

OPEN FILE 84-15

ESTIMATED OIL AND GAS RESERVES FOR ROUTT COUNTY, COLORADO

Compiled by
A. H. Scanlon

Funded by the Department of Local Affairs--
Division of Commerce and Development



Colorado Geological Survey
Department of Natural Resources
State of Colorado
Denver, Colorado
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Acknowledgments

I would like to thank the staff of the Colorado Oil & Gas Conservation Commission (C.O.G.C.C.) who provided considerable assistance during the course of this compilation, and the staff of the Colorado Geological Survey, who assisted in the manuscript preparation.

However, I assume full responsibility for any errors or omissions in these tabulations. Users of this OPEN FILE REPORT could provide a significant service if they would inform the Colorado Geological Survey of any misinformation or omissions.

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A. H. Scanlon
Senior Geologist

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ESTIMATED OIL AND GAS RESERVES FOR ROUTT COUNTY, COLORADO

Introduction

This report is the thirteenth* in a series of oil and gas reserve investigations undertaken for those counties in which oil and/or gas is currently being produced.

This study involves Routt County, located in northwest Colorado, partially within the eastern edge of the Sand Wash Basin. Routt County covers 2,331 square miles. In this county, oil and/or gas are produced from, in descending order of age, the Intrusive Alpha Sill, Niobrara Limestone and the Shinarump Conglomerate.

There are 16 fields considered active producers as of December 31, 1983. Of these, 14 are classified as oil fields (based on cumulative gas-oil ratio (GOR) of $<15:1$), and 2 are classified as gas fields (based on cumulative GOR $>15:1$).

* Refer to:

OPEN-FILE REPORT 84-3: Estimated Oil and Gas Reserves for Washington County, Colorado;
OPEN-FILE REPORT 84-4: Estimated Oil and Gas Reserves for Rio Blanco County, Colorado.
OPEN-FILE REPORT 84-5: Estimated Oil and Gas Reserves for Adams County, Colorado;
OPEN-FILE REPORT 84-6: Estimated Oil and Gas Reserves for Weld County, Colorado;
OPEN-FILE REPORT 84-7: Estimated Oil and Gas Reserves for Arapahoe County, Colorado;
OPEN-FILE REPORT 84-8: Estimated Oil and Gas Reserves for Baca County, Colorado.
OPEN-FILE REPORT 84-9: Estimated Oil and Gas Reserves for Cheyenne County, Colorado.
OPEN-FILE REPORT 84-10: Estimated Oil and Gas Reserves for Garfield County, Colorado;
OPEN-FILE REPORT 84-11: Estimated Oil and Gas Reserves for La Plata County, Colorado;
OPEN-FILE REPORT 84-12: Estimated Oil and Gas Reserves for Moffat County, Colorado;
OPEN-FILE REPORT 84-13: Estimated Oil and Gas Reserves for Elbert County, Colorado; and
OPEN-FILE REPORT 84-14: Estimated Oil and Gas Reserves for Mesa County, Colorado.

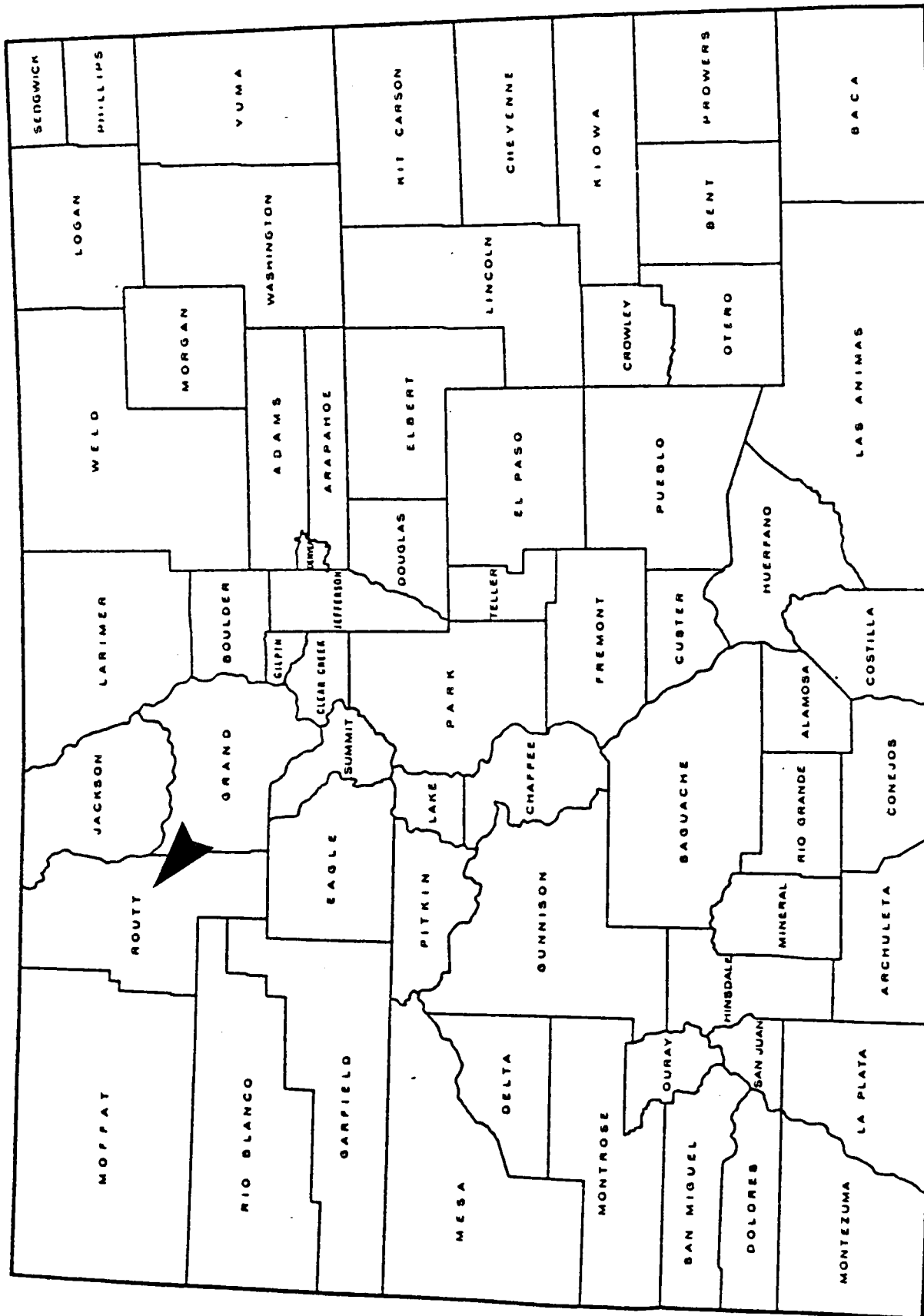


Figure 1. County Location Map

Method of Approach

Production decline curves are plotted for each currently producing horizon within each field, hereafter referred to as a field-horizon. There are 16 production decline curves plotted, one for each field-horizon. Production data were obtained from the C.O.G.C.C. annual production books. These books contain records of yearly production data, dating back to 1952. All production decline curves are plotted as rate (annual production in barrels of oil or MCF of gas) versus time (in years). The rate scale was adjusted to accommodate each field-horizon.

Oil Reserve Calculations

There are 14 oil field-horizons. Production histories have allowed for decline rates to be calculated for 11 of these. The remaining 3 oil field-horizons have not produced for a long enough time (less than 3 years) to determine a reliable decline rate. For the previously mentioned 11 fields, decline rates were determined based on actual past production and recorded, see Table I. These decline rates were then applied to the equation:

$$R_r = \frac{q_1 - q_f}{-\ln(1-dy)}$$

where: R_r = remaining reserves
 q_1 = current annual production
 q_f = final economic production rate
(see note below.)
 $-\ln$ = negative natural log
 dy = yearly decline rate (in percent)

The ultimate recoverable was then determined by adding the estimated reserves to the cumulative production. These values are listed in Table I.

Note: the final economic production rate used was one barrel of oil per day per well, for one year; therefore 365 barrels, multiplied by the number of wells needed to keep field production economic. In most cases this was one well. The number of wells used was determined at the discretion of the author.

For associated gas production, estimated reserves were calculated in the same manner as that described in the Gas Reserve Calculations section.

Gas Reserve Calculations

There are 2 gas field-horizons. One field-horizon, Pagoda-Shinarump, has only produced for 3 years. This has not produced for a long enough time to determine a reliable decline rate. The other field-horizon, Pelt-Niobrara has been producing since 1973, but production is extremely erratic, therefore no reliable decline rate could be established. Decline rates for associated gas production were determined from actual past production for the oil field-horizons and applied to the equation:

$$S = \frac{a(1-r^n)}{1-r}$$

Where: S = gas reserves
 a = current annual gas production
 $r = (1-dy)$ where dy = annual decline rate
 n = number of years -- 20 years was used
in all cases except where noted in
the remarks column of Table II.

Results can be found in Table I.

For the associated oil production, where this production was significant, the same method to determine estimated oil reserves was used, as discussed in the previous section. Whether oil production was considered significant or not was determined by the author. In all cases, if oil production indicated any kind of trend, reserves were calculated. A few cases arose where oil production, though a trend was indicated, did not exceed the economic limit (as discussed previously) of one barrel of oil per day per year, and therefore no reserve estimate was calculated, or an economic limit of zero was used.

Results

The following figures are for those field-horizons for which reserves could be calculated. Estimated oil reserves for Routt County totaled 2,943,210 barrels. Estimated gas reserves for Routt County totaled 410,089 MCF. Note that the gas reserve calculations are based on a 20-year projection, therefore they do not account for gas production after the year 2003.

These figures also do not account for production increases due to secondary and/or tertiary recovery not already in progress, or account for undiscovered reserves, nor do they reflect changes in economics or demand.

In nine to ten years, roughly half of the estimated oil reserves in Routt County will have been produced. Roughly one half of the estimated gas reserves for the next 20-year period are expected to be produced in seven to eight years.

In this county there are two classes of field-horizons: I) those with a long enough production history to calculate reserves with confidence, and II) those new field-horizons with essentially no production history, or for other reasons, reserves cannot be calculated.

To be able to calculate total county oil and gas reserves, it was necessary to apply the overall decline rates (7.38 percent per year for oil and 6.5 percent per year for gas) obtained from class I field-horizons to the current production from Class II field-horizons.

Using this approach on current production from Class II field-horizons (10,262 Bbls. of oil and 959,031 MCF of gas) additional reserves of 133,855 Bbls. of oil and 10,907,063 MCF of gas were obtained. This gives total county reserves (Class I and II) of 3,077,065 Bbls. of oil and 11,317,152 MCF of gas.

To insure that the reserve figures calculated for Class II are reasonable using this method, a comparison was made between the sources (producing horizons) of the Class I and Class II field-horizons. It was determined that there were some significant differences in the sources of the gas production for the two groups. Most of the Class I gas production is from the Shinarump Conglomerate, while most of the Class II gas production is from the Niobrara. As the Class I decline rates are not considered unusual, it is concluded that the Class II reserve figures are somewhat optimistic, but acceptable using this method.

