AtlanticRichfieldCompany
North American Producing Division
Permian District
Post Office Box 1610
Midland, Texas 79701
Telephone 915 682 8631

W. P. Tomlinson
District Engineer — West Area



February 23, 1972

DHC-109
Rec Mar 19

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

Attn: Mr. A. L. Porter, Jr., Secretary-Director

Re: Application of Atlantic Richfield Company for Administrative Approval as Provided by Rule 303-C to Down-Hole Commingle North Vacuum Abo and Vacuum Glorieta Oil Production in its State B 1578 No. 3 Well located in Section 30, T-17S, R-35E Lea County, New Mexico

Gentlemen:

Atlantic Richfield Company, P. O. Box 1610, Midland, Texas 79701, requests administrative approval as provided by Rule 303-C, to down-hole commingle North Vacuum Abo and Vacuum Glorieta Oil production in its State B 1578 No. 3 Well, located 1980' FNL and 1800' FWL of Section 30, Township 17 South, Range 35 East, Lea County, New Mexico (See attached Exhibit No. 1). In support thereof Atlantic Richfield Company submits the following data:

1. Both zones to be commingled in the well-bore are oil zones.

2. The total average daily oil production from both zones before commingling averages less than 70 bbls/day which is the maximum allowed under Rule 303-C(b) for a well with bottom perforations in the lowermost pool being between 9000' and 9999'. The bottom perforations in the North Vacuum Abo Pool in the subject well are at 9244'.

3. Both zones require artificial lift.

4. Neither zone produces more than 70 BWPD. A Production Since Recompletion History (Exhibit No. 2) is attached which shows daily average formation water production to be about 42 BWPD.

5. The oil from both zones is compatible and with no formation water being produced from the Abo zone, formation of precipitates from a combination of waters will not result.

6. The total value of the crude will be reduced by about $0.20 a day. Without commingling, however, early abandonment of the Abo zone will result because it soon will be uneconomical to produce. This will result in a reserve loss of about 30,000 BO, 1/8 of which will belong to the State of New Mexico. An economic waste results. A computation showing the value of the crude before and after commingling is attached. This is Exhibit No. 3.

7. Mineral rights in both zones are held by the State of New Mexico. Working interest in both zones is identical. There is no overriding royalty.

8. The State B 1578 No. 3 Well was very recently recompleted in the North Vacuum Abo Pool. It still is on test. A complete resume of the well's completion history is attached as Exhibit No. 4. Because of the well's poor performance in the Abo zone, no Commission Dual Complation request has been made. The Abo zone will soon be shut-in as uneconomical after testing so the well will be a single completion if this request is denied.

9. The estimated bottom hole pressure in the Vacuum Glorieta completion is 800 psi. The estimated bottom hole pressure in the North Vacuum Abo completion is 1665 psi.

10. Production decline curves for the Vacuum Glorieta (Exhibit No. 5) and the depleted Vacuum Wolfcamp (Exhibit No. 6) are attached. Since the Abo completion is quite new no decline history is available, however, a resume of the well's completion history (Exhibit No. 4) and tests (Exhibits No. 7 and 8) are attached as required by Rule 303-C,2(a). Estimated future production from the Abo is 33,000 BO and from the Glorieta 100,000 BO.

11. Downhole commingling will result in prevention of waste and will not impair correlative rights.

12. All offset operators have been notified in writing of the proposed downhole commingling.

In view of the facts stated above, it is respectfully requested that Administrative approval be granted under Rule 303-C for downhole commingling of oil from the Vacuum Glorieta and North Vacuum Abo zones in the Atlantic Richfield State B 1578 No. 3 Well.

