OPEN FILE 84-3

ESTIMATED OIL AND GAS RESERVES FOR WASHINGTON COUNTY, COLORADO

Compiled by
A. H. Scanlon

Funded by the Colorado Oil and Gas Conservation Commission
and 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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Senior Geologist

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ESTIMATED OIL AND GAS RESERVES FOR WASHINGTON COUNTY, COLORADO

Introduction

It was determined by the Colorado Geological Survey (CGS) and the C.O.G.C.C. that to most efficiently estimate oil and gas reserves for the State of Colorado, a county-by-county analysis should be undertaken. This report is the first in a series of oil and gas reserve investigations undertaken for those counties in which oil and/or gas is currently being produced.

This initial study involves Washington County, located in northeastern Colorado, approximately 65 miles east of Denver, within the eastern half of the Denver Basin. Washington County covers 2,530 square miles. In this county, oil is produced from the D and J sands, and gas is produced from these same two sands and the Niobrara Limestone. The range of depth to the Niobrara, D and J formations, respectively, are: 2,500', 3,425' and 3,475' in the southeast corner of the county to 4,100', 5,000', and 5,050' in the southwest; and 3,125', 3,975' and 4,074' in the northeast to 3,975', 4,800' and 4,875' in the northwest.

There are 129 fields considered active producers as of December 31, 1982. Of these, 116 are classified as oil fields (based on cumulative gas-oil ratio (GOR) of <15:1), and 13 are classified as gas fields (based on cumulative GOR >15:1). Note that two fields produce (predominently) oil from one horizon and gas from another (DeNova and Woodrow East). Eleven of the 116 fields produce from both the D and J sands.

Seven of the 116 oil fields are currently undergoing secondary recovery by injected fluids. These recovery projects are listed in Table I, which includes the amounts of injected fluids for 1982 and the cumulative amounts injected through 1982.