LIST OF ABBREVIATIONS USED IN TABLE OF RESERVE DATA

| | |
|-----------|--|
| 'a' | annual gas production |
| ABD. | abandoned |
| Approx. | approximate, approximately |
| Avg. | average, averaged |
| Bbls. | barrels |
| B.W.E. | Bottom Water Encroachment |
| calc. | calculate, calculated |
| Co.(s) | county (counties) |
| cond. | condensate |
| ck. | Creek |
| Cum. | cumulative |
| Dak. | Dakota Sandstone |
| Deplet. | Depletion |
| dy | annual decline rate |
| Econ. | Economic |
| Est. | Estimated |
| Exp. | Expansion |
| g | gas |
| Gas Exp. | Gas Expansion |
| G.C.E. | Gas Cap Expansion |
| G.E. | Gas Expansion |
| GOR | Gas-Oil Ratio |
| Inc. | Increase, increasing, increased |
| Inj. | Injection, injected |
| Lmtd. | Limited |
| MCF | Thousand cubic feet |
| Miss. | Mississippian |
| Mos. | Months |
| Mtn. | Mountain |
| N | North |
| N.P. | New Production or less than five years production, therefore, no reliable annual decline rate could be calculated to apply to the equations to calculate reserves. |
| No. | number, numbers, North |
| o | oil |
| P and A | Plug (ged) and Abandon (ed) |
| Poss. | Possible |
| Prod. | Production, produced |
| Proj. | Projection, projected |
| q | current annual production of oil |
| qf | final economic production of oil |
| react. | reactivated |
| Rr | Remaining reserves-oil |
| S | Remaining reserves-gas |
| S.G.D. | Solution Gas Drive |
| S.I.(SI) | Shut-in |
| So | South |
| W | West |
| W.D. | Water Drive |
| Yr or Yrs | Year or years |

TABLE I
OPEN FILE 84-15
RESERVE DATA FOR ROUTT COUNTY

| FIELD NAME/ PRODUCING HORIZON | LOCATION | DATE OF DISCOVERY | TYPE OF DRIVE | Dy | CUMULATIVE PRODUCTION 9/30/83 | | ESTIMATED RESERVES | | ULTIMATE RECOVERABLE | | REMARKS |
|---|----------|----------------------|------------------------------------|------------------------------|--|-----------|-------------------------------|-----------|--|-----------|---|
| | | | | | OIL (Bbls.) (Condensate (Bbls.)) | GAS (MCF) | OIL (Bbls.) | GAS (MCF) | OIL (Bbls.) (Condensate (Bbls.)) | GAS (MCF) | |
| 1. Bear River/ Niobrara | 6N-87W | 1975 | | 7.2 -0 | 738,399 | 160,481 | 1,725,279 | 198,911 | 2,463,678 | 359,392 | |
| 2. Bull Mountain/ Niobrara | 8N-87W | 1981 | | 6.4 -g 39.0 -0 43.2 -g | 27,423 | 51,907 | 6,615 | 9,259 | 34,038 | 61,166 | |
| 3. California Park/ Niobrara | 9N-87W | 1983 | | | 1,748 | 471 | | | | | N.P. |
| 4. Curtis/Niobrara | 6N-86W | 1958 | | | 235,132 | 96,293 | 134,962 | 993 | 370,094 | 97,286 | |
| 5. Dill Gulch/ Niobrara | 5N-89W | 1974 | S. G. D. | 5.8 -0 5.4 -g 9.3 -0 | 9,823 | | 2,407 | | 12,230 | | Econ. Limit = 0 N.P. |
| 6. Dry Creek/ Niobrara | 5N-88W | 1980 | | | 17,970 | 55,708 | | | | | |
| 7. Fish Creek/ Niobrara | 5N-87W | 1971 | | 5.7 -0 5.7 -g 13.0 -0 | 25,339 | 7,595 | 18,470 | 5,260 | 43,809 | 12,855 | |
| 8. Focus Ranch/ Intrusive Alpha Still | 12N-87W | 1971 | | | 9,117 | | 4,186 | | 13,303 | | Econ. Limit = 0 |
| 9. Grassy Creek/ Niobrara | 6N-87W | 1959 | S. G. D. & Gravity Drainage | 6.0 -0 4.2 -g | 750,749 | 115,343 | 552,223 | 195,666 | 1,302,972 | 311,009 | Econ. Limit = 2 wells |
| 10. Meander/ Shinarump | 4N-89W | 1981 | | | 5,578 | 6,139 | | | | | N.P. |
| 11. Pagoda/ Shinarump | 4N-89W | 1948 | Gas Exp. & W. D. | | (278) | 1,719,542 | | | | | Prod. 1953, 1981-83. N.P. Erratic Prod. |
| 12. Pelt/Niobrara | 6N-89W | 1973 | | | 85 (2,054) | 138,627 | | | 133,452 | | |
| 13. Sage Creek/ Niobrara | 5N-88W | 1959 | Gravity, Low Pressure G.C.E. | 6.8 -0 | 102,027 | 3,480 | 31,425 | | | | |
| 14. Sage Creek N./ Niobrara | 5N-88W | 1960 | Gravity, Low Pressure G.C.E. | 3.5 -0 | 529,936 | | 286,270 | | 816,206 | | |
| 15. Tow Creek/ Niobrara | 6N-86W | 1924 | S. G. D. & Gravity Drainage | 5.0 -0 | 2,949,519 | 338,899 | 33,669 | | 2,983,188 | +338,899 | |
| 16. Wolf Mountain/ Niobrara | 7N-87W | 1976 | | 21.4 -0 | 211,486 | | 147,704 | | 359,190 | | |
| COUNTY TOTAL OF ESTIMATED RESERVES | | | | | | | 2,943,210 Bbls 410,089 MCF | | | | |

Reference List

Colorado Oil and Gas Conservation Commission Production Records and Injected Fluids - Water and/or Gas-File.

Crouch, M.C., III, editor, 1982 Oil and Gas Fields of Colorado, Nebraska and Adjacent Areas: Rocky Mountain Association of Geologists, vols. I and II, 791 pp.

Haun, J.D., Cardwell, A.L., Herrod, W.H. and Cronoble, J.M., 1976. Oil and Gas Reserves of Colorado in Colorado School of Mines Research Institute, Mineral Industries Bulletin, v. 19, #5.

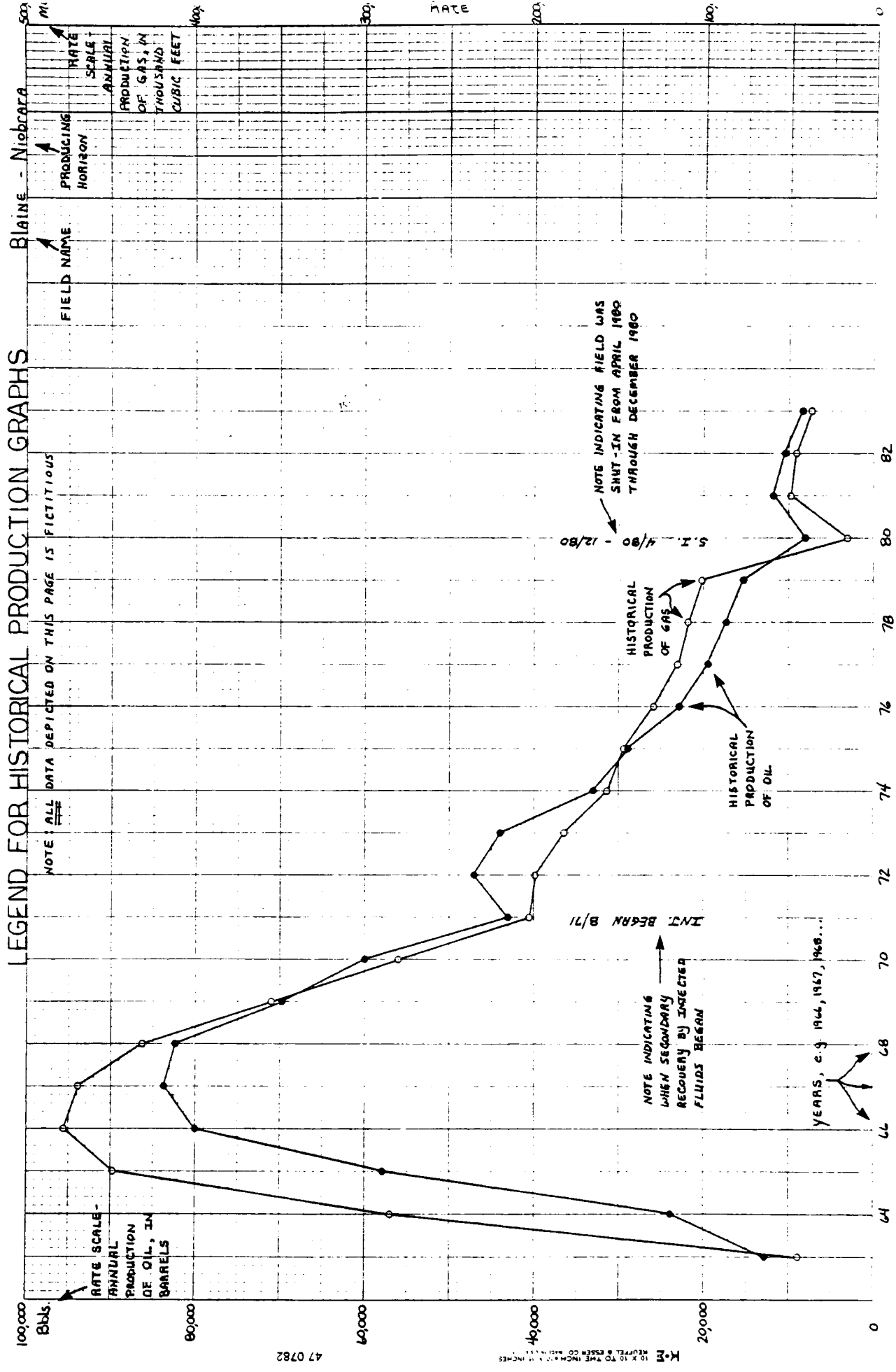
Parker, J.M., editor, 1961 Oil and Gas Field volume: Colorado-Nebraska: Rocky Mountain Association of Geologists, 389 pp.

