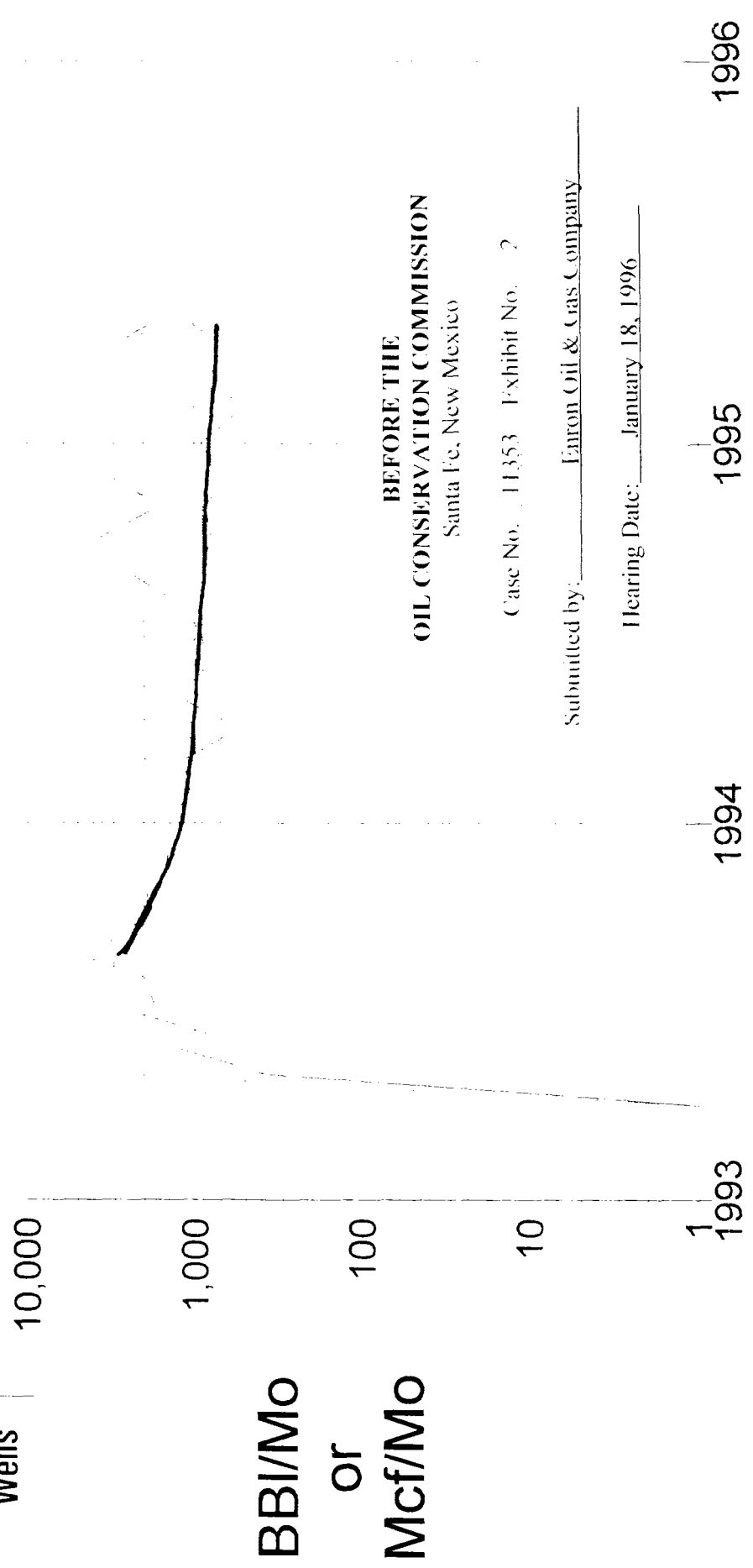


LARGE FORMAT  
EXHIBIT HAS  
BEEN REMOVED  
AND IS LOCATED  
IN THE NEXT FILE

DELAWARE 22-32

Field: RED TANK WEST  
Lease: RED TANK 26 FEDERAL | Well Number: 1  
Operator: POGO PRODUCING COMPANY  
Production Rate vs Time  
For the Period 05/1993 to 05/1995

Oil  
Gas  
Water  
Wells



BBl/Mo  
or  
McF/Mo

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico

Case No. 11353 Exhibit No. 2

Submitted by: Enron Oil & Gas Company

Hearing Date: January 18, 1996

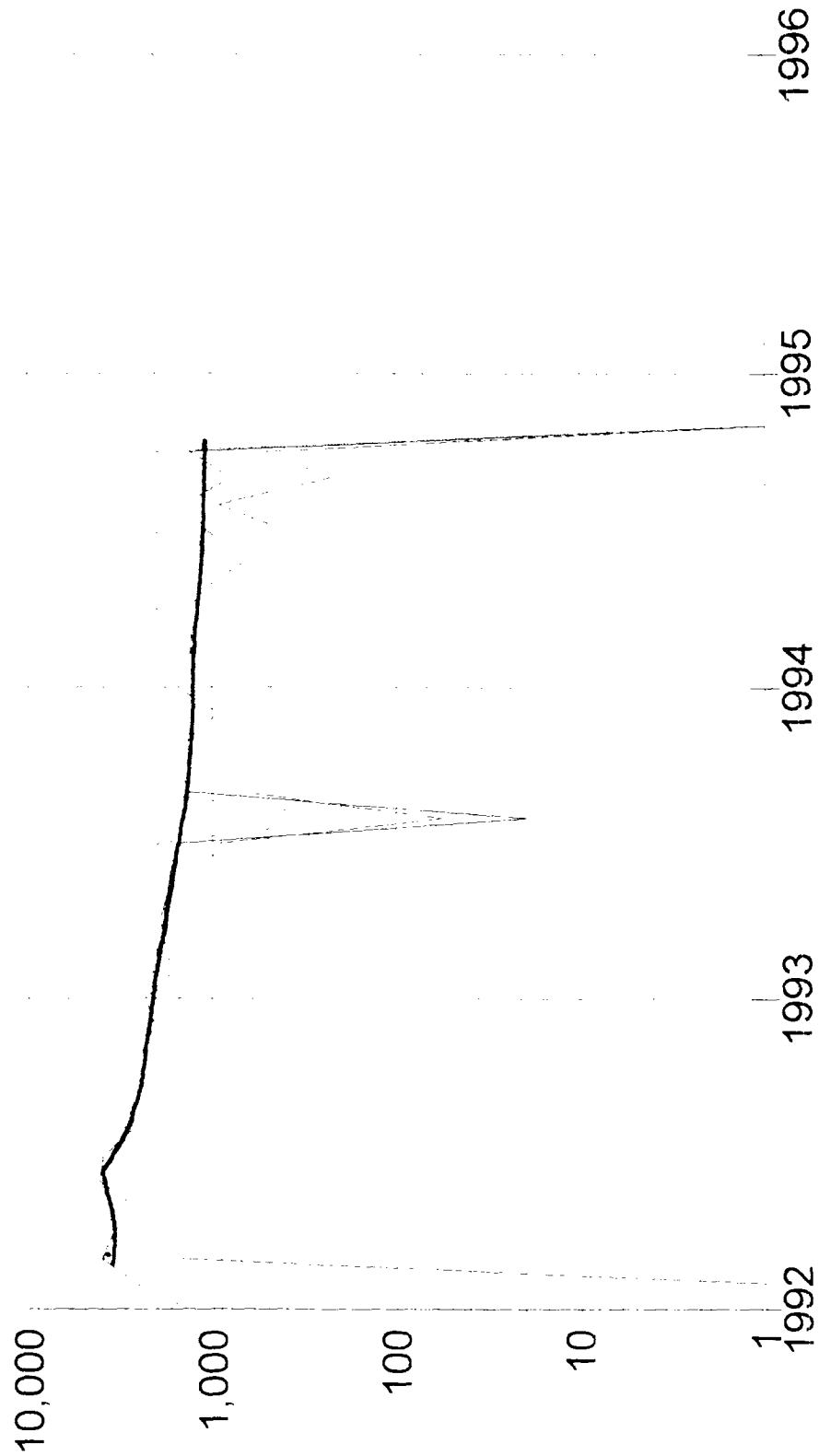
Reported Oil Production = 28,661 Bbls  
Reported Gas Production = 51,346 Mcf  
Reported Water Production = 54,492 Bbls

Time

DELAWARE 23-32

Field: DIAMONDTAIL  
Lease: CUERVO FEDERAL | Well Number: 2  
Operator: STRATA PROD COMPANY  
Production Rate vs Time  
For the Period 01/1992 to 10/1994

Oil  
Gas  
Water  
Wells



Bbl/Mo  
or  
Mcf/Mo

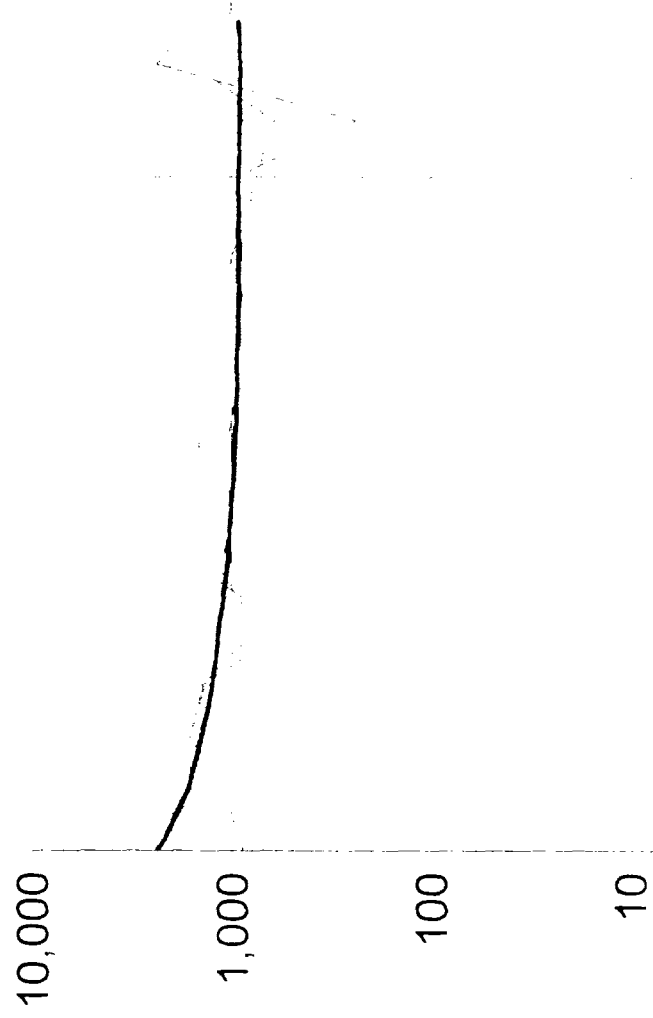
Reported Oil Production = 64,016 Bbls  
Reported Gas Production = 28,435 Mcf  
Reported Water Production = 88,414 Bbls

