> ~~further~~ seeks the establishment of  
an administrative procedure whereby interference tests could be  
conducted and allowables transferred.

(4) That a new oil pool for Pennsylvanian production should  
be created and designated the Isleta Aboue - Pennsylvanian <sup>"B" oil</sup> Pool;

that said pool was discovered by the Texaco Inc. Navajo Tribal AL Well No. 1 located in Unit H of Section 28, Township 26 North, Range 18 West, NMPM, San Juan County, New Mexico.

(5) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, temporary special rules and regulations providing for 160-acre <sup>oil well</sup> spacing <sup>and 320 acre gas well spacing</sup> ~~units~~ should be promulgated for the Acito Dome <sup>"D" Oil</sup> -Pennsylvanian Pool.

(6) That the temporary special rules and regulations should provide for limited well locations in order to assure orderly development of the pool and protect correlative rights.

(7) That the temporary special rules and regulations should provide for a limiting gas-oil ratio of 2000 to 1 and the classification of a gas well as a well with a gas-oil ratio of 20,000 to 1, or more, <sup>as a gas well</sup> in order to allow each operator in the pool the opportunity to use his just and equitable share of the reservoir energy.

(8) That due to the possibility of <sup>premature</sup> water encroachment and resulting waste the temporary special rules and regulations should ~~provide for an~~ <sup>establish</sup> ~~the same proportion~~ an oil well factor of 2.77 for allowable purposes.

(9) That due to the possibility of <sup>premature</sup> water encroachment and resulting waste the temporary special rules and regulations should ~~provide~~ <sup>establish</sup>

the following formula for computing gas well allowables:

$$\text{Normal unit allowable} \times 2000 \times 2.77 \times 2$$

(10) That in order to prevent undue dissipation of the reservoir energy and waste of oil and gas the temporary special rules and regulations should prohibit the flaring or venting of gas within a reasonable time after the issuance of this order.

(11) That the temporary special rules and regulations should be established for a one-year period in order to allow the operators in the subject pool to gather reservoir information to establish the area that can be efficiently and economically drained and developed by one well.

(12) That an administrative procedure should be established whereby the operators in the Locust Lane - Pennsylvania <sup>"S" OD</sup> Pool would be permitted to conduct interference tests and to transfer allowables among producing wells on the same lease during the temporary one-year period in order to facilitate the gathering of information pertinent to reservoir characteristics.

<sup>13</sup>(13) That this case should be reopened at an examiner hearing in July, 1965, at which time the operators in the subject

pool should be prepared to appear and show cause why the Jocito  
Blame-Pennsylvanian <sup>"D" OJ</sup> Pool should not be developed on 40-acre  
spacing units.

IT IS THEREFORE ORDERED:

(1) That a new pool in San Juan County, New Mexico,  
classified as an oil pool for Pennsylvanian production, is here-  
by created and designated the Jocito Blame <sup>"D" OJ</sup> Pennsylvanian Pool,  
consisting of the following-described area:

TOWNSHIP 26 NORTH, RANGE 18 WEST, NMPM

- Section 17: S/2
- " 20: E/2
- " 21: SW/4
- " 28: N/2 and SE/4

(2) That temporary Special Rules and Regulations for the  
Jocito Blame <sup>"D" OJ</sup> -Pennsylvanian Pool are hereby promulgated, as  
follows: effective \_\_\_\_\_, 1964.

SPECIAL RULES AND REGULATIONS  
FOR THE

Jocito Blame <sup>"D" OJ</sup> -PENNSYLVANIAN POOL

RULE 1. Each well completed or recompleted in the Jocito  
Blame <sup>"D" OJ</sup> -Pennsylvanian Pool or in the Pennsylvanian formation with-  
in one mile of ~~the acid pool - Pennsylvanian Pool~~, and not  
nearer to or within the limits of another designated Pennsylvanian  
pool, shall be spaced, drilled, operated, and produced in accord-  
ance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each oil well shall be located on a standard 160-  
acre unit comprising a governmental quarter section or on a non-  
standard unit consisting of less than 160 acres comprising a  
governmental quarter-quarter section <sup>or lot</sup> or governmental quarter-  
quarter sections <sup>or lots</sup> contiguous by common bordering sides and lying  
within a governmental quarter section.

RULE 3. Each gas well shall be located on a standard 320-  
acre unit comprising a governmental half section or on a non-  
standard unit consisting of less than 320 acres comprising a  
governmental ~~quarter-quarter~~ <sup>quarter-</sup> section <sup>or lot</sup> or governmental ~~quarter-quarter~~ <sup>quarter-</sup> section

RULE 6 The Secretary-Director of the Commission may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon. All operators offsetting the proposed unorthodox location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the unorthodox location within 20 days after the Secretary-Director has received the application.

RULE 6 A standard <sup>oil</sup> proration unit (158 through 162 acres) in the ~~the~~ Pennsylvanian Pool shall be assigned a 160-acre proportional factor of 2.77 for allowable purposes, ~~and in the event there is more than one well on a 160 acre proration unit, the operator may produce the allowable assigned to the unit from the wells on the unit in any proportion.~~

The allowable assigned to a non-standard <sup>oil</sup> proration unit shall bear the same ratio to a standard <sup>oil proration unit</sup> allowable ~~in the~~ Pennsylvanian Pool as the acreage in such non-standard unit bears to 160 acres.

RULE 7. The limiting gas-oil ratio in the ~~the~~ Pennsylvanian Pool shall be <sup>2000</sup> ~~4000~~ cubic feet of gas for each barrel of oil produced; a well with a gas oil ratio of 20,000 to 1, or more, shall be classified as a gas well.

Rule 8 A standard gas proration unit (316 through 324 acres) shall be assigned an allowable in accordance with the following formula:

$$\text{normal unit allowable} \times 2.77 \times 2$$
  
The allowable assigned to a non-standard gas proration unit shall bear the same ratio to a standard gas proration unit

allowable as the acreage in such non  
standard unit bears to 320 acres.

Rule 9 No gas shall be flared or vented on or  
after November 1, 1964, provided however, that any  
well completed in the subject pool after August 31, 1964, shall be  
given 60 days, in which to make beneficial use of the  
produced casinghead gas.  
It is Further Ordered:

(1) That any well presently drilling to or completed in the  
Pennsylvanian formation within the Jocite Name - Pennsylvanian Pool  
<sup>"D" "D"</sup>  
or within one mile of said pool  
that will not comply with the well location requirements of Rule 4  
is hereby granted an exception to the requirements of said rule.  
The operator shall notify the Aztec District Office of the Commis-  
sion in writing of the name and location of the well on or before  
August 15, 1964.

(2) That the allowable provisions of this order shall be effective August 15, 1964.

-5-  
CASE No. 3073

more than 40 acres to an oil well or more than 160 acres to a gas well  
That any operator desiring to dedicate 160 acres to a

presently drilling to or completed in the Jocito Lane -  
"10" Oil Form C-116 and a new  
Pennsylvanian Pool shall file a new Form C-128 with the Commission on or before August 15, 1964.

(3) That the Secretary-Director of the Commission is hereby authorized to approve interference tests and the transfer of allowables to wells on the same lease or, if in a unitized area, to wells in the same participating area, provided however, that any such authorization shall be limited to a period of six months, but may be renewed. No transfer well shall be permitted to receive, in addition to its own allowable, more than 50 per cent of one top unit allowable for the ~~Puerto Chiquito Gallup Oil Pool~~ Jocito Lane - Pennsylvanian Pool.  
"10" Oil

To obtain administrative approval for interference tests and the transfer of allowable, the operator shall submit in triplicate a request for such authority describing in detail the proposed method of conducting such tests and transferring the allowable. The application shall be accompanied by a plat showing thereon all ~~existing~~ <sup>Pennsylvanian</sup> wells within a radius of two miles of the proposed shut-in well(s) and the transfer well(s). The plat shall also identify each lease or participating area as to ownership or operating rights. The application shall include evidence that all offset operators to the shut-in well(s) and the transfer well(s) have been furnished a complete copy of the application. It shall also be accompanied by Form C-116 for each shut-in well, showing the results of a pre-shut-in test to determine the amount of allowable to be transferred. The transferred allowable shall not exceed the volume of oil produced during the last 24 hours of a 72-hour period during which the well shall be produced at a constant rate. The Commission and offset operators to both the shut-in well(s) and the transfer well(s) may witness such tests if they so desire

and shall be notified of the tests at least 48 hours prior to the commencement thereof.

The Secretary-Director of the Commission may grant approval of the interference tests and transfer of allowable upon receipt of waivers from all offset operators or upon expiration of a 20-day waiting period, provided no offset operator has objected to the proposed test and transfer.

(4) That this case shall be reopened at an examiner hearing in July, 1965, at which time the operators in the subject pool may appear and show cause why the Jocito Lane - Pennsylvanian Pool should not be developed on 40-acre <sup>oil well</sup> spacing ~~units~~ and 160-acre <sup>gas well spacing</sup>.

"10" Oil

(5) 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.

**CORE LABORATORIES, INC.**

*Petroleum Reservoir Engineering*

**DALLAS, TEXAS**

May 22, 1964

RESERVOIR FLUID DIVISION

Texaco Inc.  
P. O. Box 810  
Farmington, New Mexico

Attention: Mr. A. G. Walsh

Subject: Reservoir Fluid Study  
Navajo "AL" No. 1 Well  
Undesignated (Tocito Dome) Field  
San Juan County, New Mexico

Gentlemen:

Samples of separator liquid and vapor were collected from the subject well on May 6, 1964. These samples, together with a sample of stock tank liquid, were shipped to our Dallas laboratory for studies. The results of these studies are presented to you in this report.

The producing gas-liquid ratio measured in the field and after correction for the factors shown on page one of the report was 3290 cubic feet of separator gas at 14.7 psia and 60° F. per barrel of stock tank liquid at 60° F. In the laboratory this ratio was found to be equivalent to 3238 standard cubic feet of separator gas per barrel of separator liquid. The separator products were then physically recombined in this ratio and examined in a visual cell at the reservoir temperature of 159° F. The mixture exhibited a bubble point pressure of 5320 psig. This value is considerably above the reservoir pressure. When viewed at the reservoir pressure of approximately 3200 psig the system was found to be in two phases. Approximately 42 per cent of the system volume was liquid.

These results have been previously transmitted by telephone. The composition of the separator products and the stock tank liquids are presented on the following pages with the calculated composition of the producing

*Exhibit C*  
*Page 1*

Texaco Inc.  
Navajo "AL" No. 1 Well

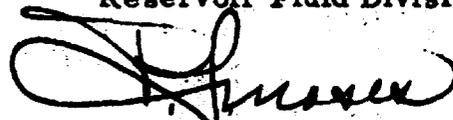
Page Two

well stream at the time the well was tested.

It was a pleasure to perform these tests for you. Should you have any questions, please do not hesitate to contact us.

Very truly yours,

Core Laboratories, Inc.  
Reservoir Fluid Division



P. L. Moses  
Operations Supervisor

PLM: jr

Exhibit C  
Page 2

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
**DALLAS, TEXAS**

Company Texaco Inc. Date Sampled May 6, 1964  
 Well Navajo "AL" No. 1 County San Juan  
 Field Undesignated (Tocito Dome) State New Mexico

**FORMATION CHARACTERISTICS**

Formation Name Pennsylvanian-Barber Creek  
 Date First Well Completed May 3, 1964  
 Original Reservoir Pressure 3214 PSIG @ 6285 Ft.  
 Original Produced Gas-Liquid Ratio 2911 SCF/Bbl  
     Production Rate \_\_\_\_\_ Bbls/Day  
     Separator Pressure and Temperature \_\_\_\_\_ PSIG \_\_\_\_\_ ° F.  
     Liquid Gravity at 60° F. \_\_\_\_\_ ° API  
 Datum \_\_\_\_\_ Ft. Subsea

**WELL CHARACTERISTICS**

Elevation 5763 DF Ft.  
 Total Depth 6910 Ft.  
 Producing Interval 6275-6302 Ft.  
 Tubing Size and Depth 2 - 3/8 In. to 6189 Ft.  
 Open Flow Potential \_\_\_\_\_ MMSCF/Day  
 Last Reservoir Pressure 3206 PSIG @ 6288 Ft.  
     Date May 6, 1964  
     Reservoir Temperature 157 ° F. @ 6150 Ft.  
     Status of Well \_\_\_\_\_  
     Pressure Gauge \_\_\_\_\_

**SAMPLING CONDITIONS**

Flowing Tubing Pressure 1892 PSIA  
 Flowing Bottom Hole Pressure 2778 @ 6288 Ft. PSIA  
 Primary Separator Pressure 55 PSIG  
 Primary Separator Temperature 43 ° F.  
 Secondary Separator Pressure \_\_\_\_\_ PSIG  
 Secondary Separator Temperature \_\_\_\_\_ ° F.  
 Field Stock Tank Liquid Gravity \_\_\_\_\_ ° API @ 60° F.  
 Primary Separator Gas Production Rate 962.1 MSCF/Day  
     Pressure Base 14.7 PSIA  
     Temperature Base 60 ° F.  
     Compressibility Factor ( $F_{pr}$ ) 1.012  
     Gas Gravity (Laboratory) 0.724  
     Gas Gravity Factor ( $F_g$ ) 1.1753  
 Stock Tank Liquid Production Rate @ 60° F. 292.5 Bbls/Day  
 Primary Separator Gas/ Stock Tank Liquid Ratio 3290 SCF/Bbl  
     or 304.0 Bbls/MMSCF

Core Laboratories, Inc., Engineer

REMARKS:

*Exhibit 'C'*  
*Page 3*

EXHIBIT "D"

Economics of Development  
And Production  
Tocito Dome Area  
San Juan County, New Mexico

|  | <u>80-Acre</u> | <u>160-Acre</u> |
|--|----------------|-----------------|
| <u>Estimated Production</u>              |                |                 |
| Oil, Barrels                             | 72,000         | 144,000         |
| Gas, MMCF                                | 270            | 540             |
| Estimated Productive<br>Life, Years      | 6              | 8               |
| Present Worth<br>Working Interest Income | \$162,000      | \$310,000       |
| Less Development and<br>Operating Costs  | \$142,000      | \$167,000       |
| Net Income                               | \$20,000       | \$143,000       |

EXHIBIT "E"

Tabulation of Initial Bottom Hole Pressures  
Tocito Dome Area  
San Juan County, New Mexico

| <u>WELL</u>                         | <u>RECORDED<br/>PRESSURE</u> | <u>DATUM</u> | <u>PRESSURE CORRECTED<br/>TO 525 FEET SUBSEA</u> |
|-------------------------------------|------------------------------|--------------|--|
| Pan American<br>Navajo "N" No. 1    | 3199 psi                     | -495'        | 3207 psi   |
| Pan American<br>Navajo "P" No. 1    | 3215                         | -525'        | 3215   |
| TEXACO Inc.<br>Navajo "AL"<br>No. 1 | 3167                         | -386         | 3206   |

EXHIBIT "F"

Proposed Special Rules and Regulations  
for the Tocito Dome-Pennsylvanian Pool  
San Juan County, New Mexico

RULE 1.

Each well completed or recompleted in the Pennsylvanian formation within the boundary of the Tocito Dome-Pennsylvanian Pool or within one mile thereof, and not nearer to nor within the boundaries of another designated Penn. pool, shall be drilled, spaced, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2.

(a) Each gas well completed or recompleted in the Tocito Dome-Penn. Oil Pool shall be located on a tract consisting of approximately 640 acres which may reasonably be presumed to be productive of gas from said Pool, and which shall comprise a single governmental section of the United States Public Lands Survey. For purposes of these Rules, a unit consisting of between 632 and 645 surface contiguous acres shall be considered a standard gas unit. Nothing contained herein shall be construed as prohibiting the drilling of a gas well on each quarter section in the 640-acre unit.

(b) ~~In order to facilitate the leasing of odd lot acreage by the Navajo Tribe,~~ wells may be drilled on non-standard spacing units as exceptions to Rule 2(a) after notice and hearing and where the following provisions are complied with:

- (1) The non-standard unit consists of contiguous quarter-quarter sections or lots.
- (2) The entire non-standard unit may reasonably be presumed to be productive of gas from said pool.
- (3) The applicant presents proof of the fact that all offset operators, and all operators owning interests in the section in which any part of the non-standard unit is situated and which acreage is not included in the non-standard unit were notified by registered mail of his intent to form a non-standard gas unit.
- (4) The allowable assigned to any such non-standard gas proration unit shall bear the same ratio to a standard allowable in said pool as the acreage in the unit bears to 640 acres.

RULE 3.

(a) Each oil well completed or recompleted in the Tocito Dome-Penn. Oil Pool shall be located on a unit containing approximately 160 acres, which may reasonably be presumed to be productive of oil from said pool, and which consists of a single governmental quarter section. For purposes of these Rules, a unit consisting of between 158 and 162 surface contiguous acres shall be considered a standard unit. Nothing contained herein shall be construed as prohibiting the drilling of an oil well on each of the Quarter-quarter sections in the 160-acre unit.

(b) ~~In order to facilitate the leasing of odd lot acreage by the Navajo Tribe, wells may be drilled on the following non-standard spacing units as exceptions to Rule 3 (a) after notice and hearing and where the following provisions are complied with:~~

- (1) On non-standard 120-acre unit comprising three governmental quarter-quarter sections lying within a governmental quarter section and contiguous by common bordering sides; or
- (2) On a non-standard 80-acre unit comprising two governmental quarter-quarter sections lying within a governmental quarter section and contiguous by a common bordering side, or
- (3) On a non-standard 40-acre unit comprising a single governmental quarter-quarter section.
- (4) The entire non-standard unit may reasonably be presumed to be productive of oil from said pool.
- (5) The applicant will furnish proof of the fact that all of the offset operators were notified by registered mail of his intent to form such non-standard unit.

(c) A standard proration unit shall be assigned a 160-acre proportional factor of 4.77 for allowable purposes.

(d) The allowable assigned to any such non-standard oil proration unit shall bear the same ratio to a standard allowable in said pool as the acreage in the unit bears to 160 acres.

(e) In order to make interference tests the District Supervisor shall have authority to approve, without notice and hearing and without administrative approval by the Secretary-Director, application by operators to shut in one of the wells completed in said pool and to transfer its allowable to any other completed well or wells on the same basic lease, or on leases with identical ownership; which are producing from said pool. Provided, however, that such allowable transfer shall be limited to a period not to exceed six (6) months.

RULE 4.

(a) Each well, oil or gas, completed or recompleted in the Tocito Dome-Penn. Pool shall be located no closer than 510 feet to any quarter section line and each such well shall be located within 150 feet of the center of the NW $\frac{1}{4}$  or SE $\frac{1}{4}$  of any quarter section. Any well drilled and producing from the Tocito Dome-Penn. Pool prior to the effective date of this Order at a location conforming to the well location requirements in effect at the time the well was drilled shall be considered to be located in conformance with this Rule.

(b) The Secretary-Director shall have authority to grant an exception to Rule 4 (a) without notice and hearing when the application has been filed in due form and the Secretary-Director determines that good cause exists for granting such exception. However, such an unorthodox location, if approved, may necessitate an allowable adjustment.

Applicant shall furnish all offset operators a copy of the application to the Commission, and the applicant shall include with his application a list of the names and addresses of all such operators together with a stipulation that proper notice has been given said operators at the addresses listed. The Secretary-Director of the Commission shall wait at least 20 days before approving any such unorthodox location, and only in the absence of objection from an offset operator may such application be approved.

RULE 5.

A well in the Tocito Dome-Penn. Oil Pool shall be classified as a gas well if it has a gas-liquid ratio of 20,000 cubic feet of gas per barrel of liquid hydrocarbons, or more. A well in said pool shall be classified as an oil well if it has a gas-liquid ratio of less than 20,000 cubic feet of gas per barrel of liquid hydrocarbons. The simultaneous dedication of any acreage to both an oil well and a gas well is strictly prohibited.