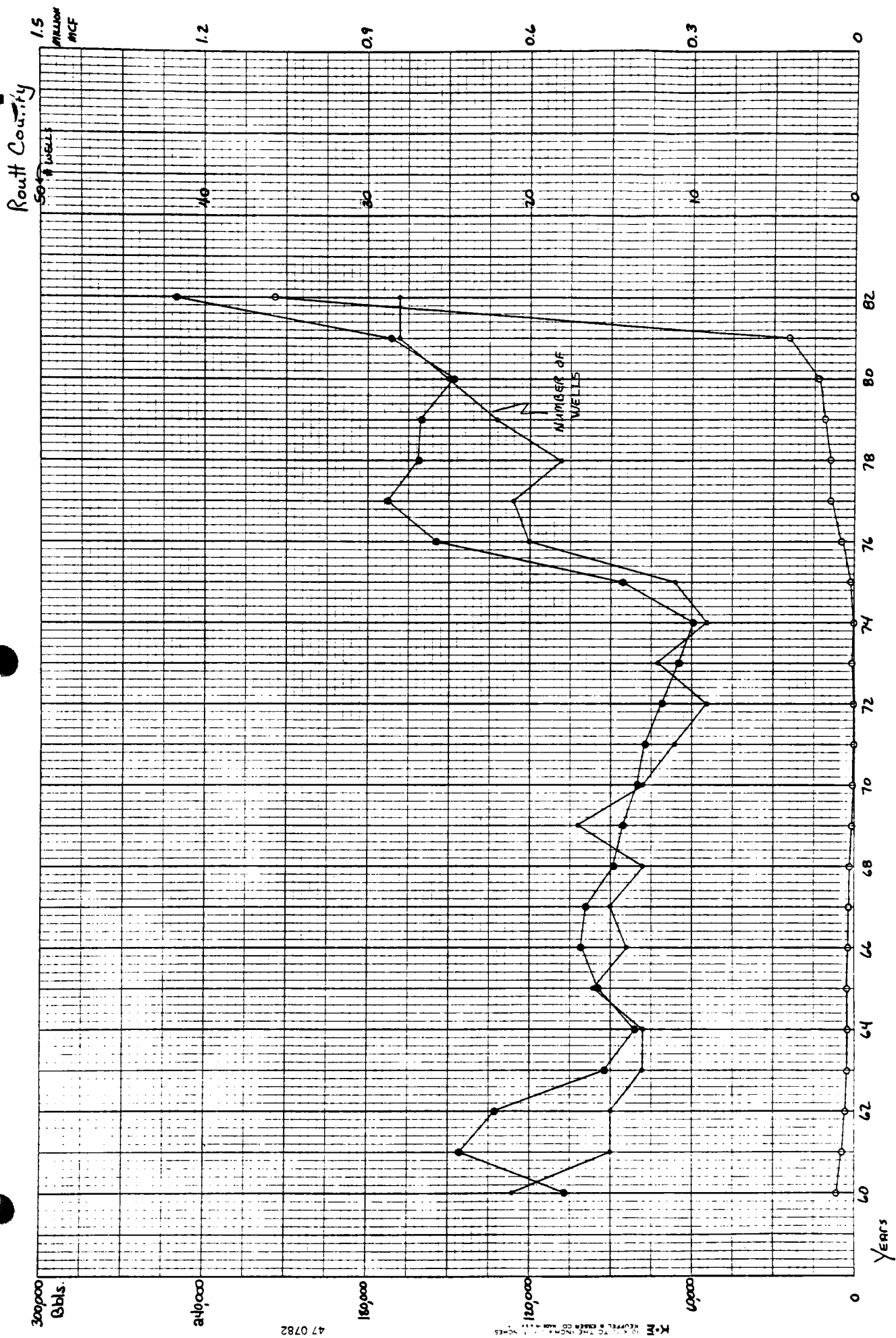
Appendix I

Historical production decline curve graphs for Routt County. These graphs are presented in alphabetical order by Field name and then by producing horizons within each field.

Note that only those fields actively producing as of 12-31-83 are included. Abandoned fields or field-horizons are not included.

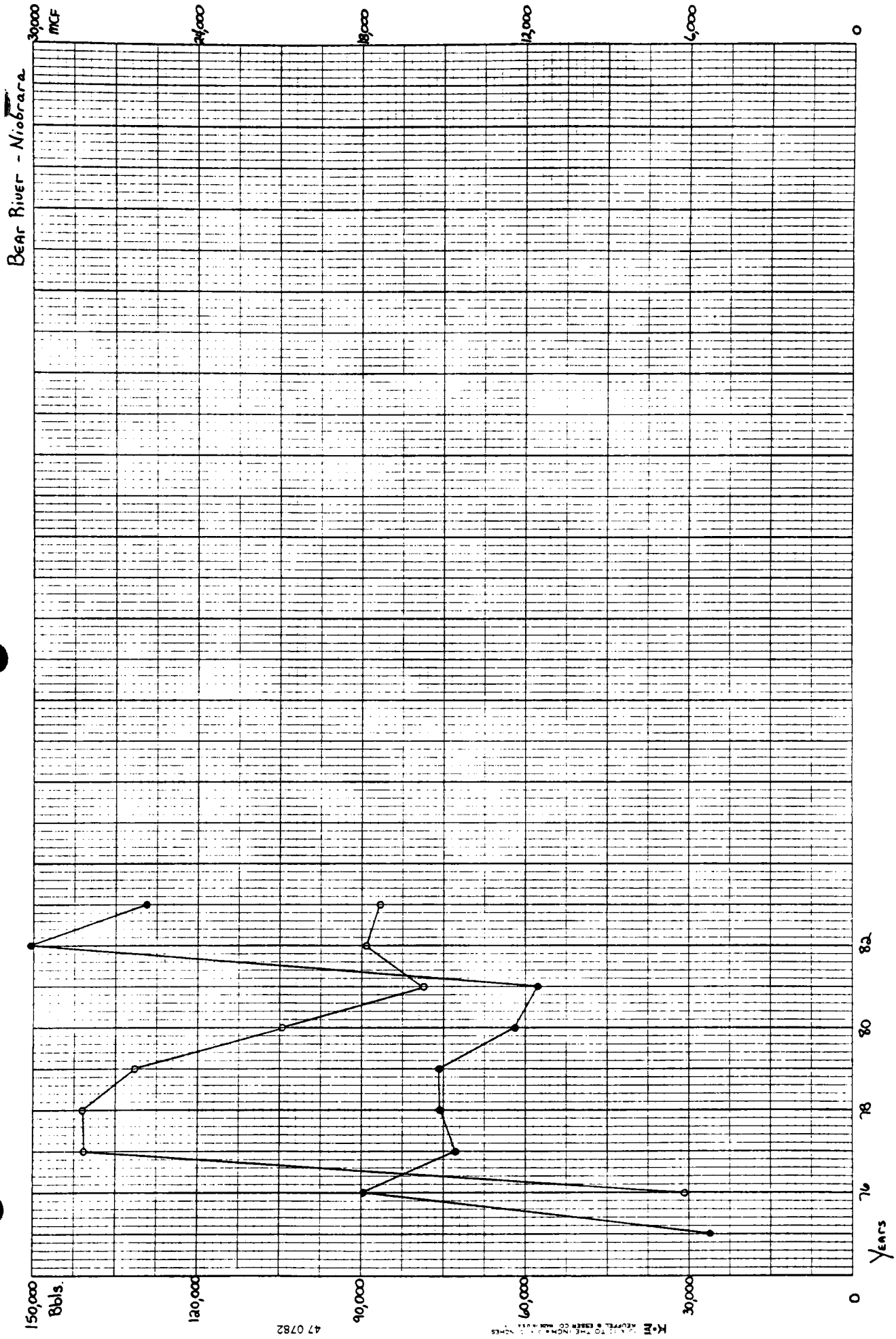
LEGEND FOR HISTORICAL PRODUCTION GRAPHS





47 0782

K-M
KUPFER, A. E. & CO. INC.
KUPFER, A. E. & CO. INC.



47 0782

K-M
 100'09
 100'06
 100'01
 150'00
 Bbls

Years

The graph displays two data series over time. The x-axis represents time in 'K-M' (thousands of months) and 'IN A.D. TO THE INCHES' (inches of the year). The y-axis represents volume in 'Bbls.' (barrels). The solid circle series starts at approximately 16,000 Bbls. at 0 K-M and rises to about 19,000 Bbls. at 18,000 K-M. The open circle series starts at approximately 16,000 Bbls. at 0 K-M and rises to about 19,500 Bbls. at 18,000 K-M.

| K-M | IN A.D. TO THE INCHES | Solid Circle (Bbls.) | Open Circle (Bbls.) |
|--------|-----------------------|----------------------|---------------------|
| 0 | 0 | 16,000 | 16,000 |
| 4,000 | 4,000 | 16,500 | 16,500 |
| 8,000 | 8,000 | 17,500 | 17,500 |
| 12,000 | 12,000 | 18,500 | 18,500 |
| 16,000 | 16,000 | 19,000 | 19,000 |
| 18,000 | 18,000 | 19,000 | 19,500 |

The graph displays two data series over time. The x-axis represents time in 'K-M' (thousands of months) and 'IN A.D. TO THE INCHES' (inches in A.D.), ranging from 0 to 20,000. The y-axis represents volume in 'Bbls.' (barrels), ranging from 0 to 20,000. The series with open circles starts at approximately 4,000 Bbls. at 0 K-M and rises to about 18,000 Bbls. at 20,000 K-M. The series with solid circles starts at approximately 4,000 Bbls. at 0 K-M and rises to about 17,000 Bbls. at 20,000 K-M.

| K-M | IN A.D. TO THE INCHES | Bbls. (Open Circles) | Bbls. (Solid Circles) |
|--------|-----------------------|----------------------|-----------------------|
| 0 | 0 | 4,000 | 4,000 |
| 4,000 | 4,000 | 6,000 | 5,000 |
| 8,000 | 8,000 | 10,000 | 9,000 |
| 12,000 | 12,000 | 14,000 | 13,000 |
| 16,000 | 16,000 | 17,000 | 16,000 |
| 20,000 | 20,000 | 18,000 | 17,000 |

The graph displays two data series over time. The x-axis represents time in 'K-M' (thousands of months) and 'IN A.D. TO THE INCHES' (inches in A.D.), ranging from 0 to 20,000. The y-axis represents volume in 'Bbls.' (barrels), ranging from 0 to 20,000. The solid line with solid circles starts at approximately (0, 16,000) and rises to about (18,000, 19,000). The dashed line with open circles starts at approximately (0, 16,000) and rises to about (18,000, 19,500).

| K-M / IN A.D. TO THE INCHES | Solid Line (Bbls.) | Dashed Line (Bbls.) |
|-----------------------------|--------------------|---------------------|
| 0 | 16,000 | 16,000 |
| 4,000 | 16,500 | 17,000 |
| 8,000 | 17,500 | 18,000 |
| 12,000 | 18,500 | 19,000 |
| 16,000 | 19,000 | 19,500 |
| 18,000 | 19,000 | 19,500 |

The graph displays two data series over time. The x-axis is labeled 'K-M' and ranges from 0 to 20,000. The y-axis is labeled 'Bbls.' and ranges from 0 to 20,000. The graph shows two lines: one with solid circles and one with open circles. Both lines show an upward trend, with the open circles line generally higher than the solid circles line.

| K-M | Bbls. (Solid Circles) | Bbls. (Open Circles) |
|--------|-----------------------|----------------------|
| 0 | 16,000 | 16,000 |
| 4,000 | 16,500 | 16,500 |
| 8,000 | 17,000 | 17,000 |
| 12,000 | 17,500 | 17,500 |
| 16,000 | 18,000 | 18,000 |
| 20,000 | 18,500 | 18,500 |

The graph displays two data series over time. The x-axis is labeled 'K-M' and ranges from 0 to 20,000. The y-axis is labeled 'Bbls.' and ranges from 0 to 20,000. The graph shows two lines: one with solid circles and one with open circles. Both lines show an upward trend, with the open circles line generally higher than the solid circles line.

| K-M | Bbls. (Solid Circles) | Bbls. (Open Circles) |
|--------|-----------------------|----------------------|
| 0 | 16,000 | 16,000 |
| 4,000 | 16,500 | 16,500 |
| 8,000 | 17,000 | 17,000 |
| 12,000 | 17,500 | 17,500 |
| 16,000 | 18,000 | 18,000 |
| 20,000 | 18,500 | 18,500 |

The graph displays two data series over time. The x-axis is labeled 'K-M' and ranges from 0 to 20,000. The y-axis is labeled 'Bbls.' and ranges from 0 to 20,000. The graph shows two lines: one with solid circles and one with open circles. Both lines show an upward trend, with the open circles line generally higher than the solid circles line.

| K-M | Bbls. (Solid Circles) | Bbls. (Open Circles) |
|--------|-----------------------|----------------------|
| 0 | 16,000 | 16,000 |
| 4,000 | 16,500 | 16,500 |
| 8,000 | 17,000 | 17,000 |
| 12,000 | 17,500 | 17,500 |
| 16,000 | 18,000 | 18,000 |
| 20,000 | 18,500 | 18,500 |

The graph displays two data series over time. The x-axis represents time in 'K-M' (thousands of months) and 'IN A.D. TO THE INCHES' (inches of the year). The y-axis represents volume in 'Bbls.' (barrels). The solid circle series starts at approximately 16,000 Bbls. at 0 K-M and rises to about 19,000 Bbls. at 18,000 K-M. The open circle series starts at approximately 16,000 Bbls. at 0 K-M and rises to about 19,500 Bbls. at 18,000 K-M.