Time

DELAWARE 25-29

Field: BRUSHY DRAW NORTH  
Lease: N BRUSHY DRAW A 35 FEDERAL | Well Number: 7  
Operator: SOUTHWEST ROYALTIES INCORPORATED  
Production Rate vs Time  
For the Period 01/1994 to 05/1995

Oil  
Gas  
Water  
Wells



Bbl/Mo  
or  
Mcf/Mo

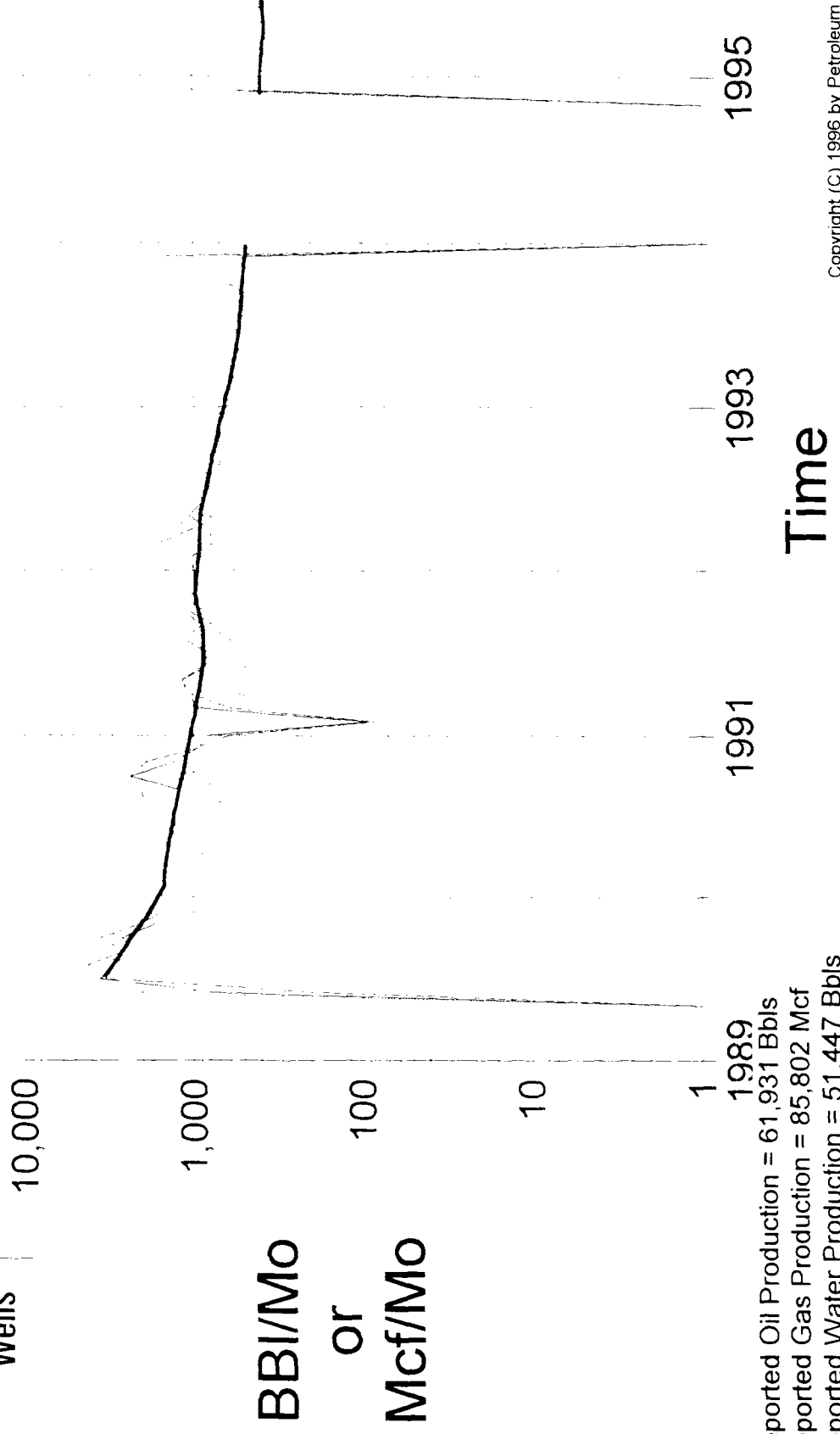
1994  
1995  
Time

Reported Oil Production = 19,806 Bbls  
Reported Gas Production = 20,940 Mcf  
Reported Water Production = 28,284 Bbls

BONE SPRING 19-3Z

Field: TONTO WEST  
Lease: BONDURANT FEDERAL COM | Well Number: 1  
Operator: MERIDIAN OIL INCORPORATED  
Production Rate vs Time  
For the Period 06/1989 to 05/1995

Oil  
Gas  
Water  
Wells



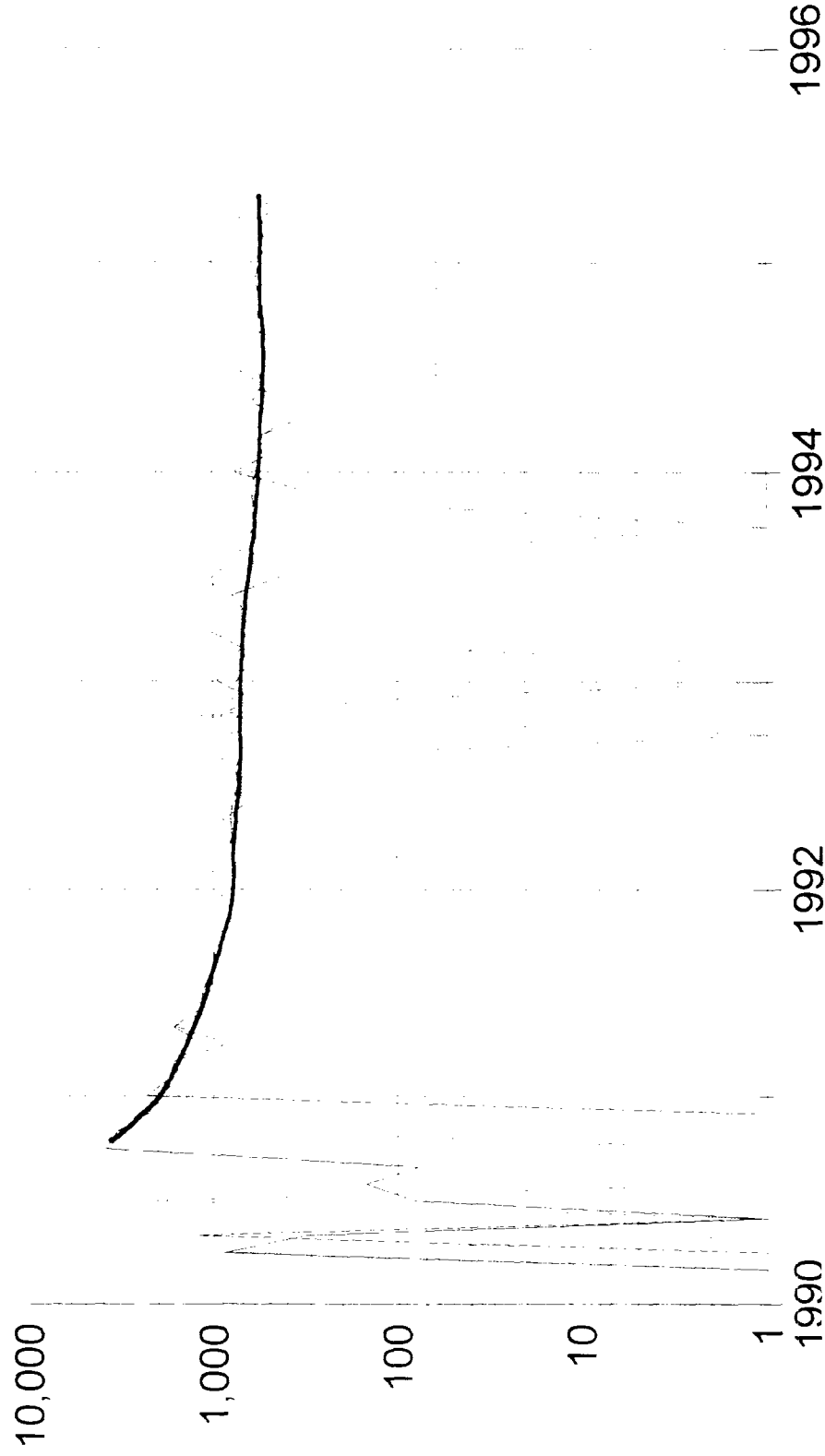
Reported Oil Production = 61,931 Bbls  
Reported Gas Production = 85,802 Mcf  
Reported Water Production = 51,447 Bbls