RULE 6.

The gas-liquid ratio limitation for the Tocito Dome-Penn. Oil Pool shall be 4,000 cubic feet of gas per barrel of liquid hydrocarbons produced.

RULE 7.

Any oil well in the Tocito Dome-Penn. Oil Pool which has 160 acres dedicated to it shall be permitted to produce an amount of gas determined by multiplying the top unit oil allowable for said pool by the limiting gas-liquid ratio for the pool (4,000). In the event there is more than one oil well on a 160-acre oil proration unit, the operator may produce the allowable assigned to the 160-acre unit from said wells in any proportion.

Any gas well in the Tocito Dome-Penn. Oil Pool shall be permitted to produce that amount of gas obtained by multiplying the top unit oil allowable for the pool by 4,000 by a fraction, the numerator of which is the number of acres dedicated to the particular gas well and the denominator of which is 160. In the event there is more than one gas well on a 640-acre gas proration unit, the operator may produce the

amount of gas assigned to the unit from said wells in any proportion.

RULE 8.

The operator of each newly completed well in the Tocito Dome-Penn. Oil Pool shall cause a gas-liquid ratio test to be taken on said well upon recovery of all load oil from the well, provided, however, that in no event shall the test be commenced sooner than 20 days nor later than 30 days from the date of first production. Provided further, that any well which is shut in shall be exempted from the aforesaid gas-liquid ratio test requirement so long as it remains shut in. The initial gas-liquid ratio test shall be taken in the manner prescribed by Rule 9. If the gas-liquid ratio is 20,000 cubic feet of gas per barrel of liquid hydrocarbons, or more, the operator shall not produce the well until beneficial use can be made of the gas.

RULE 9.

Gas-liquid ratio tests shall be taken on all wells in the Tocito Dome-Penn. Oil Pool, and on all wells producing from the Penn. formation within one mile of the boundaries of the Tocito Dome-Penn. Oil Pool which are not within another designated Penn. oil pool, during the months of January and July of each year. The initial gas-liquid ratio test shall suffice as the first semiannual test. Tests shall be 24-hour tests being the final 24 hours of a 72-hour period during which the well shall be produced at a constant normal rate of production. Results of such tests shall be filed on Commission Form C-116 on or before the 10th day of the following month. At least 72 hours prior to commencement of any such gas-liquid ratio tests, each operator shall file with the Aztec office of the Commission a test schedule for its wells, specifying the time each of its wells is to be tested. Copies of the test schedule shall also be furnished to all offset operators.

Special tests shall also be taken at the request of the Secretary-Director and may also be taken at the option of the operator. Such special tests shall be taken in accordance with the procedures outlined hereinabove, including notification to the Commission and offset operators.

RULE 10.

An initial shut-in pressure test shall be taken on each gas well and shall be reported to the Commission on Form C-125.

RULE 11.

Any well completed in the Tocito Dome-Penn. after the effective date of this Order shall receive an allowable only upon receipt by the Commission's Aztec Office of Commission Forms C-104, C-110, and C-116, all properly executed. The District Supervisor of the Commission's Aztec Office is hereby authorized to assign a temporary gas allowable to wells connected to a gas transportation facility during the recovery of load oil, which allowable shall not exceed the number of cubic feet of gas obtained by multiplying the daily top unit allowable for the Tocito Dome-Penn. Oil Pool by 4,000.

RULE 12.

The initial gas proration period shall be from 7 o'clock a.m. on August 1, 1964 to 7 o'clock a.m. on February 1, 1965. Subsequently, the dates 7 o'clock a.m. February the first and 7 o'clock a.m. August the first shall be known as balancing dates, and the periods of time bounded by these dates shall be known as the gas proration periods for the Tocito Dome-Penn. Oil Pool.

RULE 13.

Any gas well which has an underproduced status as of the end of a gas proration period shall be allowed to carry such underproduction forward into the next gas proration period and may produce such underproduction in addition to the allowable assigned during such succeeding period. Any allowable carried forward into a gas proration period and remaining unproduced at the end of such gas proration period shall be cancelled.

RULE 14.

Production during any one month of a gas proration period in excess of the allowable assigned to a well for such month shall be applied against the underproduction carried into such period in determining the amount of allowable, if any, to be cancelled.

RULE 15.

Any well which has an overproduced status as of the end of a gas proration period shall carry such overproduction forward into the next gas proration period, provided that such overproduction shall be compensated for during such succeeding period. Any well which has not compensated for the overproduction carried into a gas proration period by the end of such proration period shall be shut in until such overproduction is compensated for. If, at any time, a well is overproduced an amount equalling three times its current monthly allowable, it shall be shut in during that month and each succeeding month until the well is overproduced less than three times its current monthly allowable.

RULE 16.

The allowable assigned to a well during any one month of a gas proration period in excess of the production for the same month shall be applied against the overproduction carried into such period in determining the amount of overproduction, if any, which has not been compensated for.

RULE 17.

The Commission may allow overproduction to be compensated for at a lesser rate than would be the case if the well were completely shut in upon a showing after notice and hearing that complete shut in of the well would result in material damage to the well and/or reservoir.

RULE 18.

Each purchaser or taker of gas shall submit a report to the Commission on or before the 15th day of the month next succeeding the month in which the gas was purchased or taken. Such report shall be filed on either Form C-111 or Form C-114 (whichever is applicable) with the wells being listed in approximately the same order as they are listed on the oil proration schedule.

RULE 19.

Failure to comply with any provision of this Order or the Rules contained herein shall result in the immediate cancellation of allowable assigned to the affected well. No further allowable shall be assigned until all Rules and Regulations have been complied with. The District Supervisor shall notify the operator of the well and the purchaser in writing of the date of allowable cancellation and the reason therefor.

RULE 20.

All transporters or users of gas shall file gas well-connection notices with the Commission as soon as possible after the date of connection.

RULE 21.

Allowables to wells whose classification has changed from oil to gas or from gas to oil as the result of a gas-liquid ratio test shall commence on the first day of the month following the month in which such test was reported, provided that a plat (Form C-128) showing the acreage dedicated to the well and the location of all wells on the dedicated acreage have been filed.

RULE 22.

The vertical limits of the Tocito Dome-Penn. Oil Pool shall be the Penn. formation.

Cont. D. A. 32<sup>th</sup> 2

Reclass. 3-1-64 - 158,943 cancelled.

$$\frac{12,224,000 - 3,200}{3,820}$$

$$2,77 \times 70 = 194$$

$$\frac{62.5}{2000} \times 194 = 121$$
$$\frac{3200}{3200}$$

$$\frac{2000}{70} \quad \frac{3200}{70}$$
$$14,000 \quad 224,000$$

$$62.5 \times 334 = 208$$

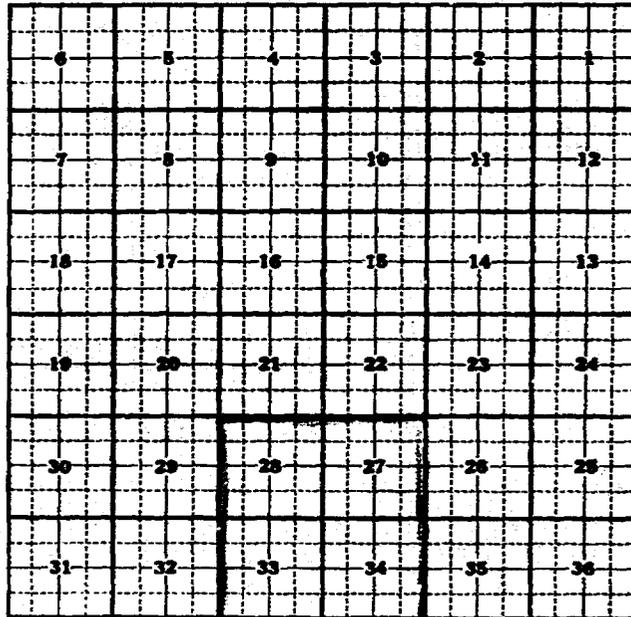
Name

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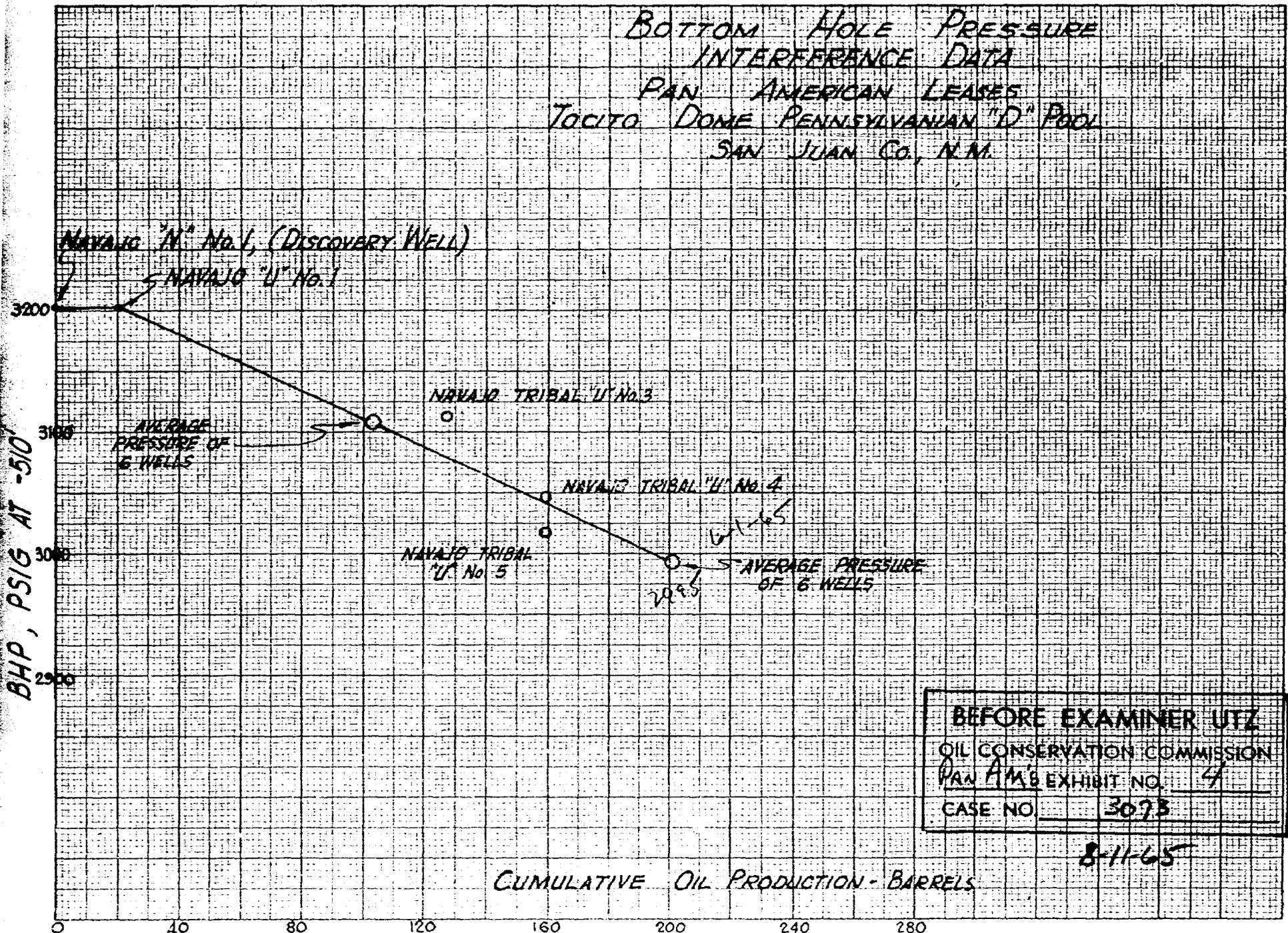
Remarks:

26 N 13 W



T ..... R 4 State 3  
or County

BOTTOM HOLE PRESSURE  
INTERFERENCE DATA  
PAN AMERICAN LEASES  
TOCITO DOME PENNSYLVANIAN "D" POOL  
SAN JUAN CO., N.M.



ATWOOD & MALONE  
LAWYERS

MAIN OFFICE OCC

1964 JUN 30 PM 1:33

P. O. DRAWER 700  
TELEPHONE 505 622-6221  
SECURITY NATIONAL BANK BUILDING  
ROSWELL, NEW MEXICO  
88201

JEFF D. ATWOOD (1963-1964)  
ROSS L. MALONE  
CHARLES F. MALONE  
RUSSELL D. MANN  
PAUL A. COOTER  
BOB F. TURNER  
ROBERT A. JOHNSON

June 29, 1964

New Mexico Oil Conservation Commission  
State Land Office Building  
P.O. Box 871  
Santa Fe, New Mexico

Re: Case No. 3073 on the Docket of July 1, 1964

Gentlemen:

We enclose herewith our Entry of Appearance as local counsel for Pan American Petroleum Corporation in Case No. 3073 on the docket of July 1, 1964. Would you please file the same.

Appreciating your courtesy, we are,

Very truly yours,



for ATWOOD & MALONE

PC/mm  
Encl.

CC: J.K. Smith, Esquire  
Division Attorney  
Pan American Petroleum Corporation  
P.O. Box 1410  
Fort Worth, Texas

MAIN OFFICE OCC

1964 JUN 8 AM 10:17

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

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APPLICATION OF TEXACO INC., FOR  
CREATION OF A NEW PENNSYLVANIAN POOL  
IN SAN JUAN COUNTY, NEW MEXICO, AND  
FOR PROMULGATION OF SPECIAL FIELD RULES  
AND REGULATIONS IN CONNECTION THEREWITH  
INCLUDING PROVISIONS FOR TEMPORARY 160-ACRE  
PRORATION UNITS, FIXED WELL LOCATIONS WITHIN  
SUCH UNITS, A GAS OIL RATIO OF 4000 to 1,  
AND OIL ALLOWABLE FACTORS FOR PRORATION PURPOSES

CASE NO. 3073

APPLICATION

Texaco Inc., a Delaware corporation, authorized and licensed to do  
business in New Mexico, hereinafter called "Applicant" for its application  
herein represents unto this Commission, as follows:

1. Applicant is the owner and operator of certain oil and gas leases  
wherein the Navajo tribe of Indians is the lessor, which said oil and gas  
leases cover Sections 27, 28, 33 and 34, Township 26 North, Range 18 West,  
San Juan County, New Mexico, and Sections 3 and 4, Township 25 North,  
Range 18 West, San Juan County, New Mexico.

2. Applicant has completed a well located 1980 feet from the north  
line and 660 feet from the east line of Section 28, Township 26 North,  
Range 18 West, San Juan County, New Mexico, which well encountered a  
Tocito Dome Pennsylvanian formation productive of oil at a depth of  
6,272 feet. Information available from the drilling of said well indicates  
that it is completed in a reservoir which contains a common accumulation of  
crude petroleum oil and which is completely separated from any other such  
accumulation. Applicant believes and represents that the common accumulation  
of oil contained in the reservoir is a separate and individual pool.

3. The information available from the drilling of the well described  
above indicates that the reservoir from which said well will produce can  
be efficiently and economically drained and developed on 160-acre proration

GILBERT, WHITE AND GILBERT  
ATTORNEYS AT LAW  
SANTA FE, NEW MEXICO

1 units. Such information further indicates that the drilling of more than  
2 one well on each 160-acre proration unit will result in the drilling of un-  
3 necessary wells and economic loss therefrom and also will result in the  
4 augmentation of risks arising from the drilling of an unnecessary number  
5 of wells. Such evidence further indicates that the reservoir from which  
6 the well is producing underlies the premises described in paragraph 1 above.

7 4. Due to the unusual reservoir characteristics encountered in the  
8 proposed pool a gas and oil ratio of less than 4000 cubic feet of gas for  
9 each barrel of oil produced would severely penalize wells in the pool and  
10 tend to make them uneconomic, and would further tend to restrict proper  
11 development of the pool causing waste.

12 5. In order to maintain a uniform well spacing pattern which will  
13 adequately protect the correlative rights of all owners of oil and gas  
14 within the area to be spaced, each well completed in the proposed reservoir  
15 should be located on a standard unit containing 160 acres, more or less,  
16 consisting of any governmental quarter section. Each standard proration  
17 unit should be assigned a 160-acre proportional factor of 4.77 for allowable  
18 purposes.

19 6. That in order to facilitate the leasing of odd lot acreage by the  
20 Navajo tribe, wells may be drilled on the following non-standard acre units:

21 (a) On a non-standard 120-acre unit comprising three governmental  
22 quarter quarter sections lying within a governmental quarter section  
23 and contiguous by common bordering sides; or

24 (b) On a non-standard 80-acre unit comprising two governmental  
25 quarter quarter sections lying within a governmental quarter  
26 section and contiguous by a common bordering side, or

27 (c) On a non-standard 40-acre unit comprising a single  
28 governmental quarter quarter section.

29

GILBERT, WHITE AND GILBERT  
ATTORNEYS AT LAW  
SANTA FE, NEW MEXICO

1           7. In order that all available information relative to effective  
2 drainage, workable reserves and other reservoir characteristics may be  
3 obtained, temporary special field rules and regulations should be established  
4 for a one-year period, during which time each operator in the pool should be  
5 granted permission to conduct interference tests in wells completed within  
6 the reservoir, and to permit adequate interference tests each operator should  
7 be permitted to transfer allowables from one producing well to any other well  
8 or wells on the same lease, or on leases with identical ownership.

9           8. Insofar as known to Applicant those persons owning oil and gas  
10 leases within one mile of the requested outer boundaries of the pool are:

11                           Sinclair Oil & Gas Company  
12                           3010 Monte Vista, NE  
                              Albuquerque, New Mexico

13                           Pan American Petroleum Corporation  
14                           P. O. Box 480  
                              Farmington, New Mexico

15                           Fletcher Oil Company  
16                           24721 South Main  
                              Wilmington, California

17           WHEREFORE, Applicant requests this Commission to enter its order,  
18 designating a Tocito Dome Pennsylvanian Oil Pool from which the well described  
19 above is producing in San Juan County, New Mexico, and establishing and  
20 promulgating temporary one year special field rules and regulations governing  
21 the production of oil and gas therefrom, as follows:

22           (a) Establishing 160-acre standard proration units for each pool, each  
23 unit to consist of a single governmental quarter section, provided that wells  
24 may be drilled on lesser non-standard units as set out in paragraph 6 above.

25           (b) Requiring the well drilled in each standard proration unit to be  
26 located within 150 feet of the center of the NW $\frac{1}{4}$  or SE $\frac{1}{4}$  of any quarter  
27 section.

28           (c) The Secretary-Director of the Commission may grant an exception to  
29 the footage requirements of paragraph (b) above without notice and hearing

GILBERT, WHITE AND GILBERT  
ATTORNEYS AT LAW  
SANTA FE, NEW MEXICO

1 when an application has been filed for an unorthodox location necessitated by  
2 topographical conditions or the recompletion of a well previously drilled to  
3 another horizon. All operators offsetting the proposed unorthodox location  
4 shall be notified of the application by registered or certified mail, and the  
5 application shall state that such notice has been furnished. The Secretary-  
6 Director may approve the application upon receipt of written waivers from all  
7 offset operators, or if no offset operator has entered an objection to the  
8 unorthodox location within twenty (20) days after the Secretary-Director has  
9 received the application.

10 (d) That a standard proration unit be assigned a 160-acre proportional  
11 factor of 4.77 for allowable purposes.

12 (e) That the gas oil ratio for the proposed pool be 4000 cubic feet of  
13 gas for each barrel of oil produced.

14 (f) That the Secretary-Director be authorized to approve interference  
15 tests and the transfer of allowables between wells producing from this pool  
16 on the same lease, or on leases with identical ownership.