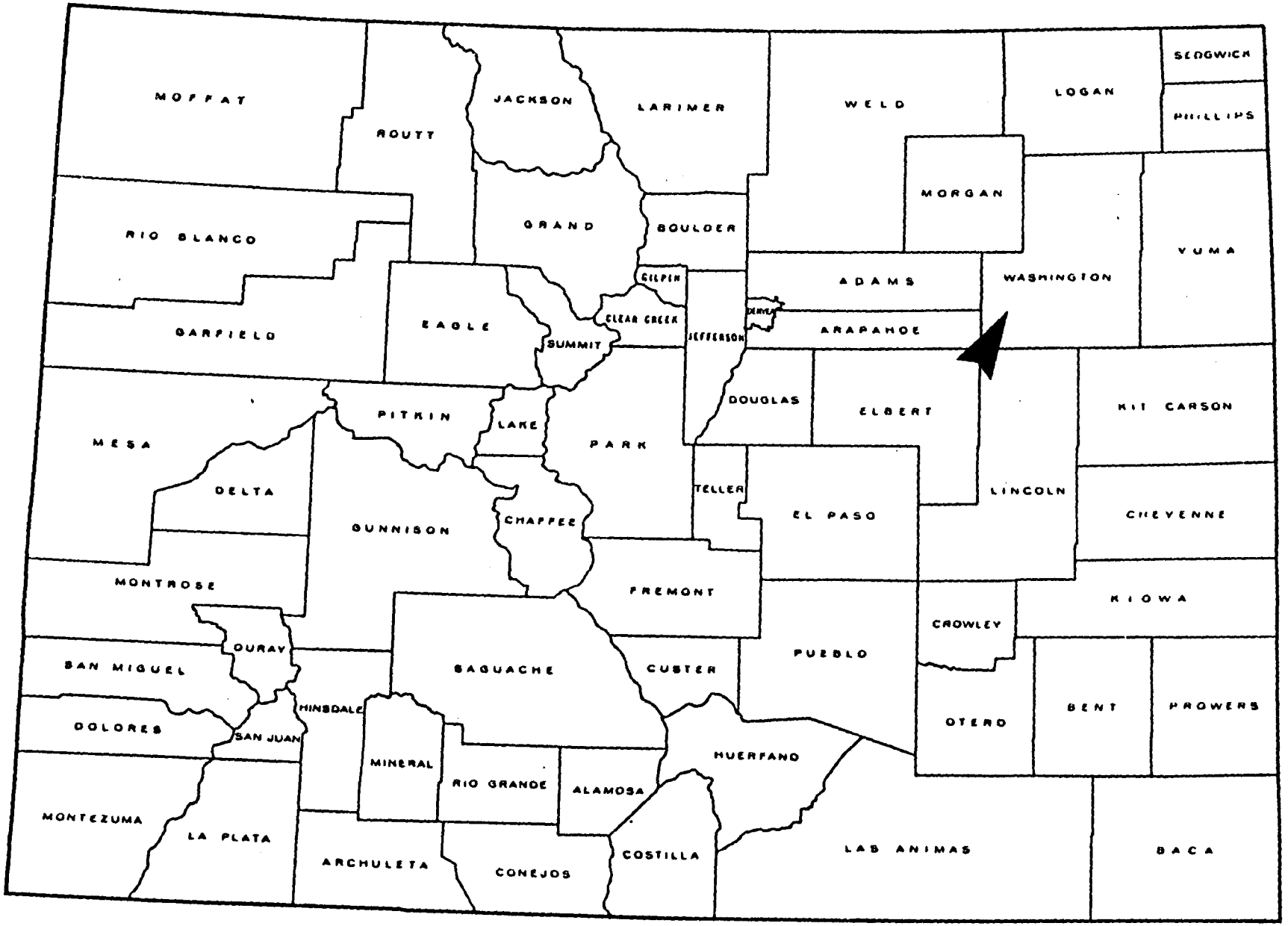

Figure 1. County Location Map.

TABLE I

Summary of Secondary Recovery Projects
by Injected Fluids
for Washington County

Field Name/ Horizon	Operator	Initial Inj. Date	Injected Water (bbls) 1982	Cumulative through 1982
Akron East/D	Phillips Petrol. Co.	3/63	645,828	10,854,778
Belle/J	Energy Reserves	2/79	216,044	1,056,304
Bobcat/D	Continental Oil Co.	4/68	561,135	14,725,154
Little Beaver/D	Continental Oil Co.	10/58	1,583,327	79,452,688
	Monsanto	9/58	167,783	17,195,983
Nugget/D	Monsanto	4/61	163,131	12,420,463
Plum Bush Creek/J	Continental Oil Co.	6/59	2,453,288	111,803,745
Westfork/J	Keba Oil Co.	2/66	177,162*	14,421,852

* No data for Oct./Nov./Dec., 1982.

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 142 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. Prior to this date, no such records were kept by the Commission. This lack of records prior to 1952 presented no problems, as only one field in this county, which is currently active, was discovered prior 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

The 127 oil field-horizons were divided into five groups based on how the decline rates were determined. They are: (1) decline rates based on the average decline rate of the actual past eight years production; (2) decline rates based on a "smoothing" out of actual past production, ranging between 7 and 10 years; (3) decline rates based on an indicated leveling off of actual past production; (4) decline rates chosen by interpolation based on other nearby and geologically similar fields, for those fields which have not yet leveled off; (5) those fields for which past production has not been long enough (four years or less) to indicate any reasonable decline rates. All fields-horizons were grouped upon the discretion of the author.

After dividing the 127 oil field-horizons into their appropriate groups, decline rates were determined and recorded (see Table II). These decline rates were then applied to the equation:

$$Rr = \frac{q_1 - qf}{-\ln (1-dy)}$$

where: Rr = remaining reserves
q1 = current annual production
qf = 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. No adjustments were necessary for the seven fields undergoing water injection. All these fields have had a substantial amount of time to level off since injection began, therefore not affecting the current decline rates calculated.

Where oil fields have associated gas, the method used to determine the gas reserves was to calculate the GOR for previous years. In many cases, the calculated annual GORs remained relatively steady, after production was established. In such cases, the GOR was multiplied by the oil reserve estimate already calculated, to obtain a gas reserve estimate. A second case involves fields which never approach a relatively constant GOR. Under these conditions an average GOR was calculated over a minimum 10-year period and then applied to the oil reserve estimate, as discussed previously. For fields which had no indication of a steadily declining or increasing GOR, the same method was used as in the previous case. The last case involves GORs which indicate a steadily declining or increasing value with time. In these cases, and there were only a few, the rate change was determined and applied to the present GOR to calculate the gas reserve estimate.