| K-M | IN A.D. TO THE INCHES | Solid Circle (Bbls.) | Open Circle (Bbls.) |
|--------|-----------------------|----------------------|---------------------|
| 0 | 0 | 16,000 | 16,000 |
| 4,000 | 4,000 | 16,500 | 16,500 |
| 8,000 | 8,000 | 17,500 | 17,500 |
| 12,000 | 12,000 | 18,500 | 18,500 |
| 16,000 | 16,000 | 19,000 | 19,000 |
| 18,000 | 18,000 | 19,000 | 19,500 |

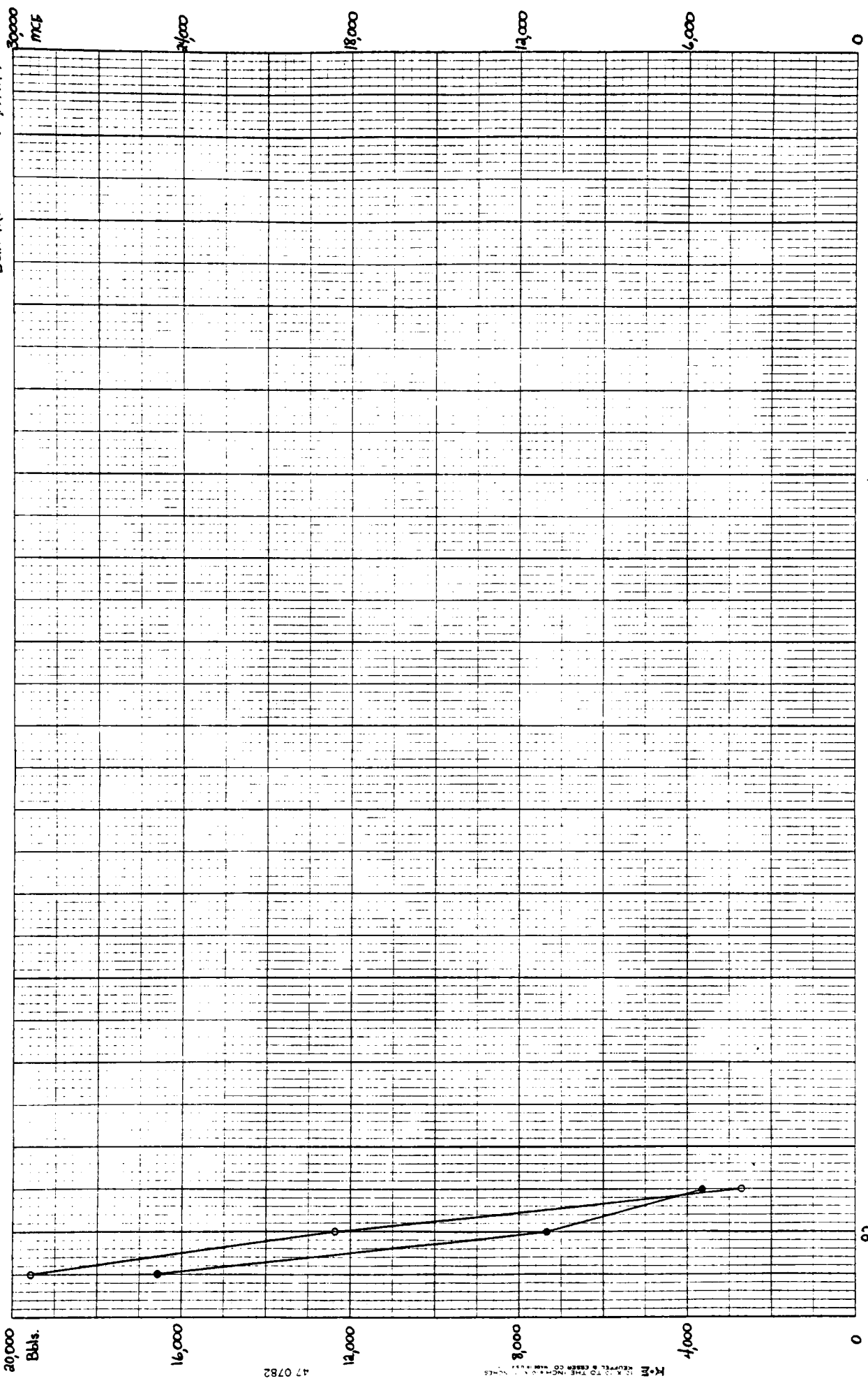
| INCHES (K-M) | Solid Circle Line (Bbls.) | Open Circle Line (Bbls.) |
|--------------|---------------------------|--------------------------|
| 0 | ~16,500 | ~16,500 |
| 4 | ~16,500 | ~16,500 |
| 8 | ~17,500 | ~18,500 |
| 12 | ~18,500 | ~19,500 |
| 16 | ~19,500 | ~20,500 |
| 20 | ~20,500 | ~21,500 |

The graph displays two data series over time. The x-axis represents time in 'K-M' (thousands of months) and 'IN A.D. TO THE INCHES' (inches of the year). The y-axis represents volume in 'Bbls.' (barrels). The solid circle series starts at approximately 16,000 Bbls. at 0 K-M and rises to about 19,000 Bbls. at 18,000 K-M. The open circle series starts at approximately 16,000 Bbls. at 0 K-M and rises to about 19,500 Bbls. at 18,000 K-M.

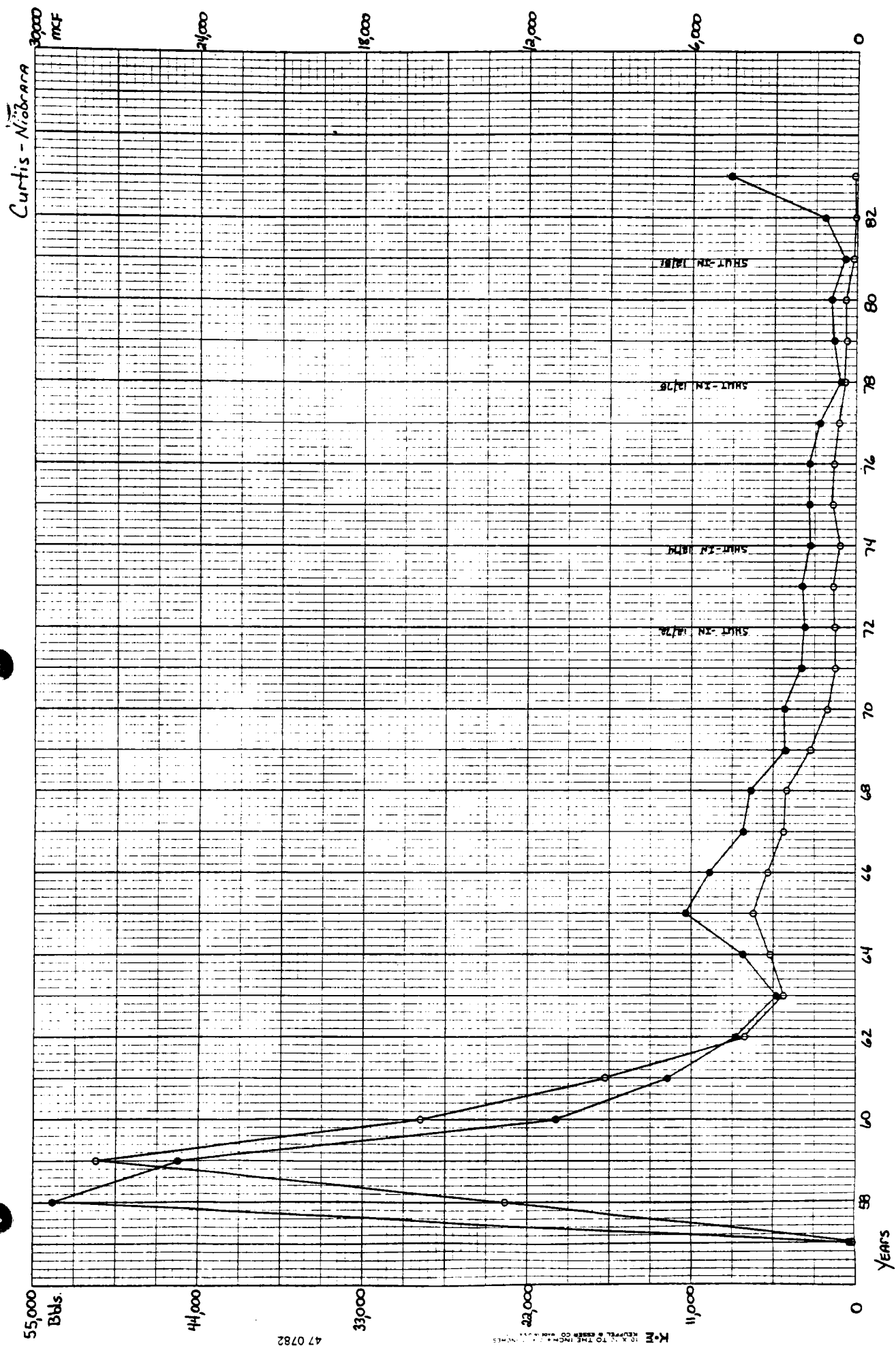
| K-M | IN A.D. TO THE INCHES | Solid Circle (Bbls.) | Open Circle (Bbls.) |
|--------|-----------------------|----------------------|---------------------|
| 0 | 0 | 16,000 | 16,000 |
| 4,000 | 4,000 | 16,500 | 16,500 |
| 8,000 | 8,000 | 17,500 | 17,500 |
| 12,000 | 12,000 | 18,500 | 18,500 |
| 16,000 | 16,000 | 19,000 | 19,000 |
| 18,000 | 18,000 | 19,000 | 19,500 |

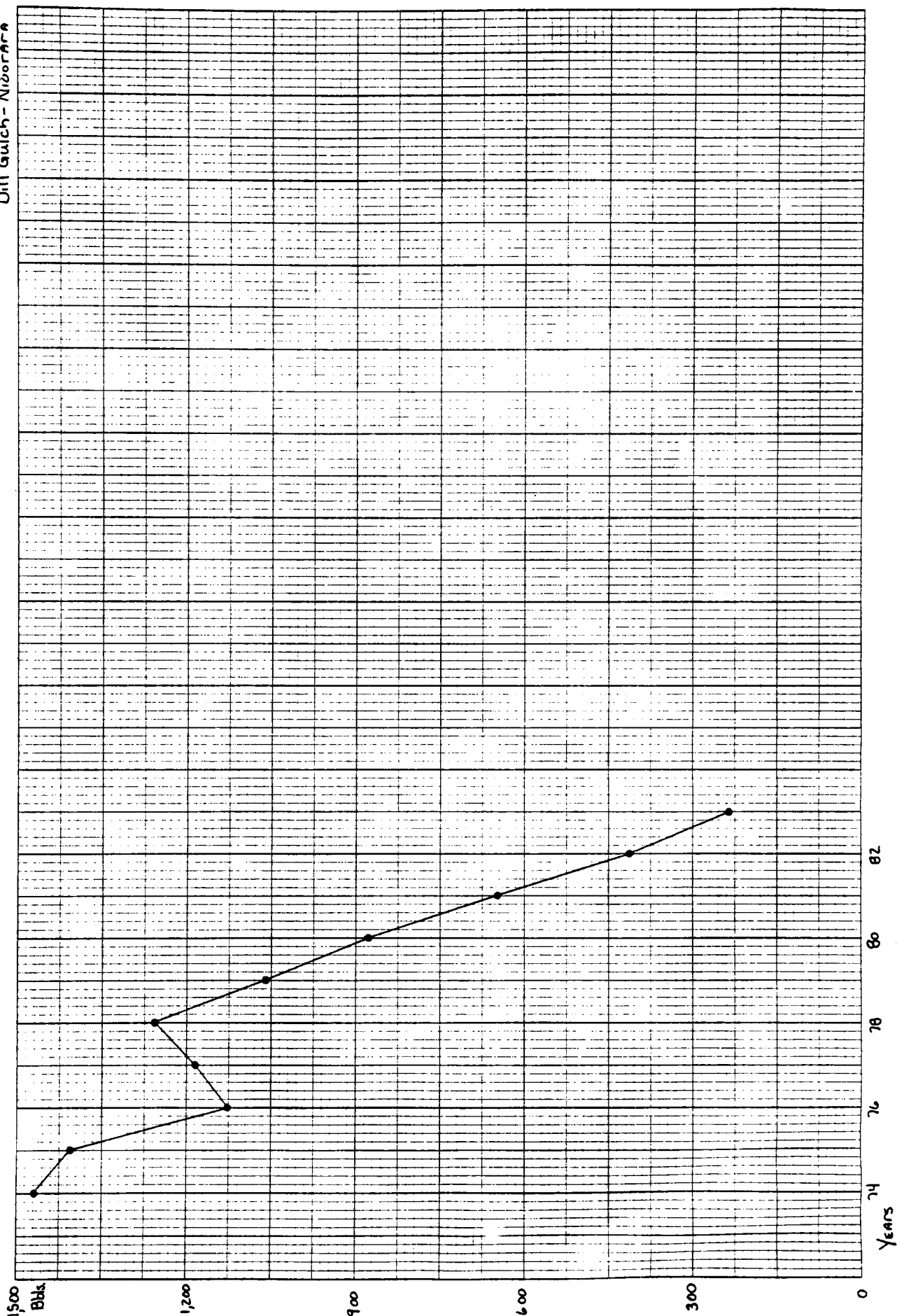
The graph displays two data series over time. The x-axis represents time in 'K-M' (thousands of months) and 'IN A.D. TO THE INCHES' (inches of the year). The y-axis represents volume in 'Bbls.' (barrels). The solid circle series starts at approximately 16,000 Bbls. at 0 K-M and rises to about 19,000 Bbls. at 18,000 K-M. The open circle series starts at approximately 16,000 Bbls. at 0 K-M and rises to about 19,500 Bbls. at 18,000 K-M.