17 (g) Making such further provisions with regard to the production of  
18 oil and gas from said reservoir as may be necessary.

19  
20 TEXACO, INC.

21 By W. B. Kelly  
22 Its Attorneys

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24

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DOCKET MAILED

Date 6/17/6

DOCKET: EXAMINER HEARING - WEDNESDAY - JULY 1, 1964

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

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

- CASE 3063: (Continued from June 10th Examiner Hearing)  
Application of R. C. Davoust Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Turkey Track Section 3 Unit Area comprising 480 acres of State land in Section 3, Township 19 South, Range 29 East, Eddy County, New Mexico.
- CASE 3064: (Continued from June 10th Examiner Hearing)  
Application of R. C. Davoust Company for a waterflood expansion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the expansion of the Turkey Track Queen Waterflood Project in Section 34, Township 18 South, Range 29 East and Section 3, Township 19 South, Range 29 East, Turkey Track Field, Eddy County, New Mexico, to include the Grayburg formation.
- CASE 3070: Application of Nearburg & Ingram and Kincaid & Watson Drilling Company for a waterflood project, Eddy County, New Mexico. Applicants, in the above-styled cause, seek authority to institute a waterflood project in the Square Lake Pool by the injection of water into the Grayburg formation through three wells located in Section 6, Township 17 South, Range 30 East, Eddy County, New Mexico.
- CASE 3071: Application of Texas Pacific Oil Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its J. P. Collier Well No. 1 located in Unit F of Section 10, Township 11 South, Range 33 East, Lea County, New Mexico, to produce oil from the North Bagley-Upper Pennsylvanian Pool and an undesignated Middle Pennsylvanian Pool through 2 1/16 inch tubing.
- CASE 3060: (Reopened)  
Application of Frank Darden for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Artesia Pool in his Cowtown Unit Area by the injection of water into the Grayburg and San Andres formations through two injection wells in Sections 13 and 24, Township 18 South, Range 28 East, Eddy County, New Mexico.
- CASE 3072: Application of Coastal States Gas Producing Company for the extension of a pool and for special temporary pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the extension of the Flying "M" San Andres Pool in Township 9 South, Range 33 East, Lea County, New Mexico, and temporary special rules therefor, including a provision for 80-acre well spacing and proration units.
- CASE 3073: Application of Texaco Inc., for the creation of a new oil pool and for special temporary pool rules, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new oil pool for Pennsylvanian production for its Navajo Tribal AL Well No. 1 located in Unit H of Section 28, Township 26 North, Range 18 West, San Juan County, New Mexico, and for the establishment of temporary pool rules including a provision for 160-acre spacing and a GOR limitation of

4000 to 1. Applicant further seeks the establishment of an administrative procedure whereby interference tests could be conducted and allowables transferred.

CASE 3074: Application of Continental Oil Company for an amendment of Order No. R-2385, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-2385 to substitute for water injection purposes a well located in Unit H of Section 9, Township 17 South, Range 29 East, Eddy County, New Mexico, for the presently authorized well in Unit I of said Section 9.

CASE 3075: Application of Marathon Oil Company for a special gas well test, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to produce and flare approximately 1000 MCF per day for a period of not less than three nor more than 30 days from Tom Brown Drilling Company's Antelope Sink Unit Well No. 1, located in Unit G of Section 18, Township 19 South, Range 24 East, Eddy County, New Mexico, in an effort to evaluate the reservoir.

CASE 3076: Application of Marathon Oil Company for a non-standard oil proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of an 80-acre non-standard proration unit comprising the SE/4 NW/4 and NE/4 SW/4 of Section 31, Township 17 South, Range 35 East, Vacuum-Upper Pennsylvanian Pool, Lea County, New Mexico, said unit to be dedicated to its State Warn A/1 Well No. 3, located in Unit F of said Section 31.

CASE 3038: (Reopened)  
Application of Kennedy Oil Company for a waterflood project and for designation of a waterflood buffer zone, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Square Lake Pool by the injection of water into the Grayburg-San Andres formation through one well located in Unit L of Section 20, Township 16 South, Range 31 East, Eddy County, New Mexico. Applicant further seeks the designation of the N/2 SW/4 of said Section 20 as a buffer zone offsetting Newmont Oil Company's Waterflood Project immediately south.

Case 3073

Heard July 1, 1964

Rec. 7-21-64

1. Grant Texaco request on the following Basis:

(a) 160 Ac. spacing - wells to be drilled within 150' of center of any  $\frac{1}{4}$  sec.

(b) 2000:1 G.O.R for Pools.

(c) Due to possibility of water encroachment oil allowables should be  $NVA \times 2.77 = 194$  or an allowable factor of 2.77.

(d) Gas well spacing shall be 320 Ac. with same drilling pattern as oil.

(e) Gas well allowable shall be 2000 X  $NVA \times 2.77 \times 2$  (for 320 Ac unit.) = 776 ACFD for 320 Ac. tracts. In proportion to this on smaller tracts.

(f) Name of Pool shall be. Jovils Dome - Pennsylvania "D" oil Pool and the horizontal limits shall be:

18<sup>th</sup> - 26<sup>th</sup> N

sec. 17. S/2

" 20 E/2

" 21 SW/4

" 28 N/2 & SE/4

(g) Grant ~~to~~ flaring preredge to oil wells up to 2000 X NVA until Oct. 1, 1964. Order No flue at that time.

(over)

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

CASE No. 3073  
Order No. R-2758-A

APPLICATION OF TEXACO INC. FOR THE  
CREATION OF A NEW OIL POOL AND FOR  
SPECIAL TEMPORARY POOL RULES, SAN  
JUAN COUNTY, NEW MEXICO.

NUNC PRO TUNC ORDER

BY THE COMMISSION:

It appearing to the Commission that due to clerical error  
and omission Order No. R-2758 dated August 3, 1964, does not  
correctly state the intended order of the Commission,

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations for the Tocito  
Dome-Pennsylvanian "D" Oil Pool promulgated by Order No. R-2758  
are hereby amended by addition of the following:

RULE NO. 9. The Secretary-Director of the Commission may grant  
an exception to the requirements of Rule 9 without notice and hear-  
ing when an application has been filed setting forth the facts and  
circumstances justifying the exception and he determines such  
action is necessary to prevent waste or protect correlative rights.

(2) That this order shall be effective nunc pro tunc as of  
August 3, 1964.

DONE at Santa Fe, New Mexico, this 30th day of September,  
1964.

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

*Jack M. Campbell*  
JACK M. CAMPBELL, Chairman

*E. S. Walker*  
E. S. WALKER, Member

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

S E A L

esr/

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. 3198  
Order No. R-2758-B

APPLICATION OF TEXACO INC.,  
FOR AN AMENDMENT OF ORDER  
NO. R-2758, SAN JUAN COUNTY,  
NEW MEXICO,

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on January 27, 1965, at Santa Fe, New Mexico, before Examiner Elvis A. Utz and was continued to February 24, 1965.

NOW, on this 5th day of March, 1965, 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 by Orders Nos. R-2758 and R-2758-A, the Commission promulgated temporary Special Rules and Regulations for the Tociito Dome-Pennsylvanian "D" Oil Pool, establishing a 160-acre proportional factor of 2.77 for allowable purposes due to the possibility of premature water encroachment and resulting waste.
- (3) That the applicant, Texaco Inc., seeks an amendment of Rules 6 and 8 of said Order No. R-2758 to establish a 160-acre proportional factor of 4.77 for said pool.
- (4) That the applicant has established that a 160-acre proportional factor of 4.77 will not cause premature water encroachment.
- (5) That a 160-acre proportional factor of 4.77 will prevent waste and protect correlative rights in the subject pool.

-2-

CASE No. 3198  
Order No. R-2758-B

IT IS THEREFORE ORDERED:

(1) That Rules 6 and 8 of the temporary Special Rules and Regulations for the Tocito Dome-Pennsylvanian "D" Oil Pool, promulgated by Orders Nos. R-2758 and R-2758-A, are hereby amended to read in their entirety as follows:

"RULE 6. A standard oil proration unit (158 through 162 acres) shall be assigned a 160-acre proportional factor of 4.77 for allowable purposes. The allowable assigned to a non-standard oil proration unit shall bear the same ratio to a standard oil proration unit allowable as the acreage in such non-standard unit bears to 160 acres.

"RULE 8. A standard gas proration unit (316 through 324 acres) shall be assigned an allowable in accordance with the following formula:

Normal unit allowable x 2000 x 4.77 x 2

The allowable assigned to a non-standard gas proration unit shall bear the same ratio to a standard gas proration unit allowable as the acreage in such non-standard unit bears to 320 acres."

(2) That this order shall be effective April 1, 1965.

(3) 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

JACK M. CAMPBELL, Chairman

GUYTON B. HAYS, Member

S E A L

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

esr/

MAIN OFFICE OCC

1964 JUN 30 PM 1 33

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION )  
OF TEXACO, INC., FOR THE CREATION )  
OF A NEW OIL POOL AND FOR SPECIAL )  
TEMPORARY POOL RULES, SAN JUAN )  
COUNTY, NEW MEXICO. )

No. 3073

ENTRY OF APPEARANCE

The undersigned, Atwood & Malone of Roswell, New Mexico,  
a firm of attorneys, all of whose members are duly licensed to  
practice law in the State of New Mexico, hereby enters its appearance  
as local counsel with Guy Buell, Esquire, of the Texas Bar, for Pan  
American Petroleum Corporation in the above entitled cause.

DATED at Roswell, New Mexico, this 29th day of June, 1964.

ATWOOD & MALONE

BY 

Attorneys for Pan American  
Petroleum Corporation  
Post Office Drawer 700  
Roswell, New Mexico

OIL CONSERVATION COMMISSION  
P. O. BOX 871  
SANTA FE, NEW MEXICO

August 7, 1964

C  
O  
P  
Y  
The Navajo Tribe  
Oil and Gas Department  
412 Petroleum Plaza Building  
3535 East 30th Street  
Farmington, New Mexico

DOCKET MAILED

Date 7-15-65

Attention: Mr. Henry F. Pohlmann

Re: Case No. 3073  
Order No. R-2758

Gentlemen:

We have your letter of August 5, 1964. The Commission has not conducted an independent engineering or geological study of this reservoir. All orders issued by the Commission following an examiner hearing are based upon the testimony, the record, the recommendations of the examiner, and conclusions drawn therefrom. The Commission has previously issued orders establishing wide spacing with decreased allowables when the possibility of premature water encroachment was believed to exist.

We sincerely hope that the value of your property has not been decreased by Order No. R-2758. The Commission issued this order believing that it would result in greater ultimate recovery of oil and gas, prevent waste, and protect correlative rights. As our statutes provide for a hearing de novo upon application filed within 30 days following a decision in an examiner hearing, we will docket such a hearing upon application of any interested party. We will be happy to discuss this matter with any representative of the Navajo Tribe.

Very truly yours,

A. L. PORTEF, Jr.  
Secretary-Director

ALP/esr

# THE NAVAJO TRIBE

OIL AND GAS DEPARTMENT

RAYMOND NAKAI  
CHAIRMAN, NAVAJO TRIBAL COUNCIL

NELSON DAMON  
VICE-CHAIRMAN

412 PETROLEUM PLAZA BUILDING  
3535 EAST 30TH STREET  
FARMINGTON, NEW MEXICO  
PHONE: 325-4284 (CODE 505)

1964 AUG



August 5, 1964

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

Gentlemen:

We have reviewed your August 3rd, 1964 ruling concerning case No. 3073, Order No. R-2758. It's the Texaco application for creation of the Tocito Dome - Pennsylvanian "D" Oil Pool.

Item No. 8 which states the allowable factor will be 2.77 instead of the more "normal" 4.77 is of interest to the Tribe. Reducing the factor from 4.77 to 2.77 decreases the value of our property and gives us some concern.

Item No. 8 states, "That due to the possibility of premature water encroachment and resulting waste, the temporary special rules and regulations should establish an oil well factor of 2.77 for allowable purposes." Has an engineering study been made that defines the reasons for the concern about "premature water encroachment"? Are there other New Mexico examples where the spacing is 160 acres/well, well depth is 6500 ft, and the allowable factor is 2.77?

Any consideration given this letter will be sincerely appreciated by all elements of the Navajo Tribe.

Very truly yours,

*H. F. Pohlmann*

Henry F. Pohlmann  
Oil & Gas Supervisor

cc: Director Resources Division  
Legal Department

GOVERNOR  
JACK M. CAMPBELL  
CHAIRMAN

State of New Mexico  
**Oil Conservation Commission**



LAND COMMISSIONER  
L. S. JOHNNY WALKER  
MEMBER

P. O. BOX 871  
SANTA FE

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

August 3, 1964

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

Re: Case No. 3073  
Order No. R-2758  
Applicant:  
TEXACO INC.

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

ir/

Carbon copy of order also sent to:

Hobbs OCC   x  

Artesia OCC           

Astec OCC   x  

OTHER   Mr. Guy Buell  

  Mr. Henry F. Pohlmann

GOVERNOR  
JACK M. CAMPBELL  
CHAIRMAN

State of New Mexico  
**Oil Conservation Commission**



LAND COMMISSIONER  
E. S. JOHNNY WALKER  
MEMBER

P. O. BOX 2088  
SANTA FE

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

September 30, 1964

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

Re: CASE NO. 3073

ORDER NO. R-2758-A

APPLICANT TEXACO INC.

DOCKET MAILED

Date 7-15-65

Dear Sir:

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

Very truly yours,

A handwritten signature in cursive script that reads "A. L. Porter, Jr.".

A. L. PORTER, Jr.  
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC   x  

Artesia OCC           

Aztec OCC   x  

DOCKET MAILED

Date 7-15-65

OTHER Mr. Guy Buell

Mr. Henry F. Pohlmann

WHITE, GILBERT, KOCH & KELLY  
(GILBERT, WHITE AND GILBERT)  
ATTORNEYS AND COUNSELORS AT LAW  
LINCOLN BUILDING  
SANTA FE, NEW MEXICO

CARL H. GILBERT (1891-1963)  
L. C. WHITE  
WILLIAM W. GILBERT  
SUMNER S. KOCH  
WILLIAM BOOKER KELLY  
JOHN F. MCCARTHY, JR.

July 15, 1965

POST OFFICE BOX 787  
TELEPHONE 982-4301  
(AREA CODE 505)

MAIN OFFICE 982-9900  
'65 JUL 16 PH 1 20

Mr. Dan Nutter  
Oil Conservation Commission  
Santa Fe, New Mexico

Re: Case No. 3073  
Tocito Dome  
Show Cause Order



Dear Mr. Nutter:

Confirming our conversation of to-day this letter is to request the above-referred to case now set for July 28, 1965, be continued until August 11, 1965.

Very truly yours,



W. B. KELLY

WEK:cc

DOCKET MAILED

Date

7-30-65

JK

DOCKET: EXAMINER HEARING - WEDNESDAY - AUGUST 11, 1965

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

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

CASE 3283: In the matter of the hearing called by the Oil Conservation Commission on its own motion to consider the adoption of a new "Manual of Back-Pressure Testing of Gas Wells" in the State of New Mexico, said manual being an adaptation of the test manual recently adopted by the Interstate Oil Compact Commission. Modification of several existing gas well test forms and adoption of several new forms will also be considered.

A copy of the proposed testing manual, complete with tables, charts, and specimens of the various forms, is available for inspection in the Santa Fe, Hobbs, Aztec, and Artesia offices of the Commission.

CASE 3284: Application of Foster Morrell for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Willow Draw Unit Area comprising 3840 acres, more or less, of State and Federal lands in Township 20 South, Range 26 East, Eddy County, New Mexico.

CASE 3285: Application of Richfield Oil Corporation for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Avalon Unit Area comprising 11,154 acres, more or less, of Federal, State and Fee lands in Township 21 South, Ranges 25 and 26 East, Eddy County, New Mexico.

CASE 3286: Application of Skelly Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Skelly Penrose "B" Unit, Langlie-Mattix Pool, Lea County, New Mexico, by the injection of water into the Queen formation through 33 injection wells in Sections 31 and 32, Township 22 South, Range 37 East, and Sections 4, 5, 6, 7, 8 and 9, Township 23 South, Range 37 East.

CASE 3287: 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 in the Langlie-Mattix Pool by the injection of water into the Queen formation through two wells in Section 21, Township 24 South, Range 37 East, Lea County, New Mexico.

CASE 3288: Application of Tenneco Oil Company for directional drilling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to recomplete by means of directional drilling the following wells:

TOWNSHIP 29 NORTH, RANGE 9 WEST  
Florance No. 22, Unit H, Section 12

TOWNSHIP 30 NORTH, RANGE 9 WEST  
Florance No. 2, Unit A, Section 20  
Florance No. 3, Unit M, Section 22  
Florance No. 4, Unit L, Section 10

August 11, 1965 Examiner Hearing

TOWNSHIP 30 NORTH, RANGE 9 WEST - Cont'd

Florance No. 6, Unit M, Section 23  
Florance No. 13, Unit B, Section 18  
Florance No. 20, Unit B, Section 24  
Prichard No. 1, Unit M, Section 1  
Riddle No. 1, Unit B, Section 21  
Riddle No. 2, Unit N, Section 17  
State No. 1, Unit M, Section 32  
State No. 2, Unit M, Section 16  
Florance No. 8, Unit N, Section 14  
Florance No. 16-X, Unit A, Section 6

TOWNSHIP 30 NORTH, RANGE 8 WEST

Florance No. 39, Unit B, Section 35  
Florance No. 45, Unit G, Section 22  
Florance No. 29, Unit K, Section 25  
Florance No. 37, Unit H, Section 6  
Florance No. 40, Unit G, Section 21  
Moore No. 1, Unit N, Section 8

All of the above wells are presently completed in the Blanco-Mesa-verde Pool. Applicant proposes to set a whipstock above the Mesa-verde producing interval and to directionally drill recompleting said wells in the Mesaverde formation, and in some instances, to further drill to the Dakota producing interval thereby permitting dual completion of the wells to produce gas from the Blanco-Mesa-verde and Basin-Dakota Gas Pools. Applicant further proposes to conduct appropriate deviation tests to ensure that none of the wells is completed nearer than 200 feet to the outer boundaries of its proration unit.

CASE 3289: Application of Kewanee Oil Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Atoka-Grayburg Unit Area comprising 560 acres, more or less, of fee land in Sections 13 and 14, Township 18 South, Range 26 East, Eddy County, New Mexico.

CASE 3290: Application of Kewanee Oil Company for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Atoka-Grayburg Pool, Eddy County, New Mexico, by the injection of water into the Grayburg formation through two injection wells in Section 13, Township 18 South, Range 26 East.

CASE 3291: Application of Kewanee Oil Company for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Atoka-San Andres Pool, Eddy County, New Mexico, by the injection of water into the San Andres formation through one injection well in Section 13, Township 18 South, Range 26 East.

CASE 3092 and CASE 3093 (Reopened):

In the matter of Case No. 3092 and Case 3093 being reopened pursuant to the provisions of Orders Nos. R-2756 and R-2757, which orders established 80-acre spacing units for the Osudo-Upper Bone Spring

August 11, 1965 Examiner Hearing

Pool and the Osudo-Lower Bone Spring Pool, Lea County, New Mexico, for a period of one year. The subject pools have apparently been depleted and these cases will be dismissed in the absence of evidence requiring other action.

CASE 3073: (Reopened and continued from the July 28, 1965 Examiner Hearing)

In the matter of Case No. 3073 being reopened pursuant to the provisions of Order No. R-2758, which order, as amended by Orders Nos. R-2758-A and R-2758-B, established 160-acre oil well spacing and 320-acre gas well spacing for the Tocito Dome Pennsylvanian "D" Oil Pool, San Juan County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre oil well spacing and 160-acre gas well spacing, or such other spacing as may seem proper.