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.

Gas Reserve Calculations

Of the 15 gas field-horizons, only two have had a long enough production history to be used in determining gas reserves. Neither of these calculated reserve estimates are considered reasonable by the author, as the decline rates indicated are very steep, and both fields have been shut-in at various times throughout their history.

These calculated decline rates were then 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.

Table II lists the gas field-horizon data.

No gas reserve estimates were calculated for any of the eight Niobrara field-horizons. The Niobrara in Washington County has a very short production history; fields average 4.5 years old. With such short histories, no production trends are yet apparent. Once production trends become more apparent for the Niobrara, an estimate of the gas reserves should be obtainable using this method.

Results

The following figures are for those field-horizons for which reserves could be calculated. Estimated oil reserves for Washington County totaled 29,145,616 barrels. Estimated gas reserve for the county totaled 6,669,086 MCF.

To determine the reliability of the results, the estimated reserves were totaled for each group discussed under the Oil Reserve Estimates section and assigned a reliability rating of excellent, good, fair, or questionable. It was found that 90 percent of the total reserves are based on good to excellent decline rates, while 10 percent of the total reserves are based on fair to questionable decline rates.

In 14 to 15 years, roughly half of the estimated oil reserves in Washington County will have been produced. In nine to ten years approximately half of the gas reserves will have been produced.

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 and demand.

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 oil decline rate (4.7 percent per year for oil) obtained from class I field-horizons to the current production for Class II field-horizons. In this county, gas reserves were calculated based on GOR. An overall GOR of 0.22 was used to calculate estimated gas reserves, rather than a decline rate.

Using this approach on current production from Class II field-horizons (241,928 Bbls. of oil and 87,835 MCF of gas, excluding Niobrara gas production) additional reserves of 4,835,919 Bbls. of oil and 1,063,902 MCF of gas were obtained. This gives total county reserves (Class I and II) of 33,981,535 Bbls. of oil and 7,732,988 MCF of gas (excluding Niobrara gas production).

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 significant differences in the sources of the gas production for the two groups. Gas production from the Niobrara accounts for an additional 2,544,985 MCF for Class II production. By applying a 15 percent and 20 percent decline rate to this figure, gas reserves of between 12 and 16 million MCF would be obtained. Note that this figure is not added to the total gas reserve figure given above. The additional reserves from Class II production given above show no significant differences in the sources between the two groups, therefore the overall decline rate and GOR are applied with confidence.

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 Encrochment
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 II
OPEN FILE 84-3
RESERVE DATA FOR WASHINGTON COUNTY