Yours very truly,

W. P. Tomlinson

RFB/agp

Production Since Recompletion
ARCo State B 1578 No. 3

| | Vacuum Glorieta | | | No. Vacuum Abo | | |
|---|---|---|---|---|---|---|
| Date | Oil Bbls. | Load Water Bbls. | Formation Water Bbls. | Oil Bbls. | Load Water Bbls. | Formation Water Bbls. |
| 12-19-71 | | | | | 56 | |
| 20 | | | | | 9 | |
| 21 | | | | | 7 | |
| 22 | | | | | | |
| 23 | | | | | 73 | |
| 24 | | | | | | |
| 25 | | | | | | |
| 26 | | | | | | |
| 27 | | | | | 18 | |
| 28 | | | | 16 | 16 | |
| 29 | | 70 | | | | |
| 30 | | | | | | |
| 31 | 0 | | | 2 | 20 | |
| 1-1-72 | 0 | | | 13 | 8 | |
| 2 | 0 | | | 13 | 8 | |
| 3 | 0 | | | 11 | 5 | |
| 4 | 0 | | | 11 | 3 | |
| 5 | | | | 10 | 3 | |
| 6 | | | | 10 | 3 | |
| 7 | | | | 10 | 3 | |
| 8 | 0 | 70 | | 10 | 3 | |
| 9 | 0 | 70 | | 8 | 3 | |
| 10 | SI | | | SI | | |
| 11 | SI | | | SI | | |
| 12 | SI | | | 10 | 3 | |
| 13 | 55 | 12 | | SI | | |
| 14 | 0 | 70 | | 10 | 3 | |
| 15 | 0 | 69 | | 11 | 3 | |
| 16 | SI | SWD Line Plugged | | 11 | 0 | |
| 17 | 0 | 46 | | 10 | 3 | |
| 18 | 0 | 71 | | 10 | 3 | |
| 19 | 0 | 70 | | 9 | 3 | |
| 20 | 0 | 70 | | 10 | 3 | |
| 21 | 0 | 70 | | 10 | 3 | |
| 22 | 30 | 55 | | 10 | 3 | |
| 23 | 30 | 62 | | 9 | 0 | |
| 24 | 30 | 9 | 43 | 10 | 0 | |
| 25 | 36 | | 56 | 10 | 0 | |
| 26 | 38 | | 52 | 5 | 0 | |
| 27 | 44 | | 51 | 10 | 0 | |
| 28 | 38 | | 52 | 11 | 0 | |
| 29 | 38 | | 51 | 12 | 0 | |
| 30 | 38 | | 51 | 10 | 0 | |
| 31 | 37 | | 52 | 11 | 0 | |

EXHIBIT NO. 2 - 1

| | Vacuum Glorieta | | | No. Vacuum Abo | | |
|---|---|---|---|---|---|---|
| Date | Oil Bbls. | Load Water Bbls. | Formation Water Bbls. | Oil Bbls. | Load Water Bbls. | Formation Water Bbls. |
| 2-1-72 | 40 | | 50 | 8 | 0 | |
| 2 | 39 | | 51 | 13 | 1 | |
| 3 | 42 | | 49 | SI | | |
| 4 | 38 | | 44 | 9 | 0 | |
| 5 | 36 | | 44 | 9 | 0 | |
| 6 | 37 | | 44 | 10 | 0 | |
| 7 | 50 | | 45 | 11 | 0 | |
| 8 | 53 | | 46 | 12 | 1 | |
| 9 | 51 | | 44 | 10 | 0 | |
| 10 | | | | | | |
| 11 | 60 | | 43 | 12 | 2 | |
| 12 | 49 | | 44 | 12 | 2 | |
| 13 | 46 | | 40 | 7 | 1 | |
| 14 | 66 | | 41 | 9 | 1 | |
| 15 | 52 | | 45 | 10 | 1 | |

EXHIBIT NO. 2 - 2

Value of Production
Atlantic Richfield Company
State B 1578 No. 3 Well

Value of Crude:

| | | |
|---|---|---|
| Glorieta | 37.3° API or Sp. Gr. = .8383 | $3.50/BO |
| Abo | 38.2° API or Sp. Gr. = .8338 | $3.52/BO |

Separate Production:

| | | | |
|---|---|---|---|
| Glorieta | 54 BOPD x $3.50 = | $189.00 | |
| Abo | 10 BOPD x $3.52 = | $ 35.20 | |
| | | $224.20/Day | $224.20 |