CASE 3292: Application of Texaco Inc. for the creation of a new pool or in the alternative for a non-standard location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new pool for the production of oil from the Bough "B" formation in Section 14, Township 12 South, Range 34 East, Ranger Lake Field, Lea County, New Mexico. Applicant, in the alternative, seeks authority to drill its State DA Well No. 1 at an unorthodox location within 150 feet of the center of Unit K, Section 14, Township 12 South, Range 34 East, Ranger Lake Pennsylvanian Pool, Lea County, New Mexico.

(Note: The above case, at the request of the applicant, will be dismissed.)

CASE 3281 (continued from the July 28, 1965 Examiner Hearing):

Application of Samuel G. Dunn for a two-well proration unit and an unorthodox location, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill and produce the second well on the 160-acre oil proration unit comprising the SW/4 of Section 26, Township 26 North, Range 1 East, Puerto Chiquito-Gallup Oil Pool, Rio Arriba County, New Mexico, the 160-acre allowable to be produced from either well in any proportion. Said second well would be drilled at an unorthodox location 1720 feet from the South line and 460 feet from the West line of said Section 26. (The SW/4 of Section 26 is currently dedicated to a well in Unit M of said section.) In the alternative, applicant seeks the creation of two non-standard 80-acre proration units comprising the N/2 SW/4 and S/2 SW/4 of said Section 26 to be dedicated to the proposed well and the existing well, respectively.

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

July 28, 1965

EXAMINER      HEARING

IN THE MATTER OF:

Case No. 3073 being reopened pursuant to the provisions of Order No. R-2758, which order, as amended by Orders Nos. R-2758-A and R-2758-B, established 160-acre oil well spacing and 320-acre gas well spacing for the Tocito Dome-Pennsylvanian "D" Oil Pool, San Juan County, New Mexico, for a period of one year.

Case No. 3073

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING



**d**  
**m**  
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PAGE 2

MR. NUTTER: The hearing will come to order, please.  
The first case this morning will be Case 3073.

MR. DURRETT: In the matter of Case No. 3073  
being reopened pursuant to the provisions of Order No. R-2758,  
which order, as amended by Orders Nos. R-2758-A and R-2758-B,  
established 160-acre oil well spacing and 320-acre gas well  
spacing for the Tocito Dome-Pennsylvanian "D" Oil Pool,  
San Juan County, New Mexico, for a period of one year.

If the Examiner please, we have a letter from Mr.  
Booker Kelley, who is the attorney for the applicant,  
requesting that this case be continued until August 11, 1965.

MR. NUTTER: Case No. 3073 will be continued to  
9:00 o'clock A.M., this same place, on August 11th, 1965.



NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

REGISTER

HEARING DATE JULY 28, 1965 TIME: 9 A.M.

| NAME:             | REPRESENTING:         | LOCATION:             |
|-------------------|-----------------------|-----------------------|
| V. T. Lyon        | CONTINENTAL OIL CO    | Hubbs, N. M.          |
| Ned R. Daniels    | Marathon Oil Co.      | Midland, Texas        |
| CHAS MALONE       | ATWOOD & MALONE       | ROSWELL, NM           |
| Jason Killeli     | Killeli & Son         | Santa Fe              |
| Paul Hull         | Std. Oil Co. of Texas | Houston, Texas        |
| Fred O. Cross     |                       | Roswell, NM           |
| J.M. Gill         |                       | Midland, Tex          |
| R.E. Cribb        | Std. oil of Texas     | Snyder, Texas         |
| Nina Williams     | R.W. Bigham           | Alamogordo & Santa Fe |
| James D. Jennings |                       | Roswell               |
| Paul C. Rex       | Paul Rex              | Midland, Texas        |
| T.F. Thayer       | Seco Prod. Co.        | Midland, Texas        |
|                   |                       | Houston, Tex.         |
|                   |                       | Midland               |
|                   | Lemmon Oil Co.        | Roswell, N. Mex       |

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

REGISTER

HEARING DATE JULY 28, 1965 TIME: 9 A.M.

| NAME:             | REPRESENTING:  | LOCATION:      |
|-------------------|----------------|----------------|
| Robert L. Monahan | Cal-Mon Oil Co | Midland, Texas |
| A.L. Porter, Jr   | OCC            | Santa Fe       |
| A.R. Kendrick     | OCC            | Ayte           |
| P. J. McBrath     | U.S.G.S.       | Farmington     |

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



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

August 11, 1965

EXAMINER HEARING

IN THE MATTER OF:

Case No. 3073 being reopened pursuant to the provisions of Order No. R-2758, which order, as amended by Orders Nos. R-2758-A and R-2758-B, established 160-acre oil well spacing and 320-acre gas well spacing for the Tocito Dome Pennsylvanian "D" Oil Pool, San Juan County, New Mexico, for a period of one year.

Case No. 3073

BEFORE:

ELVIS A. UTZ

TRANSCRIPT OF HEARING

MR. UTZ: The Hearing will come to order. Case Number 3073.

MR. DURRETT: In the matter of Case No. 3073 being reopened pursuant to the provisions of Order No. R-2758, which order, as amended by Orders Nos. R-2758-A and R-2758-B, established 160-acre oil well spacing and 320-acre gas well spacing for the Tocito Dome Pennsylvanian "D" Oil Pool, San Juan County, New Mexico, for a period of one year.

MR. BUELL: For Pan American Petroleum Corporation, Guy Buell. We have one witness, Mr. Eaton.

MR. KELLY: Booker Kelly on behalf of Texaco; we have one witness.

(Witnesses sworn.)

MR. UTZ: Any other appearances?

(Whereupon, Exhibits 1 through 5, Pan American, marked for identification.)

GEORGE W. EATON, a witness called to testify, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BUELL:

Q Mr. Eaton, would you state your complete name, by whom you are employed and what capacity, and in what location,





please?

A George W. Eaton, Junior; area engineer for Pan American Petroleum Corporation, Farmington, New Mexico.

Q Mr. Eaton, you've testified at many previous Commission Hearings and your qualifications as a petroleum engineer are a matter of public record, are they not?

A Yes, they are. In fact, I testified in the two previous Hearings on this particular pool.

MR. BUELL: Any questions, Mr. Examiner, with regard to this witness?

MR. UTZ: I think he's a qualified witness and will remain qualified for some time.

Q (By Mr. Buell) Mr. Eaton, the original Hearing in this Case was heard back in July of 1964, and as a result of that Hearing, the Commission adopted certain temporary rules which are currently in force. I wish you would, for the record, briefly review not each and every one of the rules but what, in your opinion, are the most important of the current rules now applicable in this field?

A The rules which were adopted as a result of that Hearing are contained in Order R-2758 issued August 3rd, 1964. They provide for 160-acre oil proration units, 320-acre gas proration units; under that particular order, the oil wells were limited to that allowable which would accrue to

an 80-acre proration unit. The reservoir was recognized as an associated reservoir and appropriate rules adopted relating the gas allowable to the oil allowable so as to approximate equivalent volumetric withdrawals.

Q Order R-2758 has been amended twice, I believe, by A and B Orders, has it not?

A Yes, sir, that is correct.

Q Now, the purpose of the temporary rules, Mr. Eaton, was to give the operators an opportunity to obtain data in this interim period to see whether or not the current rules were the proper rules, or whether they should be changed. What have the data that has been accumulated in this interim period revealed to you with respect to the pool rules?

A The data which have been collected subsequent to the July, 1964 Hearing conclusively prove to me that an oil well will drain in excess of 160-acres and that a gas well will drain in excess of 320-acres.

Q In order that the Examiner may have your recommendation before him so that he can evaluate your evidence and your testimony, I wish you would state right now what your recommendation to this Commission will be.

A It is my recommendation that the temporary rules in effect for the Tocito Dome Pennsylvanian "D" Pool be made permanent.



Q In that connection, Mr. Eaton, I wish you would look now, at what has been marked as our Exhibit Number 1 and is on the wall to the left of the Examiner. What is that Exhibit?

A Exhibit 1 is a map of the Tocito Dome Pennsylvanian "D" area. The map shows the location of the wells in the pool, the oil wells are colored green on Tocito Dome area map, Exhibit 1. There are 11 oil wells in the pool. The gas wells are colored red on Tocito Dome area map, Exhibit 1, there are five gas wells, a total of 16 wells in the pool. At the time of the Hearing in July, 1964, the pool consisted of one gas well, one oil well, one well which was in the process of being completed as an oil well and a drilling well. In addition to what I've already described, Exhibit Number 1 also shows the pool outline in green. The green line includes all of the area included in the nomenclature Orders, plus some additional area which has been proven productive since the most recent nomenclature order.

Q Mr. Eaton, what is the significance of the red line that trends through this field in the northwest-southeasterly direction?

A That line which has been labeled A-A Prime is the trace of a cross-section which is our Exhibit Number 2.

Q Are you ready to go to that Exhibit, now?

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A Yes.

Q It's on the opposite wall, it's marked Exhibit 2.  
What does it reflect?

A Exhibit Number 2 shows a cross-section drawn through the pool from the north to south direction generally commencing on the left-hand side, which is the north end of the cross-section with the Pan American Navajo P Number 2 Well, and terminating on the right end, which is the south end of the cross-section with the Texaco Navajo A L Number 2 Well. On this cross-section, I have delineated the upper and lower limits of the Pennsylvanian "D" porosity zone and have colored that zone with various colors depicting whether or not water, oil or gas is contained in the porosity interval. On Exhibit Number 2, the blue color depicts that portion of the porosity which lies below the oil-water contact. This contact is at a datum of approximately minus 550 feet. The green depicts that portion of the porosity which is filled with oil. That portion that is colored red depicts that part of the porosity which lies above the gas-oil contact. In this pool, the gas-oil contact is at approximately minus 510 feet. The logs which have been used to prepare the cross-section or have colored on them the perforated interval in each of the wells. In all cases except the Texaco A L Number 2, the well on the extreme

right-hand end of this cross-section, the wells are completed or were found to be nonproductive in the Pennsylvanian "D" main porosity zone. That particular well found that zone to be water productive and was completed in a small porosity stringer immediately above the main porosity zone.

Q Mr. Eaton, from the standpoint of the purpose of this Hearing, and that is adopting permanent pool rules, what is one of the significant factors revealed by this cross-section?

A The cross-section actually is intended to depict two things. One is that the Pennsylvanian "D" porosity member is a readily correlatable and continuous member that exists from one end of the pool to the other. In addition it also shows that while the oil-water contact has been established, it underlies only a small portion of the reservoir. As a matter of fact, when considering the wells on Exhibit Number Two, only one well which produces from the main Pennsylvanian "D" porosity member is actually underlain by water in that member, that's the Pan American Navajo P Number 2 Well, on this extreme north end of the cross-section which actually cut the oil-water contact within the Pennsylvanian "D" porosity zone. This well was completed making 56 barrels of water per day and it currently makes about a hundred barrels of water per day, not surprisingly since it

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actually found the oil-water contact within the well bore.

Q That's certainly not an alarming or abnormal increase in water production for the conditions that exist in that well?

A No, sir.

Q Mr. Eaton, I wish you would look now, at what has been marked as Exhibit Number 3. What does that Exhibit reflect?

A Exhibit Number 3 is a tabulation showing certain basic reservoir data for the Tocito Dome Pennsylvanian "D" Pool.

Q Most of these data seem to be self-explanatory, but are there any of the properties that you would like to comment on that might be significant from the standpoint of the purpose of this Hearing?

A With regard to rock properties, I have listed only two as being pertinent. The porosity based on approximately 125 rock samples averaged 9.2 per cent and the permeability 148 millidarcies. I have good reason to believe that the actual porosity of this reservoir and the actual permeability of this reservoir is in excess of these two values. This rock is so soft that a good part of it is always ground up during the coring operation and it's quite possible that the very best portion of the rock has never been recovered in



any of the cores. In addition to that, in attempting to perform special research development work on selected samples of the core from one well, it was found the drilling mud had completely penetrated to the center portion of the core and could not be removed; so therefore, when the porosity and permeability measurements were made on the core, that part of the core that was saturated with drilling mud, although it contained porosity and permeability, is not reflected in the measurements.

I consider the porosity of 9.2 per cent and the permeability of 148 millidarcies to be minimum values for this particular reservoir.

Q Do you wish to comment on any other items or properties contained on Exhibit Number 3, Mr. Eaton?

A I believe I might point out that the original bottom hole pressure in this pool was 3213 psia. After about 343,000 barrels of oil production and approximately 400,000,000 cubic feet of gas well, gas production, the bottom hole pressure in June, 1965 had declined to 3005 psia.

Q Mr. Eaton, let me ask you this, how would you as a reservoir engineer, grade the reservoir that we're dealing with here?

A This Tocito Dome Pennsylvanian "D" Reservoir is an excellent reservoir, both the oil and gas wells have high

productivity index.

Q Are you familiar with any other pool in Northwest New Mexico that is of the quality of this one?

A No, sir, I am not.

Q All right. I wish you would look now at what has been marked as Exhibit Number 4 and briefly state what that exhibit reflects.

A Exhibit Number 4 is a plot of the pressure, cumulative performance for Pan American leases in this pool. The heavy blue line connects points of cumulative production and pressure behavior with the pressures having been obtained either from new wells early in the life of the pool, or from pressure surveys of which the Exhibit shows two. The large circle, the first large circle depicts a pressure survey which was conducted in March, 1965 and that point represents the average pressure of six wells at that time. It is approximately 3115 psi. The second large circle represents the average pressure of six wells taken on June 1st, 1965. It is approximately 2995 psi. In addition to these surveys, initial pressures were obtained on new wells as shown. In each case, the initial pressure on these new wells was found to be substantially below the original value or virgin reservoir pressure of 3200 psi. In the case of Navajo Tribal U Number 3, the initial pressure is approximately

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3115. This is well below the virgin pressure of 3200 and in line with the existing average reservoir pressure at the time that well was completed. That is a gas well in this pool. A little bit later on, the Navajo Tribal U Number 4 Well was completed with an initial pressure of approximately 3,050 psi. It also is well below the virgin pressure and in line with the average reservoir pressure as of the time that well was completed. That well also is a gas well in this pool.

About the same time Navajo Tribal U Number 5 was completed, and its initial reservoir pressure was about 3,020 psi. This is an oil well and again, well below the original virgin pressure and in line with the actual average reservoir pressure at the time that well was completed.

Q Mr. Eaton, when you, as a reservoir engineer, see pressure, the initial pressure on a new well considerably below virgin pressure and at, or then at the average reservoir pressure, what does that mean to you?

A It means that interference has occurred and that well has been in pressure communication with the other wells in the reservoir and its pressure has been partly depleted despite the fact that it has never produced anything itself.

Q Before we leave this Exhibit, Mr. Eaton, let me ask



you whether or not these data contained on this Exhibit are from Pan American wells and leases?

A They are from Pan American leases only.

Q Would you look now at what has been marked as Exhibit Number 5? It's on the wall to the left of the Examiner, what is that Exhibit?

A Exhibit 5 again, is a map of the Tocito Dome Pennsylvanian "D" Pool area. It's the same map that is depicted over in Exhibit 1 and again, the oil wells in the pool are colored green and the gas wells are colored red. In addition, I have plotted on Exhibit 5 the actual bottom hole pressures that were measured during the June 1st, 1965 bottom hole pressure survey. These are these numbers which are listed beside the appropriate well and underlined in red. The significance of these pressures is that they are so near uniform, the highest pressure that was measured during that survey was 3,009 psi on the Navajo Tribal N Number 2 and the lowest pressure that was measured was 2982 psi on Navajo Tribal N Number 4. This is a difference of only 27 psi between the various wells in the pool, gets back to the fact that some of the pressures are on oil wells, some are on gas wells, some are on old wells and some are on wells that just have recently been completed. This means that the entire reservoir is being completed at approximately

the same rate. Whatever the producing mechanism, it is an efficient one.

Q Mr. Eaton, let me ask you this again, these pressures that you have plotted on Exhibit 5 are on Pan American wells, are they not?

A Yes, they are.

Q Do you have any comparable pressures on the Texaco wells to the south, either at the time of this last survey in '65 or an earlier survey?

A Texaco did not run a survey on their wells in June, however, they did survey two of their wells during the March period at the same time that pressures were run on Pan American wells. At that time, the reservoir pressures were approximately 100 psi higher than are depicted on the June survey but again, there was very little difference between the level of pressures throughout the entire reservoir.

Q So from one end to the other in March of '65 when you had that more or less area-wide survey, for all practical purposes, they were all identical?

A Again, they were very close.

Q Mr. Eaton, I notice that you have two circled areas on Exhibit 5, one colored red and one colored green. What is the significance of those areas?

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A These show the areas that have been influenced by interference as depicted by pressures obtained on new wells as they came in lower than the virgin pressure. I have colored the one area in red and one area in green. The one colored in red has a number inside it underlined in red saying 415 acres. This is the minimum area that is shown by these pressure data as being drained by a gas well. I might describe just how this area was arrived at.

The initial pressure on Navajo Tribal U Number 3 as shown by our Exhibit Number 4 came in, in line with the average reservoir pressure existing at the time that well was completed and well below the virgin pressure. I simply took an arc and struck it through the nearest well which had been producing, assuming that that well would certainly be the minimum distance over which this pressure communication had been effective. The 415 acres is the area inscribed by the circle using the radius from the new well to the nearest existing well. I could have -- I say it's a minimum area because I could have drawn one from the Navajo Tribal U Number 4 well through the nearest producing well which for it, would have been the Navajo Tribal U Number 3. That length is greater than the radius that I chose so that the area of this circle would have been greater. Again, Navajo Tribal U Number 4 showed very definite evidence of interference so 415

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acres I consider to be the absolute minimum area that has been demonstrated as being capable of having been drained by a gas well.

With respect to the green area, it has a number in it saying 246 acres and underlined in green, that circle colored in green is drawn around the Navajo Tribal U Number 5 Well. This is an oil well. The initial pressure on that well was very much removed from the virgin pressure and in line with the existing average reservoir pressure at the time of its completion. The radius again was struck through the nearest completed well. In this particular case, the arc was struck between Navajo Tribal U 5 and Navajo Tribal U Number 4. The area contained in that circle turned out to be 246 acres. I say this is the minimum area over which oil is effectively being drained. The actual area I feel is considerably greater for, although I chose to draw this circle through the new well with an arc the length to the nearest completed well, as a matter of fact, the nearest completed well had not ever been produced on the pipeline at the time Number 5 was completed, the actual nearest production was from the Navajo Tribal U 3, a considerable further distance away.

Q Mr. Eaton, is it your opinion that these interference data conclusively prove that an oil well will

effectively and efficiently drain in excess of 160-acres and a gas well effectively and efficiently drain in excess of 320?

A This is what the data tell me. Yes, sir.

Q In your opinion, should the Commission make the current temporary rules permanent rules, do you feel that would serve conservation as well as protect correlative rights of all of the owners of interest?

A I do.

Q Do you have anything else that you would care to add at this time?

A I don't believe so.

MR. BUELL: Mr. Examiner, that concludes all that we have by way of direct testimony. I would like to formally offer Pan American Exhibits 1 through 5 inclusive.

MR. UTZ: Without objection, they will be entered into the record in this Case.

(Whereupon, Pan American Exhibits 1 through 5 offered and admitted into evidence.)

CROSS EXAMINATION

BY MR. UTZ:

Q Is Pan American currently flaring any gas out of this pool?

A The compressor that we have down there now is a

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little bit overloaded and a little bit of gas is being flared.

Q Do you have an estimate of how much is being flared?

A Approximately 150 mcf, I believe.

Q Per day?

A Per day.

Q Is this situation going to persist?

A No, sir. We have a new compressor on order that has been promised for shipment today. It should be in Farmington sometime this weekend and be on the line sometime the middle of next week.