FIELD NAME/ PROD. HORIZON	GENERAL LOCATION	DATE OF DIS-COVERY	TYPE OF DRIVE	GOR	dy-oil (in %)	CUMULATIVE PRODUCTION 12/31/82 OIL(bbls)	GAS(MCF)	ESTIMATED RESERVES OIL(bbls)	GAS(MCF)	ULTIMATE RECOVERABLE OIL(bbls)	GAS(MCF)	REMARKS* *See last Page of Table II for Definition of # Code
1.Abarr/Nio.	3S-49W	1980					303,689					5
2.Abbott/J	2S-54W	1952		0.25	2.5	388,179	88,994	375,783	93,946	763,962	182,940	2
3.Able/J	3S-54W	1966			3.6	264,629		379,228		643,857		3
4.Agate/D	1S-56W	1956			9.7	29,945	5,400	4,156		34,101	5,400	4
5.Akron East/D	3N-51&52W	1955	Gas Exp. w/Poss. W. D.	0.52	4.0	2,433,926	1,503,188	973,005	505,963	3,406,931	2,009,151	GOR avg. '73-'82;Inj. began 3/23/63; dy calc.on 5-yr.Avg.
6.Anton/J	4S-52W	1958			10.0	6,154		2,658		8,812		4
7.Apex/J	3S-54W	1968			9.5	46,121	40	8,205		54,326	40	3
8.Apollo/J	2S-57W	1964				6,021						Prod.Only'81,'82;Also Prod. in Adams Co.; 5
9.Appaloosa/J	2S-53W	1980				38,659						5
10.AzureEast/D	1S-55W	1965			8.0	49,358	2,111	1,775		51,133	2,111	3
11.Barefoot/J	3S-52W	1963			4.0	222,274	9,970	156,019		378,293	9,970	dy-based on 3-yr.avg.
12.Bead/D	1N-55W	1974		0.10	5.0	43,696	4,278	25,052	2,505	68,748	6,783	4,Prod. Morgan Co.also
13.Belle/J	1N&S-53W	1969			5.3	950,146	246,306	294,108		1,244,254	246,306	Inj.Fluids Began 2/79; dy 3-Yr. Avg.
14.Big Beaver/J	3S-56W	1954		0.09	6.0	12,229,105	1,669,240	1,233,576	111,022	13,462,681	1,780,262	GOR Avg. - 5 Yr. dy - 4 Yr. Avg.
15.Bison/J	4S-53&54W	1960	W. D.-Partial		6.0	5,148,015	2,467	109,250		5,257,265	2,467	dy - 9 Yr. Avg.
16.Blade/J	3&4S-53W	1962	W. D.		7.3	2,666,902		366,997		3,033,899		dy - 6 Yr. Avg.
16a.Bluejay/D	2N-51W	1974				25,991	18,961					5,Only Prod 81,82,N.P.
17.Bobcat/D	1S-56W	1954		0.41	4.9	7,140,751	5,497,457	323,121	132,480	7,463,872	5,629,937	Inj.Fluids Began 4/23/68.dy-6 Yr.Avg.
18.Bobcat/J	1S-56W	1954				2,292	2,043					P and A 1963; Reactivated 1982 5
19.Braid/J	3S-50W	1977			8.5	8,480		6,552		10,523		dy - 4 Yr. Avg.
20.Buckaroo/J	3S-52W	1964			3.0	271,899		186,807		458,706		dy - 6 Yr. Avg.
21.Caballero/D	2N-54W	1971		0.44	5.0	27,283	7,567	19,613	8,630	46,896	16,197	4
22.Calhoun/J	2N-49W	1964			5.0	115,990	4,563	60,496		176,486	4,563	4
23.CampCreek/J	1N-53W	1955		0.005	6.5	210,463	12,410	52,106	260	262,569	12,670	dy-10 Yr. Avg. GOR-Declining at Approx.66% Annual Rate
24.Cantina/D	2N-53W	1969		2.80	4.0	93,695	179,852	29,763	83,336	123,458	263,188	GOR-Avg. '76-'80. 2
25.Caribou/J	3S-56W	1968			8.7	586,545		131,291		717,863		6 Yr. Avg.-dy
26.Casino/J	2S-55W	1968			5.0	597,838	32,296	152,067		749,905	32,296	3
27.Cimarron/J	3S-52W	1967	W. D.		6.0	2,073,586		635,664		2,709,250		3
28.Cody/J	3S-51W	1963			2.0	1,083,048	146,206	1,433,026		2,516,074	146,206	1
29.Concho/J	3S-51W	1966			4.0	217,479		242,119		459,598		4
30.Cope/J	3S-49W	1962			8.0	177,443	100	56,056		233,499	100	3
31.Dapper/Nio.	2S-50W	1978					182,860					5
32.Dart/J	1N-53W	1969			0.14	234,334	22,633	10,410		244,744	22,633	3