BONE SPRING 19-33

Field: TONTO SOUTH  
Lease: NORTH MADURO UNIT FEDERAL | Well Number: 2  
Operator: UNION OIL COMPANY OF CALIFORNIA

Production Rate vs Time  
For the Period 04/1990 to 05/1995

Oil  
Gas  
Water  
Wells



Bbl/Mo  
or  
Mcf/Mo

Time

Reported Oil Production = 52,041 Bbls  
Reported Gas Production = 56,682 Mcf  
Reported Water Production = 10,114 Bbls

BONE SPRING 19-35

Field: SCHARB  
Lease: JACKSON 5 | Well Number: 1  
Operator: DEVON ENERGY CORPORATION  
Production Rate vs Time  
For the Period 05/1984 to 05/1995

Oil  
Gas  
Water  
Wells

100,000

10,000

1,000

100

10

1

Bbl/Mo  
or  
Mcf/Mo

1984

Reported Oil Production = 70,876 Bbls  
Reported Gas Production = 265,152 Mcf  
Reported Water Production = 3,815 Bbls

1989

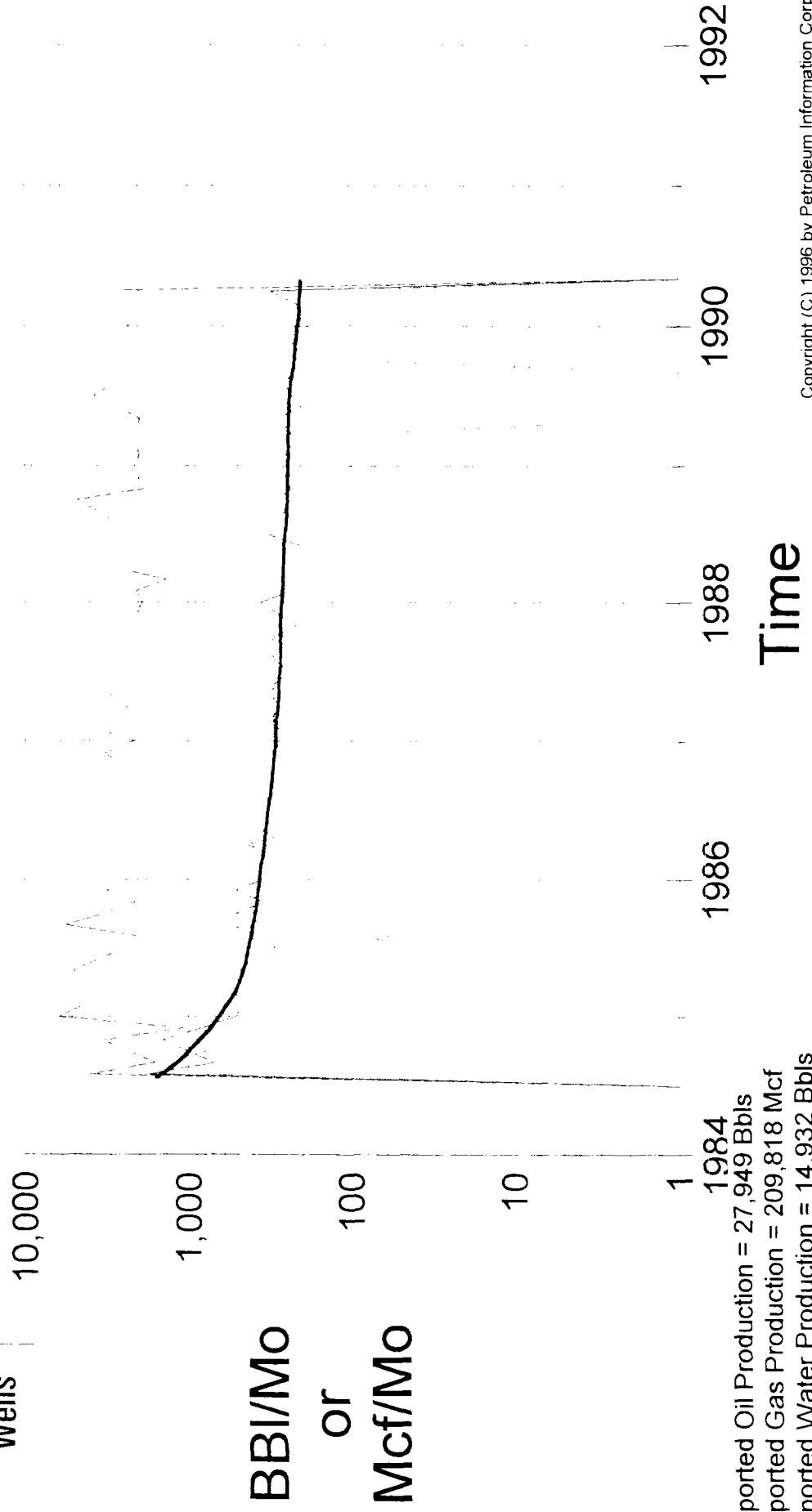
1994

Time

BONE SPRING 20-28

Field: AVALON EAST  
Lease: LEE FEDERAL | Well Number: 4Y  
Operator: PRESIDIO EXPLORATION INCORPORATED  
Production Rate vs Time  
For the Period 08/1984 to 04/1990

Oil  
Gas  
Water  
Wells

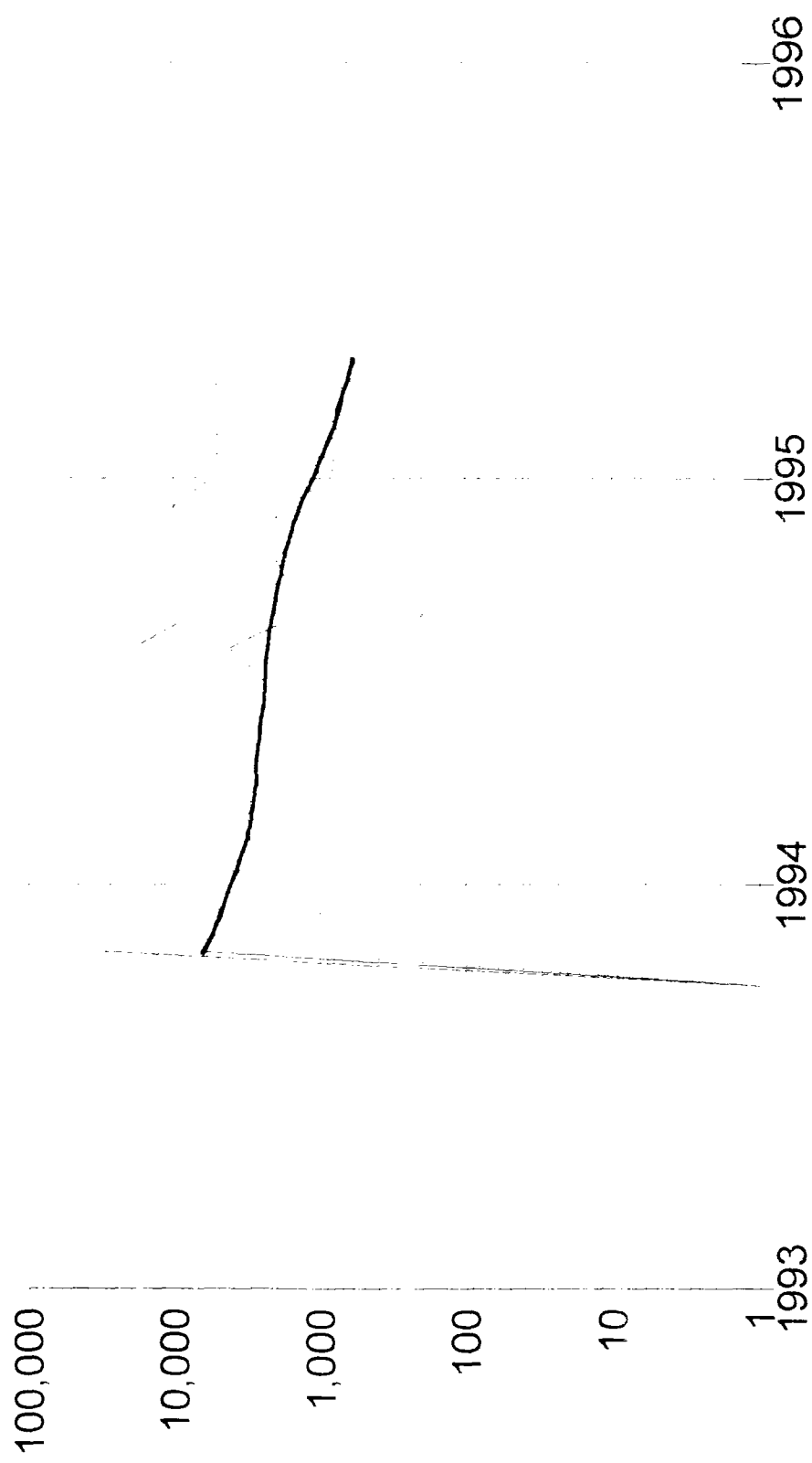


Reported Oil Production = 27,949 Bbls  
Reported Gas Production = 209,818 Mcf  
Reported Water Production = 14,932 Bbls

BONE SPRING 20-28

Field: OLD MILLMAN RANCH  
Lease: REMINGTON FEDERAL | Well Number: 2  
Operator: CHI OPERATING INCORPORATED  
Production Rate vs Time  
For the Period 11/1993 to 04/1995

Oil  
Gas  
Water  
Wells



BBI/Mo  
or  
Mcf/Mo

Reported Oil Production = 45,838 Bbls  
Reported Gas Production = 303,502 Mcf  
Reported Water Production = 8,526 Bbls

