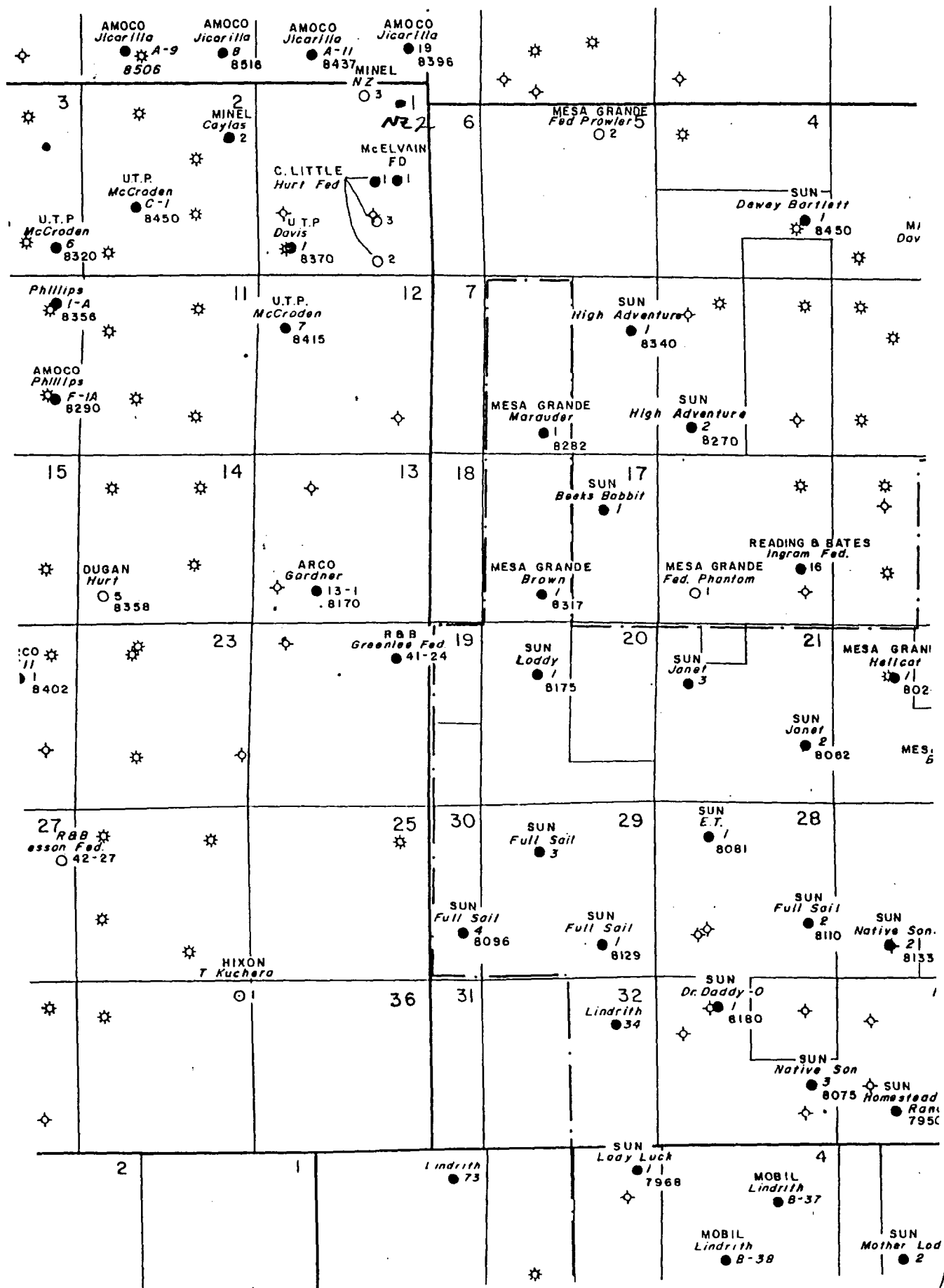


**Sun Exploration and
Production Company**



NEW MEXICO OIL CONSERVATION COMMISSION
NOVEMBER 19, 1987
GAVILAN - WEST LINDRITH
BOUNDARY
CASE 9226

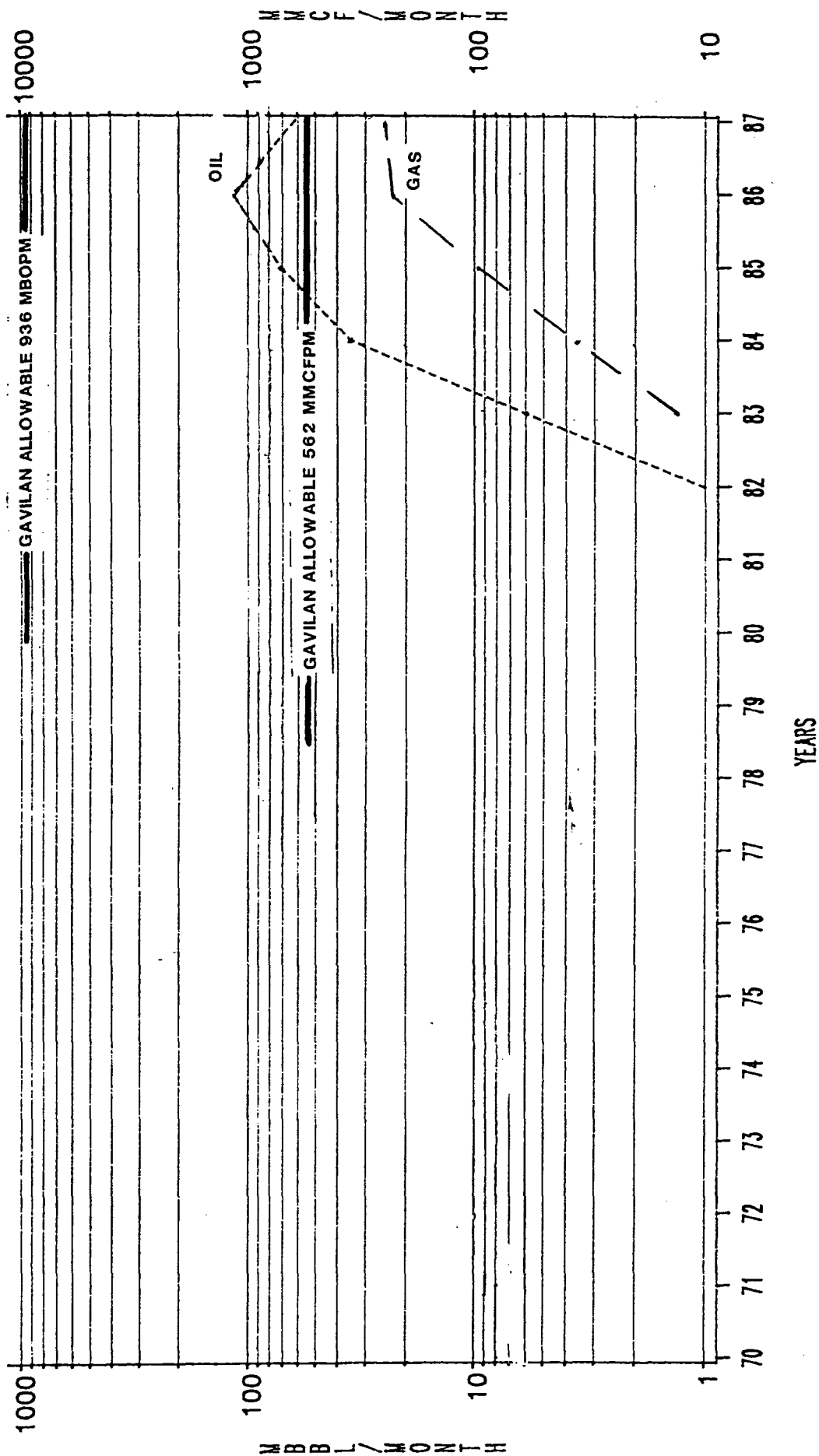


SECTION I

NEW MEXICO OIL CONSERVATION DIVISION
CASE NO. 9226

<u>Pool</u>	<u>Spacing</u>	<u>BOPD</u>	<u>Allowables</u>		<u>640 Acre Allowable</u>	
			<u>GOR</u>	<u>MCFPD</u>	<u>BOPD</u>	<u>MCFPD</u>
West Lindrith	160	382	2000	764	1528	3056
Gavilan-Mancos	640	800	600	480	800	480