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33.Dealer/J	2S-52W	1980				12,576						5
34.DeNova/J	2S-49W	1956	W. D.	0.10	2.4	104,938	2,969	40,588	4,059	145,526	7,028	2
35.DeNova/Nio	2S-49W	1979	Gas Exp.				2,995,219					5
36.Dorado/J	3S-50W	1964			3.0	155,720		64,051		219,771		3
37.Dugout/D	3N-50W	1976				2,342						ABD-1977,React.1982
												5
38.Ember/J	4S-52W	1979				7,959						5
39.Epiphany/J	2S-53W	1966			3.9	103,115		89,968		193,083		4
40.Faro/J	3S-52W	1965			2.6	248,859		194,921		443,780		2
41.Feather/J	3S-54W	1973			4.8	20,388		12,767		33,155		3
42.Feral/Nio	1S-49W	1979					79,237					5
43.Fiesta/J	2S-53W	1967			4.9	133,944		74,859		208,803		1
44.Ginghan/D	1S-55W	1977				12,094						5
45.Gullible/J	2S-53W	1981				24,677						5
46.Hardway/D	3N-51W	1955	S. G. D.		4.9	609,228	540,170	194,520		803,748	540,170	No Gas Prod.Since'78
												1
47.Harrisburg/J	2S-52W	1961			2.7	326,855		864,632		1,191,487		3
48.Hinge/D	1S-56W	1954			0.37	493,461	500,032	522,973		1,016,434	500,032	No Gas Prod.Since'76
												1
49.Hone/J	2S-55W	1958	S. G. D.		3.1	504,078	81,402	38,551		542,629	81,402	No Gas Prod.Since'78
												1
50.Hoolahan/J	2N-51W	1979			8.1	30,686		24,298		54,984		4
51.Hurry-Up/J	3S-52W	1977			8.0	14,166		5,468		19,634		4
52.Hyde/D	2N-49W	1955	W. D.	0.27	5.0	2,013,119	528,229	469,457	126,753	2,482,576	654,982	GOR-5 yr. Avg.
												1
53.Incline/J	3S-55W	1982				13,439						5
54.Jeeper/D	2N-51W	1974		0.06	7.5	58,713	4,288	29,630	1,778	88,343	6,066	3
55.Jesse/J	4S-53W	1978			3.8	31,890		42,806		74,696		4
56.Jitter/D	1S-54W	1963			3.2	160,928	300	75,423		236,351	300	1
57.Justice/J	3S-51W	1966			5.0	232,320		170,432		402,752		3
58.Kachina/J	3S-52W	1974			4.8	892,618		1,246,324		2,138,942		3
59.Kejr/D	2S-56W	1955			12.7	2,228,758	579,162	10,403		22,298,161	579,162	No Gas Prod.Since'69
												1
60.Kejr/J	2S-56W	1955		0.63	10.5	709,181	158,911	47,678	30,037	756,859	188,948	GOR-3 yr. Avg.
												1
61.KejrSouth/J	2S-56W	1955		0.05	15.0	248,843	102,607	54,738	2,737	303,581	105,344	GOR-3 yr. Avg.
												2
62.Lariat/D	1&2S-56W	1960		0.06	5.6	696,518	252,651	120,061	7,204	816,579	259,855	GOR-6 yr. Avg.
												2
63.LastChance/J	3S-56W	1955			1.5	686,974	33,050	148,343		835,317	33,050	No Gas Prod. Since '73
												1
64.Lindon/J	3&4S-53&54	1959	W. D. (partial)		3.2	3,694,446	10,462	1,503,850		5,198,296	10,462	2
65.Little Beaver/D	1&2S-56&57	1951		0.20	1.3	13,692,798	8,352,204	2,443,440	488,688	16,136,238	8,840,892	Inj. Fluids Began: Continental-10/16/58; Monsanto-9/19/58. 1, Also Prod in Adams Co.