| K-M | IN A.D. TO THE INCHES | Solid Circle (Bbls.) | Open Circle (Bbls.) |
|--------|-----------------------|----------------------|---------------------|
| 0 | 0 | 16,000 | 16,000 |
| 4,000 | 4,000 | 16,500 | 16,500 |
| 8,000 | 8,000 | 17,500 | 17,500 |
| 12,000 | 12,000 | 18,500 | 18,500 |
| 16,000 | 16,000 | 19,000 | 19,000 |
| 18,000 | 18,000 | 19,000 | 19,500 |



K.M. REFLECTAL & ESSEN CO. MADE IN U.S.A. 100% COTTON





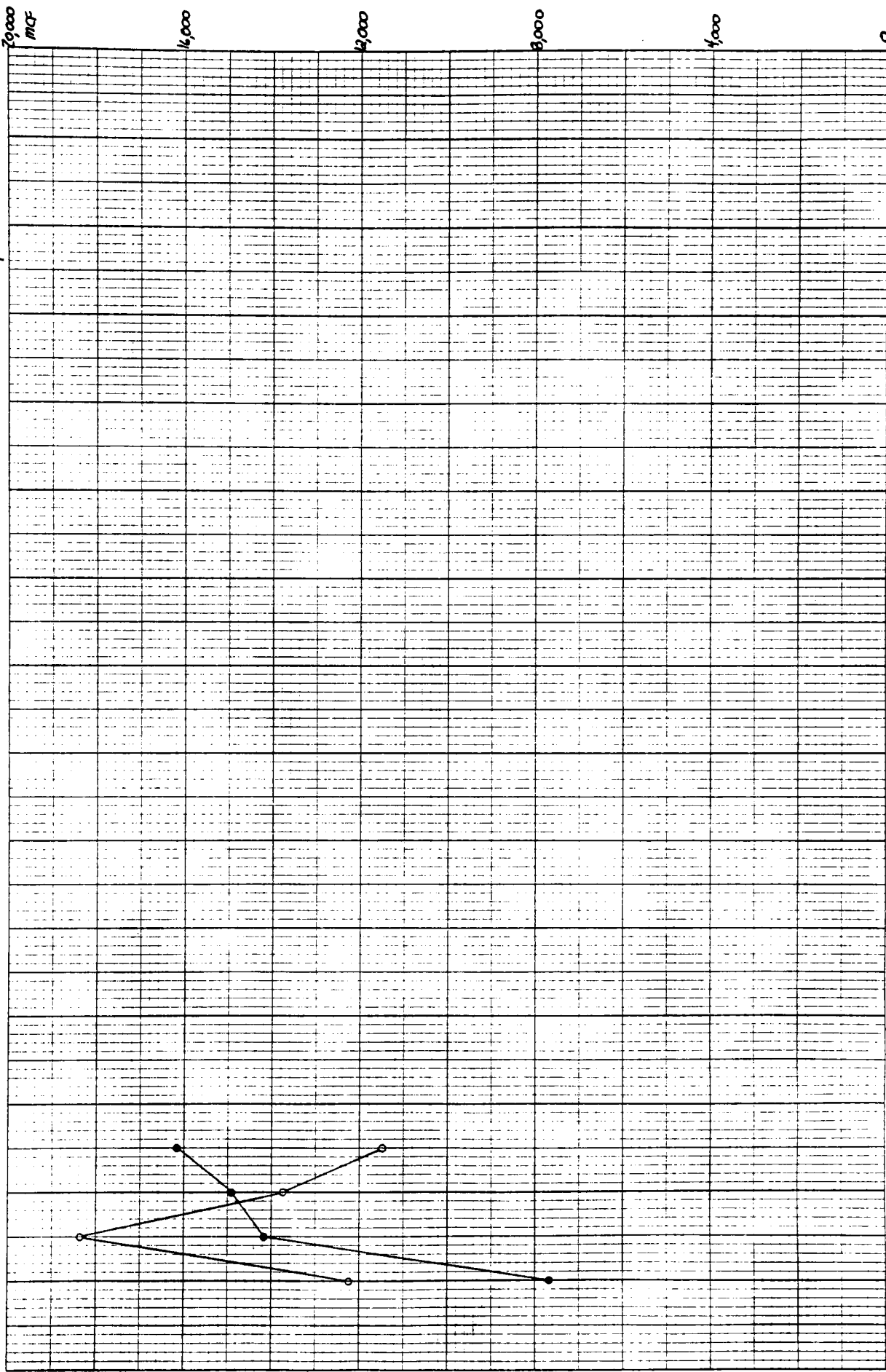
70,000 MCX

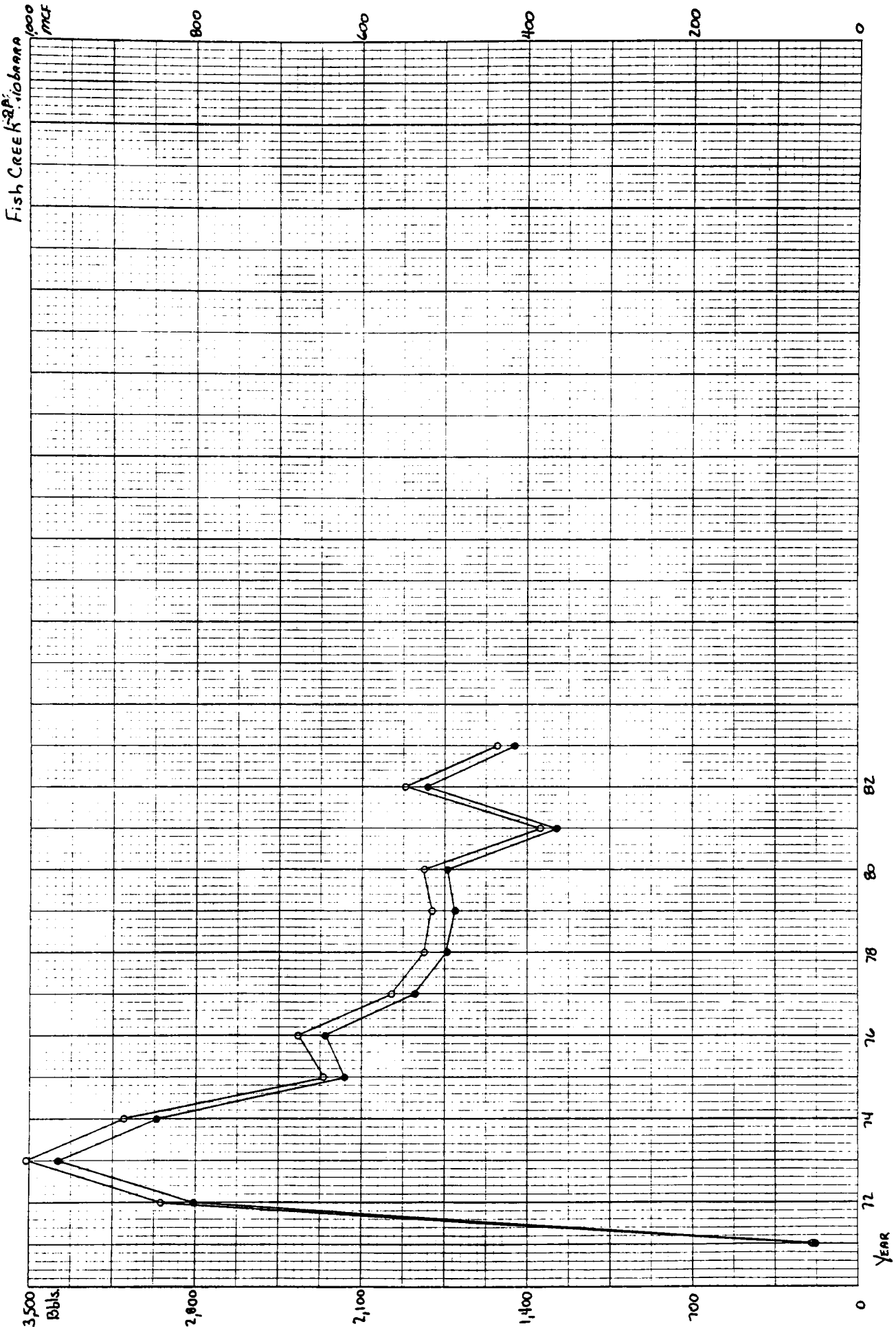
866,000 Bbls

47 0782

K.M. **LETTER TO THE INCH.** **KEUFFEL & ESSER CO. MADE IN U.S.A.**

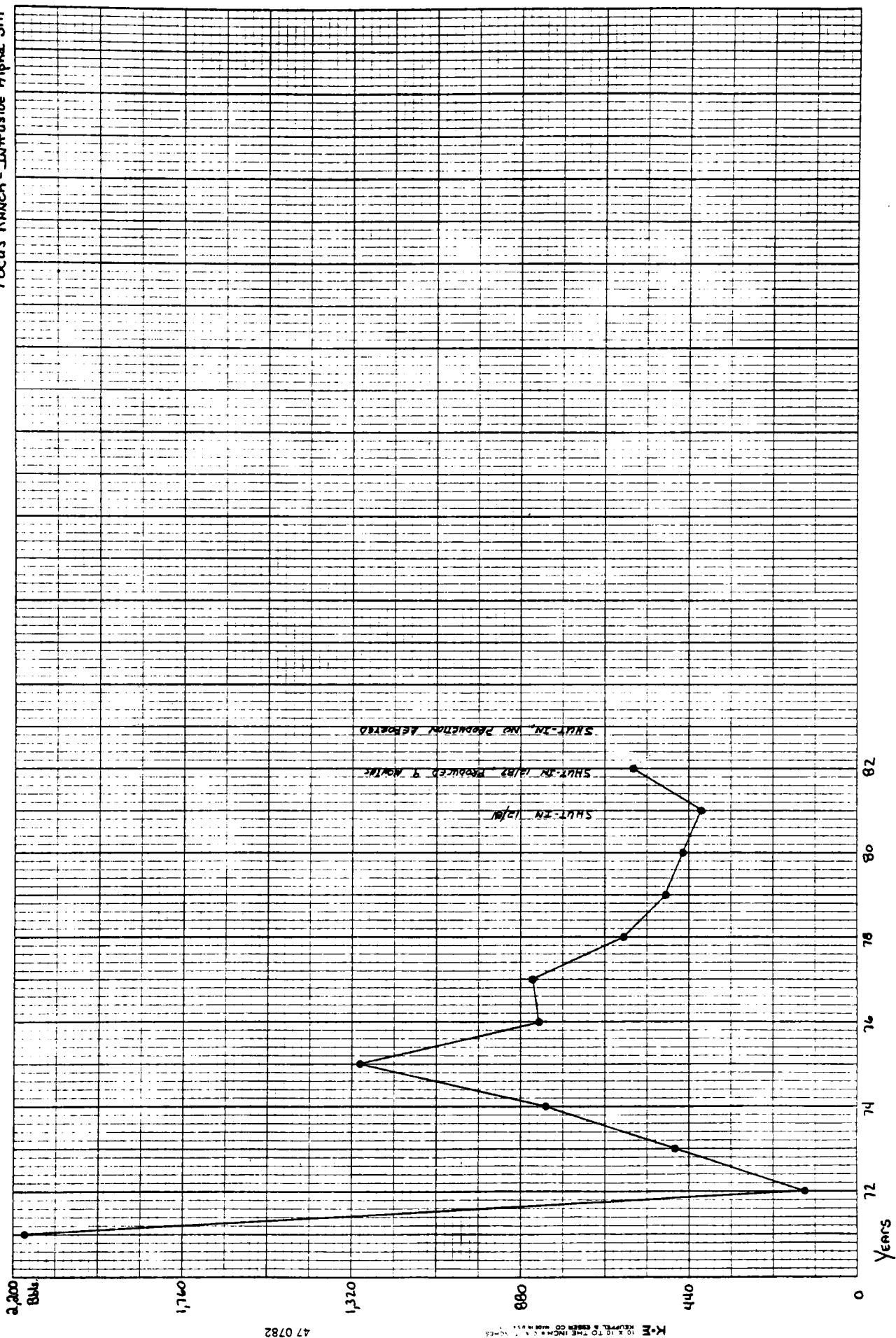
82

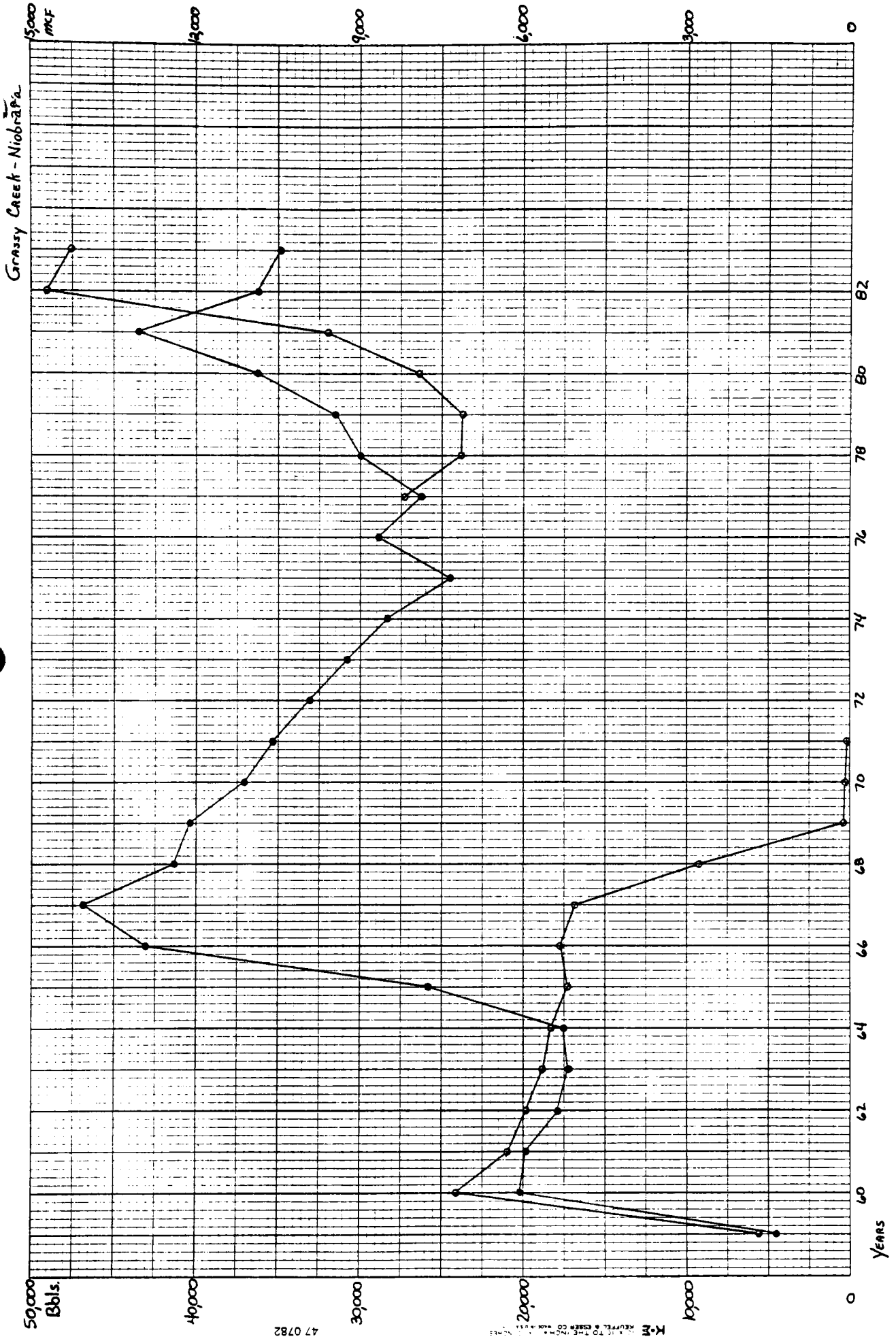
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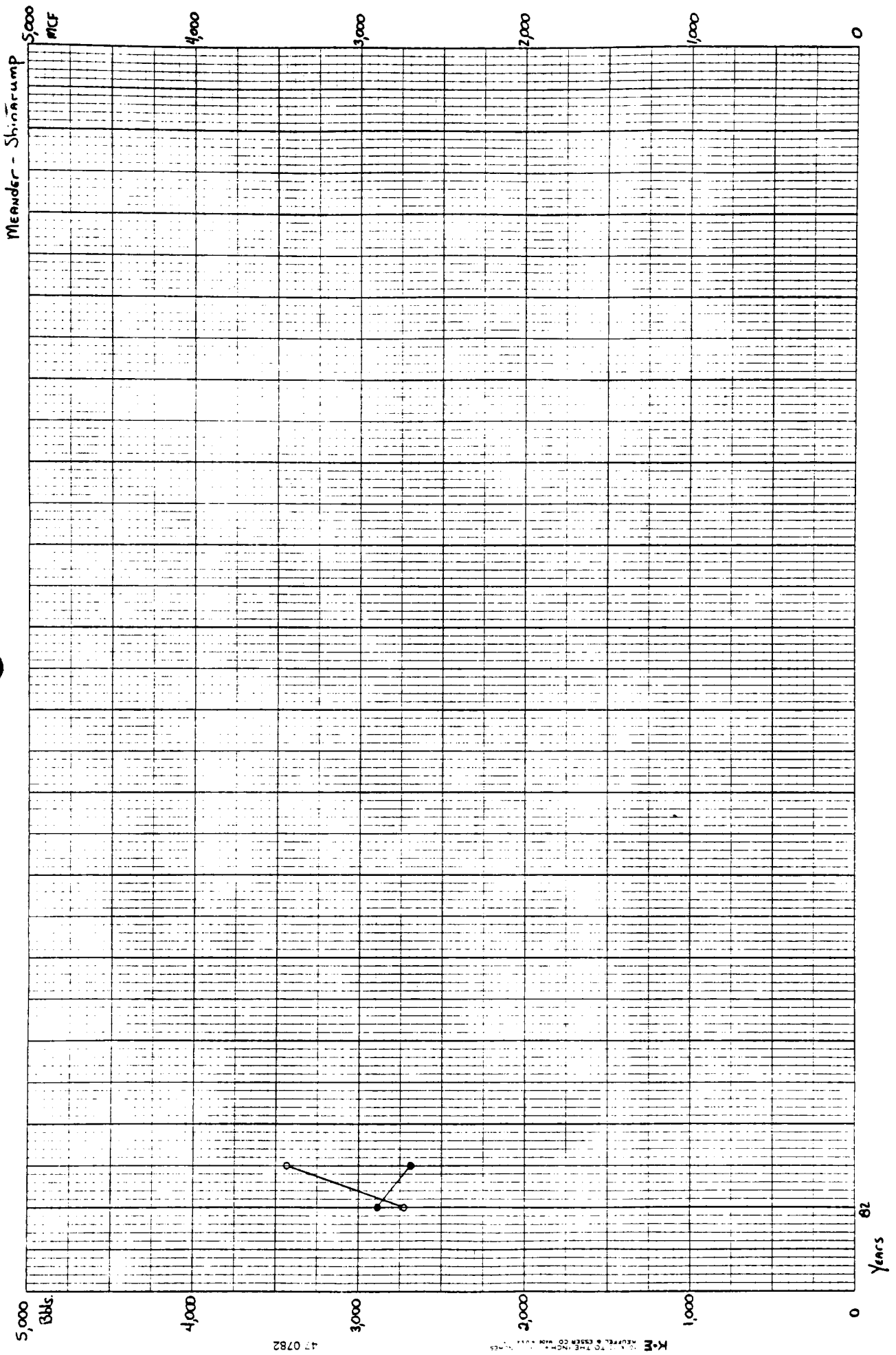