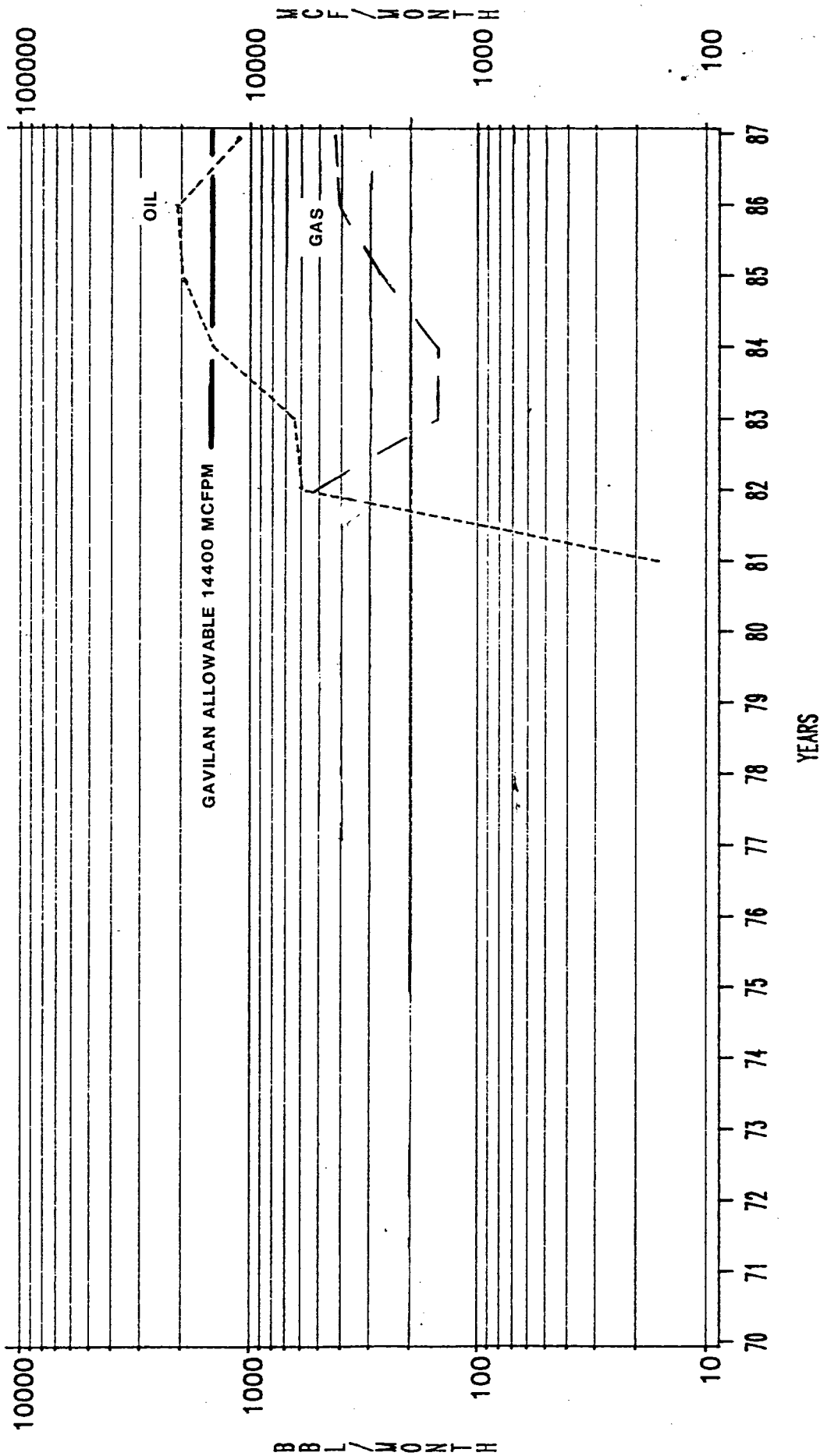
GAVILAN FIELD AVERAGE PRODUCTION PER MONTH



GAVILAN OIL
GAVILAN GAS

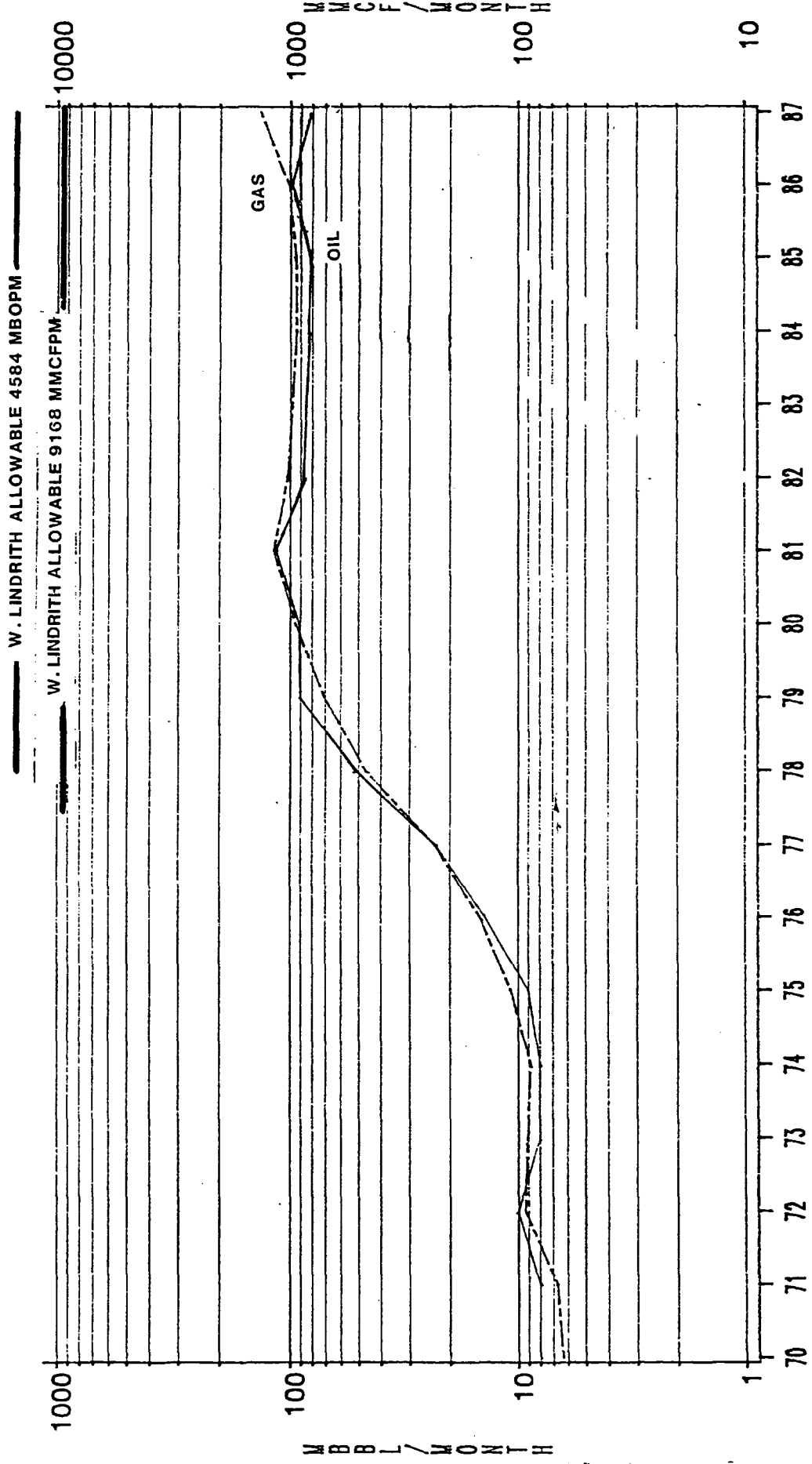
GAVILAN FIELD AVERAGE PRODUCTION PER WELL PER MONTH

— GAVILAN ALLOWABLE 24000 BOPM



GAVILAN OIL
GAVILAN GAS

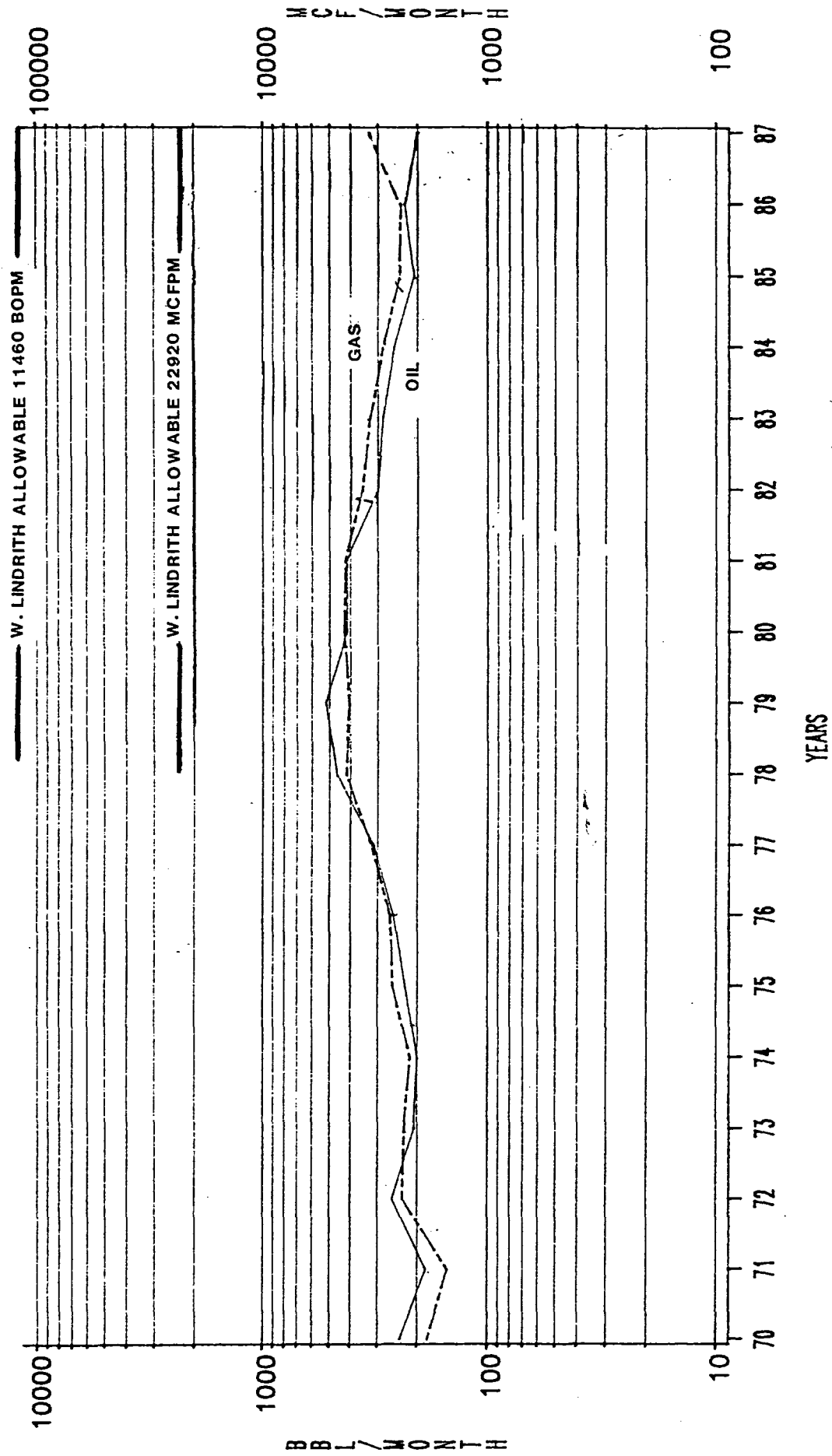
LINDRITH FIELD AVERAGE PRODUCTION PER MONTH



YEARS

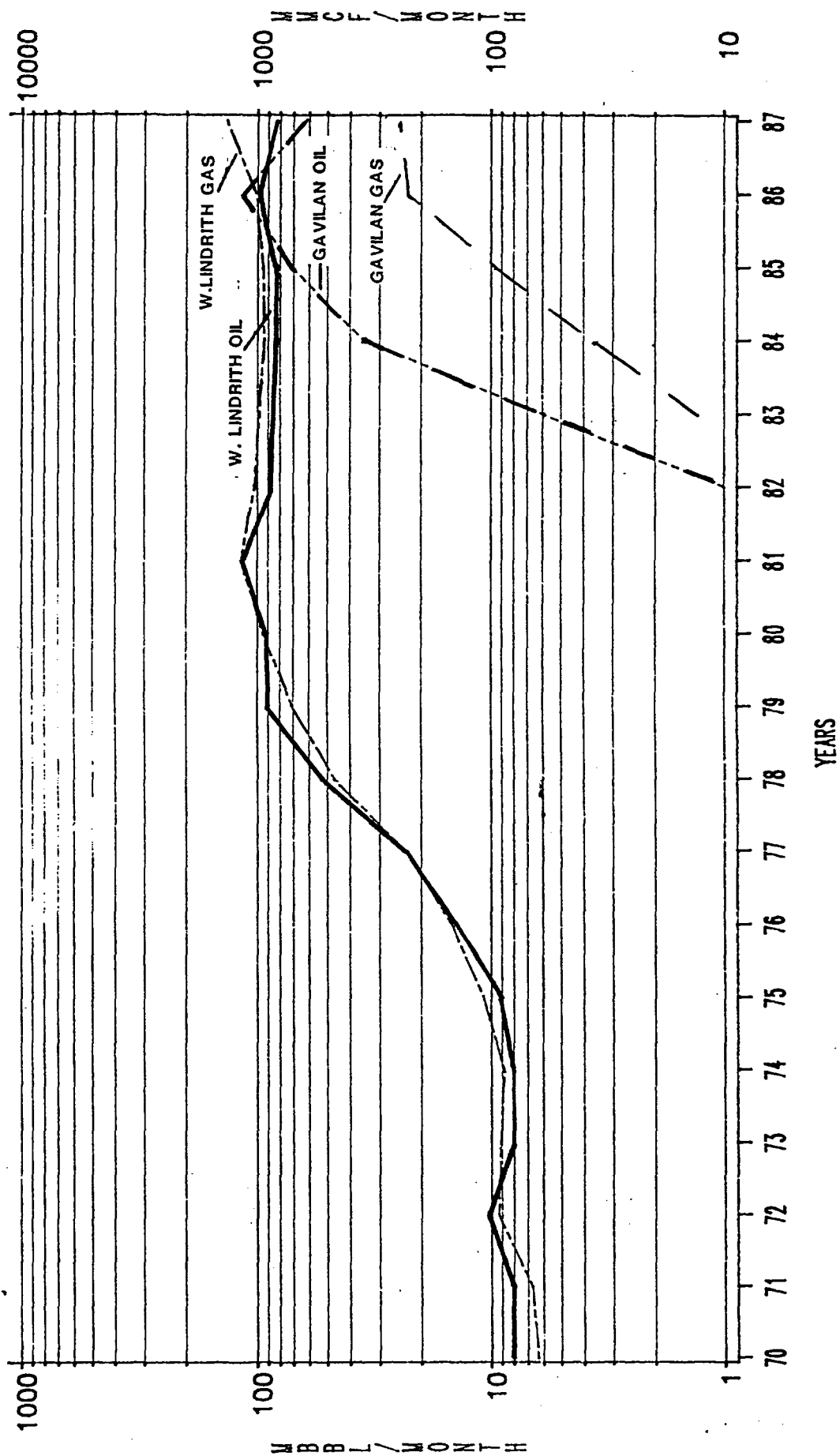
LINDRITH OIL
LINDRITH GAS

LINDRITH FIELD AVERAGE PRODUCTION PER WELL PER MONTH

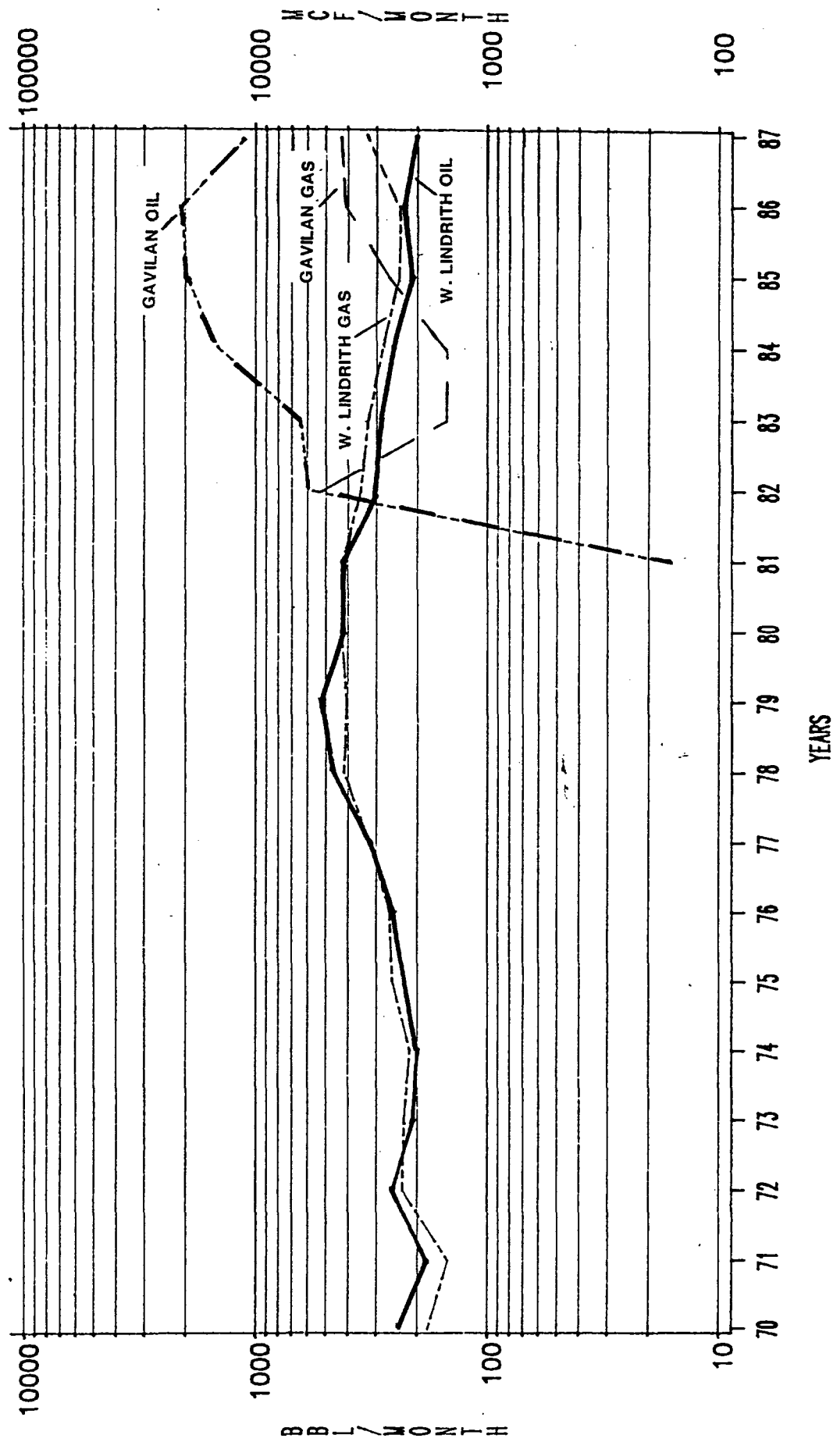


LINDRITH OIL -
LINDRITH GAS - - - -

LINDRITH FIELD AND GAVILAN FIELD AVERAGE PRODUCTION PER MONTH



LINDRITH FIELD AND GAVILAN FIELD AVERAGE PRODUCTION PER WELL PER MONTH



LINDRITH OIL - GAVILAN OIL
LINDRITH GAS - GAVILAN GAS

NEW MEXICO OIL CONSERVATION DIVISION
CASE NO. 9226

W. LINDRETH
WELL CAPACITY

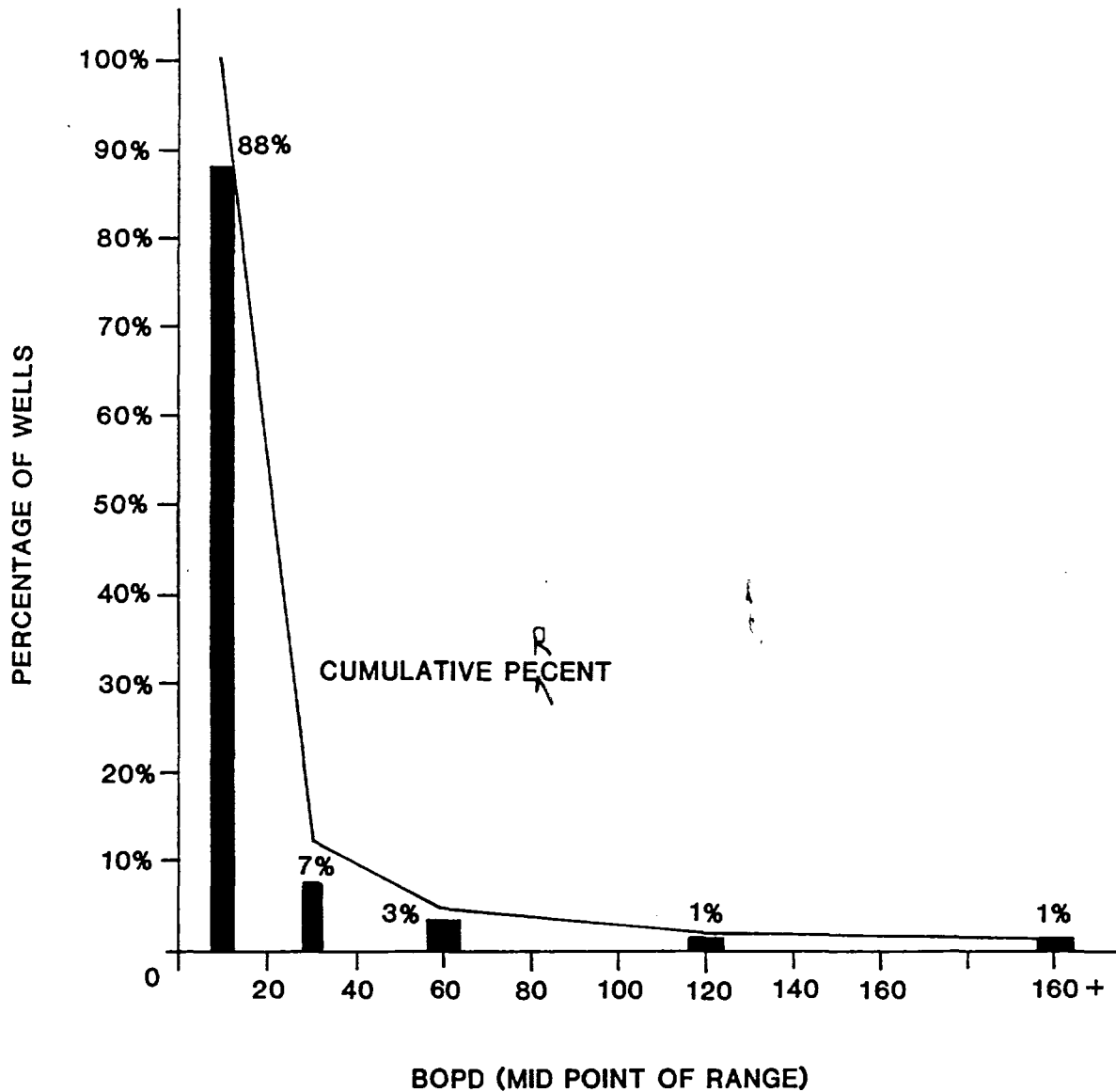
<u>BOPD</u>	<u>NO. WELLS</u>	<u>CUM WELL COUNT</u>	<u>% OF TOTAL</u>	<u>CUM %</u>
160+	7	7	1%	1%