Commingled Production:

Revised Gravity

| | | |
|---|---|---|
| Glorieta | 54 BOPD x .8383 = | 45.2682 |
| Abo | 10 BOPD x .8338 = | 8.3380 |
| | | 53.6062 |

$\frac{53.6062}{64}$ = .8375 or 37.5° API or $3.50/BO

64 BOPD x $3.50/BO = $224.00/Day $224.00

$ 0.20/Day
Loss

EXHIBIT NO. 3

Completion History
ARCo State B 1578 No. 3
1980' FNL & 1800' FWL Section 30
T-17S, R-35E, Lea County, New Mexico

| | |
|---|---|
| 2-27-65 | Spudded, 17½" hole |
| 3-2-65 | Ran 1571' of 13-3/8" OD 48 and 54.5# casing and cemented with 1300 sacks. Cement circulated. |
| 3-3-65 | Recemented top of 13-3/8" OD casing with 50 sacks. |
| 3-14-65 | Ran 4800' of 9-5/8" OD casing 30# and cemented with 2170 sacks. Cement circulated. |
| 4-16-65 | Ran 5544' of 7" OD liner (4656' to 10,200') and cemented with 1440 sacks. Cement circulated. Total depth 10,200'. Drilled out to 10,176'. |

Completion:

| | |
|---|---|
| Vacuum Wolfcamp | Perforated 10,084-10,102'. Mud acid washed perforations with 250 gals. Acidized perforations with 2000 gals LST acid. Swabbed Wolfcamp perforations 10,084-10,102'. Recovered 1 BNL plus 19 BFW in 3 hours. Squeezed perforations 10,084-10,102' with 78 sacks cement. Jet perforated Wolfcamp 9769-73', 9957-58'. 9990-94'. Treated with 500 gals Western spearhead acid. Acidized Wolfcamp perforations 9769-9994' with 2000 gals LST acid. Acidized Wolfcamp perforations 9769-9994' with 10,000 gals gelled acid using 16 ball sealers in 3 stages.<br>5-21-65 - On 24-hour potential test flowed 99 BNO, no water on 9/32" choke. |
| Vacuum Glorieta | Jet perforated Glorieta 6082-88', 6092-6105', 6112-22', 6126-28', 6134-39'. Acidized with 500 gals.<br>5-28-65 - On potential test pumped 60 BNO plus 15 BFW in 10 hours. Dual Completion Order No. MC-1629. |
| 12-16-71 | Set 7" Titan CIBP @ 9650' WLM. |
| 12-20-71 | Spotted 10 sacks cement on top of CIBP from 9654-9602'. New PBTD 9602'. Perforated Abo with 1 JSPF at 8469, 76, 89, 8504, 22, 28, 40, 50, 60, 77, 9098, 9136, 48, 57, 66, 81, 98, 9210, 26, 9244'. Set packer at 9316'. Treated Abo perfs 8469-9244' with 4000 gals 15% LSTNE-HCl acid. Flowed 1 hour. Recovered 19 BLW. Swabbed 3½ hours. Recovered 37 BLW with trace of oil. Swabbed 5 hours. Recovered 9 BF, 5% oil, 95% water. |
| 12-22-71 | Added Abo perfs at 8467, 90, 8521, 22, 29, 61, 90, 91, 8653, and 54'. Set RPB at 8724'. Treated Abo perfs 8467-8654' with 5000 gals 15% LSTNE-HCl acid. |
| 12-23-71 | Swabbed 2-3/8" tbg. 3 hours and recovered 49 BLW. Swabbed 2-3/8" tbg 4 hours and recovered 24 BLW. EFL 8000'. 13½" hour SITP 130#. |