Time

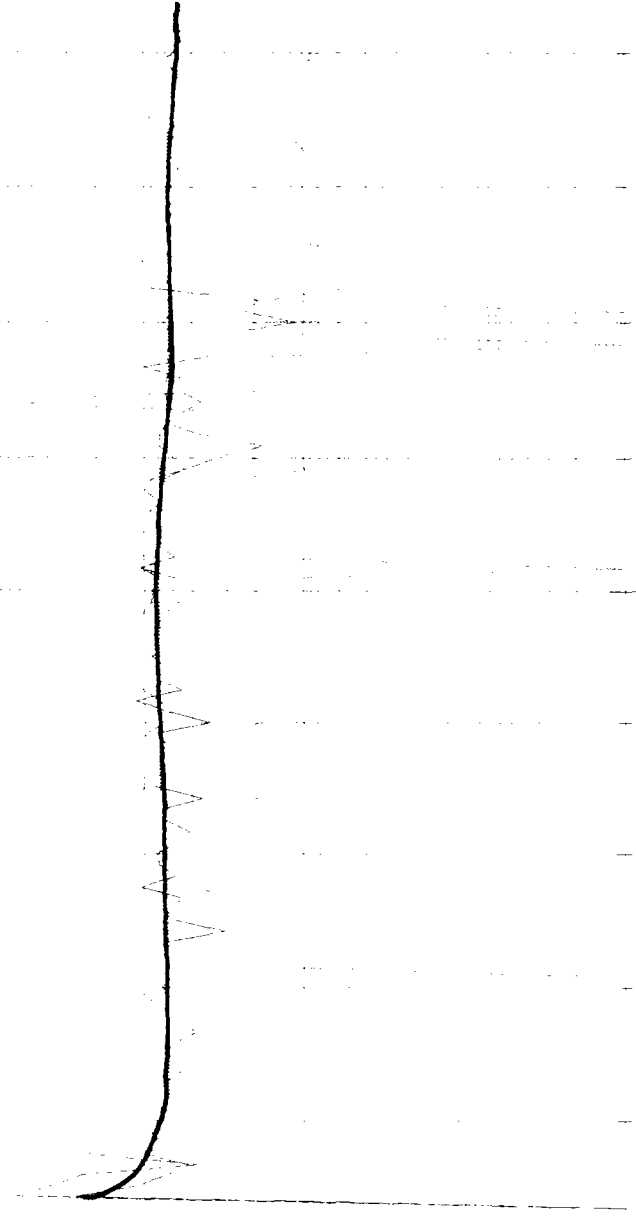
BONE SPRING 20-34

Field: LEA SOUTH  
Lease: LEA UNIT | Well Number: 13  
Operator: MARATHON OIL COMPANY  
Production Rate vs Time  
For the Period 06/1986 to 05/1995

Oil  
Gas  
Water  
Wells

100,000  
10,000  
1,000  
100  
10  
1

Bbl/Mo  
or  
Mcf/Mo



1986  
Reported Oil Production = 77,816 Bbls  
Reported Gas Production = 113,080 Mcf  
Reported Water Production = 32,599 Bbls

1991  
Time

1996

BONE SPRING 22-32

Field: RED TANK  
Lease: COVINGTON A FEDERAL | Well Number: 18  
Operator: POGO PRODUCING COMPANY  
Production Rate vs Time  
For the Period 10/1993 to 02/1995

Oil  
Gas  
Water  
Wells

10,000

1,000

100

10

1

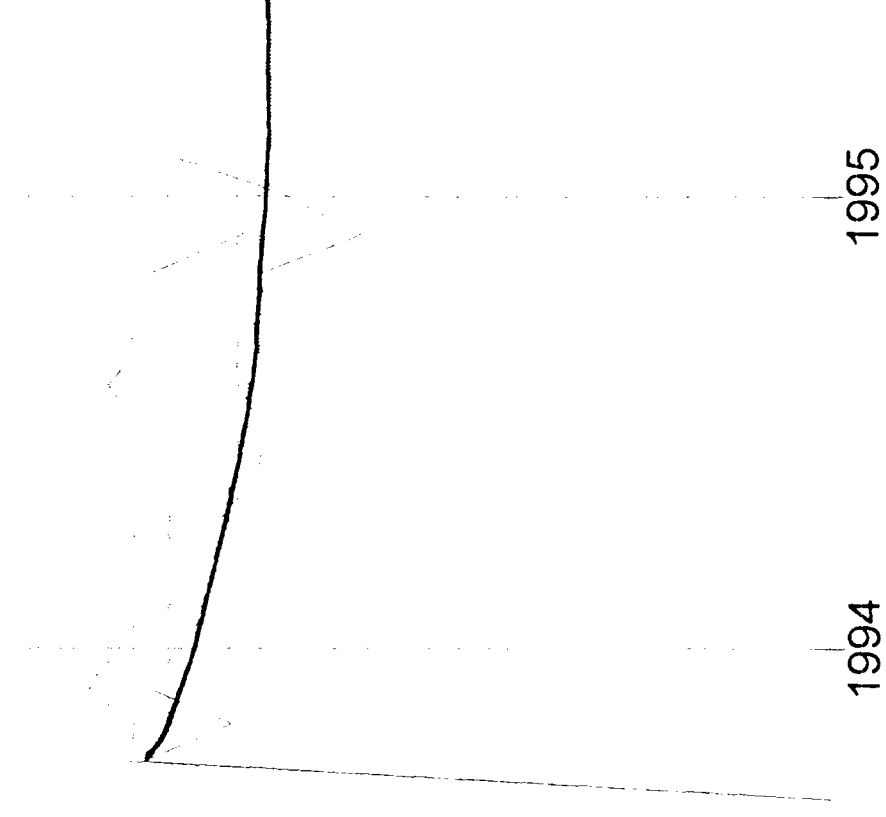
1993

Reported Oil Production = 20,569 Bbls  
Reported Gas Production = 49,371 Mcf  
Reported Water Production = 37,962 Bbls

BBl/Mo

or

Mcf/Mo



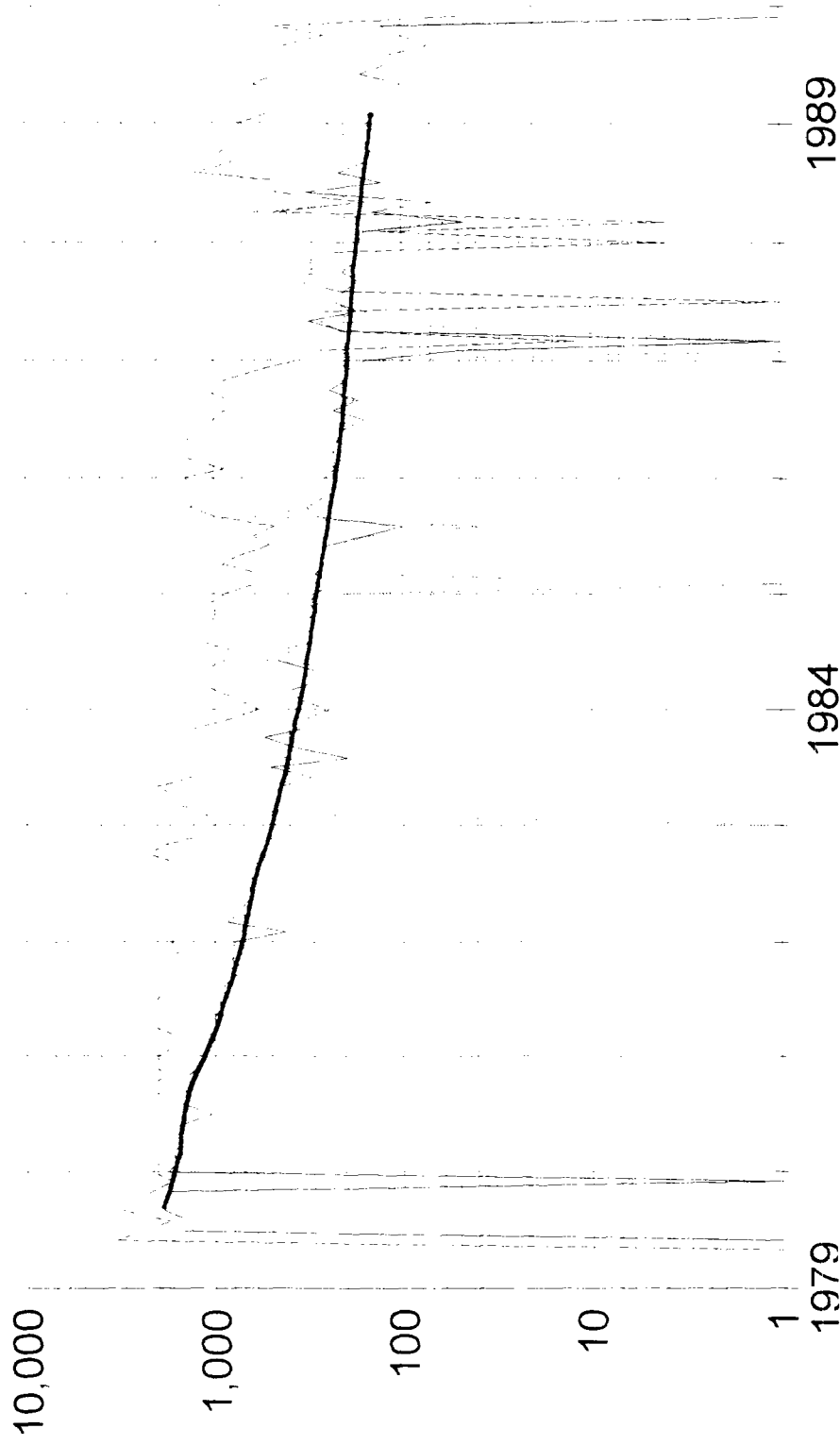
Time

BONE SPRING 23-28

Field: CULEBRA BLUFF SOUTH  
Lease: S CULEBRA BLUFF UNIT | Well Number: 3  
Operator: RB OPERATING COMPANY