80-160	3	10	1%	2%
40-80	12	22	3%	5%
20-40	26	48	7%	12%
0-20	348	396	88%	100%

<u>MCFD</u>	<u>NO. WELLS</u>	<u>CUM WELL COUNT</u>	<u>% OF TOTAL</u>	<u>CUM %</u>
800+	15	15	4%	4%
400-800	20	35	5%	9%
200-400	53	88	13%	22%
100-200	94	182	24%	46%
0-100	214	396	54%	100%

NEW MEXICO OIL CONSERVATION COMMISSION

CASE NO. 9226

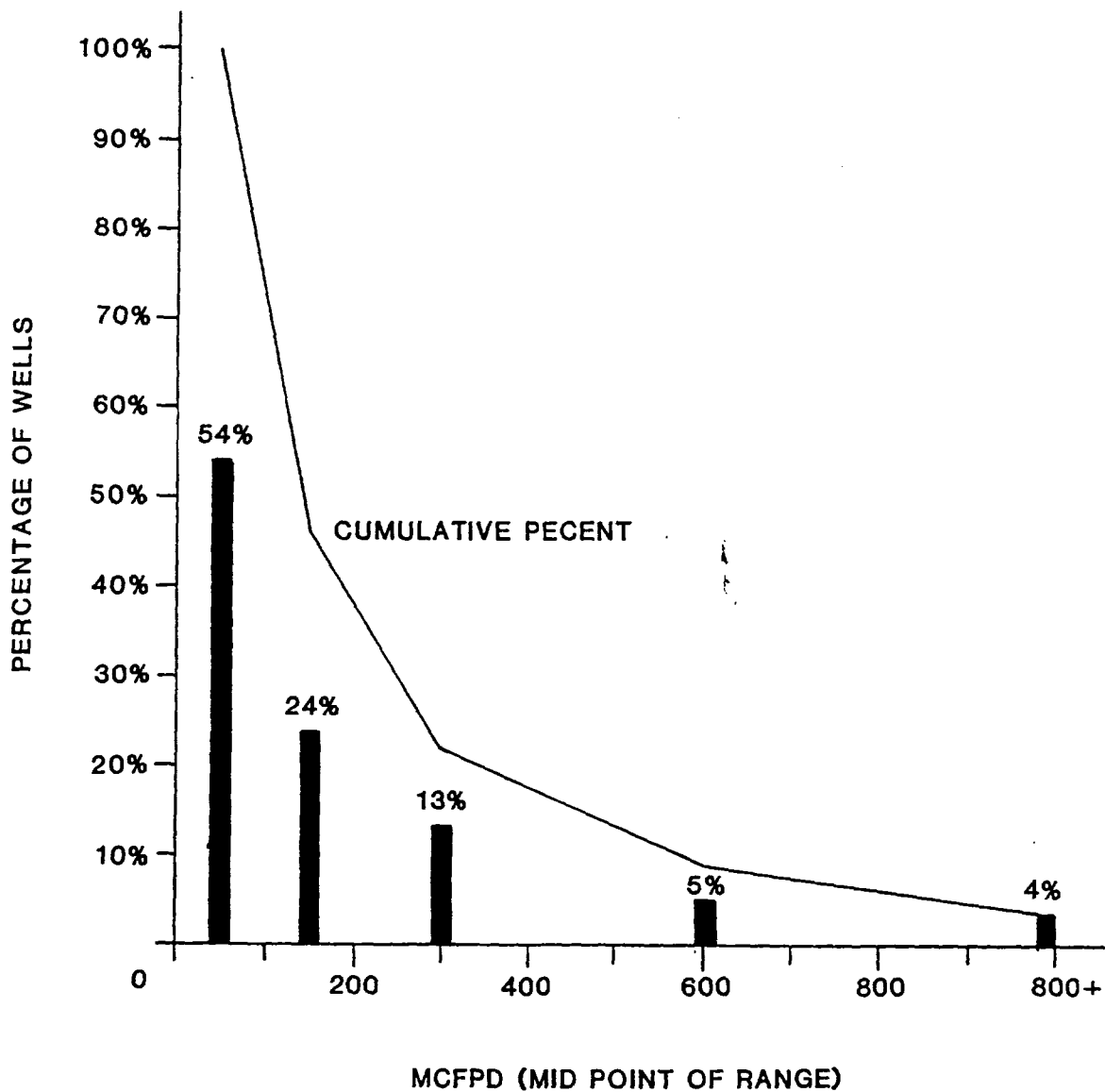
WEST LINDRITH WELL CAPACITY DISTRIBUTION



NEW MEXICO OIL CONSERVATION COMMISSION

CASE NO. 9226

WEST LINDRITH WELL CAPACITY DISTRIBUTION



11

NEW MEXICO OIL CONSERVATION DIVISION
CASE NO. 9226

GAVILAN WELL CAPACITY

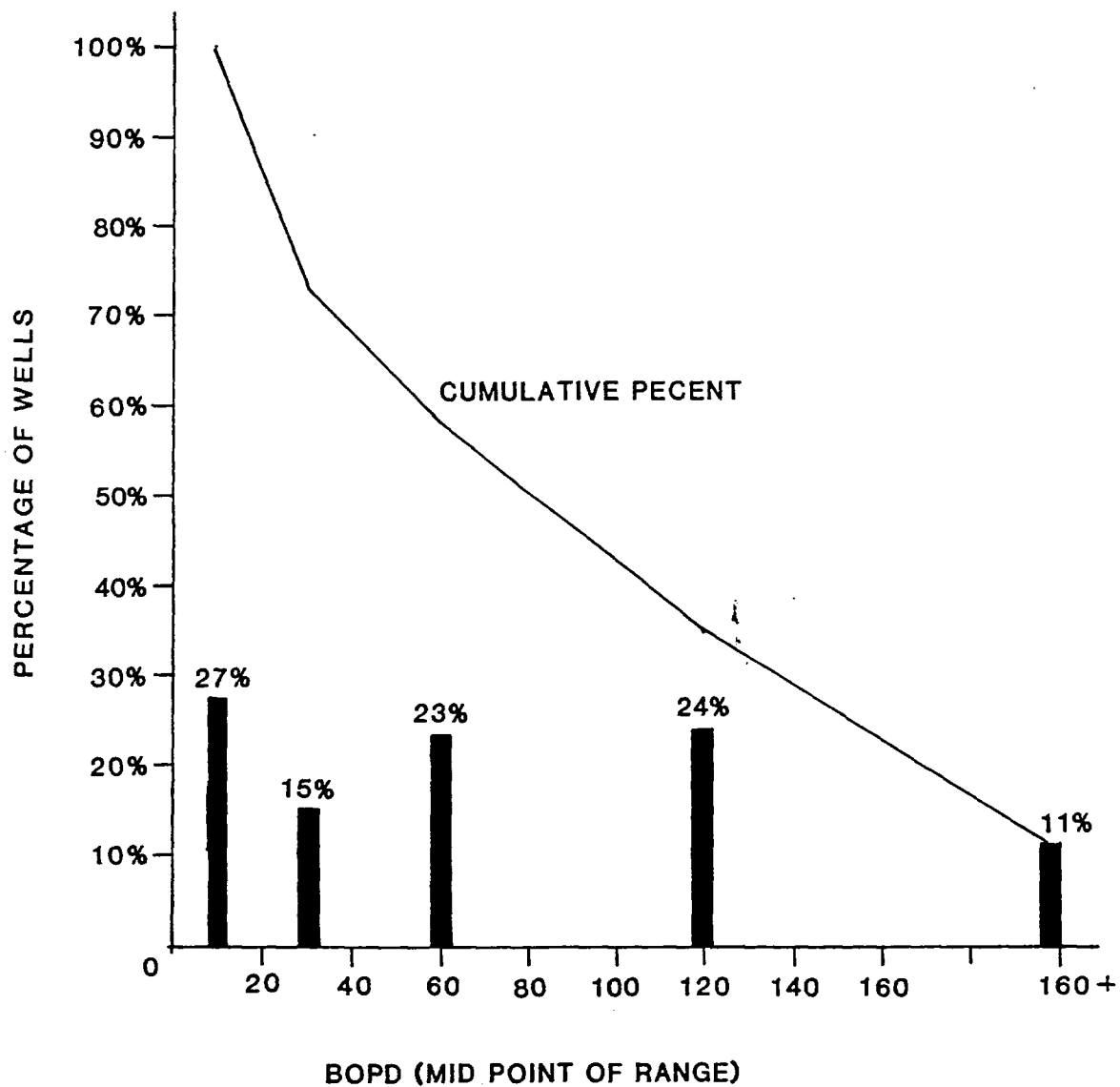
<u>BOPD</u>	<u>No. Wells</u>	<u>Cum Well Count</u>	<u>% of Tot.</u>	<u>Cum %</u>
160+	7	7	11	11
80-160	15	22	24	35
40-80	14	36	23	58
20-40	9	45	15	73
0-20	17	62	27	100

<u>MCFD</u>	<u>No. Wells</u>	<u>Cum Well Count</u>	<u>% of Tot.</u>	<u>Cum %</u>
800+	9	9	15	15
400-800	13	22	21	36
200-400	17	39	27	63
100-200	9	48	14	77
0-100	14	62	23	100