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66.Little Beaver/J	1&2S-56&57	1951		4.4	5.5	3,279,481	10,905,637	82,906	364,786	3,362,387	11,270,423	GOR-8 yr. Avg. 2, Also Prod in Adams Co.
67.Little Beaver East/D	1&2S-56W	1954	W. D.	0.66	8.5	3,634,168	2,360,328	59,641	39,363	3,693,809	2,399,691	1
68.Lobo/J	3N-54W	1963		1.7	3.0	337,599	476,308	189,762	322,595	527,361	798,903	GOR-6 yr. Avg. 1
69.LoneStar/J	3S-52W	1977			5.0	43,346		59,086		102,432		4
70.LoneValley/J	1N-54W	1957	S. G. D.	0.20	8.4	671,864	370,599	58,081	11,616	729,945	382,215	1
71.Long Knife/ Nio	2S-50W	1978					64,488					5
72.Monte/J	3S-52W	1964			5.0	1,502,047		517,728		2,019,775		3
73.Nugget/D	1S-56W	1955	Depletion w/ minor W. D.	0.06	8.9	2,416,432	1,205,255	75,140	4,508	2,491,572	1,209,763	Inj. Began 4/14/61 1
74.Otis/D	3N-50W	1954					1,216,193		42,594		1,258,787	SI '74-'80
75.Pack/D	3N-53W	1979					79,179					5
76.Pack/J	3N-53W	1979					12,916					5
77.Patrol/J	1N-54W	1964			3.5	133,338	691	1,011,117		1,144,455	691	1
78.Phegley/D	1S-55&56W	1955	W. D.	0.11	8.4	2,539,836	456,492	41,669	4,584	2,581,505	461,076	GOR-5 yr. Avg., 2
79.Pinto/D	3N-52W	1963			5.0	22,699	191,420	19,042		41,741	191,420	4
80.Pinto/J	3N-52W	1963			3.8	29,313		9,320		38,633		4
81.PintoNorth/J	3N-52W	1979		7.0		4,892	42,407					GOR INC.;5
82.Plains/J	3S-53W	1975			4.8	129,089		139,742		268,831		4
82a.Platner D	2N-51W	1955				3,088	77,992					5, N. P.
83.Plum Bush Creek/J	2S-55&56W	1954	S. G. D.	0.085	9.9	18,705,051	2,132,354	403,129	34,266	19,108,180	2,166,620	Inj. Began 6/15/59 1
84.Pod/J	3S-50W	1961			3.9	845,823	882	1,061,314		3,193,668	882	3
85.PointBar/D	3N-50W	1970			5.0	38,639		15,431		54,070		4
86.Rago/D	1N&S-54&55W	1953	S. G. D.		10.7	179,927	90,668	3,526		183,453	90,668	1
87.Rago/J	1N&S-54&55W	1953	S. G. D. w/ Bottom W. D.		4.0	148,057	49,057	69,405		217,462	49,057	1
88.RagoNorth/D	1N-54W	1954			4.0	614,156	110,481	383,053		994,209	110,481	4
89.RagoNorth/J	1N-54W	1954			5.0	1,240,601	230,517	890,370		2,130,971	230,517	4
90.Rainbow/J	2S-53W	1974		0.83	5.0	276,582	153,705	158,494	131,550	435,076	285,255	GOR-6 yr. Avg. 4
91.Ramp/J	3S-55W	1958			5.0	878,173	72,836	434,403		1,312,576		No Gas Prod.after '80 3
92.Ranchero/D	2N-53W	1963		3.0	9.0	27,394	272,460	16,396	49,188	43,790	321,648	GOR-3 Yr. Avg. 4
93.Ranchero/J	2N-53W	1963		1.5	5.0	831,745	615,585	251,163	376,744	1,082,908	992,329	GOR Increasing 2
94.Ranger/J	3S-51W	1963			6.0	1,100,721		224,129		1,324,850		2
95.Red Cloud/J	1N-53W	1969		0.25	7.5	245,073	49,403	32,542	8,136	277,615	57,539	3
96.Redwing/D	2&3N-52W	1968	Gas Exp. & Poss. W. D.	2.2	3.6	1,221,610	1,882,969	741,081	1,630,378	1,962,691	3,513,347	GOR-5 yr. Avg. 3
97.Rill/J	4S-56W	1958			SeeRemarks	108,822	9,519	365		109,187	9,519	1982-Small Amt.Prod.