Production Rate vs Time  
For the Period 06/1979 to 12/1989

Oil  
Gas  
Water  
Wells



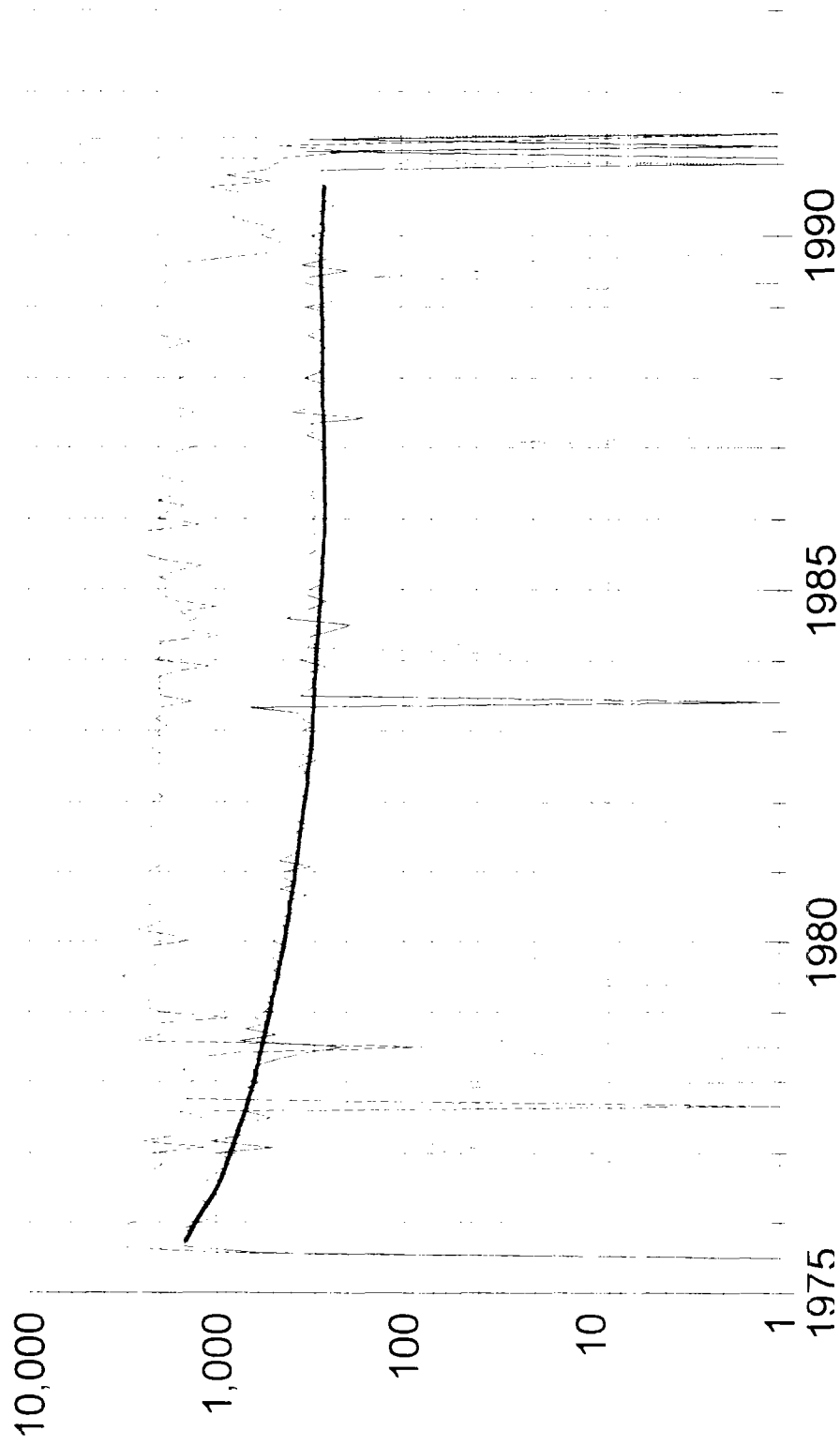
Time

Reported Oil Production = 66,440 Bbls  
Reported Gas Production = 147,655 Mcf  
Reported Water Production = 18,621 Bbls

BONE SPRING 23-32

Field: SAND DUNES  
Lease: FEDERAL SAND 18 | Well Number: 1  
Operator: TEXACO EXPLORATION & PRODUCTION INC  
Production Rate vs Time  
For the Period 08/1975 to 05/1991

Oil  
Gas  
Water  
Wells



Bbl/Mo  
or  
Mcf/Mo

Reported Oil Production = 82,349 Bbls  
Reported Gas Production = 341,375 Mcf  
Reported Water Production = 16,935 Bbls

Time

BONE SPRING 23-32

Field: SAND DUNES SOUTH  
Lease: TRESNOR MITCHELL 30 FEDERAL | Well Number: 2  
Operator: SANTA FE ENERGY RESOURCES INCORPORAT  
Production Rate vs Time  
For the Period 02/1995 to 05/1995

Oil  
Gas  
Water  
Wells

Bbl/Mo  
or  
Mcf/Mo

100,000

10,000

1,000

100

10

1

1995

Reported Oil Production = 7,406 Bbls  
Reported Gas Production = 34,281 Mcf  
Reported Water Production = 430 Bbls

Time

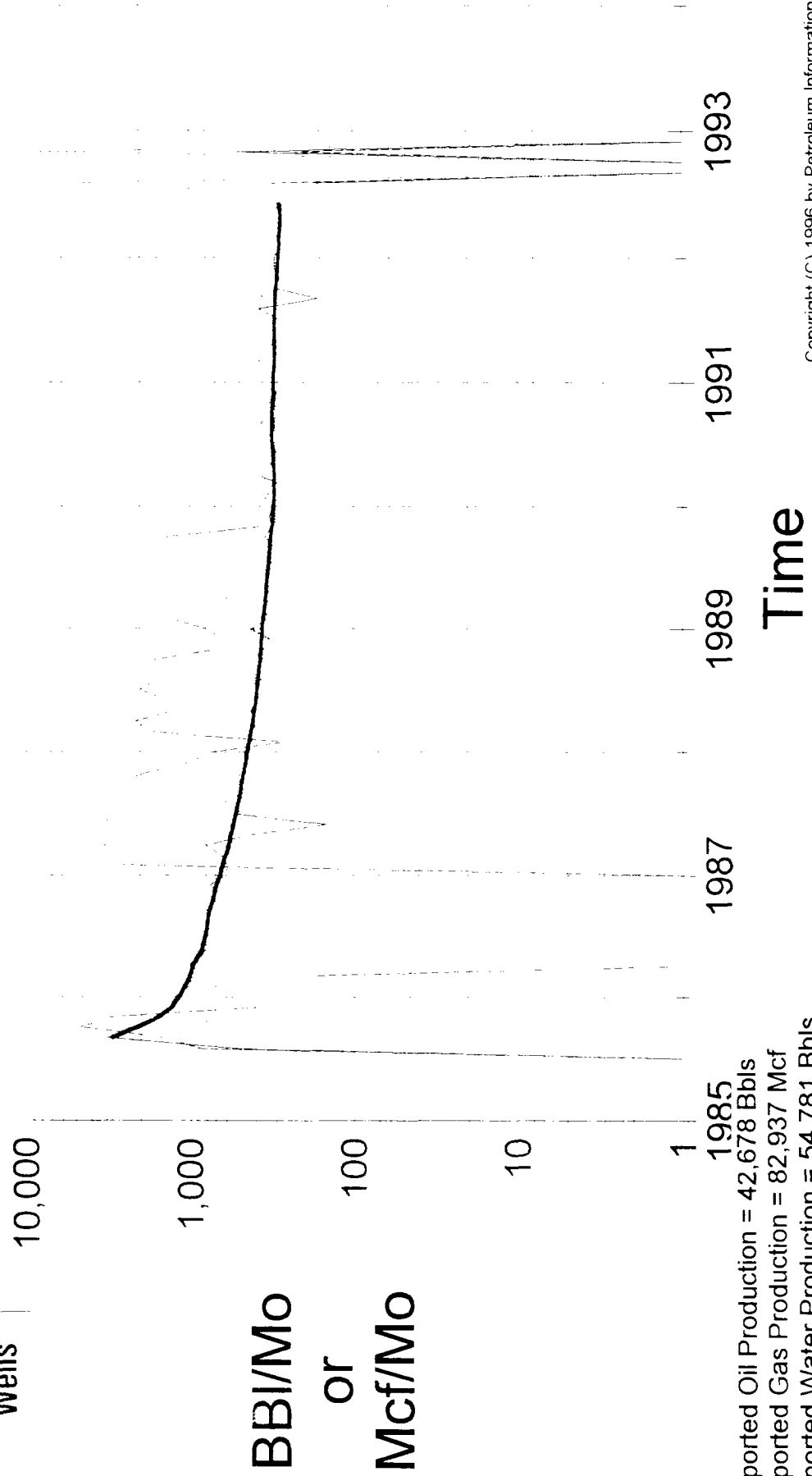
1996

BONE SPRING 24-28

Field: MALAGA NORTH  
Lease: MALAGA COM | Well Number: 1  
Operator: PARKER & PARSLEY DEVELOPMENT COMPANY