EXHIBIT NO. 4 - 1

| | |
|---|---|
| 12-28-71 | 90½ hour SIP 480#. Flowed 1 hour and recovered 7 BO. Swabbed 2-3/8" tbg for 6 hours and recovered 25 BF, 35% oil, 65% water. Starting fluid level 5000'. ending FL 8118'. |
| 12-29-71 | 17½ hour SITP 230#. FL @ 6000'. Released FBRC and recovered RBP. Set RBP @ 6262'. Treated Glorieta perfs 6082-6139' w/1000 gals. 15% HCl LSTNE acid. Released FBRC and pulled RBP. |
| 12-30-71 | WIH w/Abo tbg. string. Ran 7" Guiberson KVL-30 packer and Guiberson 7" HHD. Set packer @ 8396.08'. Ran Glorieta tbg. String. Bottom of tubing 6101,44'. |
| 1-3-72 | WIH w/Abo rod string. WIH with Glorieta rod string. Turn over to producing section for testing. |

PRODUCTION vs TIME
A.R.Co. STATE B 1578 NO.3
VACUUM GLORIETA POOL
LEA COUNTY, NEW MEXICO

OIL BOPM
GAS MCFM x $10^{-1}$
WATER BWPM

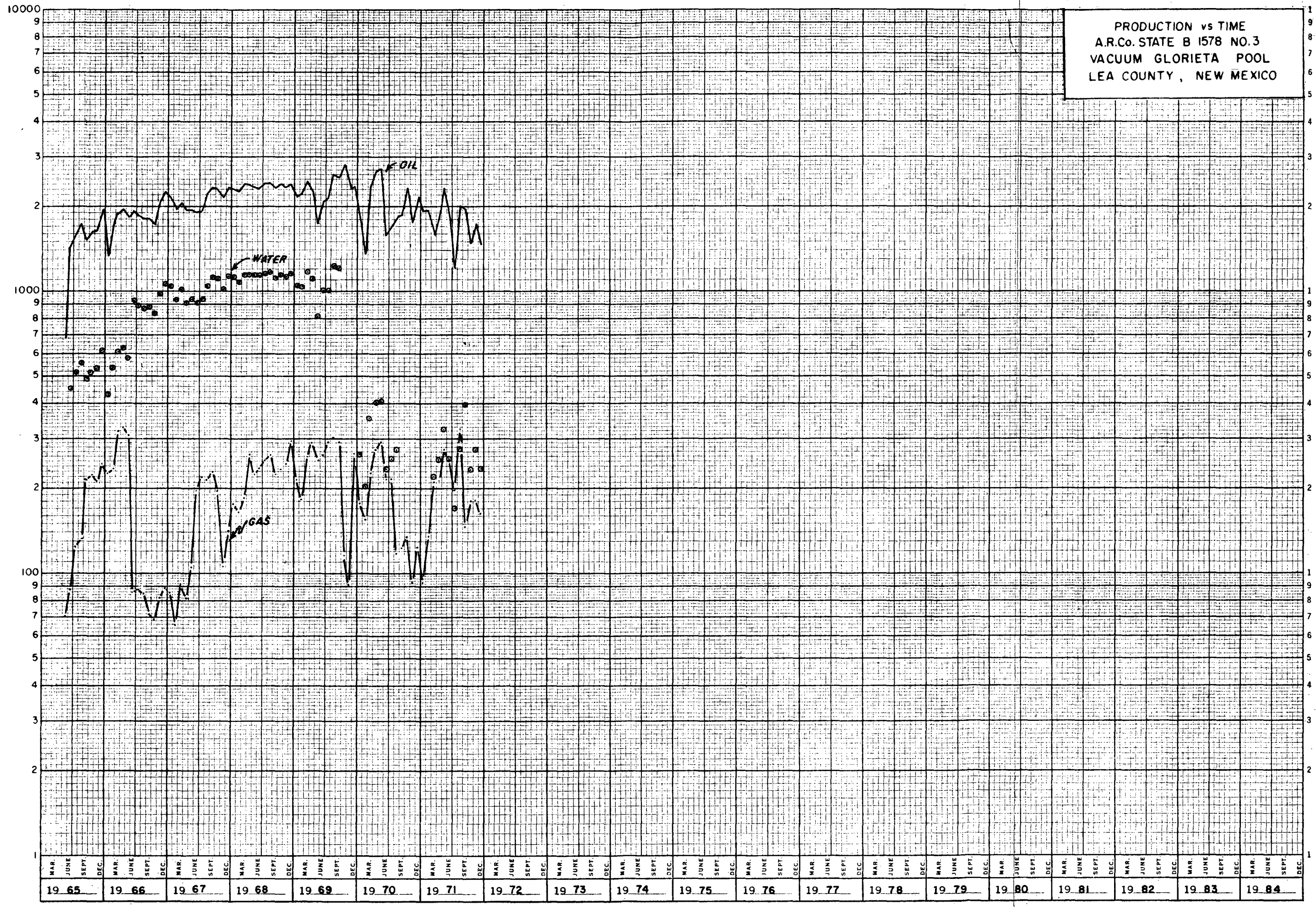


EXHIBIT NO. 5

PRODUCTION vs TIME
A.R.Co. STATE B 1578 NO. 3
VACUUM WOLFCAMP POOL
LEA COUNTY, NEW MEXICO

OIL BOPM
GAS MCFM

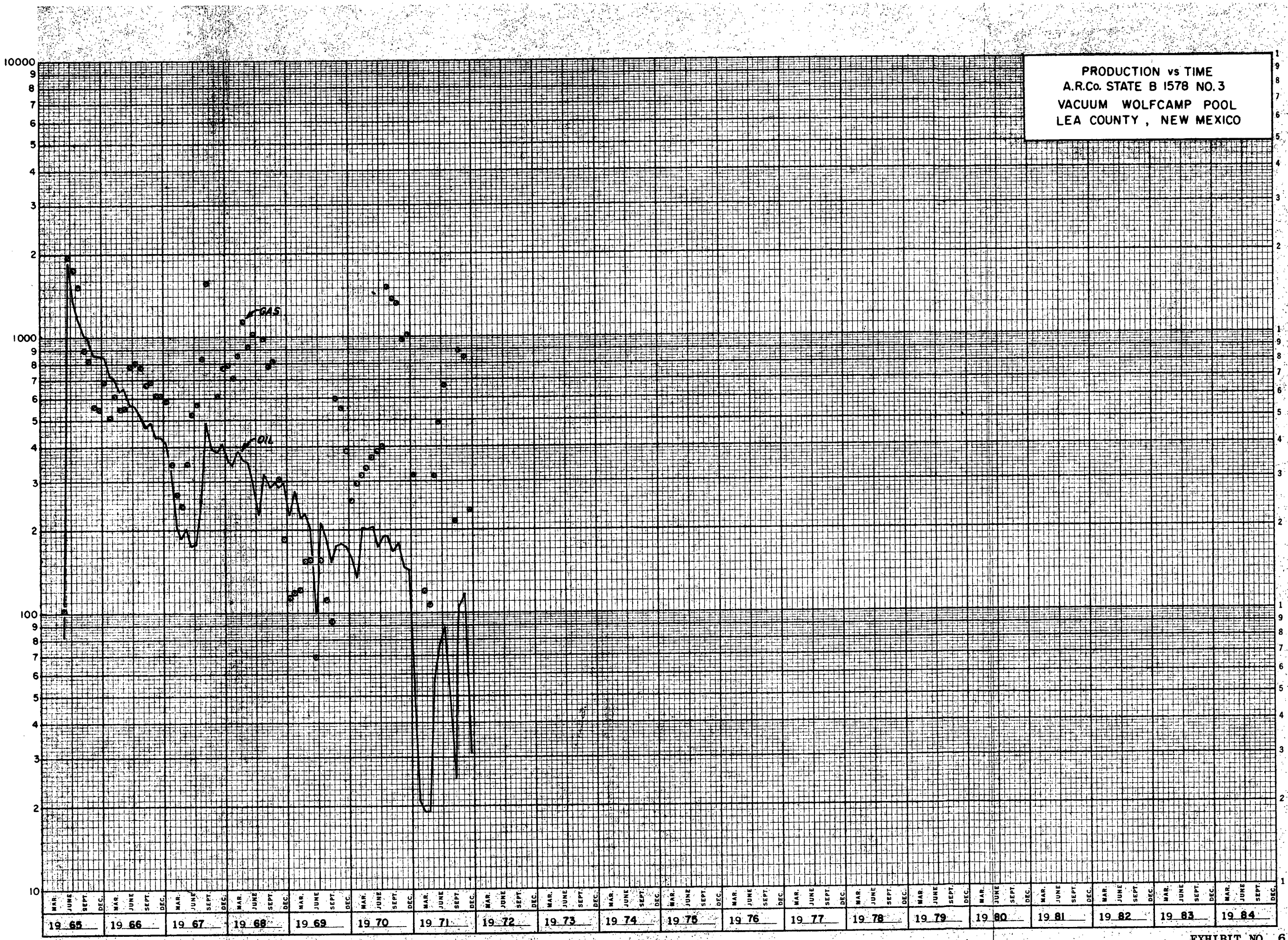


EXHIBIT NO. 6

NEW MEXICO OIL CONSERVATION COMMISSION