NEW MEXICO OIL CONSERVATION COMMISSION

CASE NO. 9226

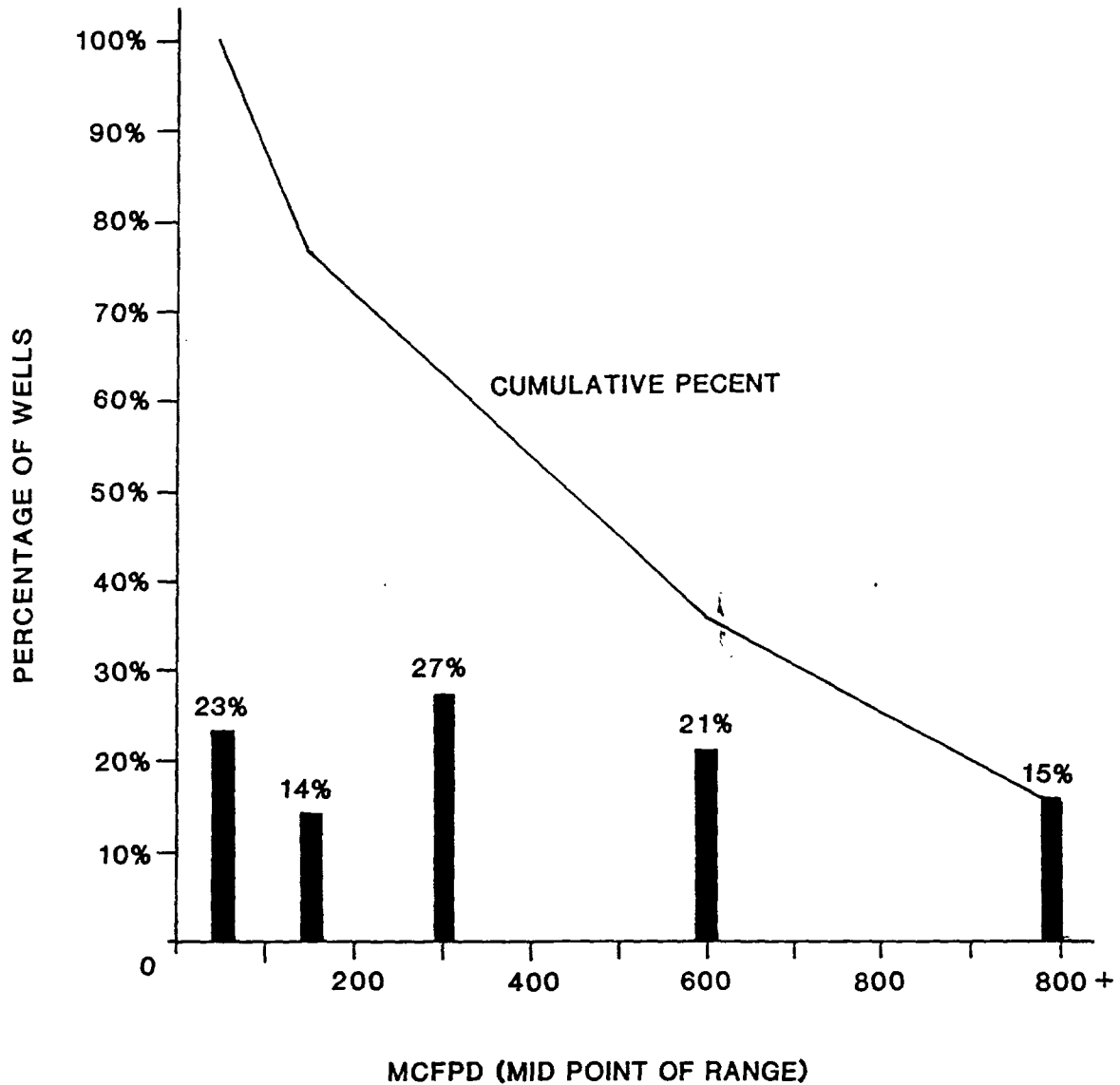
GAVILAN WELL CAPACITY DISTRIBUTION



NEW MEXICO OIL CONSERVATION COMMISSION

CASE NO. 9226

GAVILAN WELL CAPACITY DISTRIBUTION



ADDITION TO CASE 9226, WELL CAPACITY EXHIBITS
MAXIMUM CAPACITY SINCE 1970

OIL, BOPD				
<u>Range</u>	<u>W. Lindrith Wells</u>	<u>Ojitos Wells</u>	<u>% of Total</u>	<u>Cum. %</u>
0-20	109	10	28.1	100.0
20-40	92	10	24.0	71.9
40-80	103	17	28.3	47.9
80-160	53	3	13.2	19.6
160+	<u>20</u>	<u>7</u>	<u>6.4</u>	6.4
TOTAL	377	47	100.0	

GAS, MCFPD				
<u>Range</u>	<u>W. Lindrith Wells</u>	<u>Ojitos Wells</u>	<u>% of Total</u>	<u>Cum. %</u>
0-100	81	17	23.2	100.0
100-200	100	13	26.7	76.8
200-400	104	9	26.7	50.1
400-800	49	7	13.2	23.4
800+	<u>42</u>	<u>1</u>	<u>10.2</u>	10.2
TOTAL	376	47	100.0	



NEW MEXICO OIL CONSERVATION COMMISSION
CASE NO. 9226

BUFFER ZONE - EQUAL INCREMENT PROPOSAL
PRESENTED OCTOBER 15, 1987

TOP ALLOWABLE RATES BASED ON 640 ACRE TRACTS

	<u>Gavilan Mancos</u>	<u>Gavilan Westernmost 505 Acres</u>	<u>W. Lindrith Easternmost 320 Acres</u>	<u>West Lindrith</u>
Oil	800	1042.7	1285.3	1528
Increment	0	242.67	242.67	242.67
% Change	0	30.34	23.27	18.88
Gas	480	1338.7	2197.3	3056
Increment	0	858.67	858.67	858.67
% Change	0	178.90	64.14	39.08

Buffer Zone Allowable Formulas:

$$\begin{aligned}
 \text{W. Lindrith} &= A + 2/3 (B-A) = 1/3 A + 2/3 B \\
 \text{Gavilan} &= A + 1/3 (B-A) = 2/3 A + 1/3 B \\
 B &= \text{W. Lindrith Oil \& Gas Allowables} \\
 A &= \text{Gavilan Mancos Oil \& Gas Allowables}
 \end{aligned}$$

ACTUAL TOP ALLOWABLE BASED ON SPACING

	<u>Gavilan 640 Acre Spacing</u>	<u>Gavilan 505 Acre Buffer</u>	<u>W. Lindreth 160 Acre Buffer</u>	<u>W. Lindreth 160 Acre Spacing</u>
Oil	800	823	321	382
Gas	480	1056	549	764

NEW MEXICO OIL CONSERVATION COMMISSION
CASE NO. 9226

BUFFER ZONE - EQUAL PERCENTAGE CHANGE PROPOSAL

TOP ALLOWABLE BASED ON 640 ACRE TRACTS

	<u>Gavilan Mancos</u>	<u>Gavilan Westernmost 505 Acres</u>	<u>W. Lindrith Easternmost 320 Acres</u>	<u>West Lindrith</u>
Oil	800	992.6	1231.6	1528
Increment	0	192.6	238.9	296.5
% Change	0	24.07	24.07	24.07
Gas	480	889.6	1648.9	3056
Increment	0	409.6	759.2	1407.2
% Change	0	85.34	85.34	85.34

Buffer Zone Allowable Formulas:

A = Gavilan Oil & Gas Allowable
 B = W. Lindrith Oil & Gas Allowable
 Equal Percentage Factor = $K = \sqrt[3]{B/A}$
 For Gas K = 1.8534
 For Oil K = 1.2407
 W. Lindrith = (KxK)xA
 Gavilan = KxA

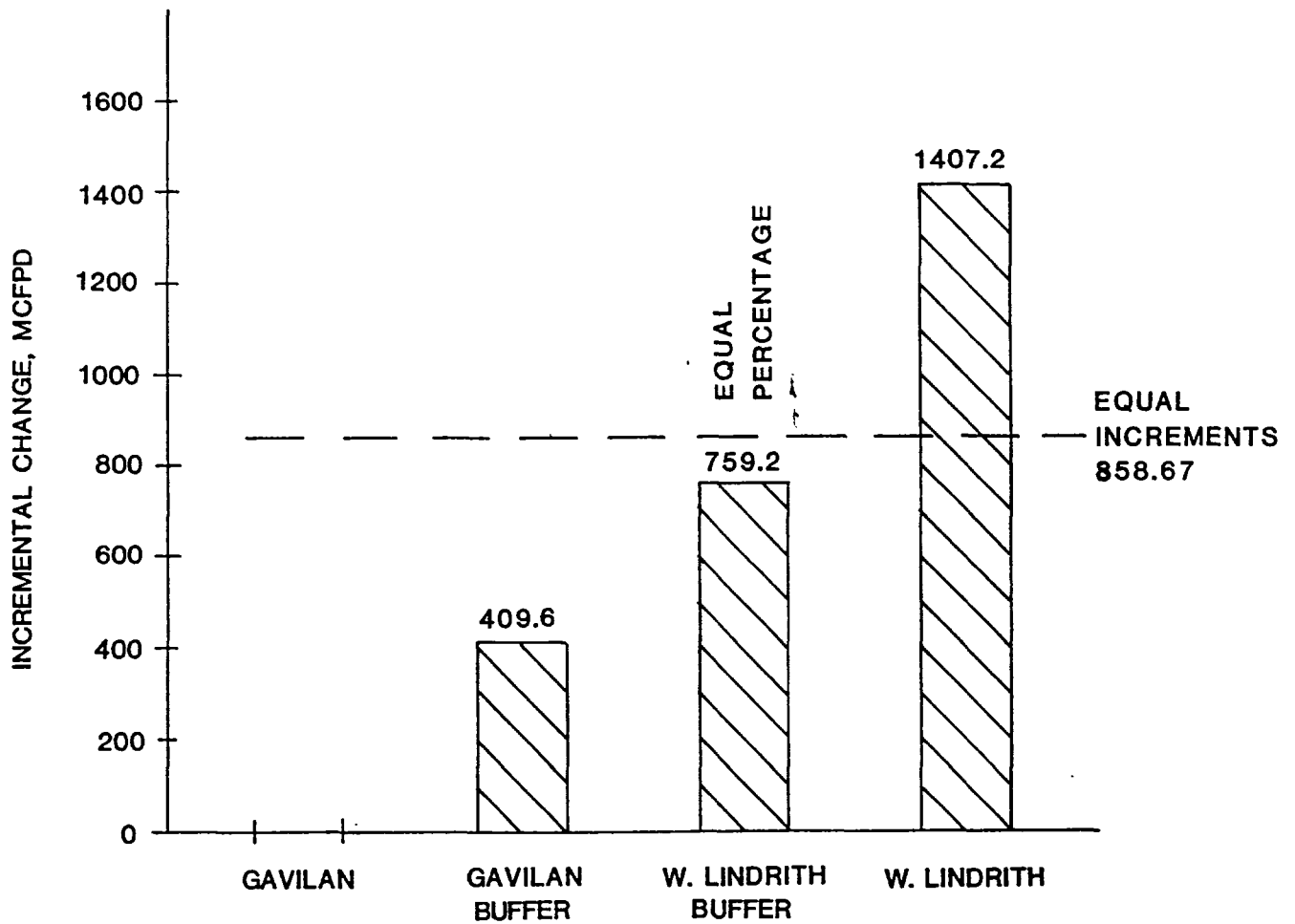
ACTUAL TOP ALLOWABLE BASED ON SPACING

	<u>Gavilan 640 Acre Spacing</u>	<u>Gavilan 505 Acre Buffer</u>	<u>W. Lindreth 160 Acre Buffer</u>	<u>W. Lindreth 160 Acre Spacing</u>
Oil	800	783	308	382
Gas	480	702	412	764