Production Rate vs Time  
For the Period 08/1985 to 11/1992

Oil  
Gas  
Water  
Wells



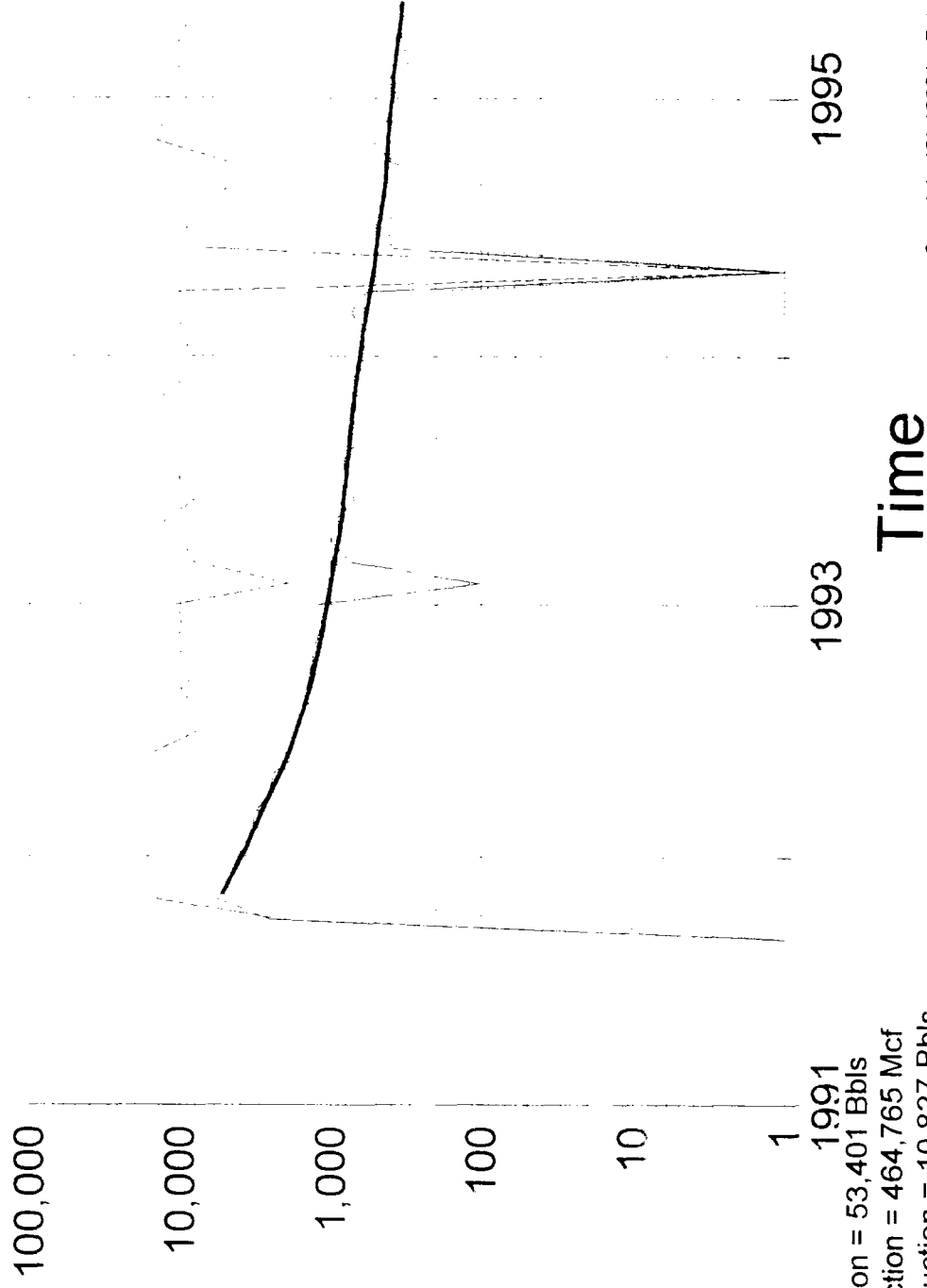
Reported Oil Production = 42,678 Bbls  
Reported Gas Production = 82,937 Mcf  
Reported Water Production = 54,781 Bbls

BONE SPRING 24-29

Field: CEDAR CANYON  
Lease: H. B. 3 FEDERAL | Well Number: 1  
Operator: VISION ENERGY INCORPORATED  
Production Rate vs Time  
For the Period 10/1991 to 05/1995

Oil  
Gas  
Water  
Wells

Bbl/Mo  
or  
Mcf/Mo



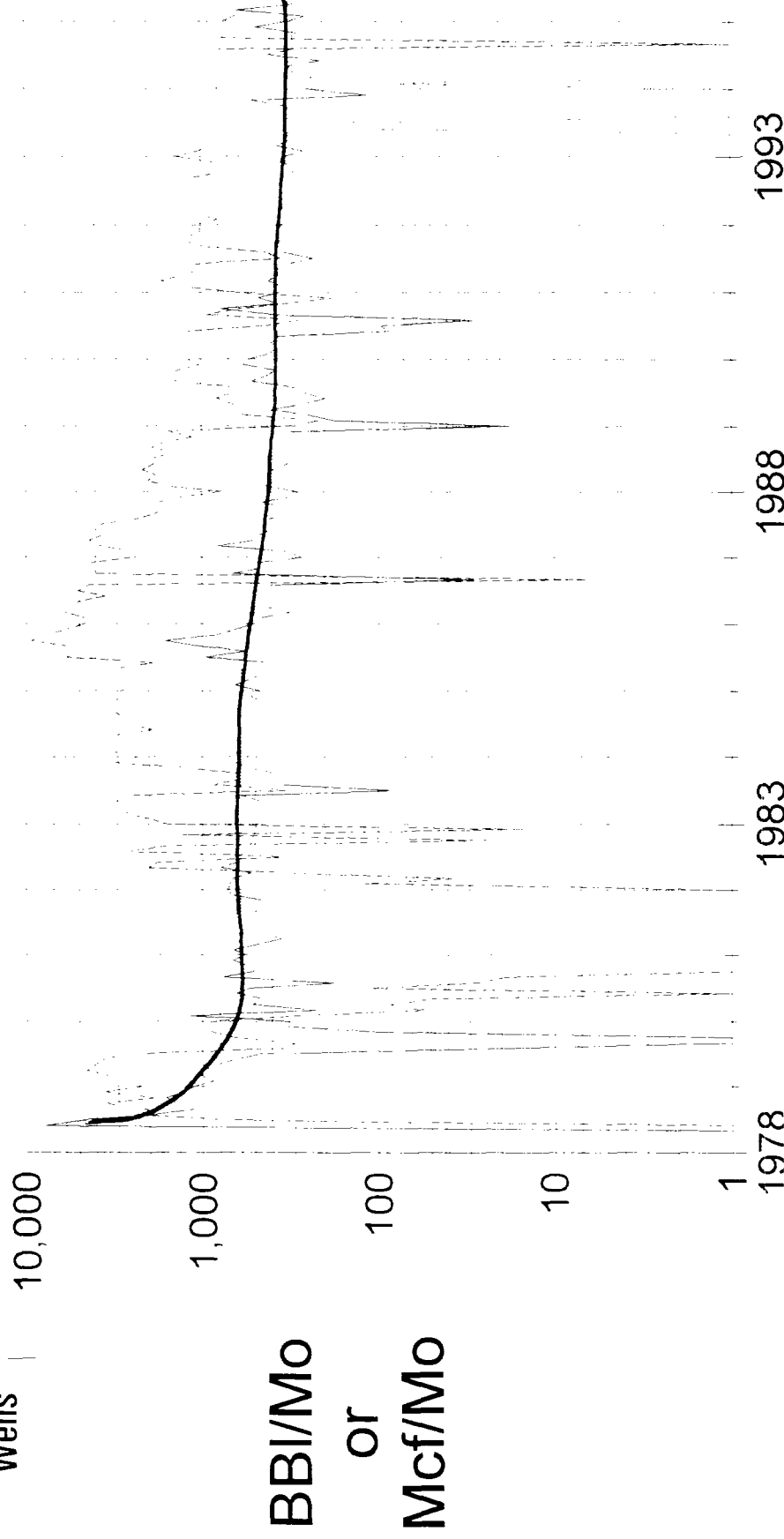
Reported Oil Production = 53,401 Bbls  
Reported Gas Production = 464,765 Mcf  
Reported Water Production = 10,827 Bbls

Wolcamp 19-32

Field: LUSK EAST  
Lease: SUN MCKAY FED | Well Number: 1  
Operator: PETROLEUM DEVELOPMENT CORPORATION