Q How do the -- How does the gas cap compare now in your opinion with what you showed on your last testimony in this case?

A Mr. Utz, I don't believe I ever did try to estimate the size of the gas cap in previous testimony. At the present time, or is this what you were asking, the size of the gas cap?

Q Well, what I asked you, how does it compare now with what you showed on your first exhibit in this case? I believe you estimated the color, as I recall, the size of the gas cap?

A No, sir. That was, I believe that was Texaco's Exhibit.

MR. UTZ: Was that Texaco's?



MR. WALSH: Yes.

Q (By Mr. Utz) How do the tops of your other four gas wells compare in relation to the third one from the right, which I can't read from here. What number is that?

A That's the Navajo Tribal N Number 3.

MR. BUELL: As shown on Pan American's Exhibit Number 2.

A Actually, as you will notice from that Exhibit Number 2, the structure is fairly gentle in its dip. It doesn't have steep dips in this north-south direction, we found that it does have steep dips along this western edge here. As far as how these tops compare, Navajo Tribal N 3 is this well right here in the southeast of 17. The Navajo Tribal U 3 is higher than that well. All of the others are lower than that well.

Q (By Mr. Utz) I assume the Number 5, U 5 is lower than the Number 3?

A Yes, sir, and U 6 which is this well in the northwest of Section 22 was very low, as a matter of fact it's a dry hole. It's below the oil-water contact.

Q What kind of GOR do you have in the Number 5, does it produce much gas?

A It's approximately solution ratio of 1100 cubic feet per barrel.



Q So you assume from that it's definitely not in the gas cap?

A Yes, sir.

Q In your opinion, has this pool been delineated?

A There's only one other possible location, I think, and that might be in the northern part of Section 16. I believe that it has been delineated in the other directions. I'll just point out if I can where these dry holes are.

Navajo Tribal N Number 5 in the southeast quarter of Section 20, pretty well delineates the pool in this direction to the southwest. More recently, and actually the well has been completed as a dry hole since this map was drawn, Navajo Tribal N 7 in the southeast quarter of Section 18, pretty well delineates the pool to the west. On the northeast flank of the pool Navajo Tribal P Number 1 is a dry hole in the southwest quarter of Section 8, and then, Navajo Tribal U Number 6 in the northwest quarter of Section 22, defines the pool to the easterly direction.

Q Was that a dry hole?

A Yes, sir, it was.

But there was the one possibility of another location in the north half of Section 16, or possibly another one in Section 9 but with those exceptions, I believe that this pool is pretty well defined.

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Q I believe we went into this at the last Hearing. I might refresh your memory on it. This U 2, did you pick the top of the water bearing zone from the log? Is that the way you determined the top of the water there?

A No, sir, the top of the water was picked on this well both from the log and from production tests.

Q It's perforated in the bottom of the water, isn't it?

A Yes, sir. It's perforated at this point right here but it also had drill stem test, is not shown across the upper part.

Q So the entire zone was, the DST recovered no oil?

A Yes, sir, or very little, not enough to make a completion out of.

Q Do you think there's communication through that area there?

A It's my opinion that it is pressure communication, Mr. Utz, both from a standpoint of the initial level of pressures that were found on this side of this well, as compared to those to the north and also from the level of pressures that were obtained during the March survey which showed that approximately the same level of pressure existed in the south end of the pool as compared to the north end. It would be fortuitous that the same level of

pressures would exist and there not be any communication.

Q You didn't actually run any interference tests as such?

A The interference tests that we ran were confined to measurement of the initial pressure values on new wells. We did not choose a well and shut it in and produce others around it and measure the pressure performance of that shut in well. However, the pressure data obtained on brand new wells, in my opinion, are in effect interference data.

Q You are assuming that the pressure in the reservoir of those wells was virtually the same as the initial pressures in the old wells?

A Yes, sir.

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

MR. PORTER: What's the oil allowable, Mr. Eaton?

A The oil allowable is 334 barrels per day per well.

MR. PORTER: Do you know how many marginal wells you have in the pool?

A Pan American has one. Texaco has three. This Navajo Tribe P Number 2 Well, Pan American's, that is, the oil-water contact in its completion interval is currently capable of approximately 60 barrels per day. These three wells of Texaco's which are the one in the southwest quarter, one in the southeast quarter of Section 28 and one in the

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northwest quarter of Section 34, are three wells which found the main porosity member below the oil-water contact and each were completed in this little porosity stringer right above and none of those wells are top allowable.

MR. PORTER: That's all the questions I have.

MR. UTZ: Are there any other questions? The witness may be excused. (Witness excused.)

\*\*\*

A. G. WALSH, a witness called to testify, having been first duly sworn, was examined and testified as follows:

(Whereupon, Exhibits A, B, and C were marked for identification.)

DIRECT EXAMINATION

BY MR. KELLY:

Q Would you state your name, position and employer, please?

A I'm A. G. Walsh. I work for Texaco, Inc. in Farmington, New Mexico as District Engineer.

Q You have previously testified before the New Mexico Oil Conservation Commission?

A That is correct. I testified at both of the two previous Tocito Hearings.

MR. KELLY: Are the witness' qualifications a matter of record?



MR. UTZ: Yes, they are.

Q (By Mr. Kelly) Could you tell the Examiner the change, as far as the amount of drilling and production that has occurred since the initial Hearing in this Case on Texaco's properties?

A As far as Texaco's leases are concerned, at the first Hearing Texaco had one well complete and was in the completion process of one more. Since that time, we have completed five oil wells in the Tocito Dome Field.

Q Referring to what we have marked as Exhibit A, would you point out those wells?

A Texaco Navajo Tribe A L Number 1 located in the northeast quarter of Section 28 was completed at the time of the last Hearing. This well is a top allowable oil well. Texaco Navajo Tribe A L 2 in the southeast quarter of Section 28 was in the completion process at that time. It is now a limited capacity, pumping oil well producing approximately 50 barrels of oil per day. Texaco Navajo Tribe A L Number 3 in the southwest quarter of Section 28 has been completed since the last Hearing. It's a limited capacity pumping well producing approximately 25 barrels of oil per day. Texaco Navajo Tribe A R Number 1 is located in the southwest quarter of Section 27, it's a top allowable flowing oil well producing 334 barrels per day, and the

Texaco Navajo Tribe A U Number 1, located in the northwest quarter of Section 24 is a pumping oil well producing approximately 150 barrels of oil per day.

Q So your two wells capable of producing allowable are your A R 1 and A L 1, is that correct?

A That is correct.

Q What was your initial bottom hole pressure on both of those wells?

A The initial bottom hole pressure on the Texaco Navajo Tribe A L Number 1 was determined to be 3206 psi at a datum of 525 feet below the sea level. After a production of 719 barrels of oil, the initial bottom hole pressure on the Navajo Tribe A R Number 1 was determined to be 3170 psi at the datum of 525 feet below sea level after it had produced 819 barrels of oil.

Q Would these comparative bottom hole pressures lead you to a conclusion as to the ability of these wells to drain acreage in excess of 160-acres?

A Yes. That is my opinion. To digress a little further, I would like to explain the significance of Exhibit A. Noted beside each of the wells is the cumulative production from that well at the time that the Navajo Tribe A R Number 1 was completed. If you notice the A R Number 1 has no production beside it so this indicates that no production

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had been taken from that location. The Navajo Tribe A L Number 1 had produced 21,425 barrels and this well is located 1866 feet from the A R Number 1. Going further to the northwest the Navajo Tribe U Number 1 of Pan American had produced 19,785 barrels, this well is located 1.4 miles from the Texaco A R Number 1. Pan American's Navajo N Number 2 had produced 25,476 barrels, located two miles away; and the Pan American P Number 4 had produced 5694 barrels and this well is 3.3 miles away.

The significance of this Exhibit is that this indicates that the pressure in the Navajo Tribe A R Number 1 had been decreased some 36 psi as a result of production from the Navajo Tribe A L Number 1 and other wells in the field over a seven month period. This is evidence of the fact that one well is capable of draining an area in excess of 160-acres.

Q Would you refer to what you have marked as Texaco's Exhibits B and C and explain those to the Examiner?

A Exhibit B is a plot of bottom hole pressure versus time for the Texaco Navajo Tribe's A L Number 1 and A R Number 1. Exhibit C is a plot of the bottom hole pressure in these two wells versus the cumulative production from these two wells. Coming back to Exhibit B, you will note that the pressure in the Navajo Tribe A R Number 1 in

December of 1964, at which time it was completed is essentially equivalent to the bottom hole pressure in the Navajo Tribe A L Number 1 at that time. This is evidence that the pressures were essentially equal in these two wells at this time, which means that the entire area was drained by the production from Navajo Tribe A L Number 1. Reference to Exhibit C, you will notice that the bottom hole pressures in each well appear to be a function of the cumulative production from both of the wells. This indicates that the wells are in excellent pressure communication.

Q Do you have any opinion as to whether the limits of this pool have been pretty well defined?

A I would hesitate to say that the field is completely developed but at the present time I know of no other future drilling which we contemplate.

Q You were present when Mr. Eaton testified on behalf of Pan American?

A That is correct.

Q Would you, in your professional opinion, agree with the statements he made as far as the recommendations on making these rules permanent?

A Yes. I agree wholeheartedly with Mr. Eaton.

Q Do you feel in your professional opinion, that this pool can be effectively drained as far as oil on 160-acre



spacing and gas on 320-acre spacing?

A That is correct.

MR. KELLY: We have no further questions on direct but I would like to move for the introduction of Exhibits A, B, and C. They were prepared by you or under your direction?

A That is correct.

MR. UTZ: Exhibits A, B and C, without objection, will be entered into the record of this Case.

(Whereupon, Exhibits A, B, and C, offered and admitted.)

CROSS EXAMINATION

BY MR. UTZ:

Q Are these wells producing any gas?

A They're producing solution gas, not free gas.

Q What is their GOR?

A Approximately 1300.

Q Is that gas being flared?

A No, sir.

Q When you took these pressures, did you take them with a bottom hole pressure gauge?

A Yes, sir.

Q How does the top of the pay -- Well, I guess we got it, I will ask it anyway. How does the top of the pay compare in these wells as compared to the gas wells up in the northern end of the pool?

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A Well, the top of pay in our well, or all our wells, is considerably lower than those wells in the north part of the field which are gas wells. You may recall at the first Hearing, that Texaco's Navajo Tribe A L Number 1 was a high gas-oil ratio well. Since that time we have performed remedial work on this well, squeezed off the upper perforations and reperforated the lower portion of it and shut off the gas so this well apparently did have the remnants of a gas cap.

Q You don't feel you have a gas cap now?

A Yes, sir. The gas cap is still there. We just -- We're not perforated in it, we are not producing gas cap gas.

Q You perforated below?

A Yes.

Q You are not producing any of the gas cap gas?

A That's correct.

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

(Witness excused.)

I would like to call Mr. Eaton for another question or two.

\*\*\*

G. W. E A T O N, having previously been sworn, was recalled and testified further as follows:



CROSS EXAMINATION

BY MR. UTZ:

Q In regards to the gas cap situation, Mr. Eaton, have you detected in the gas production of any of your gas wells any increase in oil production?

A Not that I know of, Mr. Utz. We are experimenting out in this pool with several varieties of separation equipment and we have just recently moved -- Well, let me say this first, not all of the wells have exactly the same gas condensate ratio. Now, we are experimenting with different kinds of separation equipment and we just recently made a switch with some of this equipment to see if the difference in gas-oil ratio is due to the separation equipment, or if it is due to a difference in the reservoir fluids at that particular location. I don't expect that there will be significant changes between wells. The point I am trying to make is that there may be some changes due to this moving about of equipment.

Q Well, the quality and type of liquids produced from the gas wells is different than the oil produced from the oil wells?

A Oh, yes, sir. The average gravity of the condensate is about 64 to 65 degrees. The average gravity of the oil which is a black oil, is about 46 degrees, so there's a

substantial difference between the liquids produced from the gas wells in comparison to those produced from the oil wells.

Q At this time you see no evidence of your gas allowables being high enough to pull the oil up into the gas cap?

A No, sir. We certainly don't want that to happen and if it does begin to happen, you can rest assured that we will take steps to prevent it. We certainly do not want this oil to move up into that gas cap, and with the present rules, I believe that the situation is well taken care of.

Q You think that the gor is about right, then?

A Yes, sir.

MR. UTZ: That's all I have.

A I might add one more thing, since I'm on recross, with regard to this flare gas situation I want to make it plain that it is only this new, last completed well that has overloaded our existing compressor and under the pool rules there is a certain time limit that is given for new wells to make beneficial use of the gas.

MR. UTZ: Is that 60 days?

A 60 days.

MR. UTZ: It hasn't been producing 60 days?

A Well, it's right at it right now. We are taking immediate steps and have taken immediate steps to get another

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compressor in there to take care of the situation.

MR. PORTER: You'd rather sell the gas?

A Much rather, yes, sir. And you see, we have two levels of separation in this, the high pressure separator on our oil wells is operated at high enough pressure that that gas can go directly into the sale line so that the only gas that is processed into the compressor is the tail gas off the low pressure separator, that's the reason the volume that I described is nominal, because it's only the low pressure separator gas that's being compressed to put into the sale line anyway. In order to get a gas market out of this pool, we had to lay a line ten miles long from this pool eastward to tie into El Paso's main line that goes from Shiprock down to Gallup and we had to be able to deliver gas to El Paso at the end of that ten mile line at 850 psi. In order to do that, then, we have to operate our end of that line at about a thousand pounds and if it weren't for the fact that these are such good wells that they will produce with high enough flowing pressure to permit that high pressure separator to be operated in excess of a thousand pounds, then we would have a real compressor problem but the flowing pressure on these oil wells is 1400 psi or in this range, and for that reason we can operate our high pressure separator at a pressure high enough to put that gas into this high pressure

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sales line and then, we must compress this 200 pound separator gas.

MR. UTZ: As the pool depletes, you'll have more acute compressor problems?

A Possibly, yes.

MR. UTZ: Unless it's a water drive?

A Yes, sir.

MR. UTZ: Any other questions? The witness may be excused again. Any statements in this Case?

The Case will be taken under advisement and the Hearing adjourned.

(Whereupon, the Hearing was adjourned at 3:20 o'clock P.M.)

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I N D E X

WITNESSES

G. W. EATON

Direct Examination by Mr. Buell  
Cross Examination by Mr. Utz  
Further Cross Examination by Mr. Utz

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A. G. WALSH

Direct Examination by Mr. Kelly  
Cross Examination by Mr. Utz

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E X H I B I T S

| EXHIBIT                       | MARKED FOR IDENTIFICATION | OFFERED | ADMITTED |
|-------------------------------|---------------------------|---------|----------|
| Pan American Nos. 1 through 5 | 2                         | 16      | 16       |
| Texaco Nos. A, B, and C       | 22                        | 27      | 27       |

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STATE OF NEW MEXICO )  
 ) ss  
COUNTY OF BERNALILLO )

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 27th day of August, 1965.

*Ada Dearnley*  
NOTARY PUBLIC

My Commission Expires:  
June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3028 heard by me on 8-11, 1965.

*Thomas A. [Signature]*, Examiner  
New Mexico Oil Conservation Commission

BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
July 1, 1964

EXAMINER HEARING

IN THE MATTER OF:

Application of Texaco Inc., for the  
creation of a new oil pool and for  
special temporary pool rules, San Juan  
County, New Mexico.

Case No. 3073

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

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MR. UTZ: Case 3073.

MR. DURRETT: Application of Texaco Inc., for the creation of a new oil pool and for special temporary pool rules, San Juan County, New Mexico.

MR. KELLY: Booker Kelly of Gilbert, White and Gilbert in Santa Fe, appearing on behalf of Texaco. I have two witnesses and ask that they be sworn.

MR. UTZ: Are there any other appearances?

MR. BUELL: For Pan American Petroleum Corporation, Guy Buell.

MR. UTZ: Any other appearances?

MR. DURRETT: Did you have a witness?

MR. BUELL: Yes, sir.

(Witnesses sworn.)

A. P. McCONNELL, JR.

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

DIRECT EXAMINATION

BY MR. KELLY:

Q Would you state your name, position and employer, please?

A I am A. P. McConnell, Junior. I am District Geologist with Texaco in Farmington, New Mexico.

Q Have you previously testified before this Commission?



A No, sir.

Q Would you give the Examiner a brief statement of your qualifications?

A I was graduated from the University of Washington in 1942 with a Bachelor of Science degree in geology. From 1945, '49 I was doing field work in West Texas and New Mexico, including the Four Corners area here. From 1949 to '56 I was in Midland, Texas doing subsurface geology. In 1956 I was transferred to Farmington, New Mexico as District Geologist and in charge of drilling and exploration work, which included the Tocito Dome area.

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

MR. UTZ: Yes, sir, they are.

(Whereupon, Applicant's Exhibit A was marked for identification.)

Q Referring to what has been marked Exhibit A, could you state to the Examiner what Texaco seeks by this application?

A Texaco seeks the creation of a new oil pool that would include sections in Townships 25 and 26 North, Range 18 West, San Juan County, New Mexico. They also seek 160-acre oil well spacing, 640-acre gas well spacing, and a gas-oil ratio of 4,000 to 1.

Q On Exhibit A you have drawn a structure map. Could you briefly explain that?

A Exhibit A is a structural interpretation of the Tocito

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Dome area. It is contoured on a 50-foot interval on the Barker Creek formation of the Pennsylvanian. It shows both the Pan American and Texaco wells. In the Northwest corner there is the Pan American P-1 Navajo dry hole, the Pan American N-1 shut-in gas well, the Texaco No. 1 Navajo "AL" producer, and the No. 2 Navajo "AL" of Texaco's.

Q Could you give the present status of these wells?

A The Texaco No. 1 Navajo "AL" was completed for initial potential of 430 barrels per day, flowing through perforations 6275 to 6302. During May the well produced 3820 barrels of oil plus 12,224,000 cubic feet of gas.

MR. UTZ: Would you give me those figures again?

A 3820 barrels of oil plus 12,224,000 MCF of gas.

MR. PORTER: Was that just produced a portion of the month of May?

A The well was completed the first day of May and it was produced during May.

MR. PORTER: You say it had a potential of 430 barrels?

A Right.

MR. PORTER: Thank you.

A The No. 2 "AL" is testing and has produced 99 barrels of oil per day through perforations of 6314 to 18, flowing.

Q (By Mr. Kelly) On your structure map you have shown

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what would be your interpretation based on present data of some type of barrier between the Pan American acreage and the Texaco acreage. Is this interpretation based on just evidence you have now correct?

A That is right.

Q Do you feel if further evidence were established that it might be possible there is communication between these two proposed pools?

A Yes, there could be.

Q Would there be any harm as far as the development in this area in treating this as one pool?

A Well, no, there would be no harm if it were treated as one pool, that would be all right if it were -- if we had two separate pools at this time and then later proved to be one pool, we might get into trouble with spacing and correlative rights.

Q In other words, if temporary rules were established for the lower proposed pool of 160 acres and the statewide rules of 40 acres were left up on the Northwest corner, you would have spacing problems and correlative rights problems possibly?

A That is right.

Q Would you recommend then that Texaco's application be amended to include additional acreage as far as the proposed pool limits?

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A Yes, it could be extended to include Sections 17, 20 and 21.

(Whereupon, Applicant's Exhibit B was marked for identification.)

Q Referring to what has been marked Exhibit B, would you go through that for the Examiner?

A Exhibit B is a cross section starting on the Northwest from the Pan American 1-P Navajo through the Pan American 1-N Navajo to the Texaco No. 1 "AL" Navajo and on the end the No. 2 "AL" Navajo. The electric log correlations show that the porous zone is continuous over a wide area. The pay zone in the No. 2 "AL" was cored and had good porosity and permeabilities in excess of 70 millidarcies. The "AL" 1 and the "AL" 2 were drilled on 160-acre spacing and there's no indication of any physical barrier between the two wells. Further, that the initial bottom hole pressures corrected to 525 feet subsea show the following: that the Pan American 1-N Navajo is 3207 psi, that the Pan American 1-P Navajo is 3215 psi, and that the Texaco No. 1 "AL" Navajo is 3206 psi.