NEW MEXICO OIL CONSERVATION DIVISION

CASE NO. 9226

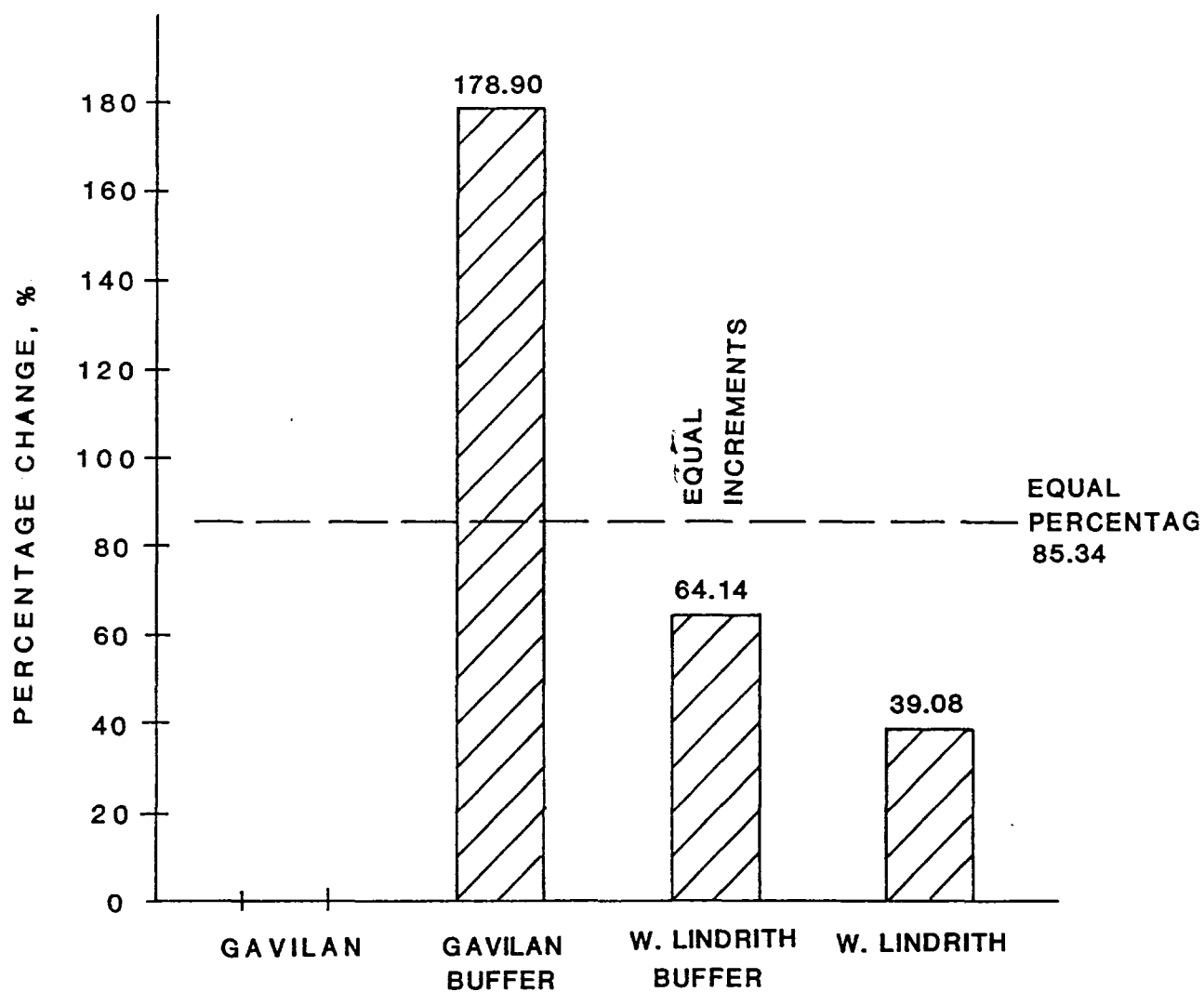
BUFFER ZONE GAS ALLOWABLES



NEW MEXICO OIL CONSERVATION DIVISION

CASE NO. 9226

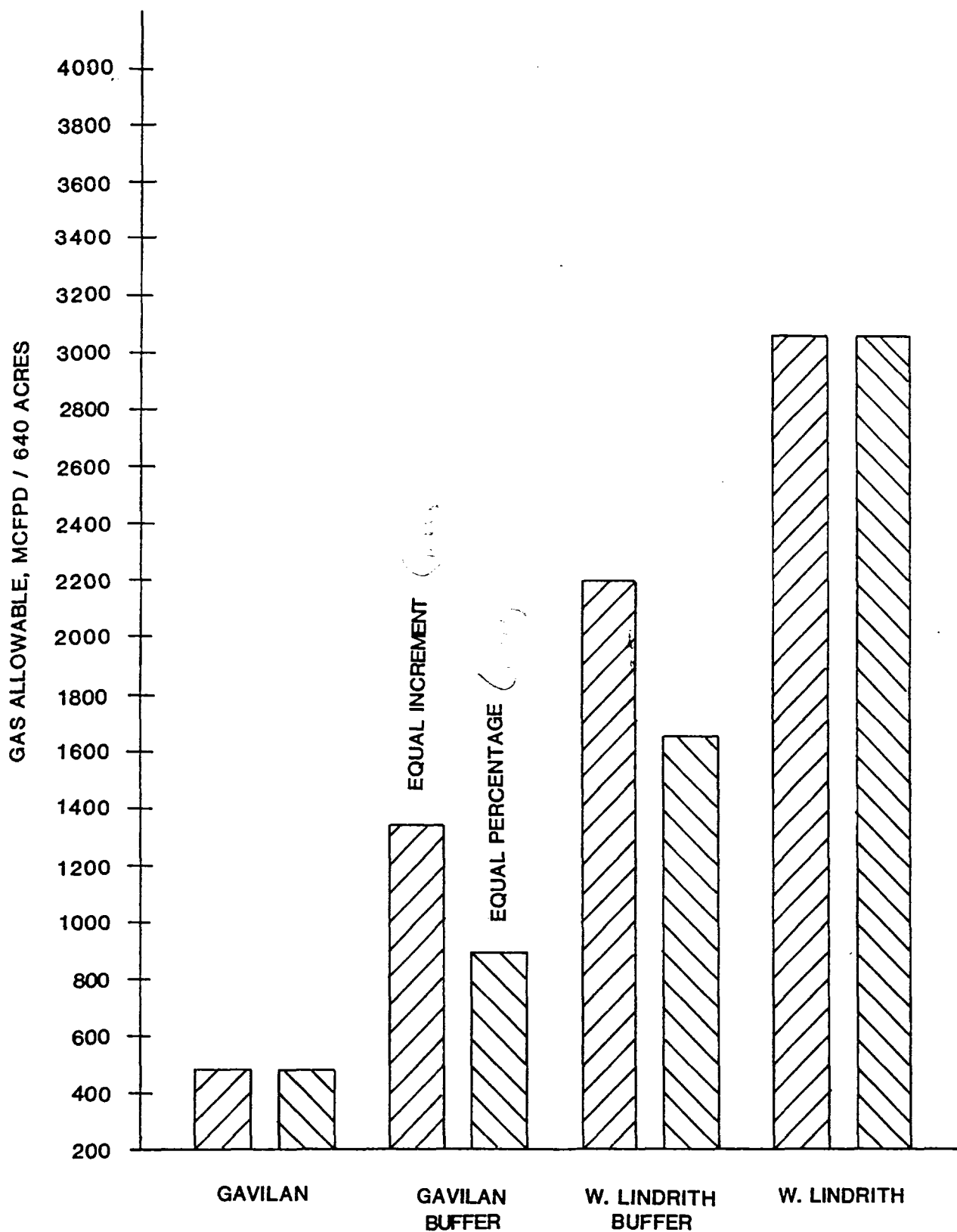
BUFFER ZONE GAS ALLOWABLES



NEW MEXICO OIL CONSERVATION DIVISION

CASE NO. 9226

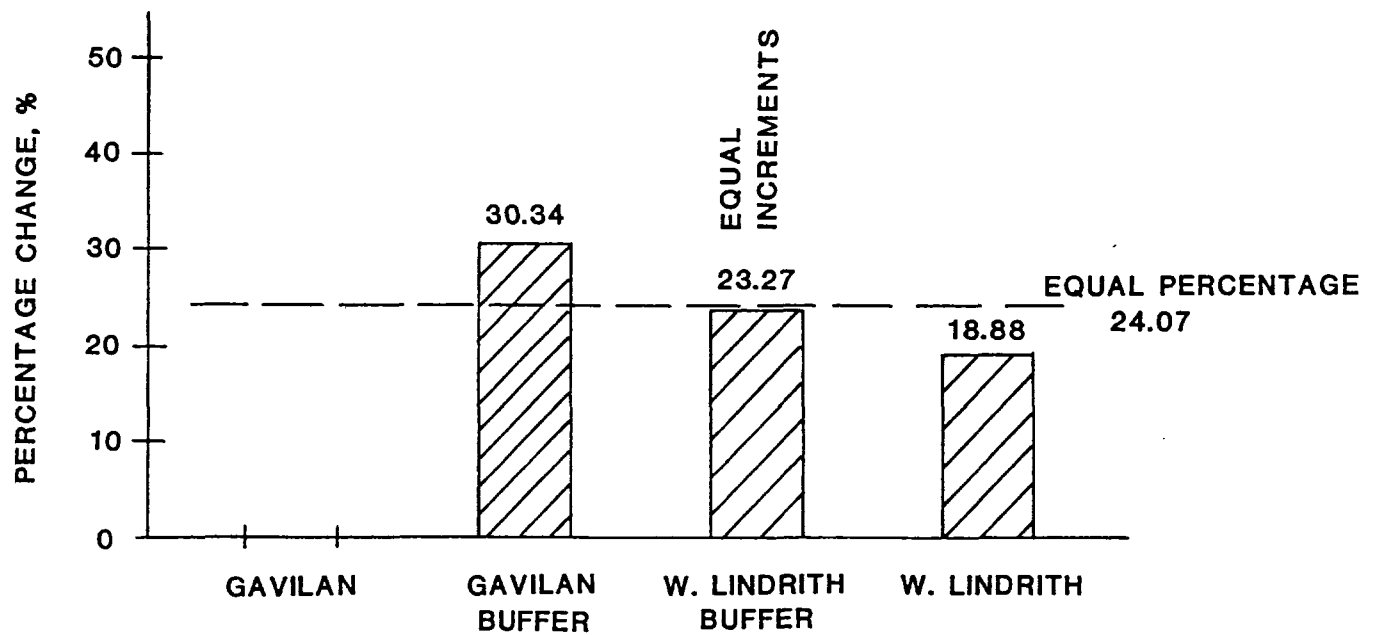
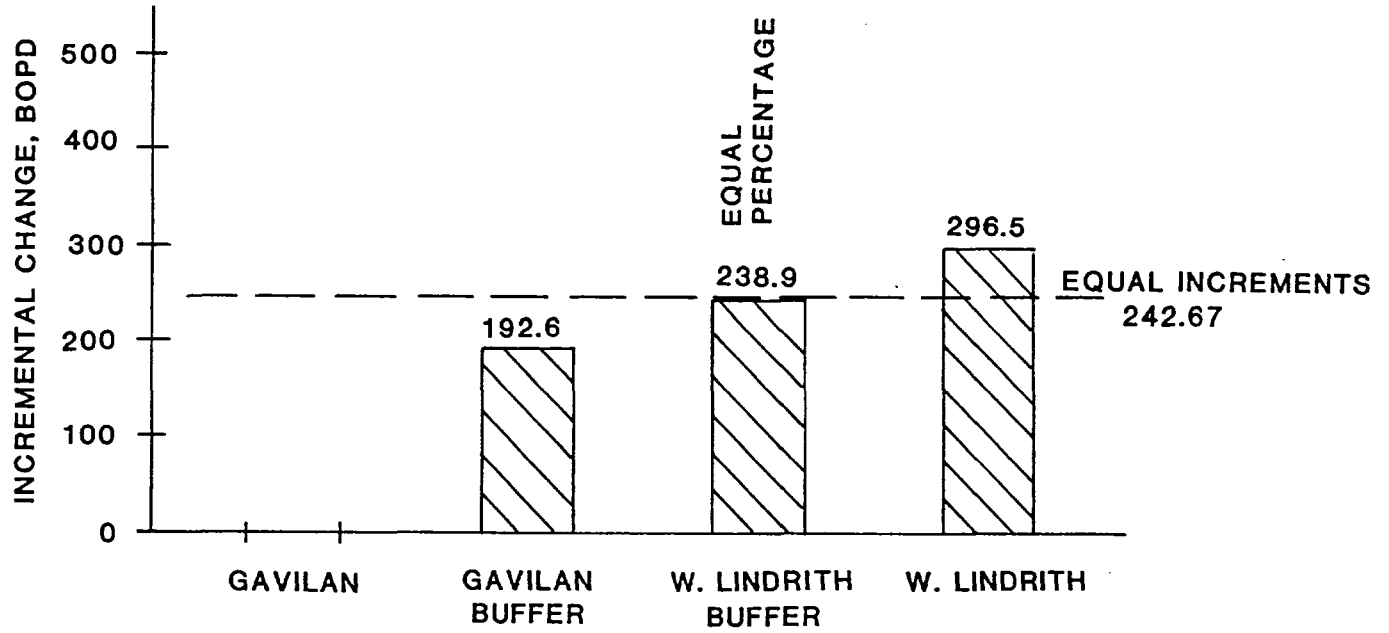
BUFFER ZONE GAS ALLOWABLES