Production Rate vs Time  
For the Period 06/1978 to 05/1995

Oil  
Gas  
Water  
Wells

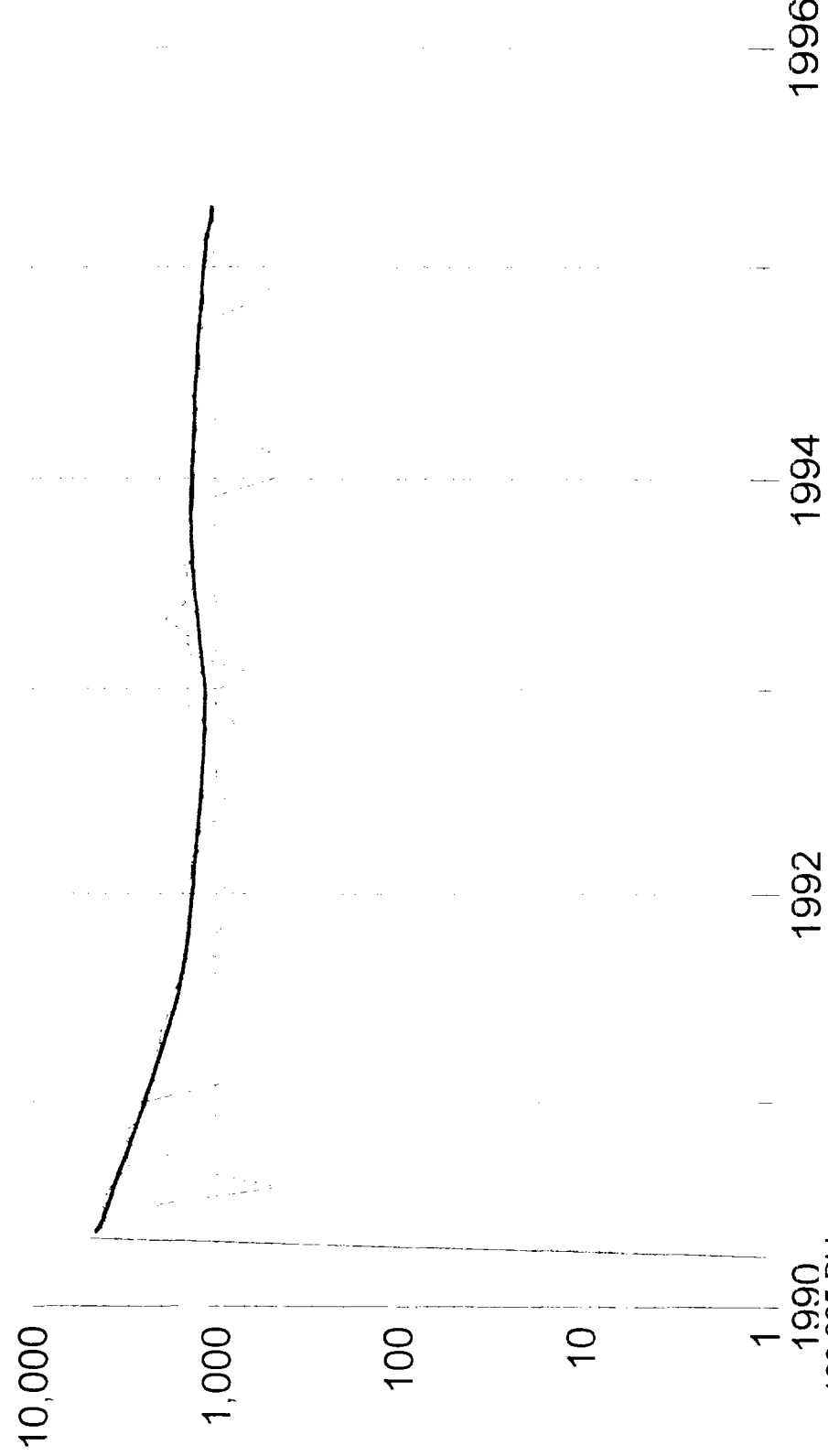


Reported Oil Production = 105,439 Bbls  
Reported Gas Production = 335,929 Mcf  
Reported Water Production = 451 Bbls

wolfcamp 19-32

Field: TONTO  
Lease: TEXACO FEDERAL | Well Number: 1  
Operator: MANZANO OIL CORPORATION  
Production Rate vs Time  
For the Period 05/1990 to 05/1995

Oil  
Gas  
Water  
Wells



BBI/Mo  
or  
Mcf/Mo

Time

Reported Oil Production = 102,225 Bbls  
Reported Gas Production = 72,769 Mcf  
Reported Water Production = 52,977 Bbls

**ENRON OIL & GAS COMPANY**  
***Application for Downhole Commingling***  
***and Special Allowable***  
**James Ranch Unit Development Area**  
**Eddy County, New Mexico**

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**Pools Involved:**            Southeast Quahada Ridge - Delaware  
                                     Los Medanos - Bone Spring  
                                     South Los Medanos - Wolfcamp

**Producing Characteristics of each Formation:**

***Delaware*** - 6 producers in Development Area (see Exhibit No. 12)  
Average 1st mo. rates: 100 BOPD, 100 BWPD, GOR 1.5 MCF/BO  
Average 3rd mo. rates: 50 BOPD, 80 BWPD, GOR 1.5 MCF/BO  
Initial BHP: 3,200 psia to 3,400 psia  
Perforations: 7,200' - 7,600' for "C" and "D" sand interval;  
                     6,700' - 6,750' for "B" interval in the JRU No. 19  
Treatment: Acid ball-out. Hydraulic fracture w/30,000 gals. + 80,000 lbs.  
                     sand to 40,000 gals. + 200,000 lbs. sand.

***Bone Spring*** - 4 producers in Development Area (see Exhibit No. 13)  
Average 1st mo. rates: 120 BOPD, 20 BWPD, GOR 1.8 MCF/BO  
Average 3rd mo. rates: 47 BOPD, 15 BWPD, GOR 2.0 MCF/BO  
Initial BHP: 6,947 psig @ 10,909' in the JRU No. 71;  
                     5,734 psig @ 10,932' in the JRU No. 30  
Perforations: 10,880' - 10,938' in the JRU No. 71  
Treatment: Acid ball-out. Hydraulic fracture w/80,000 gals. + 325,000 lbs. sand.

***Wolfcamp*** - 1 producer in Development Area (see Exhibit No. 14)  
Average 1st mo. rates: 66 BOPD, 0 BWPD, GOR 0.9 MCF/BO  
Average 3rd mo. rates: 27 BOPD, 0 BWPD, GOR 0.9 MCF/BO  
Initial BHP: 7,069 psig @ 11,100'; after 6 months 3,725 psig SI 98 hrs.  
Perforations: 11,091' - 11,124' in the JRU No. 71  
Treatment: Acid ball-out. Hydraulic fracture w/24,000 gals. + 155,000 lbs. sand.

## **Reservoir Protection Issues:**

**Crossflow** - In wells in which only Bone Spring and Wolfcamp is commingled the SIBHP differential is about 122 psi. A flowing BHP gradient showed only 100 psia difference in the JRU No. 71. Additionally, after a few months of production the near wellbore pressures are drawn down approximately 50% because of the very low permeabilities ( $>0.2$  md Eff).

In a well where a Delaware zone will be commingled the well will have artificial lift installed with bottom hole draw down to 500 to 800 psig, therefore, preventing any opportunity for crossflow. The initial SIBHP's of the Bone Spring formation in the JRU Nos. 30 and 71 adjusted to a Delaware datum of 7,500' is 4,688 psig and 6,100 psig, respectively. The Delaware pressures are more than 50% of the adjusted Bone Spring pressures (see Exhibit No. 15). The operator shall immediately notify the supervision of the Artesia District Office of the Division any time subject well has been shut-in for seven consecutive days and shall concurrently present, to the Division, a plan for remedial action.

- **Oil and Gas Quality** - All oils are sweet and 41.0 to 43.1 gravity. All associated gas is delivered to a low pressure system with a processing agreement. The product prices received will not be affected by commingling the production.

**Water Compatibility** - The produced waters are compatible. (see Exhibit No. 16)

**Secondary Recovery Operations** - There is little potential for future secondary recovery operations for the Wolfcamp/Bone Spring interval due to depth and low permeabilities. Delaware is possible in the distant future. In that event, the zones could easily be isolated.

## **Allocation Procedure:**

The Bone Spring and Wolfcamp formations will be completed together initially and production monitored for 30 to 90 days or until stabilized. A production log will be run or the formations will be mechanically isolated and tested. A temporary plug will be set between the Bone Spring and Delaware intervals and the Delaware will be completed and tested for 30 to 90 days or until stabilized. The plug will be pulled and all/any zones commingled.

Allocation will be consistent with actual tests and closely compared to the expected rates based on offset production history of these formations.

**Special Allowable:**

It is requested that the daily allowable for commingled production be set as the top allowable of the shallowest zone commingled (i.e., 320 BOPD if Bone Spring; 187 BOPD if Delaware is the shallowest formation commingled). Standard gas limits rules should apply. A water production limit of 80 BPD per commingled zone is appropriate.

**Other Agency Approvals:**

The operator will still be required to satisfy other State and Federal agency requirements on an individual well basis.

**Results of Authority Approval:**

Additional Drilling and workover activity will result.

Correlative rights will be protected.

Waste will be prevented.

Operator will be allowed to develop reserves economically and efficiently.

11/15/95  
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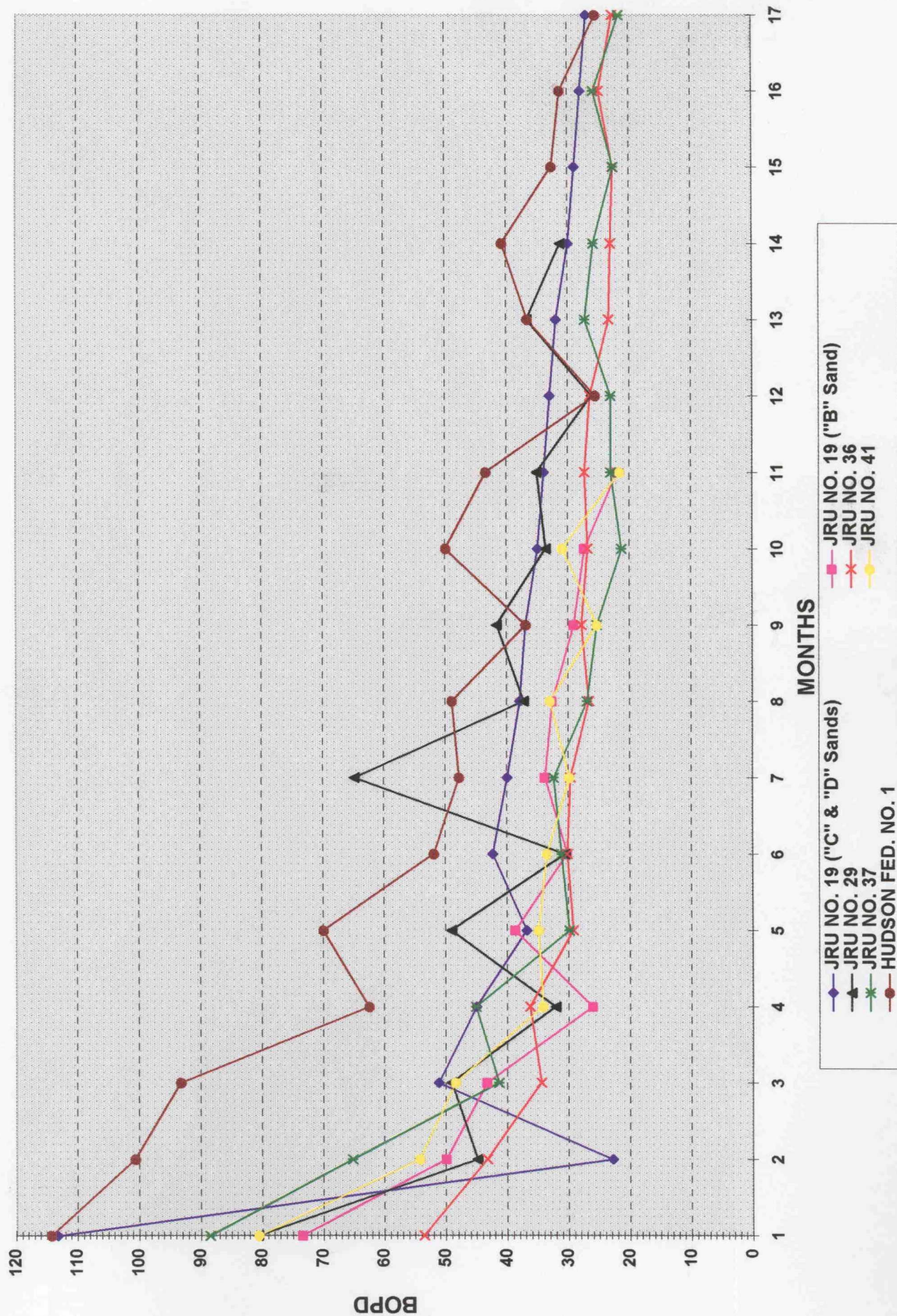
**BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico**