Q This bottom hole pressure information is contained on Texaco's Exhibit E, is that correct?

A That's right.

Q Mr. McConnell, in all the information that is available

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to Texaco now indicates that oil wells are capable of drilling in excess of 160 acres in the proposed area, is that correct?

A That is correct.

Q Do you have any information to indicate that an oil well could not drain 160 acres in this area?

A We have no indication that would indicate it otherwise.

Q Were Exhibits A, B and what has been marked Exhibit E prepared by you or under your direction?

A Exhibits A and B were prepared by me.

(Whereupon, Applicant's Exhibit E was marked for identification.)

Q Exhibit E was prepared by Mr. Walsh?

A Right.

MR. KELLY: We will hold up on offering Exhibit E for Mr. Walsh. Texaco offers Exhibits A and B.

MR. UTZ: Without objection, Texaco's Exhibits A and B will be entered into the record in this case.

(Whereupon, Applicant's Exhibits A and B were offered and admitted in evidence.)

MR. KELLY: I have no further questions at this time, Mr. Examiner.

MR. UTZ: Are there questions of the witness?

MR. POHLMANN: Could I ask a question?



MR. UTZ: Yes, state your name for the record.

MR. POHLMANN: Henry Pohlmann, Oil and Gas Supervisor for The Navajo Tribe. I would like to ask the witness a question.

CROSS EXAMINATION

BY MR. POHLMANN:

Q Is it possible that this is a minimum picture that has been drawn here, this contour, Exhibit A?

A Yes, it is possible.

Q It could be a lot larger?

A Yes.

MR. POHLMANN: Thank you.

MR. UTZ: Any other questions?

MR. DURRETT: I have a question or two.

BY MR. DURRETT:

Q Your next witness may go into this, and if so, just tell me that. I believe you felt that you felt one oil well would drain 160 acres. What do you base your opinion upon?

A I would like Mr. Walsh --

Q Will he go into that?

A Yes.

Q All right.

BY MR. UTZ:

Q With reference to your Exhibit B as your cross section

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between the four wells, it is my understanding that the Navajo 1-P of Pan Americans was a dry hole, which one was the dry hole?

A The Pan American 1-P.

Q That is a dry hole?

A Yes.

Q And the Pan American 1-N, is that a gas well?

A It is a shut-in gas well.

MR. PORTER: Is that gas in the Pennsylvanian?

A Yes, sir.

Q (By Mr. Utz) Do you have any information as to the potential of that well?

A Yes, sir.

MR. BUELL: Mr. Examiner, if you please, we intend to put that on unless you would like to have it right here.

MR. UTZ: If he has it, I would like to have it at this time.

A It was potentialled for 577,000 gas per day plus 40 barrels of condensate.

MR. EATON: 40 barrels per million?

A Per million.

Q (By Mr. Utz) And your Texaco 1 or your Tribal "AL" No. 1 was potentialled for 430 barrels a day, and during the month of May it produced 3820?

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A Yes, sir.

Q It wasn't producing quite its potential, was it?

A I don't know, sir.

Q Well, 3820 would be 30 times 4 into 20, was it on the line 30 days during May?

A I don't know that.

Q And the Navajo 2 "AL" also is an oil well, right?

A Yes, sir.

Q That well was potentialized for 99 barrels of oil per day, is that correct?

A I believe that's right, yes, sir.

Q So it appears that neither of these wells would be top allowable wells on 160 acre basis, would that be a fair statement?

A Yes, sir, that's a fair statement.

Q I note between the Pan American No. 1 and your Tribal "AL" No. 1 that you've shown a syncline in your contouring here. Was that on the basis of the No. 1 Tribal N No. 1 of Pan American's being a gas well, and yours being an oil well?

A No, sir, that's based on other information.

Q What other information do you have?

A Seismic information.

Q Seismic, I see. The Pan American well is, however, slightly higher structurally, would that be a fair interpretation



of this cross section?

A Yes, sir, it is higher.

Q Do you have an opinion as to whether the Pan American well could possibly be a part of a gas cap?

A Yes, sir, it could be.

Q But you actually don't have any concrete information to show that there's connection between these two wells?

A Only that the reservoir is continuous.

Q Do you have any gas analysis that would give you any indication whether it was from the same formation or not?

A I believe the engineer will develop this further.

MR. UTZ: Are there any other questions of the witness?

The witness may be excused.

(Witness excused.)

A. G. WALSH

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

DIRECT EXAMINATION

BY MR. KELLY:

Q Would you state your name, position and employer, please?

A I am A. G. Walsh, and I am District Petroleum Engineer in Farmington, New Mexico for Texaco Incorporated.

Q Have you previously testified before the New Mexico

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Commission?

A No, sir, I have not.

Q Would you give the Examiner a brief statement of your qualifications?

A I was graduated from the Texas A & M College with a B. S. in petroleum engineering in 1950, at which time I went to work for Seaboard Oil Company in an engineering capacity. I worked in West Texas with Seaboard Oil Company for eight years, at which time I went to work for Texaco Incorporated. In July of 1961 I was promoted to District Petroleum Engineer in the Farmington District. Since that time I have been working with development in production problems in New Mexico in the Farmington District, and as such I'm familiar with the drilling and completion and subsequent production history of the Navajo Tribe "AL" No. 1 and "AL" No. 2.

(Whereupon, Applicant's Exhibit C was marked for identification.)

Q Referring to what has been marked Texaco Exhibit C, has Texaco undertaken a study to establish that we are concerned with an oil pool here?

A Yes. Exhibit C is a brief reservoir fluid study of the separated liquids and vapor that were collected from the Texaco Navajo Tribe "AL" No. 1 on May 6, 1964. The liquid and gas were

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recombined in proportion to their producing rates and returned to reservoir conditions of 159 degrees Fahrenheit and approximately 200 pounds per square inch. Under these stimulations the system was found to be in two phases with liquid occupying 42 percent of the volume. This is interpreted to indicate that the Navajo Tribe "AL" No. 1 has penetrated a gas-oil contact and is producing from both a gas and oil saturated zone.

Q Has Texaco encountered any high gas-oil ratio problem in the "AL" No. 1 well?

A Yes, the initial gas-oil ratio on "AL" No. 1 was 2,880 cubic feet per barrel. Since that time it has increased and now it's approximately 3800 feet per barrel.

Q What do you think the explanation for this is?

A The reason that the gas-oil ratio is high is the fact that the well penetrated a gas-oil contact and is completed from a zone which is gas saturated, and immediately below it a zone which is oil saturated. There apparently is excellent vertical communication within the reservoir since Texaco has made an effort to produce from the lowermost portion of the pay section to reduce the gas-oil ratio. These attempts have been unsuccessful, however.

Q Referring back to Exhibit A, could you locate other possible locations where you would encounter the same problem that you have in your "AL" No. 1?

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A This situation will no doubt occur at any time a well intersects a gas-oil contact. The way our geologists have the structure mapped, at the present time one could expect a well located in the Northwest corner of the Southwest, the Northwest Quarter of the Southwest Quarter of Section 27. This situation could exist there; likewise in the Northwest Quarter of the Northwest Quarter of Section 34 this same situation could exist.

Q If 160-acre spacing were granted here and the 2,000 to 1 statewide GOR was retained, what would be the effect as far as these wells are concerned?

A This would reduce the amount of oil that a well would be allowed to produce in one day. This, of course, results in a much longer time for the operator to recover the oil that's in place, and also takes a longer time for him to recover his investment. This reduces the incentive for an operator to drill and produce this type of reservoir.

Q In effect, it would have the effect of nullifying if the Commission were to grant 160 to nullify the 160-acre spacing for these wells, wouldn't it?

A That is correct. In the case of the "AL" No. 1 it would effectively reduce the oil allowable by 50 percent.

Q If your economic analysis shows that it would be un-economic to develop wells on say 80-acre spacing, this would have



the same effect as far as these wells were concerned?

A That is correct. It would extend the length of time required to recover the oil.

Q Now, has Texaco made any attempt to negotiate with anyone to get a pipeline in here?

A Yes, Texaco has made contact with El Paso Natural Gas Company and has also been working with the Pan American Petroleum Corporation in an effort to develop a contract whereby the gas can be sold, and also to build a pipeline from the field area over to the El Paso trunk line, which is approximately eight miles to the east.

Q Now, going on to what has been marked Texaco Exhibit D, which is your economic analysis, would you give the Examiner your underlying data and then go through that?

(Whereupon, Applicant's Exhibit D was marked for identification.)

A Exhibit D is an economic analysis of development of an oil well on either 80-acre spacing or under 160-acre spacing. The significant factors are that under 80-acre spacing the present worth of the working interest income is \$162,000. The development and operating costs for a well under these conditions is \$142,000.

Under 160-acre spacing the present worth working interest income is \$310,000, whereas the development operating costs are

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\$167,000. As you can see, an operator has an incentive to develop this type of reservoir under 160 acres. Under 80-acre spacing the income is such that it is not an attractive investment.

Q What figures did you use to arrive at your barrels of oil, MCF, and price of gas, et cetera?

A These figures were based on assuming that this is an oil-saturated zone, having a pay thickness of approximately 20 feet. The porosity we used was 8.3 percent. This is obtained from core data and also log data. We've assumed that the water saturation is 30 percent, that the recovery factor would be approximately 15 percent, and that a formation volume factor of 1.5 would apply. The price of oil that we used was \$2.69 a barrel. Under Texaco's leases the Navajo Tribe has a 16-2/3 percent royalty and we have used a thirteen cent per MCF price per gas.

Q On your "AL" No. 1 you have a core analysis, is that correct?

A No, we have core analysis on "AL" No. 2.

Q What does that show as far as porosity and permeability?

A The porosity is in the range of 8.3 percent, which we have here. The permeability is relatively high for limestones in this area, it's in excess of 70 millidarcies.

Q This would be further evidence, in your opinion, to show that oil wells could drain in excess of 160 acres?

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A Yes, sir.

Q Now, this economic analysis is based on a comparison of 80 and 160 acres, and you show a possible return of \$20,000 on 80 acres. With this type of risk, in your opinion would a prudent operator develop this pool on 80-acre spacing with a possible \$20,000 return?

A No, sir, Texaco or any other prudent operator would be unable to make this type of development.

Q Of course, if the statewide 40-acre spacing were allowed, the picture would be doubly black?

A Well, this would result in a net loss, yes, sir.

Q Has Texaco, in developing this case for hearing, consulted with the representatives of the Navajo Tribe?

A Just briefly, yes, sir.

Q Have they made certain suggestions or requests concerning rules changes that would affect the proposed rules?

A Yes, sir. The Navajo Tribe has suggested that we make several changes in the rules which we propose.

(Whereupon, Applicant's Exhibit F was marked for identification.)

Q Referring to what has been marked Exhibit F, which is proposed rules, would you show the Examiner both where Exhibit F varies from the proposed rules that were in the application and



also what changes have been made in Exhibit F itself as far as it goes?

A The first rule that is different from what appeared in the application is Rule 2 in which a gas well is specified or allocated 640-acre spacing. Our application did not mention gas wells. Rule 2 (b), at the request of the Navajo Tribe, has been altered to show that wells may be drilled on non-standard spacing. This was originally written up so that the Navajo Tribe might have odd lot leasing; however, the Tribe has advised us that they do not have any odd lots in the neighborhood and that this would not be necessary.

On page 2 of the Exhibit F, Rule 3 (b), the same applies. We have eliminated the mention of odd lot leasing by the Navajo Tribe. On page 3 of the Exhibit F in Rule 4 (a), the terms "the Northwest Quarter or Southeast Quarter of" have been eliminated. This was done at the request of the Tribe.

Q So that would leave you with what sort of spacing?

A This would leave you with the same spacing, 640-acre gas well.

Q I mean location.

A You can put the well in the center of any quarter section, any quarter quarter section.

Q There are no other changes?

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A I believe that is all. Yes, that's all.

Q This application that Texaco is seeking would be a temporary one-year application to allow interference tests to properly develop the pool?

A That is correct. In the proposed rules the provision is made for transfer of allowable and interference test.

Q If, in fact, further evidence showed that you could not drain 160 acres, then you could always come back and infill drill, is that correct?

A That is correct.

Q Based on the geologic and engineering evidence Texaco has at the present time, everything indicates that 160 acres could be adequately drained?

A That's the way we believe at the present time.

Q In your opinion would the granting of this application be in the interest of conservation and the prevention of waste and the protection of correlative rights?

A Yes, sir.

Q Were Exhibits C, D, E and F prepared by you or under your direction?

A That is correct.

MR. KELLY: I have no further questions.

MR. UTZ: Do you wish to introduce those exhibits at

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this time?

MR. KELLY: I would like to move to introduce these exhibits, and also move to amend our application to include Sections 21, 20 and 17, and for the rules changed as outlined by Mr. Walsh.

MR. UTZ: These rules were included in your application, were they not?

MR. KELLY: They were, but those changes would have to be inserted, I think we are okay on the advertising because it just refers to the "AL" No. 1.

MR. UTZ: Exhibits C through F will be entered into the record of this case without objection. The motion to amend your application to include Sections 17, 20 and 21 will be granted as well as the proposed rule changes since it is not in conflict with the advertisement.

(Whereupon, Applicant's Exhibits C through F were offered and admitted in evidence.)

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

MR. POHLMANN: Yes, Henry Pohlmann, Oil and Gas Supervisor, Navajo Tribe.

CROSS EXAMINATION

BY MR. POHLMANN:

Q On rule change 3 (b), the Tribe would prefer that just



certain words be struck out of (b), I think we agreed to that, not the removal of (b) altogether. 3 (b), for example, it would be our preference that the words "in order to facilitate the leasing of odd lot acreage by the Navajo Tribe," those words be stricken from the rule and all the remaining words remain as it was our desire not to remove the whole thing?

A That's the way it was presented in the exhibit. Those words were removed.

Q I have a question, we have referred to the potential of "AL" No. 1 on a number of occasions as 430 barrels a day. Is that absolute potential?

A No, sir. The well will make in excess of that. I don't have the exact figures handy, but I am reaching back in memory. I believe the well was producing with 1600 pounds tubing pressure at the time.

Q And through a  $\frac{1}{4}$ " choke?

A Yes, that's correct.

Q So the absolute potential would be far in excess of 430 barrels a day?

A Yes, sir. Correct me if I'm out of order. I believe one of the gentlemen at the table asked whether or not the well had the ability to produce 160-acre allowable. As evidenced by that potential and other tests which have been run on the well, it

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certainly has the ability to produce the 160-acre allowable.

MR. PORTER: Apparently it didn't produce the full month of May then?

A Yes, sir, it produced fourteen days during May. We have an allowable of 124 barrels per day.

MR. PORTER: I see.

A And the New Mexico rules will allow you to produce I think 20 percent over the allowable in one month.

MR. PORTER: We allow 25 percent.

A 25 percent, so the well actually only produced fourteen days, and it does have the ability to produce.

Q (By Mr. Pohlmann) How about the porosity in "AL" No. 1, could it be greater than 8.3 percent?

A We have made an analysis on the porosity in "AL" No. 1 based on the sonic log, and the 8.3 percent is what we came up with.

Q Is it possible, I mean, to be higher?

A Yes, it's possible.

Q And recovery factor of 15 percent, is it possible that this might be higher?

A This could very well be higher. It could also be lower.

Q Is this a possible secondary recovery project?

A I think all oil reservoirs are possible secondary recovery prospects, yes.

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Q In this case the recovery factor, then, might be 30 percent, or something in excess of 30 percent?

A It could be different from 15 percent.

MR. POHLMANN: Thank you.

MR. UTZ: Are there any other questions?

MR. DURRETT: I have a question.

MR. UTZ: Mr. Durrett.

BY MR. DURRETT:

Q I was involved in another matter for a moment and I heard you reach a conclusion that one oil well would efficiently drain 160 acres. Could you just very briefly summarize what you base that conclusion on?

A Well, there are several things that enter into the ability of a well to drain a wide area. One of them is the fact that it must be established that the entire area is in communication with the well bore. Exhibit B is a cross section which covers some two and a half to three miles and if you'll refer back to Exhibit B you'll see that the pay zone is continuous over this real wide area.

Another thing that enters into the ability of a well to drain a wide area is the reservoir permeability. As established earlier, core analyses of the Texaco "AL" No. 2 shows that there is a permeability in excess of 70 millidarcies. We have drill stem test



data which shows that the bottom hole flowing pressures and shut-in pressures stabilize within a matter of minutes. In other words, if on a drill stem test a well has a bottom hole flowing pressure of 2,000 pounds and it is shut in, it jumps up to the shut-in bottom hole pressure of 3200 pounds in a matter of minutes.

Q Which well are you speaking about here, the Texaco wells?

A Specifically I am referring to the Texaco "AL" No. 1.

Q As compared to which well? As compared to the "AL" No. 2 on your bottom hole pressures? Which wells were you comparing to?

A I wasn't making a comparison. I was saying that on all the wells that we have run drill stem test on, the shut-in pressures stabilize in a matter of minutes. Texaco has run some on the "AL" No. 1, some actual production tests, with a bottom hole pressure bomb in the hole and, let me reach in my file a minute. This test was taken at the same time that we were obtaining the bottom hole fluid sample. The well had a flowing bottom hole pressure of 2,757 psi. It was shut in and six minutes later it stabilized at 3,167 psi. I would like to comment that this is the pressure at the bottom. It is not corrected down to the minus 3925 datum that Mr. McConnell referred to.

Q You have not conducted any interference test?

A No, we have just completed the second well.

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Q Is that because of the time involved that it was just completed?

A That is correct.

Q Do you plan to run interference tests if this application is approved?

A Yes, sir.

Q One additional question. Now, referring to your proposed rules, the Rule 4, what was the line of thought or the reason behind your striking the rigid spacing provisions here to come up with what we generally term a flexible pattern? What was your reason that you felt that a flexible drilling pattern would be better?

MR. KELLY: Possibly I can answer this.

MR. DURRETT: Yes.

MR. KELLY: This is not something that Texaco is recommending one way or the other. We have no particular feelings on it. However, the Tribe requested this change and we have no objection to it. We put in the, we say more standard spacing in our original rules, but when we discussed this with the Tribe, since it is all Tribe territory, we had no objection to making that change. We have left it to the discretion of the Commission. It was done as a courtesy to the Tribe.

MR. UTZ: From an Examiner standpoint and an engineering

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standpoint, how does the witness feel about flexible spacing in this area?

A We see no objection to it. We initially preferred that we set these rules up so that the well could be drilled in a Southwest Quarter of the Northwest Quarter of any quarter section. But I feel that the flexibility certainly wouldn't be damaging to drainage.

MR. UTZ: This, in effect, could allow 40-acre spacing, so-to-speak, and 160-acre units on allowable. In other words, you could drill two wells on adjoining 40's?

A Yes, they would have to be in separate sections, however, or separate quarter section.

MR. UTZ: Separate 160-acre units?

A Yes.

MR. UTZ: Go ahead.

MR. DURRETT: I would like to deviate just a minute. Mr. Pohlmann, are you in a position to state the Navajo's reason for desiring the flexible spacing pattern?

MR. POHLMANN: Yes, sir.

MR. DURRETT: Go ahead.

MR. POHLMANN: We prefer the more flexible spacing pattern because this pool may not be as defined on this map.

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This is probably a minimum picture. So we have other lands to sell in this area and we like these locations flexible so that people can drill any place that they think they might get something.