# GAS – OIL RATIO TESTS

C-116
Revised 1-1-65

| Operator | Pool | County |
|---|---|---|
| Atlantic Richfield Company | North Vacuum Abo | Lea |

| Address | TYPE OF TEST – (X) | Scheduled ☐ | Completion ☐ | Special ☒ |
|---|---|---|---|---|
| P. O. Box 1610, Midland, Texas 79701 | | | | |

| LEASE NAME | WELL NO. | LOCATION U | S | T | R | DATE OF TEST | STATUS | CHOKE SIZE | TBG. PRESS. | DAILY ALLOW-ABLE | LENGTH OF TEST HOURS | PROD. DURING TEST WATER BBLS. | GRAV. OIL | OIL BBLS. | GAS M.C.F. | GAS – OIL RATIO CU.FT./BBL. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| State B-1578 | 3 | F | 30 | 17 | 35 | 2-15-72 | P | | | - | 24 | 1 | 42.0 | 10 | 10 | 1030 |

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

*(Signature)*

District Engineer
*(Title)*

February 18, 1972
*(Date)*

EXHIBIT NO. 7

NEW MEXICO OIL CONSERVATION COMMISSION

# GAS – OIL RATIO TESTS

C-116
Revised 1-1-65

| Operator | Pool | County |
|---|---|---|
| Atlantic Richfield Company | Vacuum Glorieta | Lea |

| Address | TYPE OF TEST – (X) | | | |
|---|---|---|---|---|