Fish Creek 22-106-0000

Focus Ranch - Intrusive Alpha Sill

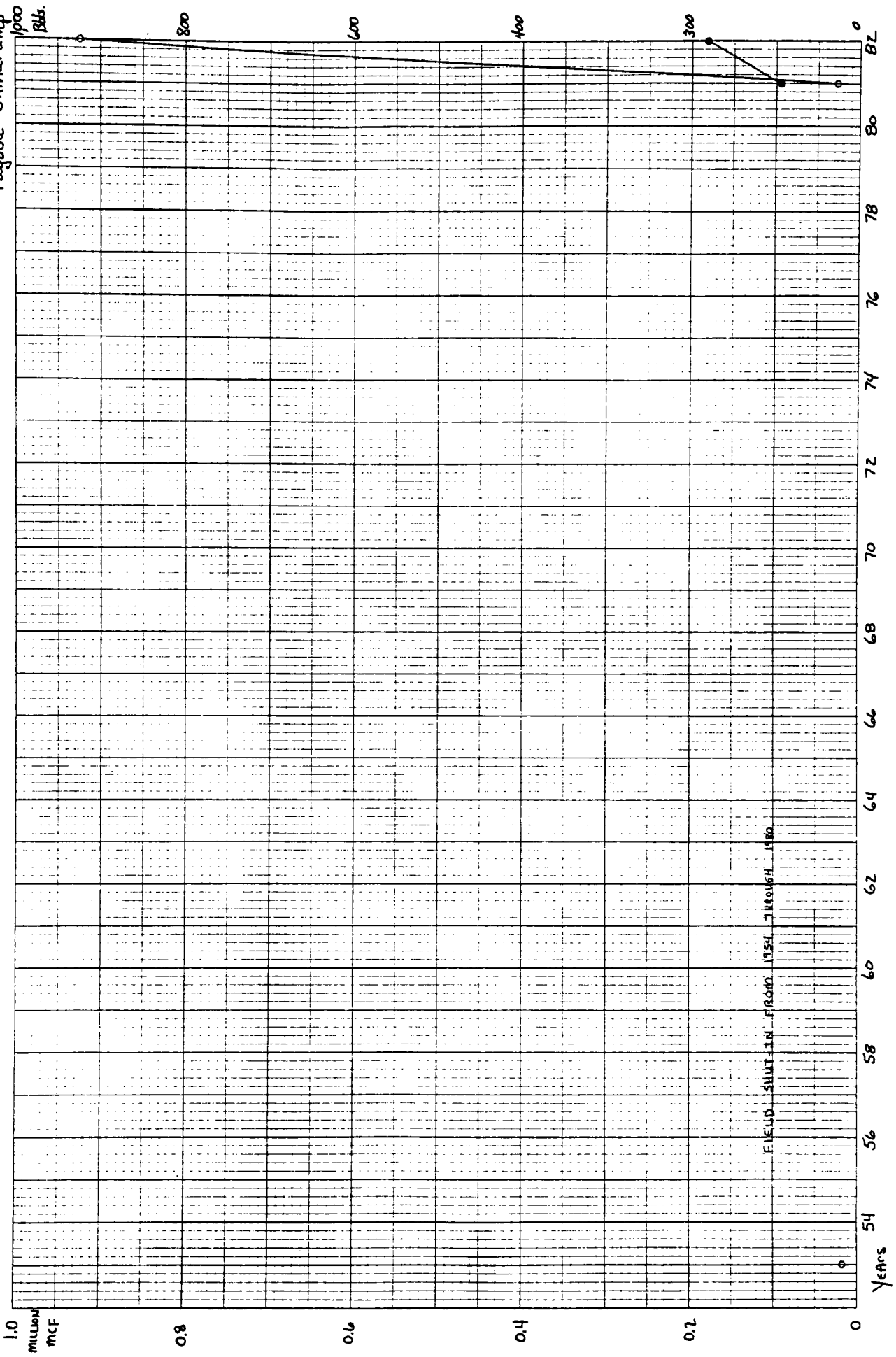




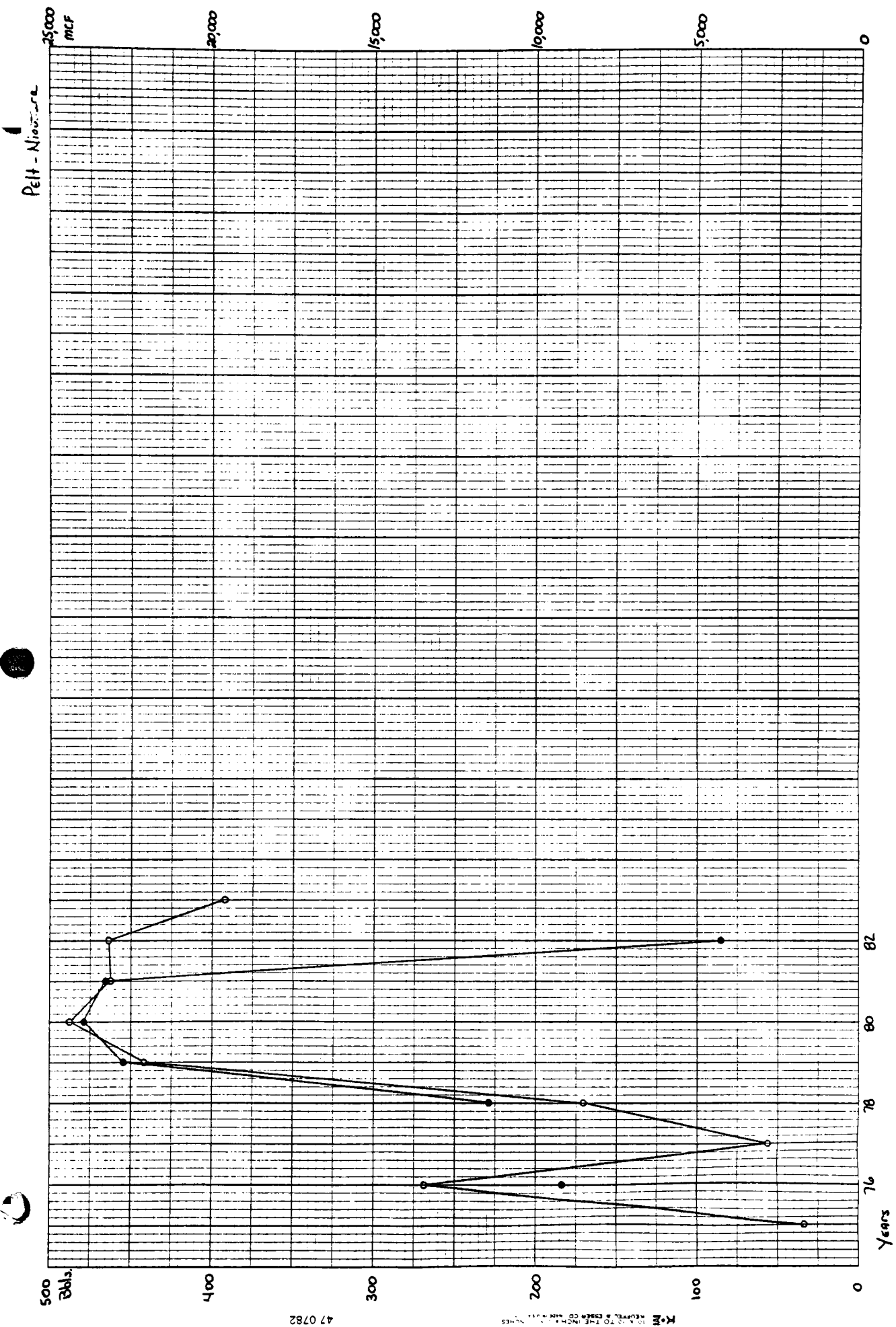


Pagoda-Shinarump

Bbls.



FIELD SHUT-IN FROM 1954 THROUGH 1980



3-K
U.S. DEPT. OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION
WASHINGTON, D.C. 20535