Say it another way. From a Navajo viewpoint we'll get more wells drilled on our land with a flexible spacing than we will with this rigid spacing. Of course, the more wells we will get drilled the more money we will make, the more property we will sell. It's better for us from an economic picture.

MR. UTZ: You think you can recover more oil in this manner?

MR. POHLMANN: I personally believe that more wells, more oil will be recovered, but we will make more money, which, of course, is my primary purpose in life.

MR. UTZ: Particularly if you have 160-acre <sup>allowance</sup> pattern?

MR. POHLMANN: It's still only one well to 160 acres no matter where it is drilled, in what quarter section.

MR. PORTER: You consider structure here more important than a geometric pattern of well location?

MR. POHLMANN: Very definitely.

MR. DURRETT: Do you feel, Mr. Pohlmann, that a so-called rigid pattern would seriously hamper your development program or your proposed plans for selling your leases?

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MR. POHLMANN: Yes, sir, I think it could hamper. I don't know if the word seriously could be used in there, but I think it would be detrimental to us to have a rigid pattern.

MR. DURRETT: Thank you.

MR. UTZ: You would not be so concerned, however, if all your acreage in the area were already leased, would you?

MR. POHLMANN: I would have less concern then, but we have a sale coming up in this area on July 14th. This hearing is awfully close to that.

MR. DURRETT: That's all the questions I have.

MR. PORTER: I have a question or two.

MR. UTZ: Mr. Porter.

BY MR. PORTER:

Q Now, you are proposing 160-acre spacing for oil well locations and 640-acre spacing for gas wells, is that correct?

A That is correct.

Q The question was asked of the other witness if he thought there was a probability that the Pan American well was drilled into a gas cap. What's your opinion on that? Do you think that represents a gas cap here?

A According to our geological interpretation it's very possible that it is a dry gas reservoir.

Q I see.

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A There is a disturbing lack of data at the present time because of the fact that there has been no completed wells between Pan American's well and our well. At the present time Pan American is drilling their "N" No. 2 which may ultimately serve to clear up a lot of the questions that we now have. This well is located in the Southwest Quarter of the Northeast Quarter of Section 20.

Q In a matter of allocating production, are you proposing to allow a gas well on a 640 to withdraw the same amount of gas that you would an oil well on 160?

A No, sir, we are proposing that a gas well be allowed to produce the same amount on 640 acres, the same amount of gas that four oil wells would be allowed to produce on 160 acres.

MR. PORTER: That's all I have.

MR. UTZ: Mr. Nutter.

BY MR. NUTTER:

Q Is my interpretation correct, you mean that you believe that is an associated reservoir and that there's an oil pool and a gas cap?

A Yes, sir. On the basis of the reservoir fluid testing that we have done, we think that the Texaco "AL" No. 1 produces from an oil zone and a gas zone.

Q Do you believe that one of the sources of drive for this



oil pool would be the expansion of the gas cap?

A Yes, sir, very likely.

Q You think it's prudent to produce the gas from the gas cap and lose that source of energy for the oil pool?

A Well, the gas will represent considerable economic advantage to the operators. We are going to have to produce it. It's there, we are going to have to produce it. As I stated in our testimony, we have made an attempt to segregate the gas zone from the oil zone in the "AL" No. 1 and we have been unable to do so.

Q You attempted, I believe you said, to produce the well with a low GOR?

A Right.

Q Why have you done that?

A It was our intention to see if we could do it to determine if it could be produced at a gas-oil ratio of less than 2,000 to 1.

Q If the GOR for this pool were 2,000 to 1, it would provide the operators with more incentive to perforate their wells in the oil and not across the twilight zone between the oil and gas, wouldn't it?

A That's very possible.

Q Thereby conserving the gas in the gas zone?

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A That's true, if that sort of completion would be successful. The work that we have done on the "AL" No. 1 indicates that it would be very difficult. There appears to be very excellent communication between the upper portion of the reservoir and the lower portion.

Q If the gas cap is produced and the oil moves upstructure into the gas cap, wetting the gas sands, a certain amount of that oil would be lost and never be able to be recovered?

A That is possible.

Q If the oil is produced and the gas expands into the oil pool, there is no gas lost if the gas is produced later?

A Well, in theory that is correct, yes, sir.

Q Are you proposing a no-flare order for this pool in conjunction with your requested 4,000 to 1 GOR?

A No, sir.

Q Why?

A We are making every effort at the present time to bring a gas line in, and it's our opinion that this order would have no effect.

Q What would the allowable be with the proposed 640-acre spacing and the depth factor under the present 70 barrels a day basic allowable?

A 334 barrels per day for an oil well.

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Q And you would be allowed 400 MCF of gas per barrel?

A That's what we are producing.

Q You would have some 1200 MCF of gas that would be available to a flare without a no-flare order in the pool?

A Right.

MR. NUTTER: Thank you.

MR. UTZ: Are there any other questions?

MR. PORTER: I would like to ask a question. Has any attempt been made to unitize this?

A No, sir.

MR. PORTER: That's all.

BY MR. UTZ:

Q In your opinion would unitization be the way to handle a reservoir that is a gas cap reservoir?

A It would depend on a number of conditions. At the present time I don't feel that we have sufficient data to determine whether or not a unitization as it occurs to date. In order for unitization to be effective it's probable that you would need to have some well in which to return gas to the reservoir, and on the basis of the information we have right now I don't think there's a well available for that.

Q On your 4,000 to 1 GOR ratio on 640 acres a gas well would receive about five and three-tenths million?

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A That's correct.

Q That wouldn't be depleting the market, it would be depleting the gas cap at a pretty high rate?

A That is correct.

MR. NUTTER: What evidence do you have that one gas well will drain 640 acres?

A Texaco has not developed any evidence to that effect. It's my understanding that Pan American will present some data which would verify that.

MR. NUTTER: I see.

Q (By Mr. Utz) Do you have any information as to the pay zone in this pool?

A I didn't understand your question.

Q Do you have any information as to the net pay or pay zone in this pool?

A We based our economics on 20 feet of pay. That's what we found in our "AL" No. 1 in this zone; as it occurs in the Pan American "N" No. 1, we have estimated 18 feet. In our "AL" No. 2 we have four feet of pay.

MR. PORTER: Is that net?

A Yes, sir, net pay.

Q (By Mr. Utz) You have only four feet in your No. 2?

A Yes, sir.



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Q It appears to be thinning out pretty fast, doesn't it?

A Well, it's below, a portion of the pay is below water.

Q Below water did you say?

A Yes, sir.

Q Do you think this is also a water drive pool?

A I'm not ready to say that. I couldn't tell you.

Q There is that possibility, though?

A I suppose it is, yes, sir.

Q With the "AL" No. 1 and the "AL" No. 2 being just a little over a half a mile apart and the structure being such that you go from approximately 20 feet to four feet, isn't it pretty certain that this is a fairly steeply dipping structure?

A I would say that the structure dips fairly steeply from the "AL" No. 1 to the "AL" No. 2. That's the only information we have.

Q On a 160-acre basis what acreage would you dedicate to the "AL" 2?

A We would dedicate 160 acres.

Q Which 160?

A The Southeast Quarter of Section 28.

Q Based on what you know now, do you think that entire 160 will be productive of oil?

A The well is drilled in the Southeast Quarter of the



Southeast Quarter, Mr. Utz. It's in one of the furthest extremities in the quarter section, I think it's reasonable to assume that the entire quarter section is productive of oil.

Q On a steeply dipping structure such as this there is a great possibility of having a large amount of dry acreage dedicated to a well, is there not?

A That, of course, is possible, yes.

Q In your Exhibit D, or your economics exhibit, this eight year's life on 160-acre, was that based on the top allowable of 334 barrels?

A That was based on that initially, yes.

Q And you tapered it off to something less than that?

A Yes, sir. It's based on our interpretation of what the producing life of the well would be. If you'll notice, I think we have a total gas-oil ratio, a cumulative gas-oil ratio of almost 4,000 to 1 and, of course, this means that as the well produces the gas-oil ratio goes up and the well will be penalized during its later life. Also as a result of depletion will be unable to produce the top allowable during the later part of its life.

Q So this economic picture you present here was based on a well such as the "AL" 1?

A This was based on a well with the approximate pay

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characteristics of "AL" No. 1, but which would contain all oil rather than a gas and oil saturated zone. A well such as "AL" No. 1, the economics, of course, will be less attractive than this because the "AL" No. 1 does have this gas cap present.

Q Any well that doesn't have the capability of producing 334 barrels for an extended period of time, the economics would be much less than you show here?

A Correct.

Q Were these rules taken from any particular order?

A They are similar to the rules that were established for the Angel Peak Gallup Field which produces in San Juan County.

Q Do you have a name to propose for this pool?

A We have proposed the Tocito Dome Pennsylvanian.

Q As I understood your answer to the question of Mr. Nutter's, what you would propose to do then would be to flare gas at the rate of 4,000 cubic feet to 1 until such time as you could negotiate a contract with a gas company to lay a line?

A That's correct.

Q This could be for a period of, or a substantial length of time, could it not?

A We're estimating somewhere in the range of six months.

Q Would you term this act as being an act of conservation?

A We feel like that by doing this we'll give the operator

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incentive to drill more wells and to develop the field at an earlier date.

Q Then the elapsed time would be your only consideration. You know with reasonable certainty that you are going to get a gas connection, do you not?

A Yes, sir.

MR. UTZ: How does the Navajo Tribe feel about this?

MR. POHLMANN: We're on your team along the line of questioning you have been asking, if I may use those words.

MR. UTZ: Any other questions of the witness?

MR. KELLY: Just one or two questions.

REDIRECT EXAMINATION

BY MR. KELLY:

Q On the possibility of flaring gas, as far as you know Pan American has taken the lead in getting this pipeline?

A Yes, that is correct.

Q And Texaco is, as far as you are aware, has been very actively negotiating with them, is doing everything to get this done?

A That is true.

Q If the Navajo Tribe was on their team, I wonder if they are on our team.

MR. POHLMANN: Yes, sir. At certain times we are on

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your team, but in a case like this we have to be on their team, because seriously speaking, if we take that stand we know it will hurry you people up with the pipeline. You'll work a little faster.

MR. KELLY: Texaco would suggest if a no-flare order were to be imposed that we would be given some reasonable time limit for it starting. So we would have a product, but we would be able to produce for some length of time.

MR. PORTER: I have another question.

RECROSS EXAMINATION

BY MR. PORTER:

Q What about your oil line here, do you have an oil pipeline?

A At the present time the oil is being trucked.

Q You do anticipate a pipeline?

A It will depend, of course, on the economics. If the reservoir of sufficient size is indicated, the pipeline will be put in.

Q Who is buying the oil?

A I believe the oil is going to the West Coast. We are selling our oil to the McWood Corporation.

Q It is probably linked up with the Four Corners Pipeline?

A Well, we're selling to the Four Corners Pipeline.

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MR. PORTER: Thank you.

MR. UTZ: Are there any other questions of the witness?  
If not, the witness may be excused.

(Witness excused.)

MR. UTZ: Do we have any other testimony in this case?

MR. BUELL: If it please the Examiner, we have some testimony we would like to present. We have one witness, Mr. Eaton. We will avoid all repetition possible consistent with an orderly presentation and with making a 12:00 o'clock plane in Albuquerque.

GEORGE W. EATON, JR.

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

DIRECT EXAMINATION

BY MR. BUELL:

Q Mr. Eaton, would you state your complete name, by whom you are employed and what capacity and what location?

A George W. Eaton, Junior, Senior Engineer for Pan American Petroleum Corporation in Farmington, New Mexico.

Q You've testified at many previous Commission hearings and your qualifications as a petroleum engineer are a matter of public record, are they not?

A They are.

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MR. BUELL: Any questions as to Mr. Eaton's qualifications?

MR. UTZ: No questions.

Q So the Examiner may follow your testimony with respect to your recommendations, I wish you would briefly at the outset summarize as rapidly as possible your recommended pool rules for this associated oil and gas reservoir.

A I have six pertinent rules which I intend to recommend. They are as follows: One, assignment of up to 160 acres to an oil well; two, assignment of up to 640 acres for a gas well; three, gas allowables based on 100 percent acreage, that is, the allowable for a 660 acre gas well would be four times the top gas limit for an oil well on 160 acres. Four, a gas-oil ratio limit of 4,000 cubic feet per barrel. Fifth, a definition of an oil well as one which produces with a gas-oil ratio less than 20,000 cubic feet per barrel. Saying it another way, a gas well would be one which produces with a gas liquid ratio in excess of 20,000 cubic feet per barrel.

Q Would you briefly state the basis for your selecting a breakover point of 20,000 to 1?

A The basis for that selection of definition is that Pan American's Navajo "N" No. 1, I believe to be a true gas well. That well had a gas liquid ratio of 24,400 cubic feet per barrel

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at its completion. Therefore, a gas well definition would have to be one that had no more than 24,000 cubic feet per barrel and 20,000 is something less than that, so that looks like a good break-over point between a gas well and an oil well.

Q Do you have any other recommendation with regard to pool rules?

A I have one other, and that is that gas wells be balanced for proration purposes under the same rule as exists in the general gas order for Northwest New Mexico.

MR. PORTER: Just a minute right here, Mr. Buell.

MR. BUELL: Yes, sir.

MR. PORTER: Do any of your recommendations differ with those of Texaco?

A I believe they are substantially identical. I don't believe Texaco touched on the balancing provision. I had this other basic thing I wanted to get in why I picked 20,000 cubic feet per barrel as a definition.

Q (By Mr. Buell) Are you generally familiar with the Texaco pool rule exhibit?

A Yes, sir, I am.

Q With probably your recommendation of the adding to the exhibit of a balancing rule you would concur in those rules as you understand them?

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A Yes, sir.

(Whereupon, Pan American's Exhibit No. 1 was marked for identification.)

Q Would you look now at what has been marked as Exhibit No. 1? What is that Exhibit, Mr. Eaton?

A Exhibit No. 1 is a map of the Tocito Dome area showing thereon the completed wells in the area and two wells which are currently in the processes of completion and/or drilling. The completed wells are the Pan American Navajo "P" No. 1, a dry hole in the Southwest Quarter of Section 8 --

Q That's the northernmost well on Exhibit 1?

A That is correct.--the Pan American Navajo "N" No. 1 in the Southwest Quarter of Section 17, a gas well. The next completed well is an oil well, being the Texaco Navajo "AL" No. 1 in the Northeast Quarter of Section 28. There are two wells that are incomplete, the Texaco Navajo "AL" No. 1 in the Southeast Quarter of Section 28 is currently testing; the Pan American Navajo "N" No. 2 in the Northeast Quarter of Section 20 is currently drilling below 4,000 feet.

Q The Pan American well that you mentioned is drilling is located between the Pan American completed gas well and the Texaco completed oil well?

A That is correct.

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Q What is the significance of the red line you have used to connect these three completions in this reservoir on your Exhibit No. 1?

A The red line labeled A-A<sup>1</sup> is the trace of a cross section which appears as our Exhibit No. 2.

(Whereupon, Pan American's Exhibit No. 2 was marked for identification.)

Q Would you look then at Exhibit 2, the cross section, the trace of which you just mentioned, and as briefly as possible outline for the record and the Examiner what Exhibit 2 reflects?

A Exhibit 2 shows the logs of the three completed wells in the Tocito Dome Pennsylvanian Pool. The log on the left of the cross section is from the Texaco "AL" No. 1, the oil well, the center log is the Pan American Navajo "N" No. 1, the gas well. The right-hand log is the Pan American Navajo "p" No. 1, the dry hole.

This cross section simply illustrates that the three wells either were completed or tested and found not productive in the same correlative porous interval fairly close to the top of the zone that I've labeled top Pennsylvanian pay member. The other marker that I have noted on Exhibit No. 2 is the top of the Mississippian, which I will call also the base of the Pennsylvanian.

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Q Mr. Eaton, what is the significance of the lower perforations on the Pan American gas well?

A You'll notice that there are two sets of perforations on that well. They're approximately 30 feet apart. The lower set of perforations opened a porous member that occurred in that well that has not occurred in any other well in the area. It was open because it appeared to be productive from log calculations in that well. We perforated that zone by itself and attempted to selectively test it and actually did get gas from it. Later on, after opening the upper zone and attempting to selectively test it, we found communication existed between the two sets of perforations.

Now, we don't know whether that lower zone is productive of gas or whether, in fact, it is productive of any hydrocarbon, and in any event, it's apparently a relatively unimportant member since it hasn't appeared in any other wells. It may only be a matter of a few acres in size.

Q So, from the standpoint of being critical data with regard to separation of our well from the Texaco well, even assuming that some gas did come from that zone, it wouldn't be definitive of separation or communication?

A No.

Q From the standpoint of this hearing, and from the stand-

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point of whether or not our gas well is in the same common source of supply with the Texaco oil well, what is the significance of this cross section, Mr. Eaton?

A This cross section presents my interpretation that all three of these wells are completed in or tested the same common source of supply.

Q Did you use all subsurface control available to you from wells completed in this immediate area?

A Yes, sir, I did.

Q By using all available subsurface control, is there any way that you can show separation between the Pan American gas well and the Texaco oil well?

A No, sir, there isn't.

Q Would you locate for the record on this exhibit approximately where the Pan American well would fall that is currently drilling?

A It would fall approximately one-third the distance between the Pan American Navajo "N" No. 1 and the Texaco "AL" No. 1.

Q Do you think it will be helpful in determining the question of separation or communication?

A It will be extremely helpful.

Q Do you feel similarly about any other wells that are

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completed in this area?

A Yes, sir. Every well that is completed will provide more data to support my interpretation or the interpretation presented by the use of subsurface data and seismic data as Mr. McConnell did.

Q With regard to seismic data, of course, we all realize it's a valuable tool in oil and gas exploration, but based on your experience in the industry, do you think it is accurate enough to attempt to precisely define pool limits with such data?

A I think it would be extremely fortuitous if it were to coincide with the pool limits.

Q Do you recognize the possibility, Mr. Eaton, that subsequent development and data might show that in truth and in fact our gas is separate from the oil well?

A I certainly would admit that my interpretation could be wrong and these could be two separate reservoirs. I believe that they're not, I think they are associated. All these wells are completed in the same reservoir and it is an associated gas-oil reservoir.

Q From the standpoint of protection of correlative rights and the prevention of waste, would any harm result if these wells were prorated and regulated as if they were in the same pool and ultimate data showed that they were separate? Would any harm

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result during this interim period by prorating them as being in a common source of supply?

A No harm would result.

Q Let's turn that coin over now. Can you see harmful results if they were prorated as separate and in truth and in fact ultimate data showed they were exclusively a separate source of supply?

A In that phase of it there would be an opportunity for violation of correlative rights and opportunity for waste to occur.

Q Let's touch briefly on a question of Mr. Nutters. From a strict reservoir engineering standpoint and ignoring all property rights, are you of the opinion that the most efficient way to produce an oil and gas reservoir, an associated oil and gas reservoir, would be through shutting in all the gas wells, all the high gas-oil ratio oil wells, and depleting that reservoir completely through low ratio oil wells?

A The most efficient recovery would result in doing that that you described there.

Q If you wanted to ignore property rights completely from a technical standpoint, that would be the best way to complete an associated reservoir?

A That's right. Forgetting completely correlative rights

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that would be the best way to complete it.

Q In a reservoir such as this where there are differing property rights, would you see where such a method of depletion would do violence to property rights?

A Definitely violate correlative rights and property rights.

Q Would not the best solution be to strike a happy medium and protect correlative rights commensurate with the utmost conservation effort?

A Yes, sir, that's what we have done in proposing this set of rules. This is striking a good balance between a protection of correlative rights and a prevention of waste.

Q Are you familiar with any other associated oil and gas reservoir where the Commission has adopted rules similar in theory to what you are recommending here today?

A Yes, sir. I am very familiar with the Angel Peak Gallup reservoir where similar rules have been adopted.