NEW MEXICO OIL CONSERVATION DIVISION

CASE NO. 9226

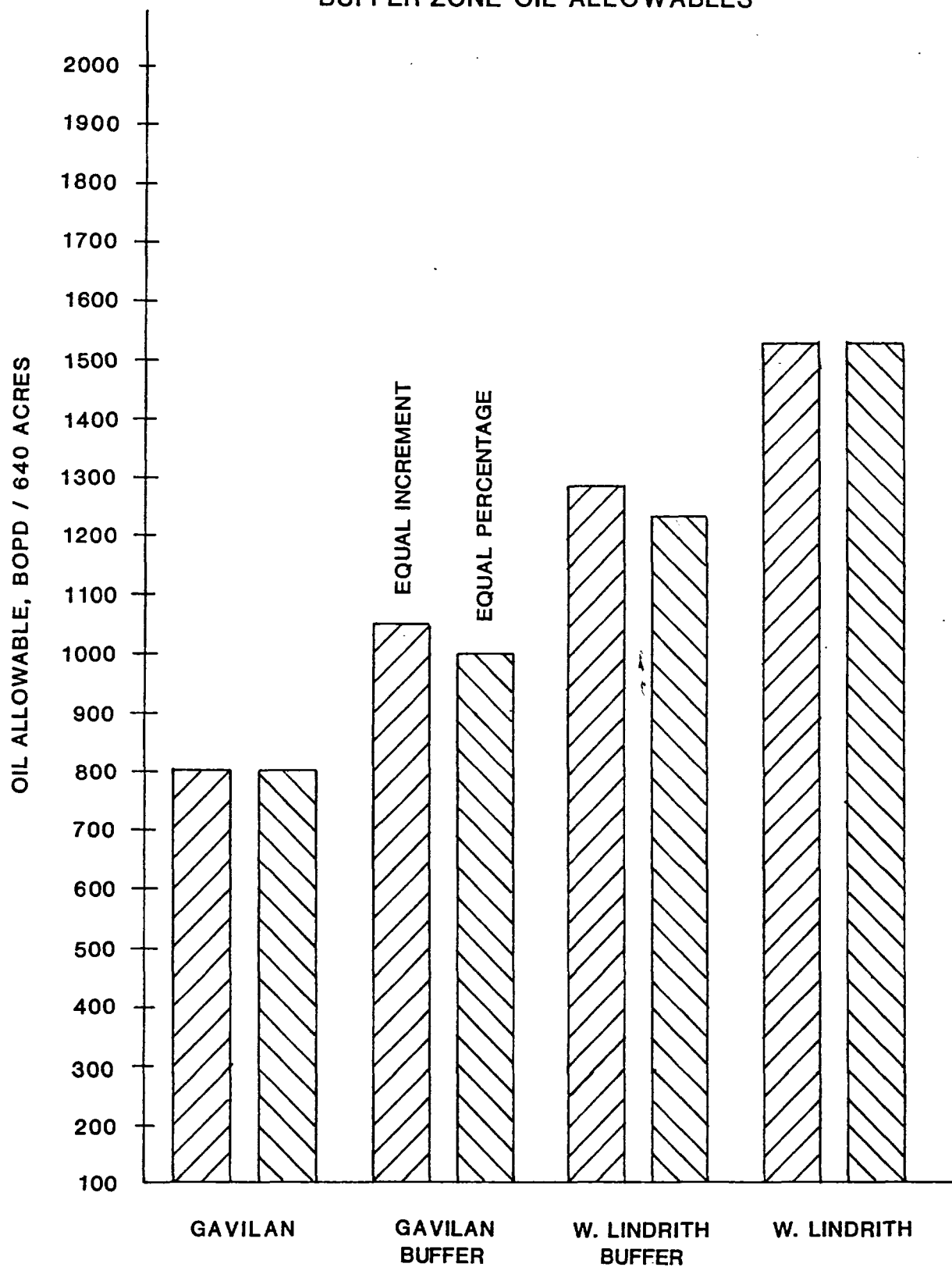
BUFFER ZONE OIL ALLOWABLES



NEW MEXICO OIL CONSERVATION DIVISION

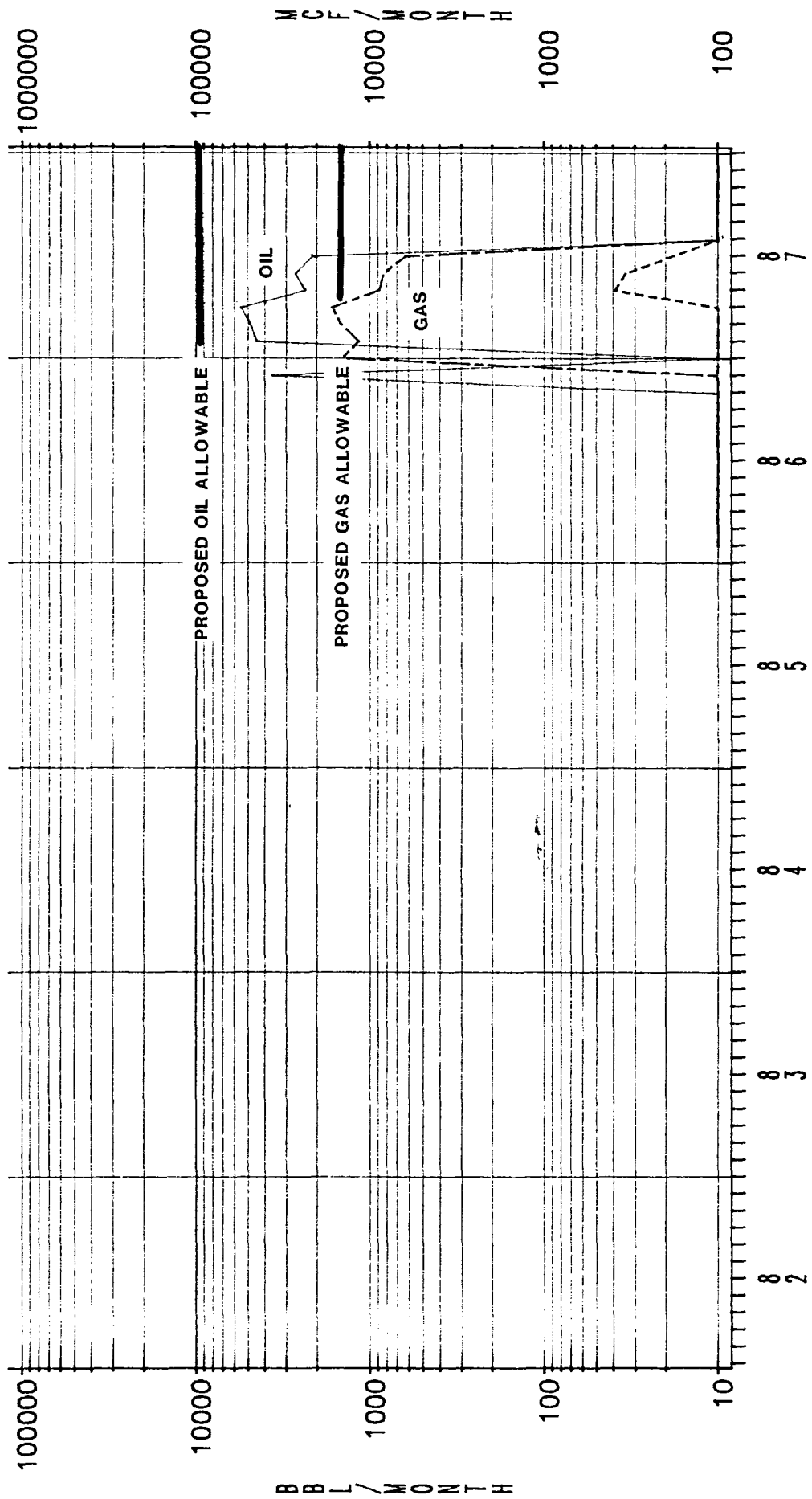
CASE NO. 9226

BUFFER ZONE OIL ALLOWABLES



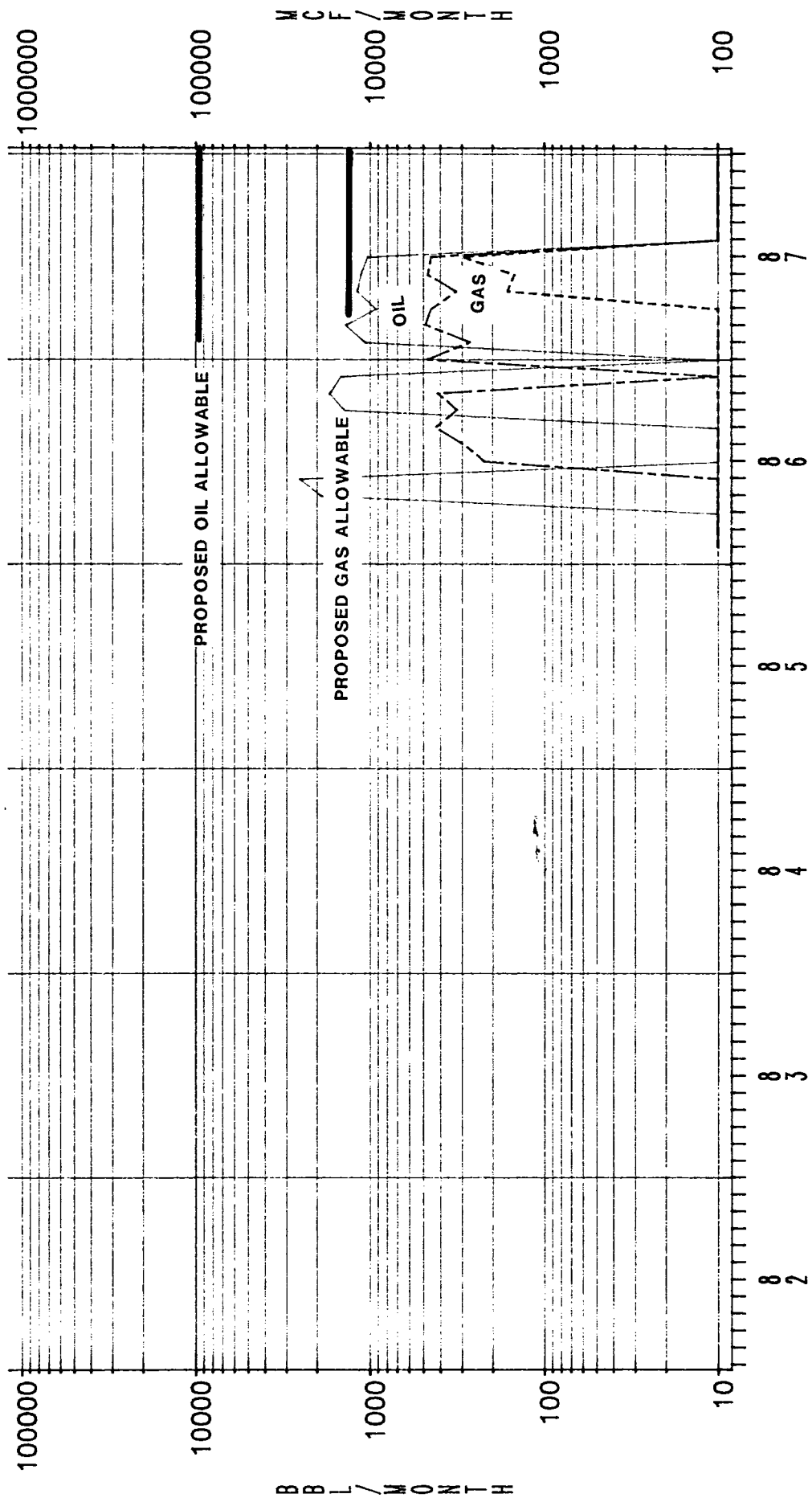
SECTION II

LEASE=NZ WELL=000002



OIL - WTR - - - GAS - - -

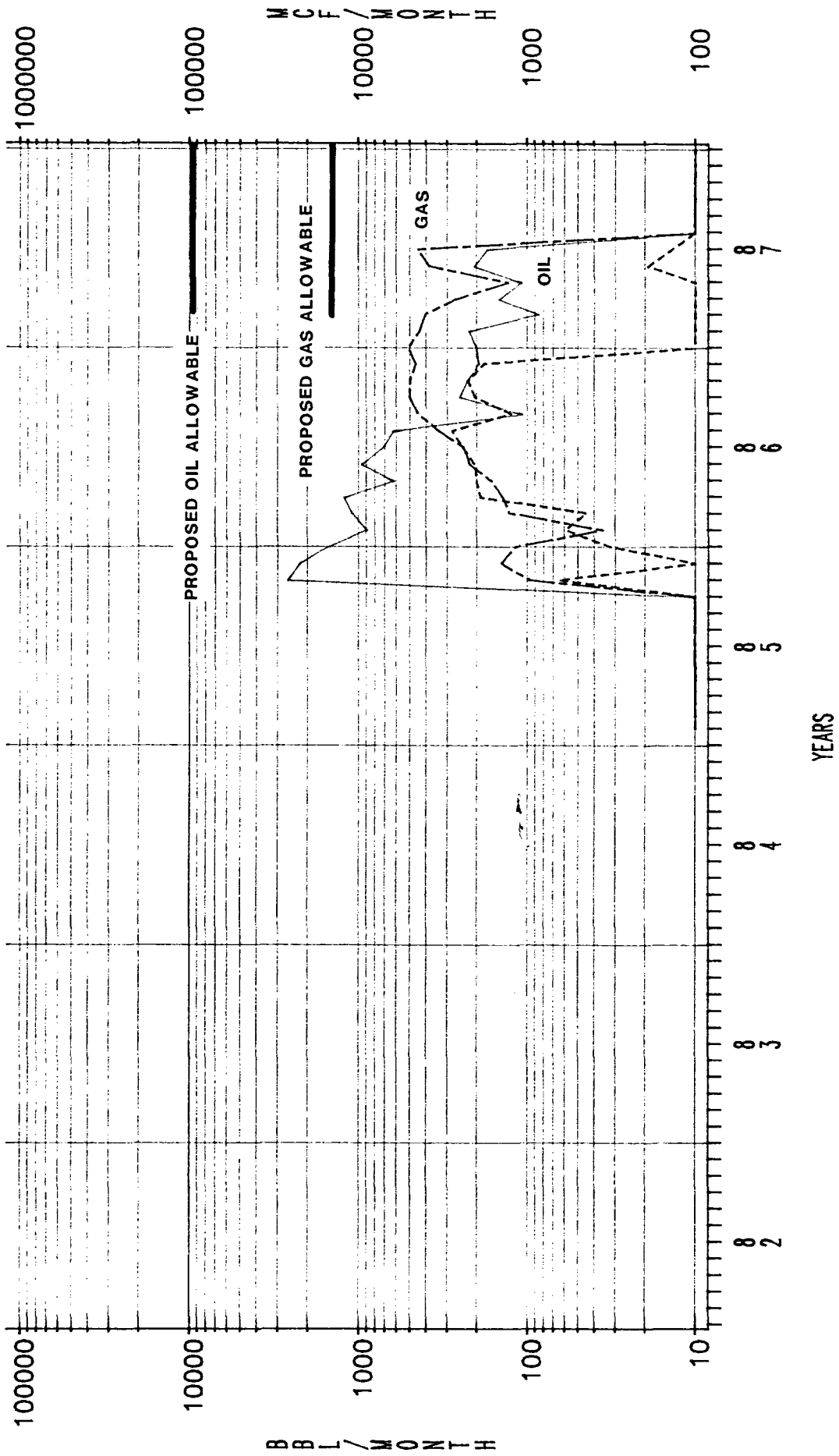
LEASE=NZ WELL=000001



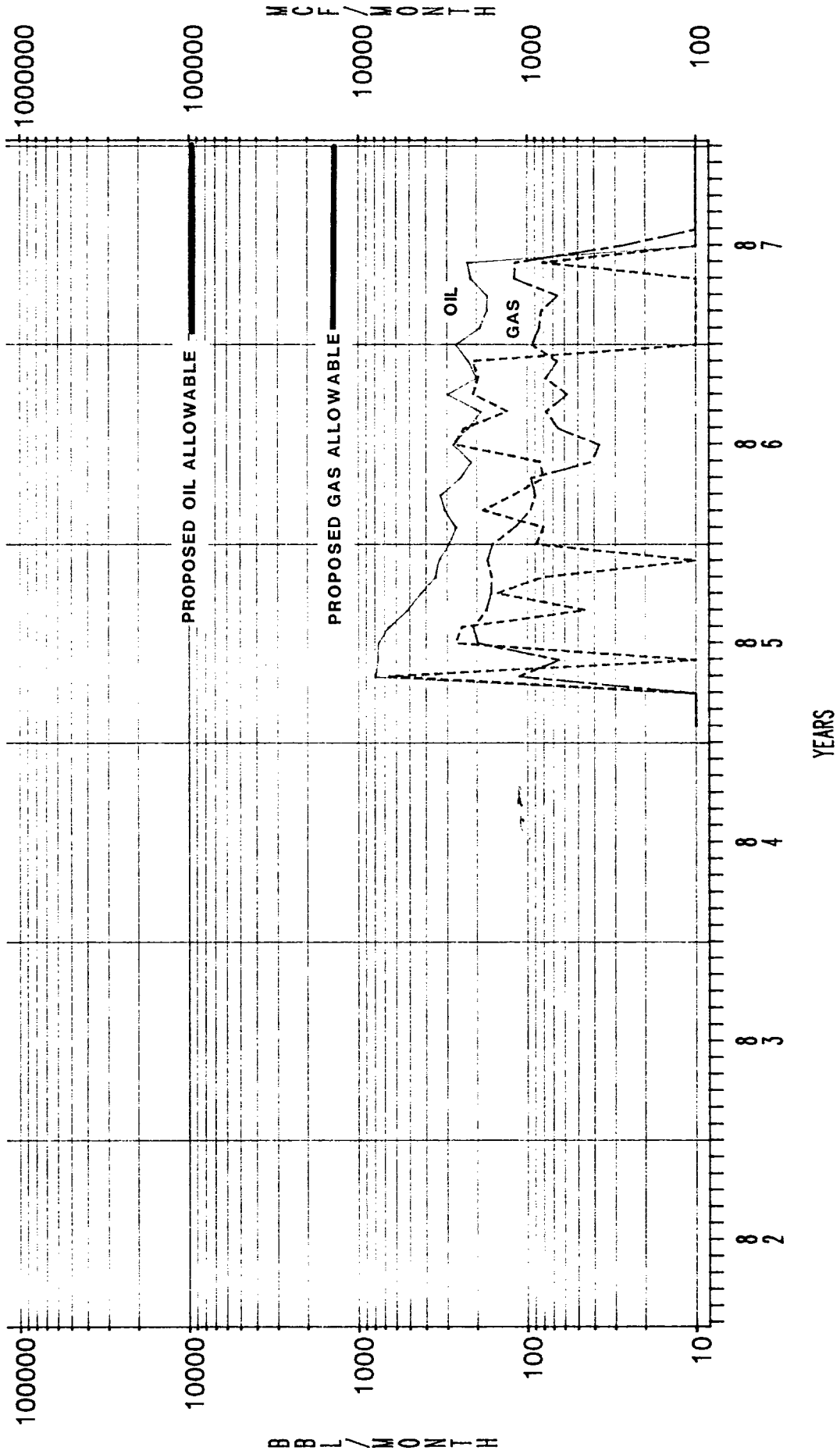
YEARS

OIL - WTR - - - GAS - - -

LEASE=FRED DAVIS WELL=000001

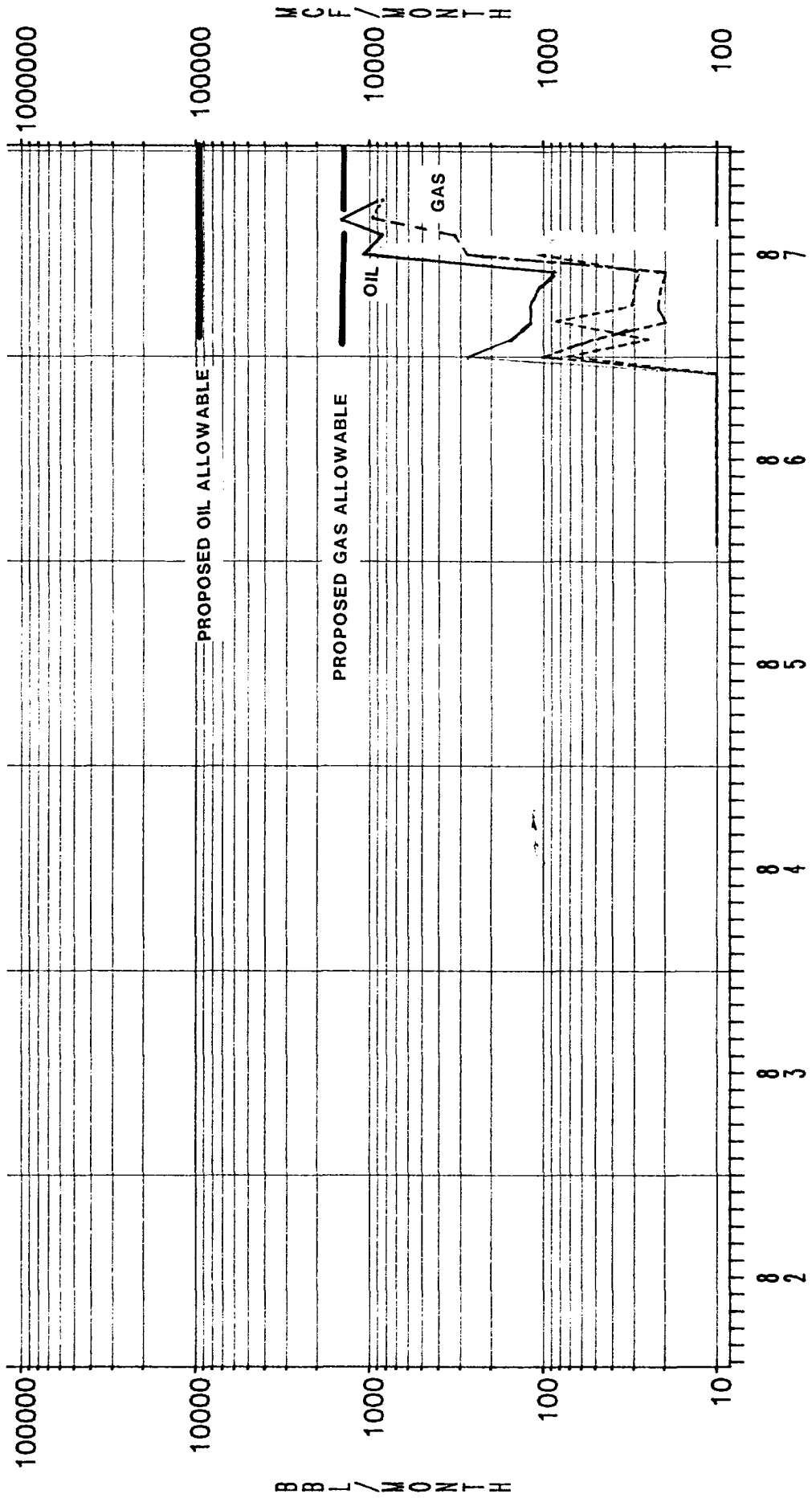


LEASE=MCRODEN WELL=000007

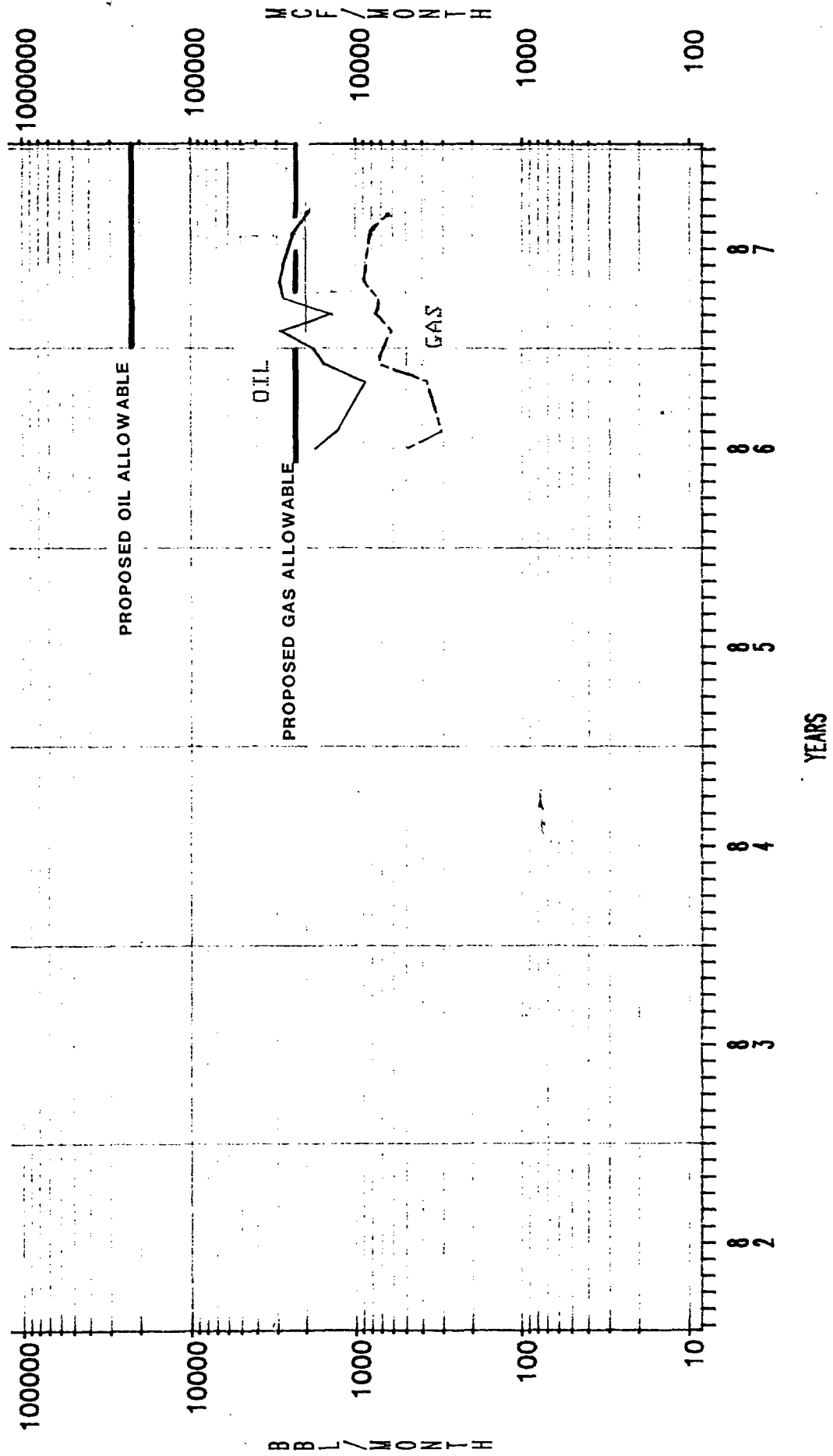


OIL _ WTR _ _ _ GAS _ _ _ _

LEASE=GARDNER 13 WELL=000001

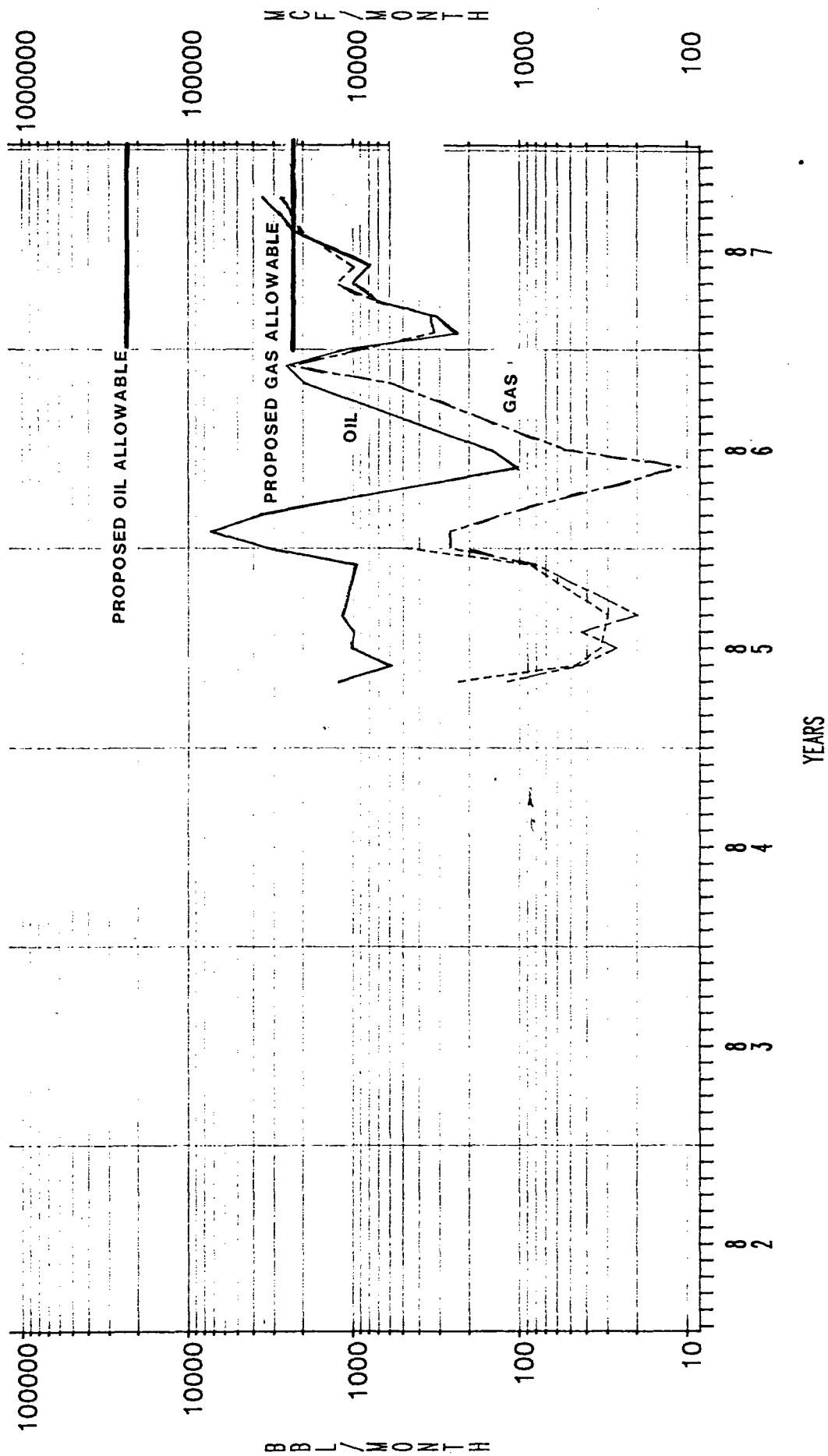


OPERATOR=MESA GRANDE RE LEASE=HARAUDER WELL=000001

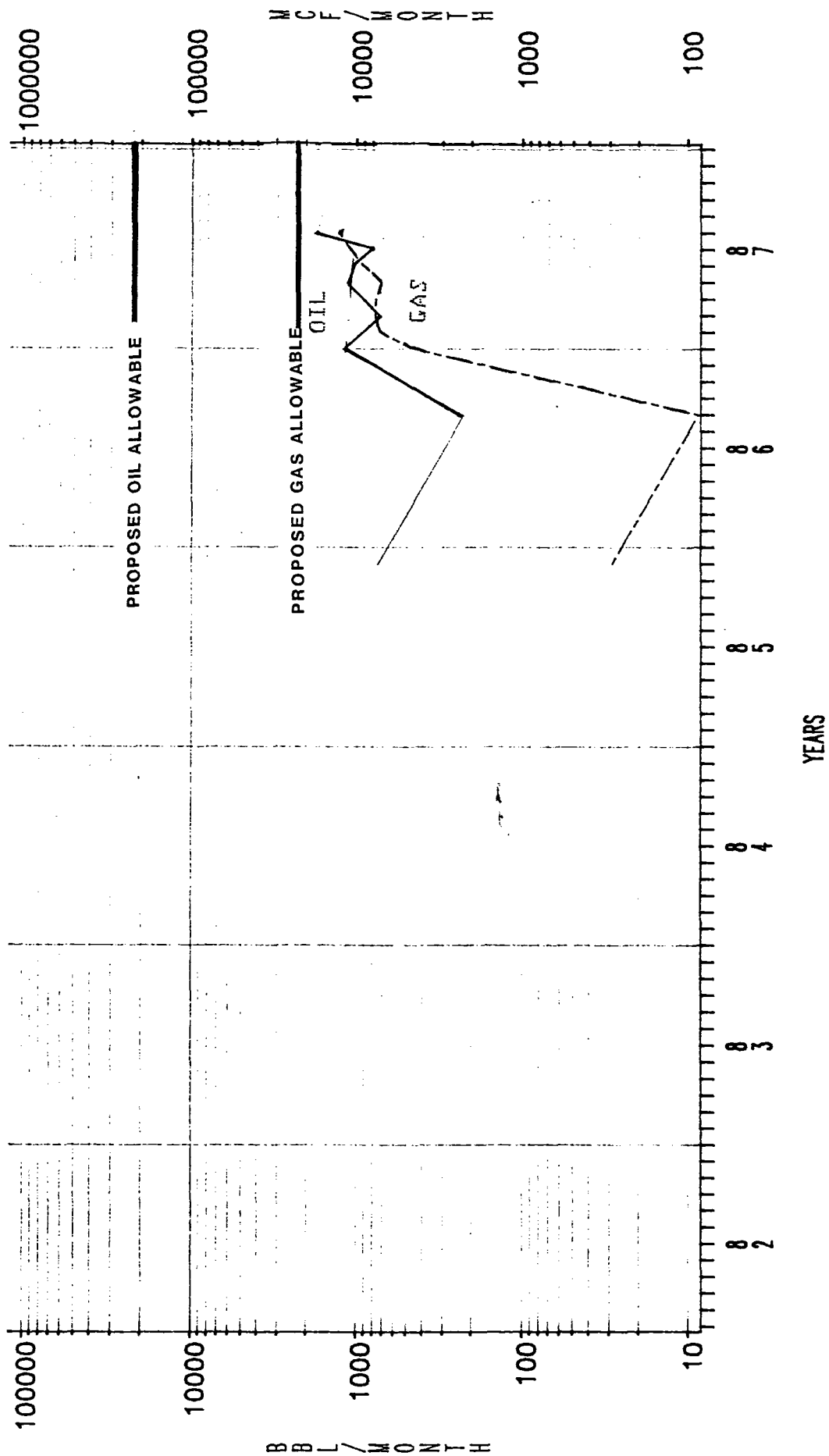


OIL - WTR - - - GAS - - -

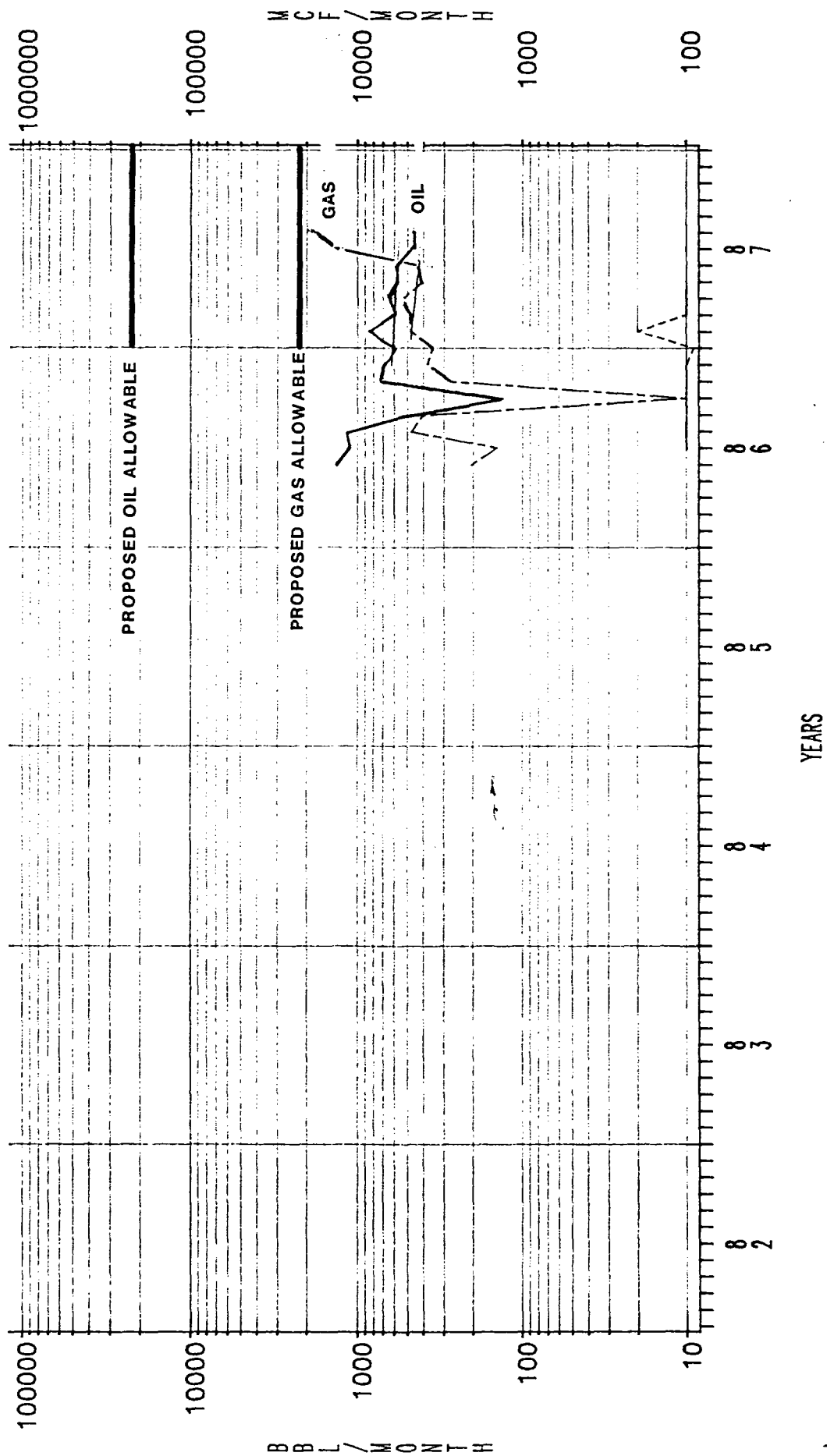
OPERATOR=MESA GRANDE RE LEASE=BROWN WELL=000001



OPERATOR=SUN E&P LEASE=LODDY WELL=000001

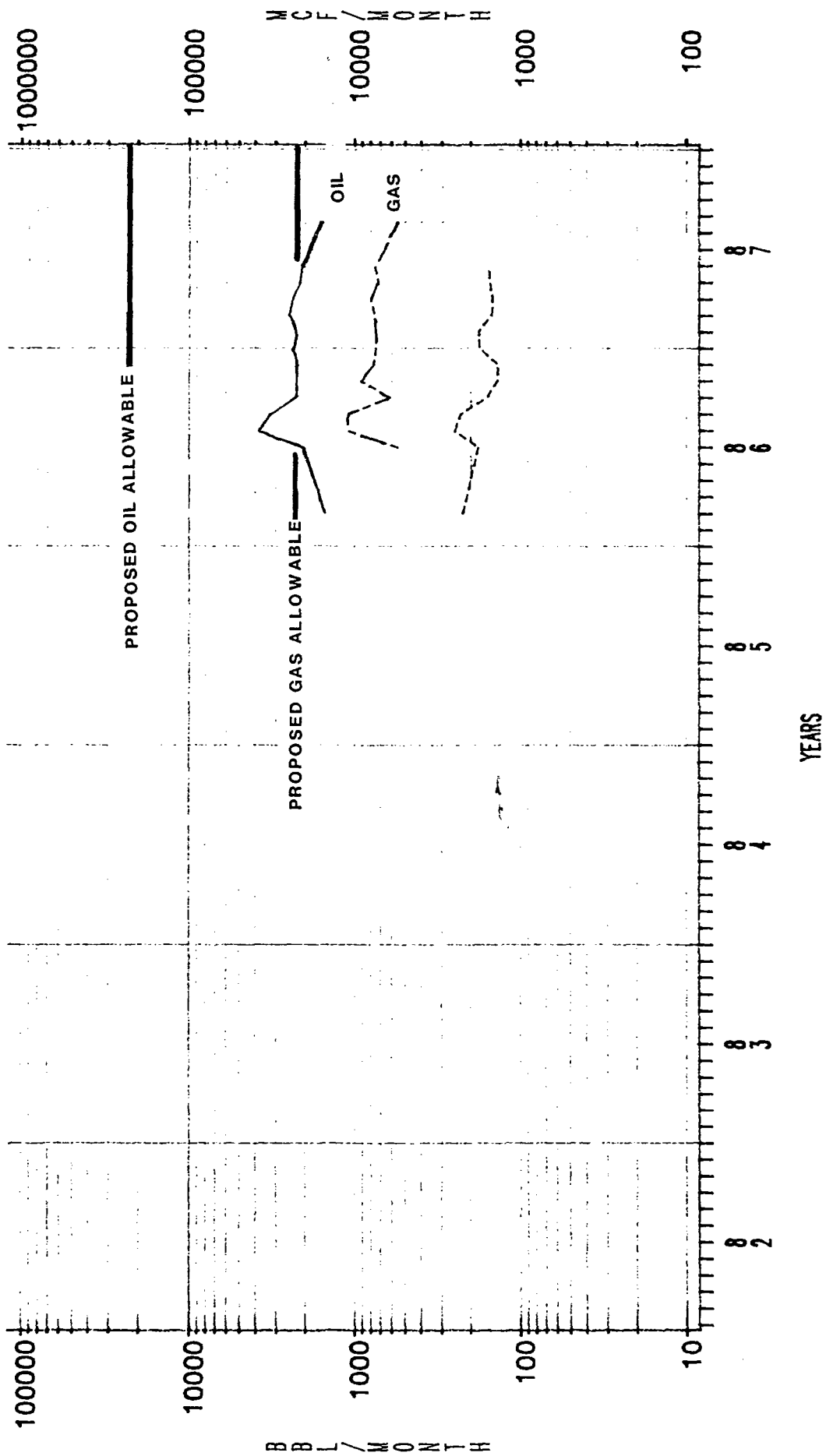


OPERATOR= SUN E&P : LEASE=FULL SAIL WELL=000003



OIL - WTR - - - GAS - - -

OPERATOR=MOBIL PRODUCTION LEASE=LINDRITH B UNIT WELL=000034



OIL - WTR - - - GAS - - -

NEW MEXICO OIL CONSERVATION DIVISION
• WEST LINDRITH - GAVILAN BOUNDARY •
CASE 9226

Section I:

The purpose of this section is to show that, in general, there is no need for a buffer zone. The first series of graphs are Gavilan Field and West Lindrith Field average monthly production for the total field and for an average per well per month. It should be noted that neither field is producing at or near its top allowable and that an average well in neither field can produce its top allowable. The next two graphs compare West Lindrith production to Gavilan production. These graphs show that an average well in Gavilan has a higher productivity than an average West Lindrith well. The West Lindrith Field, approximately 400 wells, produces slightly more than the Gavilan Field, approximately 60 wells.

The next series of plots are statistical plots of current well capacity (1987) for West Lindrith and Gavilan Field. These clearly indicate that the Gavilan Field has a higher percentage of wells with greater production capacity. Also one should note that very few of the wells are capable of making their top oil allowable. Only 4% of the wells in West Lindrith can produce at top gas allowable rates. Thirty-six percent of the wells in Gavilan can produce the top gas allowable rate. Therefore, considering that a maximum of 13 wells in West Lindrith will be in a buffer zone and a maximum of 7 wells in Gavilan will be in a buffer zone, statistically only 3 to 4 wells of the 20 total would be affected by a buffer zone with different top allowables.

Section II:

The purpose of this section is to show that a different buffer zone allowable formula is needed, should a buffer zone be created. The first two exhibits show the original proposed formula and Sun's proposal. The original proposal creates a dramatic percentage increase in the gas allowable going from Gavilan to the Gavilan Buffer area. Sun's proposal is to use a constant percent increase in both oil and gas allowables from Gavilan to West Lindrith. The next series of graphs show the difference in the two concepts. The first proposal has constant incremental changes of 242.67 BOPD and 858.67 MCFPD in the oil and gas allowables, respectively. This proposal yields the highest percentage changes in the Gavilan side of the buffer. Sun's proposal is to keep each percent change constant. This yields a higher incremental rate change on the West Lindrith side of the buffer where the rates need to change more rapidly.

Section III:

The purpose of this section is to show the effect of Sun's proposal on wells in the buffer zone. Since so few wells have been drilled in the buffer zone area, especially on the West Lindrith side, plots of nearby wells are also used to show the effects. This analogy assumes that wells to be drilled in the buffer zone area will produce at comparable rates of their offsets. On the first five plots, only one well on the West Lindrith side of the buffer area would be restricted by Sun's proposed gas allowables, the NZ #2. No wells would be restricted by the proposed oil allowables. On the Gavilan side, the last five plots, only one well would be restricted by Sun's proposed gas allowable, the Brown #1. No wells would be restricted by the oil allowable. Therefore, since so few wells would be near top allowable, Sun recommends that no buffer zone be created.