17,600

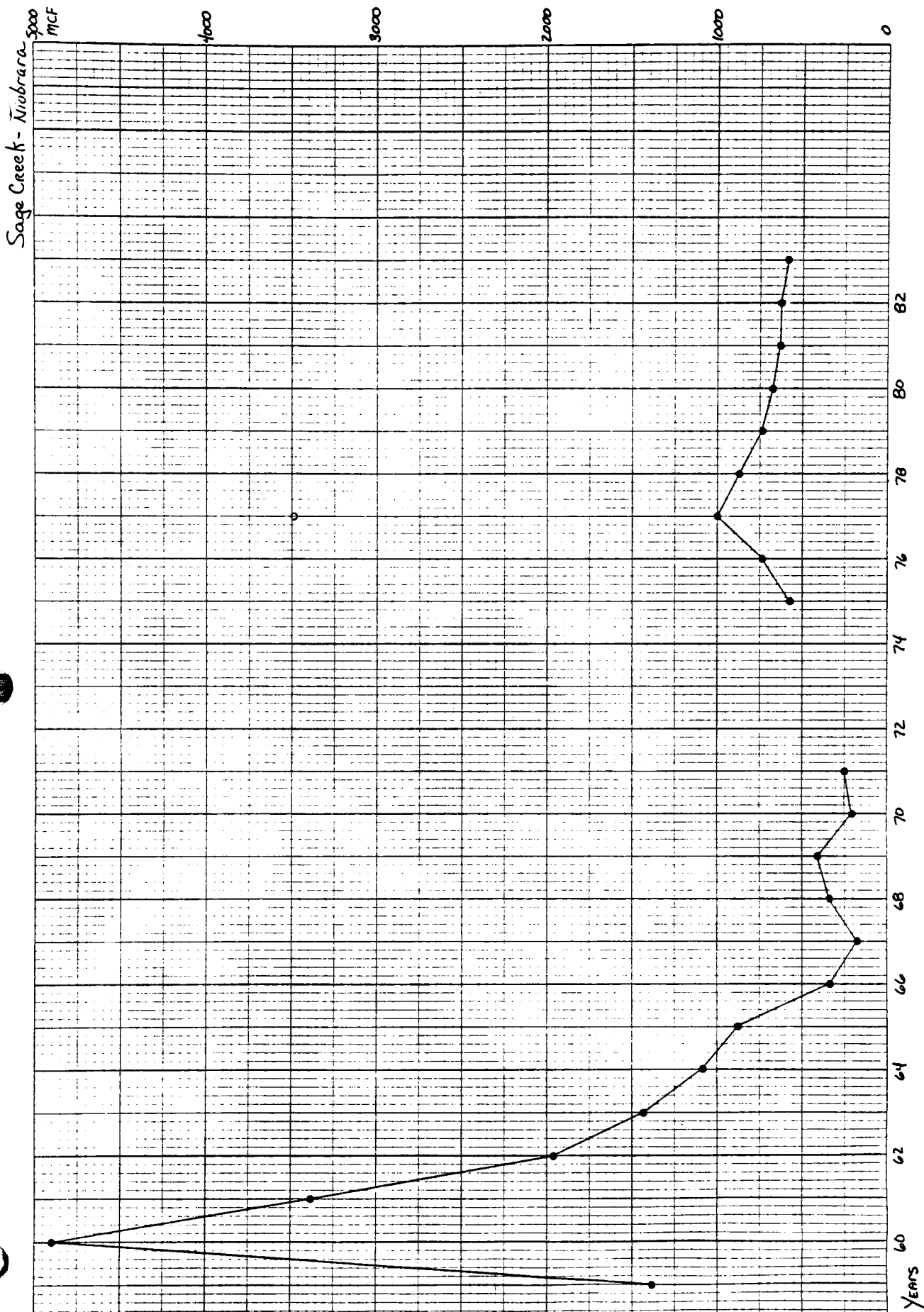
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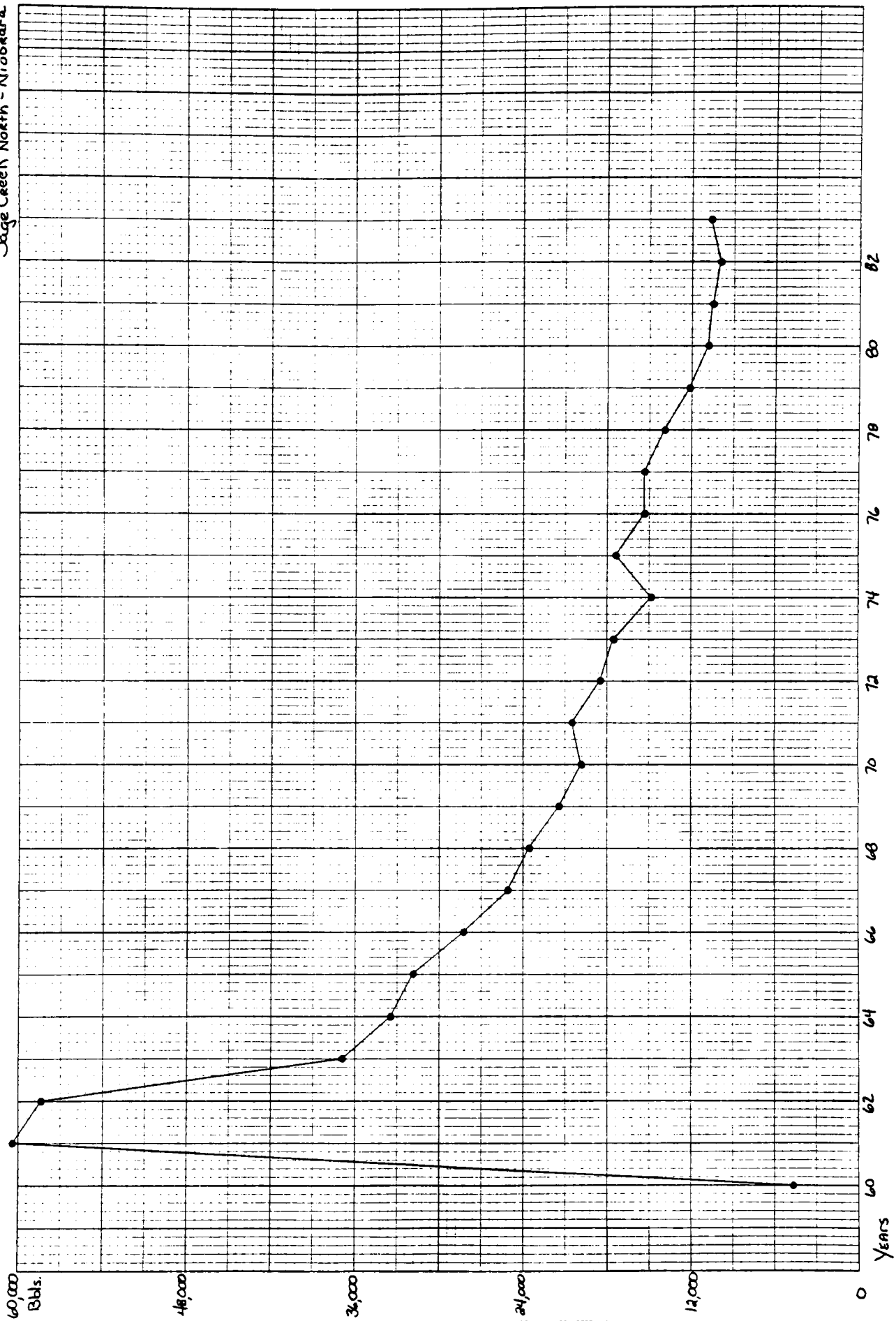
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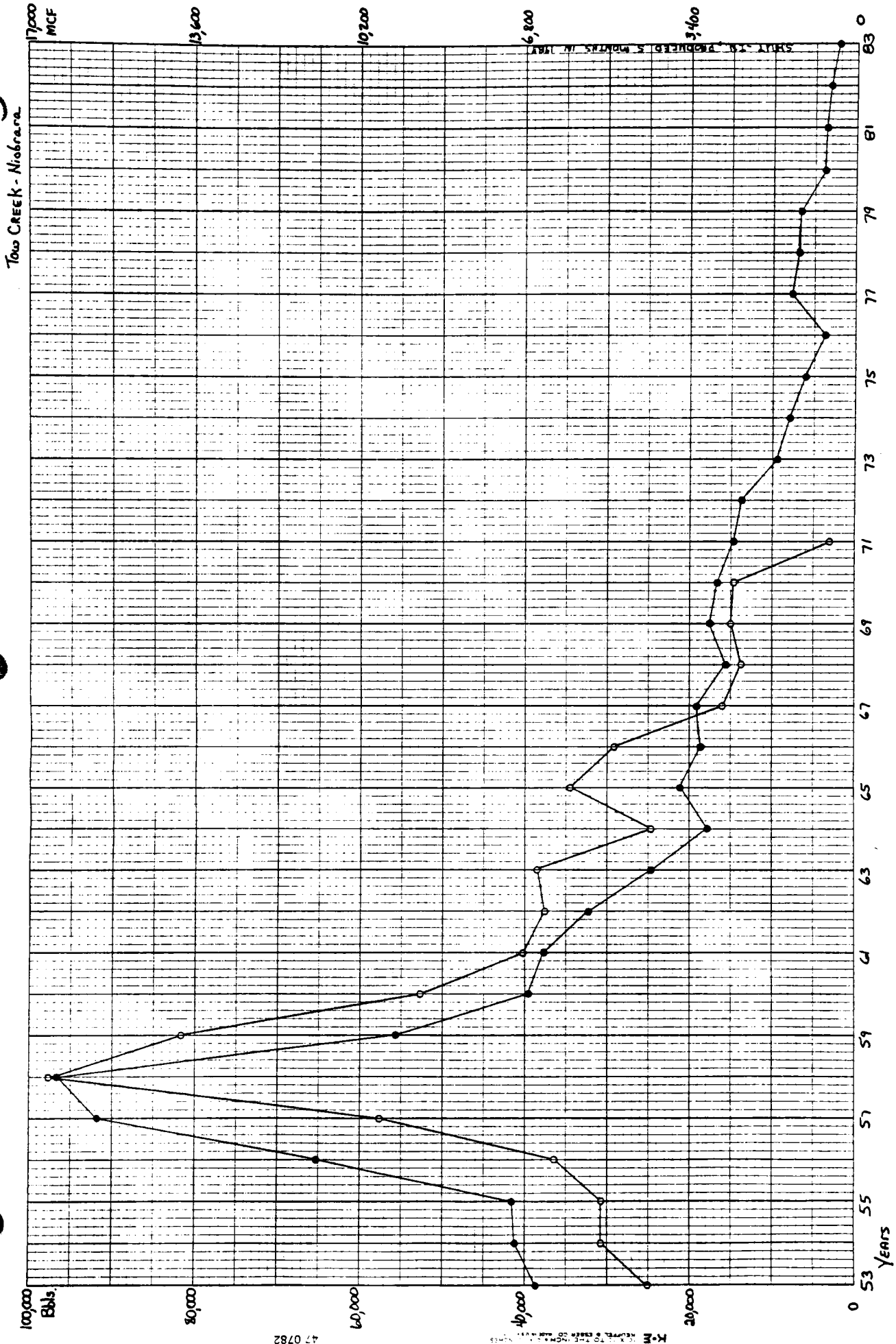
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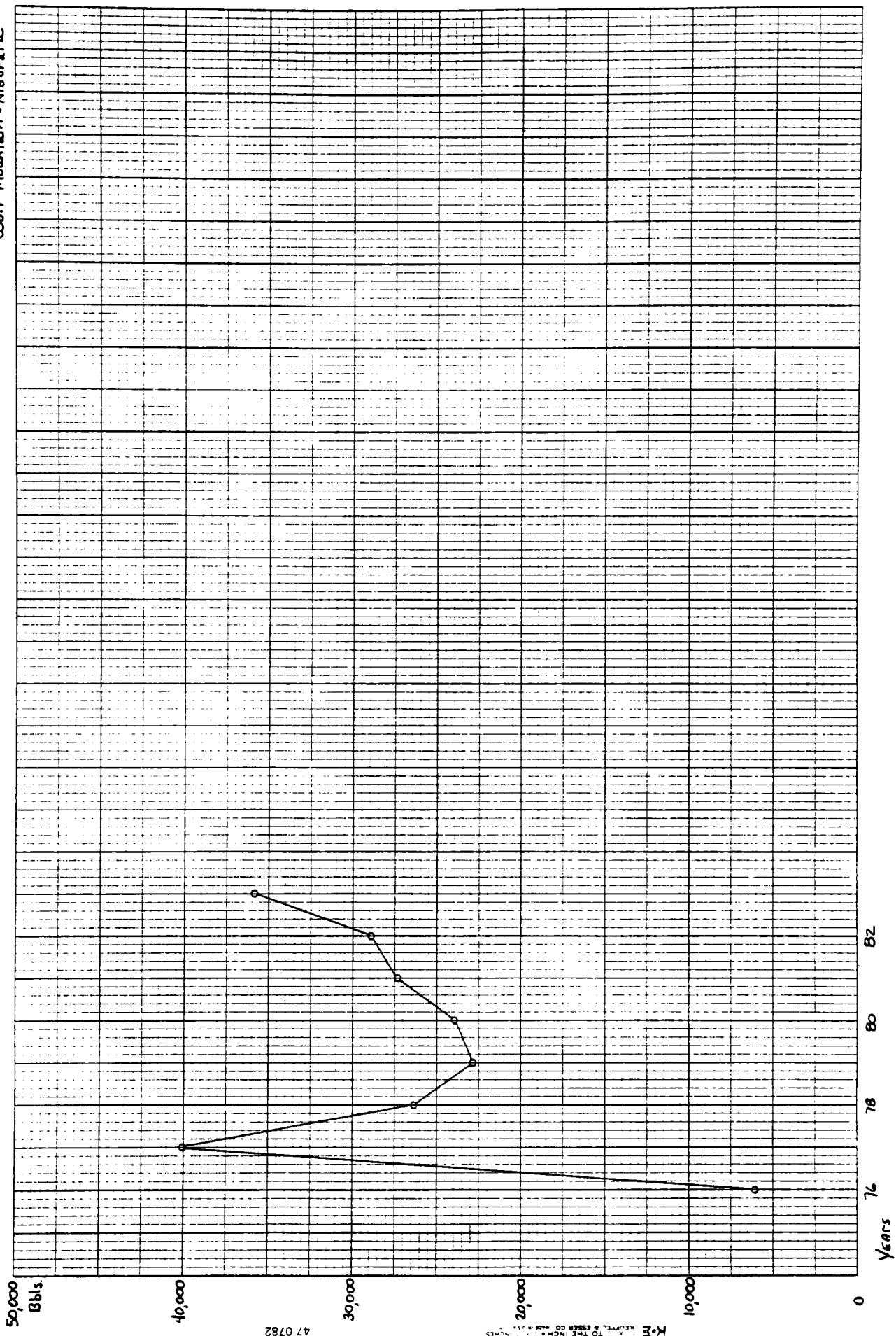
Years







Wolf Mountain - Niobrara



Other Publications

INFORMATION SERIES 18--Oil and Gas fields of Colorado: Statistical Data through 1981.

MAP SERIES 22--Oil and Gas fields map of Colorado. 1983, (1:500,000).

OPEN-FILE REPORT 84-3: Estimated Oil and Gas Reserves for Washington County, Colorado;

OPEN-FILE REPORT 84-4: Estimated Oil and Gas Reserves for Rio Blanco County, Colorado.

OPEN-FILE REPORT 84-5: Estimated Oil and Gas Reserves for Adams County, Colorado;

OPEN-FILE REPORT 83-6: Estimated Oil and Gas Reserves for Weld County, Colorado;

OPEN-FILE REPORT 84-7: Estimated Oil and Gas Reserves for Arapahoe County, Colorado;

OPEN-FILE REPORT 84-8: Estimated Oil and Gas Reserves for Baca County, Colorado.

OPEN-FILE REPORT 84-9: Estimated Oil and Gas Reserves for Cheyenne County, Colorado.

OPEN-FILE REPORT 84-10: Estimated Oil and Gas Reserves for Garfield County, Colorado;

OPEN-FILE REPORT 84-11: Estimated Oil and Gas Reserves for La Plata County, Colorado;

OPEN-FILE REPORT 84-12: Estimated Oil and Gas Reserves for Moffat County, Colorado;

OPEN-FILE REPORT 84-13: Estimated Oil and Gas Reserves for Elbert County, Colorado;

OPEN-FILE REPORT 84-14: Estimated Oil and Gas Reserves for Mesa County, Colorado;

OPEN-FILE REPORT 84-15: Estimated Oil and Gas Reserves for Routt County, Colorado;

OPEN-FILE REPORT 84-16: Estimated Oil and Gas Reserves for Yuma County, Colorado.

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