Q And those rules have been in operation now for some time, if memory serves me correct?

A Yes, sir, they have.

Q Pan American is an operator in that pool?

A Yes, sir, they are.

Q Have you followed operations in that pool since these

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type rules were adopted?

A Yes, sir.

Q What has been your observation with respect to the two objectives the Commission was attempting to achieve, protecting correlative rights commensurate with the maximum conservation effort?

A I believe those rules have accomplished that objective very well.

Q Has there been any indication whatsoever that we have had migration of oil up into the gas cap resulting in waste, as Mr. Nutter questioned the Texaco witness about?

A No, sir, there hasn't.

Q Actually, evidence has shown, has it not, that operating under those rules, that we have actually had an expansion of the gas cap?

A There have been some oil wells, wells that were originally oil wells which have later had to be classified into gas wells.

Q So certainly, then, in that pool those rules achieve the purpose for which they were designed?

A That is correct.

Q Do you know of any reason why they would not achieve the same purpose in this Pennsylvanian reservoir?

A I know of no reason that this reservoir should react

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any differently. One thing I might add here, from a theoretical standpoint with these rules there should be some net expansion of the gas cap due to the fact that we are not taking into account in allocating to the gas wells production that would account for the volume of fluid, liquids, reservoir liquids that are produced by the oil well. So the gas wells are not exactly under these rules obtaining an equivalent volumetric withdrawal. This is the way these rules differ from the ones that we have in Devils Fork, for example.

Q Experience has shown us as a practical matter these rules will achieve our primary purpose?

A That is correct.

Q Protection of correlative rights and prevention of waste?

A That is right.

Q Lets talk briefly a moment on the status of our gas well, would you state for the record first its potential, IP?

A It's initial potential was 5,007 MCF per day plus a 220 barrels of condensate per day.

Q Do you recall what the gravity of that condensate was?

A 63.8 degrees.

Q As opposed to an oil gravity?

A My recollection is that the oil gravity on Texaco's well was 46 degrees.

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MR. PORTER: 46 as compared with 68?

A 63.8.

Q (By Mr. Buell) What is the status of the Pan American well at this time?

A That well is shut in awaiting a gas market.

Q What is the status of a market?

A Pan American has signed a contract with the El Paso Natural Gas Company providing for sale of this gas. That contract has not yet received FPC approval, but such approval is expected in the fairly near future.

Q Are not our FPC experts predicting two or three weeks?

A Yes, sir, I have heard that estimate <sup>made</sup> week.

MR. PORTER: What did you call them, an FPC expert?

MR. BUELL: I should have said our alleged.

Q Does our contract contemplate that El Paso will come into the pool to get the gas or are we going to have to take the gas to El Paso?

A That contract provides that Pan American will deliver the gas to El Paso. This means that a line will have to be laid from the pool area to a point on the El Paso line which runs roughly from Shiprock down to Gallup in a north-south direction over, near the middle of Range 17 West, which is just off of the map shown here in Exhibit 1.

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Q The east edge of your map?

A Yes.

Q Has any engineering work been done by Pan American with regard to the line that we will use to connect up with El Paso's main line?

A Yes, sir, the preliminary engineering work on this matter has been completed, but we have held up final design of the line on account of the present development that is occurring in the Tocito Dome Penn Field.

Q Why is development important to your engineering of this line?

A Well, in view of the length of the line involved it's very necessary that we not design a line and install it that's too big, because there would be excessive cost. Likewise, we have to have a line that is big enough to handle the volume of gas that's going to be available to us, for again, it would be extremely costly to immediately loop the line or lay another one to handle the additional gas.

Q Based on the current situation existing in the pool at this time, what, in your opinion, would be an accurate estimate as to when the design would be completed and the pipeline completed and the pipe laid and connection made with El Paso?

A I believe we will be selling gas from this pool within

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six months.

Q In connection with the testimony I believe of Mr. Walsh, has it been Pan American's hope and desire that Texaco would cooperate not only in the planning of this line but cooperate with the cost of this line?

A Yes, sir. And preliminary contacts with Texaco along that line have been made to work out an arrangement by which we can share the costs of the line and share the capacity of the line.

Q Do you have anything else that you would care to add at this time, Mr. Eaton?

A No, sir, I don't believe so.

MR. BUELL: That's all we have by way of direct of Mr. Eaton. May I formally offer Pan American's Exhibits 1 and 2?

MR. UTZ: Without objection Pan American's Exhibits 1 and 2 will be entered into the record of this case.

(Whereupon, Pan American's Exhibits 1 and 2 were offered and admitted in evidence.)

CROSS EXAMINATION

BY MR. UTZ:

Q On your cross section Exhibit 2 you didn't use seismic data in your interpretation?

A No, sir, I only used subsurface data available from the three completed wells.

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Q That's basically the difference between your interpretation and Texaco's?

A Yes, sir.

Q Did you have a recommendation as to pool limits?

A Well, I didn't, but I will join with Texaco in their revised or amended application insofar as the pool limits are concerned.

Q In effect, then, that would create a pool of some four sections in Texaco's area, for example, that has actually not been proven?

A Yes, sir.

Q Would you not be of the opinion that a better way to handle this would be if the 160-acre and the 640-acre development is approved to create a spacing area rather than a pool area?

A That would be satisfactory, yes, sir.

Q That would eliminate the possibility of having a large amount of dry acreage being dedicated to the pool?

A It might eliminate having a nomenclature contracture hearing sometime.

Q In this situation that is definitely a possibility, is it not?

A Yes, could be.

Q You spoke of the Angel's Peak order in relation to this

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order, now there is a basic difference between the two orders. It is 80-acre and 320-acre gas spacing and this order 640 and 40-acre gas spacing, is it not?

A That is correct.

Q The larger the spacing, whether oil or gas, the more likelihood you have of including not productive acreage to a unit, is that not true?

A I believe I'd have to agree that that would be more likely.

Q So a gas well receiving some five and three tenths million allowable when it would actually only have maybe 160 acres, or say 320 acres productive acreage, that would be allowing him, would it not, to disturb correlative rights by producing a 640-acre allowable and only have 160 or 320 acres productive?

A You said violation of correlative rights?

Q Yes.

A Yes.

Q And more than his share of the gas in place?

A Yes, with regard to waste, we would have to assume that there would be some well that had more than 640 productive acres and had only 640 acres assigned to it. So the two might balance out, but then that wouldn't take care of correlative rights. It would take care of your waste problem.

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Q Yes. So actually the only thing Pan American has to gain by a 4,000 to 1 ratio is twice the allowable, is that not true?

A That is correct. And Pan American supported this 4,000 cubic feet per barrel because the initial well in the pool had a gas-oil ratio at its completion of more than 2,000 cubic feet per barrel. Until this morning when we had this fluid analysis data available to us, we were of the opinion that that might all be solution gas, which this would unnecessarily penalize the oil well to restrict it to a gas-oil ratio limit down below its solution gas-oil ratio, which it cannot possibly produce less at a lower gas-oil ratio than its solution ratio.

Q In regard to this no-flare situation, what would you think of the possibility of say a 2,000 to 1 ratio until you got a pipeline connection, or something less than 4,000?

A Well, that would be one way of handling the matter. I would rather recommend that a reasonable time limit be permitted in which to get this pipeline installed and gas sales commenced.

Q After which a complete shut-in would be ordered?

A Yes.

Q What would you consider a reasonable time limit?

A Oh, since I believe that we will have this line installed and gas sales made within six months, I would say six

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months.

MR. PORTER: Mr. Eaton, in connection with that, you have a shut-in gas well during all this time, wouldn't this do damage to your correlative rights if these oil wells are allowed to produce and flare gas at that rate?

A Well, perhaps to some extent. I don't think that these correlative rights will be irreparably damaged in a six-month period. I'm willing to risk it over a short period.

Q (By Mr. Utz) You are gambling on getting an oil well somewhere?

A It would be nice, Mr. Utz.

MR. BUELL: If I may speak on behalf of Pan American in that this is more of a policy and position and principle involved since everyone has to admit that flaring of gas is waste, just looking at it as that and nothing else. As you stated now we are an operator of a gas well which will be shut-in until we get a market. It would seem to me that the Commission would need to weigh the pros and cons involved here with the detriment that would occur in development with a no-flare order effective immediately with regard to the volumes of gas that would be saved due to that order.

This is a field where we desperately need development information not only from the standpoint of designing our line, but

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also from the standpoint of what type and size reservoir we have here. So, on behalf of Pan American it would seem to me that the Commission in its wisdom is going to have to weigh and decide.

MR. UTZ: You mean you think you are going to anticipate your development of this pool by production rather than the drilling of wells?

MR. BUELL: I think our experience is going to come through both. But certainly a no-flare order with no provision at this time for saving the gas is going to be a detriment to development, because companies just don't invest their money in a well they know they are going to have to shut-in for a period of time.

MR. UTZ: They might invest their money so they can get their money out that they have already invested, might they not?

MR. BUELL: That would seem to follow. We are in the process of drilling as actively as we can right now with Texaco's cooperation.

MR. PORTER: That's all I have.

MR. UTZ: Any other questions? The witness may be excused.

(Witness excused.)

MR. UTZ: Any other statements in this case or further

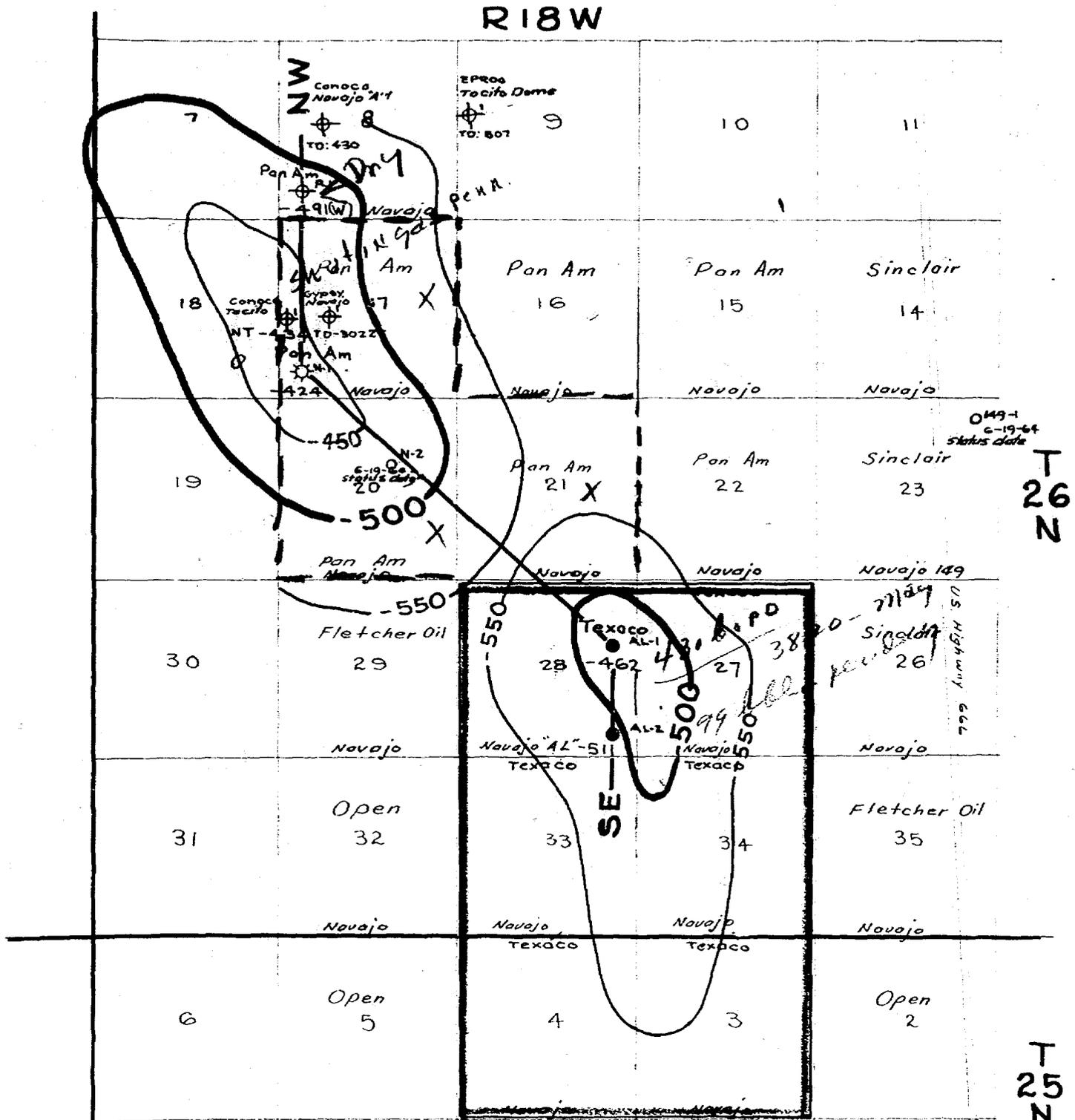
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PHONE 243-6691





Case 3073



- LEGEND**
- ◆ Dry hole
  - \* Gas Well, Paradox-Penn.
  - Oil Well, Paradox-Penn.
  - Outline of spaced area
  - Location
  - NT Not Tested
  - 434 Top of Barker Creek
  - 419(W) Tested water

TEXACO INC.  
DENVER COLORADO  
TOCITO DOME PENNSYLVANIAN FIELD  
CONTOURED ON TOP OF BARKER CREEK ZONE  
C.I. = 50'  
SCALE: 1"=4000'  
EXHIBIT "A"

TOGITO DOME PENNSYLVANIAN "D" POOL  
SAN JUAN COUNTY, NEW MEXICO  
BASIC RESERVOIR DATA

|                                |           |
|--------------------------------|-----------|
| Porosity                       | 9.2%      |
| Permeability                   | 148 Md    |
| Water Saturation               | 25%       |
| Oil Gravity, API               | 46        |
| Gas Gravity                    | 0.72      |
| Condensate Gravity, °API       | 64        |
| Bottom Hole Temperature, °F.   | 158       |
| Bottom Hole Pressure, Original | 3215 psia |
| Bottom Hole Pressure, 6-1-65   | 3005 psia |
| Cumulative Production, 6-1-65  |           |
| Barrels Oil                    | 343,455   |
| MCF Gas (Casinghead)           | 443,169   |
| MCF Gas (Gas Well)             | 400,219   |
| Number of Wells                |           |
| Oil                            | 11        |
| Gas                            | 5         |
| Current Production             |           |
| Oil, BOPD                      | 2608      |
| Gas Well Gas, MCFD             | 5344      |

GOVERNOR  
JACK M. CAMPBELL  
CHAIRMAN

State of New Mexico  
**Oil Conservation Commission**



LAND COMMISSIONER  
GUYTON B. HAYS  
MEMBER

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

P. O. BOX 2088  
SANTA FE

August 16, 1965

Mr. Booker Kelly  
White, Gilbert, Koch & Kelly  
Attorneys at Law  
Lincoln Building  
P. O. Box 787  
Santa Fe, New Mexico

Re: Case No. 3073  
Order No. R-2758-C  
Applicant:

Texaco Inc.

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

ir/

Carbon copy of order also sent to:

Hobbs OCC   x  

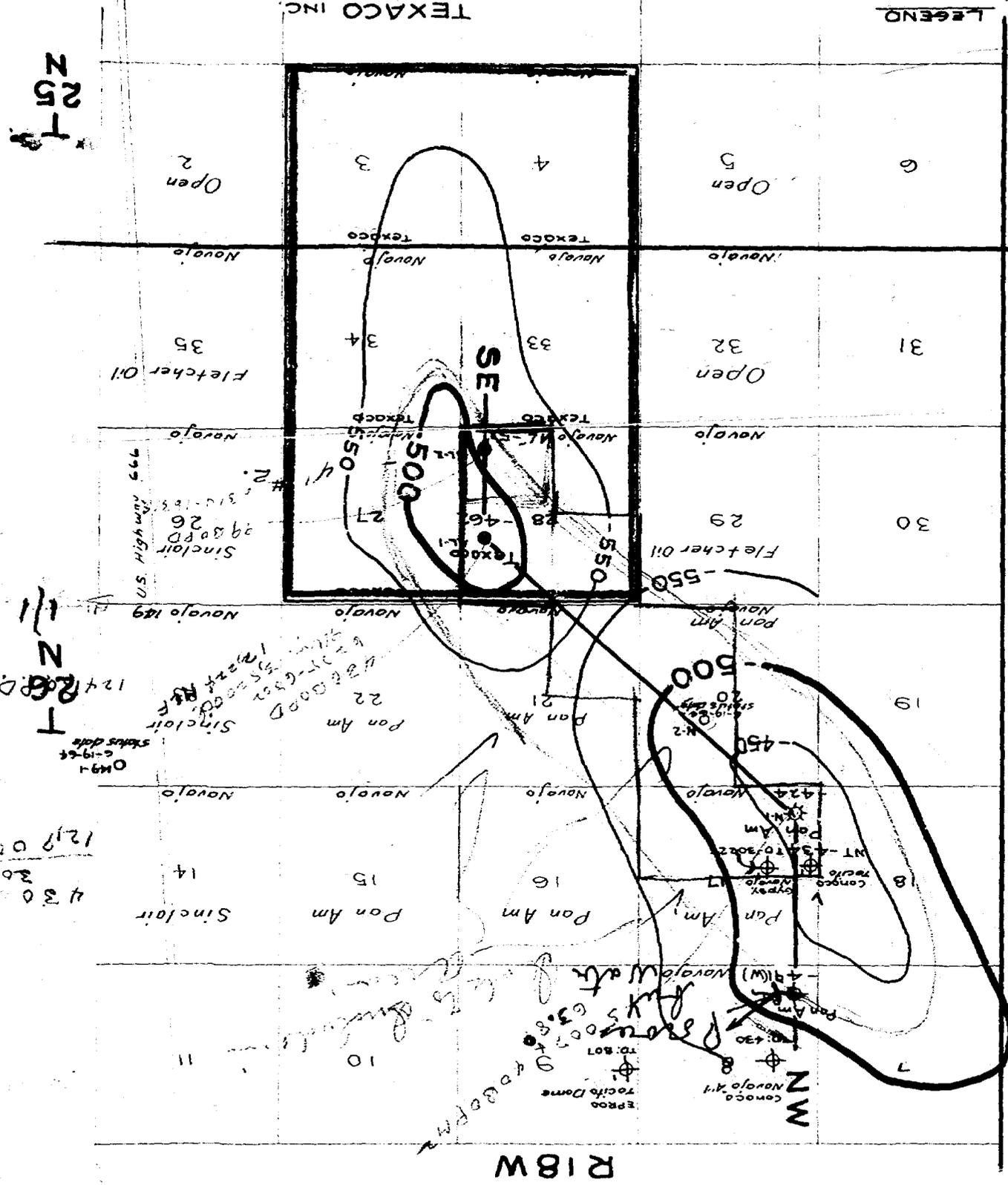
Artesia OCC       

Aztec OCC   x  

OTHER           Mr. Guy Buell

BEFORE EXAMINER UTZ  
 OIL CONSERVATION COMMISSION  
 TEXACO EXHIBIT NO. A  
 CASE NO. 3073

*Tocito Dome - Pennsylvania "D" Oil Field*



TOCITO DOME PENNSYLVANIAN FIELD  
 DENVER COLORADO  
 EXHIBIT A

Legend  
 \* Dry hole  
 \* Gas Well, Paradox-Penn.  
 • Oil Well, Paradox-Penn.  
 ○ Location of spaced area  
 ○ Location  
 ○ NT Not Tested  
 - 434 Top of Barker Creek  
 - 419(W) Tested water

SCALE: 1" = 4000'

C.I. = 50'

CONTOURED ON TOP OF BARKER CREEK ZONE

TEXACO INC.

N 25 T

R 18 W