| P. O. Box 1610, Midland, Texas 79701 | Scheduled ☐ | Completion ☐ | Special ☒ |

| LEASE NAME | WELL NO. | LOCATION | | | | DATE OF TEST | STATUS | CHOKE SIZE | TBG. PRESS. | DAILY ALLOW-ABLE | LENGTH OF TEST HOURS | PROD. DURING TEST | | | | GAS – OIL RATIO CU.FT./BBL. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | U | S | T | R | | | | | | | WATER BBLS. | GRAV. OIL | OIL BBLS. | GAS M.C.F. | |
| State B-1578 | 3 | F | 30 | 17 | 35 | 2-15-72 | P | | | 70 | 24 | 45 | 37.6 | 52 | 34 | 654 |

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

W. F. Stevenson
*(Signature)*

District Engineer
*(Title)*

February 18, 1972
*(Date)*

EXHIBIT NO. 8

Offset Operators Notified by Mail

Texaco, Inc.
P. O. Box 728
Hobbs, New Mexico 88240

Humble Oil & Refining Company
P. O. Box 1600
Midland, Texas 79701

Shell Oil Company
P. O. Box 1509
Midland, Texas 79701

Phillips Petroleum Company
Phillips Building
4th and Washington
Odessa, Texas 79760

Marathon Oil Company
P. O. Box 552
Midland, Texas 79701

Hanson Oil Corporation
P. O. Box 1515
Roswell, New Mexico 88201