Case No. 11353 Exhibit No. 4

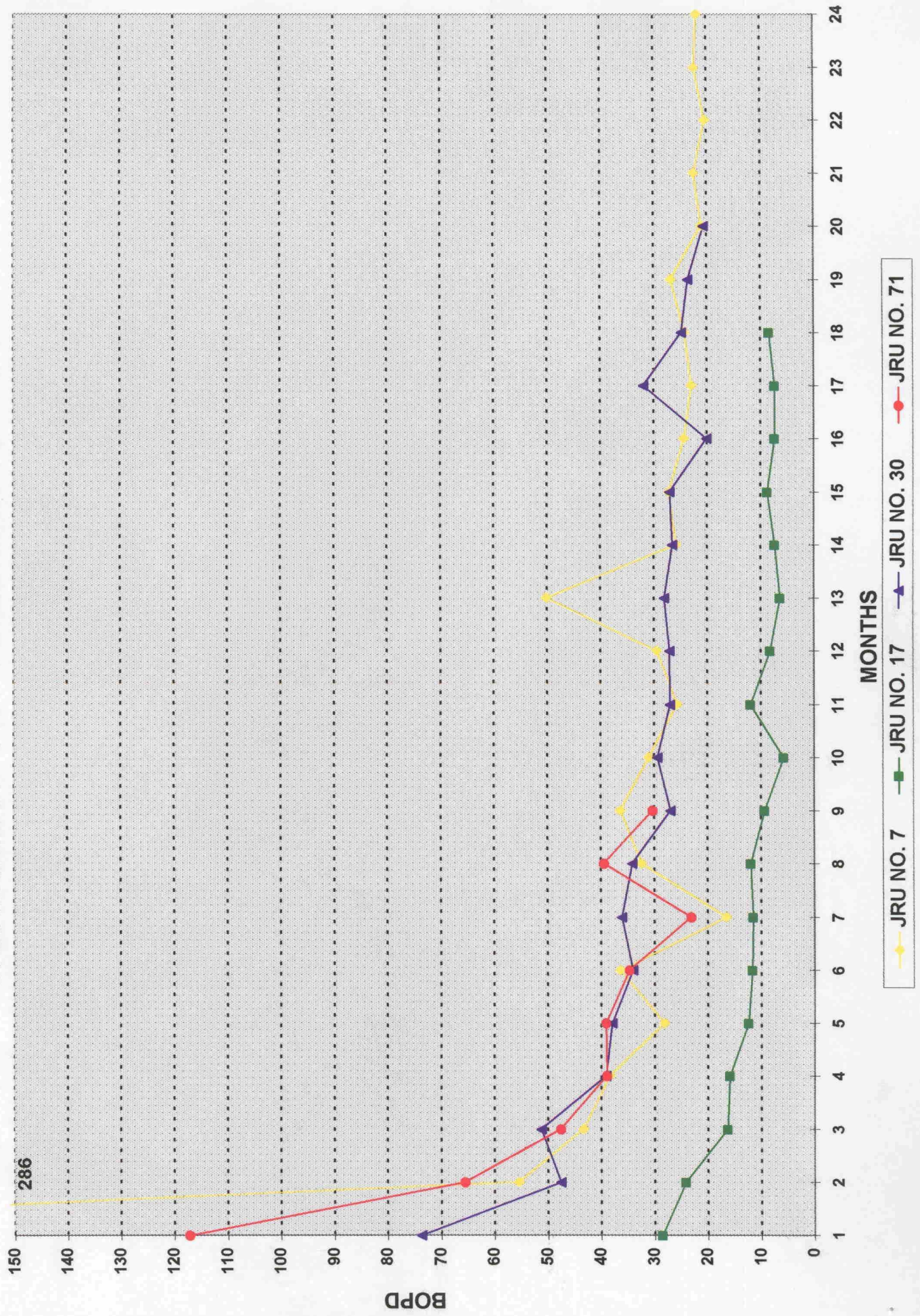
Submitted by: Enron Oil & Gas Company

Hearing Date: January 18, 1996

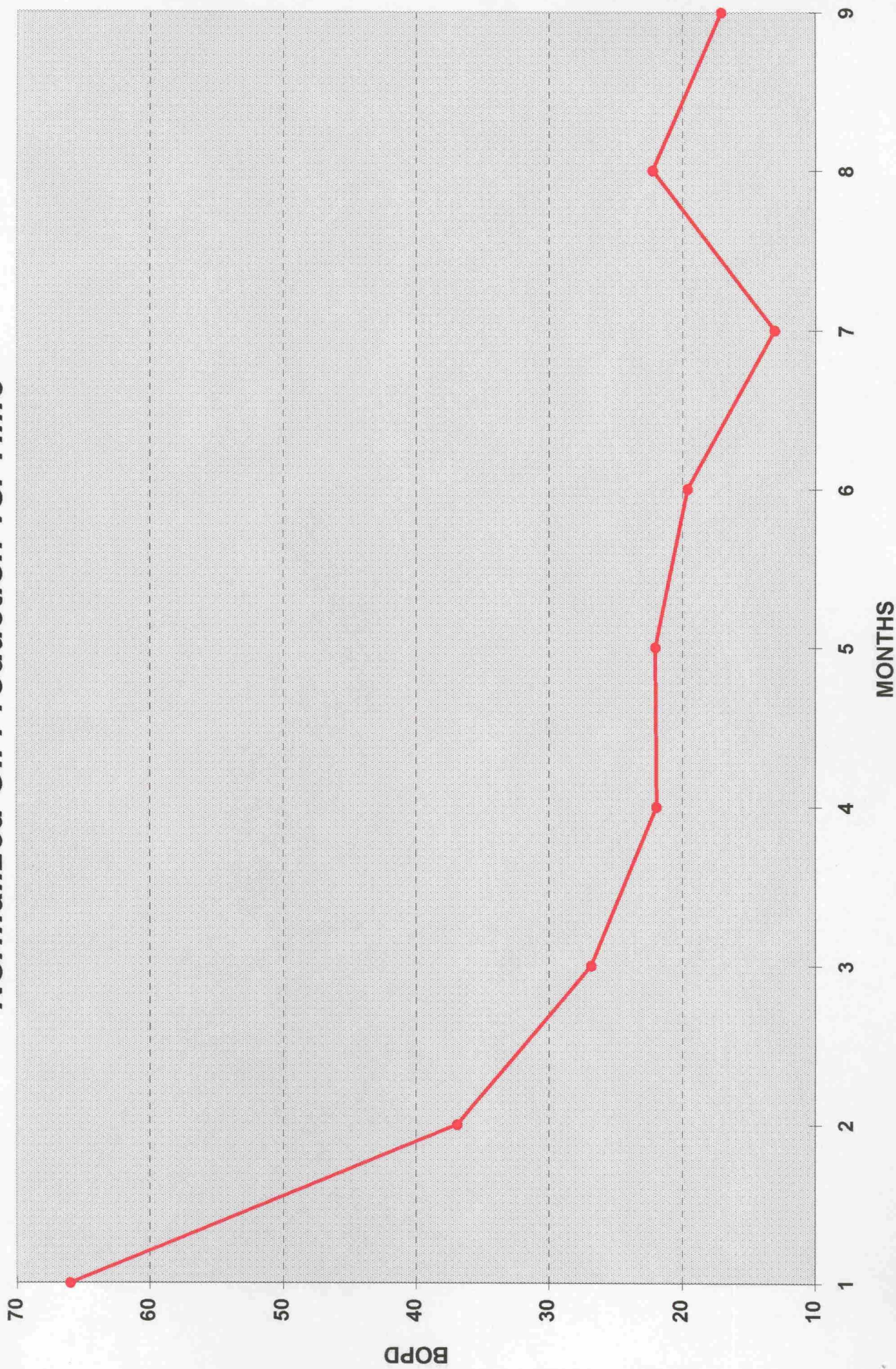
# Quahada Ridge, SE (Delaware) Normalized Oil Production vs. Time



# Los Medanos (Bone Spring) Normalized Oil Production vs. Time



**James Ranch Unit No. 71**  
**Allocated Wolfcamp Production**  
***Normalized Oil Production vs. Time***



LARGE FORMAT  
EXHIBIT HAS  
BEEN REMOVED  
AND IS LOCATED  
IN THE NEXT FILE

LARGE FORMAT  
EXHIBIT HAS  
BEEN REMOVED  
AND IS LOCATED  
IN THE NEXT FILE