TABLE II
OPEN FILE 84-3
RESERVE DATA FOR WASHINGTON COUNTY

FIELD NAME/ PROD. HORIZON	GENERAL LOCATION	DATE OF DIS-COVERY	TYPE OF DRIVE	GOR	dy-oil (in %)	CUMULATIVE PRODUCTION 12/31/82 OIL(bbls)	GAS(MCF)	ESTIMATED RESERVES OIL(bbls)	GAS(MCF)	ULTIMATE RECOVERABLE OIL(bbls)	GAS(MCF)	REMARKS* *See last Page of Table II for Definition of # Code
98.Ring/J	3S-56W	1960			4.0	495,665	103,527	118,686		614,351	103,527	3
99.Roderick/J	3S-54W	1956			3.0	1,891,545	140,567	689,038		2,580,583	140,567	No Gas Prod.Since'79 1
100.Rolling Hills/J	3S-55W	1979				5.0	13,803		21,738		35,541	3
101.Rowell/J	3S-54W	1975			5.0	63,446		50,344		113,790		4
102.Rush Willadel/D	3S-51W	1952	S. G. D.		4.0	562,568	12,464	410,710		973,278	12,464	1
103.Rush Willadel/J	3S-51W	1952			4.0	4,537,432		2,304,787		6,842,219		3
104.Saddle/J	2S-55W	1960			10.0	122,015	18,823	5,429		127,444	18,823	Econ. Limit 2 wells 1
105.Santo/J	4S-55W	1980				3,139						5
106.Scottie/Nio	2S-49W	1981					16,405					5
107.Scout/D	3N-52W	1970			4.0	32,258		7,104		39,362		3
108.Shears Draw/J	1N-54W	1955	S. G. D.		4.1	283,765	14,940	160,602		444,367	14,940	dy - Calc.'66-'74 1
109.Shoal/J	3N-50W	1982				155						5
110.Sioux/D	2N-51W	1967		0.64	8.7	246,106	78,824	124,138	79,448	370,244	158,272	GOR-6 yr. Avg. 3
111.SnowFlake/J	3N-54W	1972				23,440	1,308,329		24,846	23,440	1,333,175	
112.Spar/J	1N-54W	1958		0.22	6.3	713,842	47,379	184,719	40,638	898,561	88,017	GOR Inc.Used'82 1
113.Spear/Nio	2S-50W	1977					879,682					5
114.Stallion/J	3S-50W	1966			6.0	52,388		21,446		73,834		3
115.Stirrup/D	3S-51W	1968			5.0	250,770		147,533		398,303		4
116.Stoney Point/D	2N-54W	1954				9,981	9,270					SI '60,React.'79 5
117.Sundown/D	2N-53W	1970		2.0	2.9	58,331	592,724	54,329	108,658	112,660	701,382	GOR-6 yr. Avg. 4
118.Sunup/J	3S-52W	1973			2.9	130,601		72,123		202,724		4
119.Surveyor Creek/D	2N-52W	1955		3.0	1.8	544,247	3,724,549	543,156	1,629,468	1,087,403	5,354,017	1
120.Swan/J	2S-56W	1955	S. G. D.		12.6	1,608,897	402,122	24,518		1,633,415	402,122	1
121.Taco/D	1N-53W	1975				4,522	95,886					5
122.Tap/D	2N-49W	1975			3.8	55,183		37,083		92,266		4
123.Topaz/J	1N-54W	1957			3.5	184,150	36,076	124,764		308,914	36,076	1
124.Trader/J	3S-52W	1962			5.0	438,113	3,504	187,841		625,954	3,504	4
125.Uranus/D	2N-54W	1978		0.85	2.6	27,626	114,257	17,856	15,178	45,482	129,435	GOR-3 yr. Avg. 4
126.Vortex/J	2S-55W	1981				194,094						5
127.Wampum/J	3S-52W	1966			2.8	184,390		120,389		304,769		1
128.Westfork/J	3S-55W	1956	Gas Exp. w/ Poss. W. D.		6.5	3,641,659	888,287	296,479		3,938,138	888,287	Inj.Began2/19/66 1
129.Whirlpool/J	4S-53W	1980				7,371						5
130.White Eagle/Nio	2S-50W	1977					1,031,117					5

TABLE II
OPEN FILE 84-3
RESERVE DATA FOR WASHINGTON COUNTY

FIELD NAME/ PROD. HORIZON	GENERAL LOCATION	DATE OF DIS-COVERY	TYPE OF DRIVE	GOR	dy-oil (in %)	CUMULATIVE PRODUCTION 12/31/82 OIL(bbls)	CUMULATIVE PRODUCTION 12/31/82 GAS(MCF)	ESTIMATED RESERVES OIL(bbls)	ESTIMATED RESERVES GAS(MCF)	ULTIMATE RECOVERABLE OIL(bbls)	ULTIMATE RECOVERABLE GAS(MCF)	REMARKS* *See last Page of Table II for Definition of # Code
131. Woodrow East/D	1S-55W	1952			2.0	110,676	45,519	56,181		4,104,995	45,519	2
132. Woodrow East/J	1S-55W	1952					1,216,193					5
133. Woodrow South/D	1S-55W	1954	S. G. D./ W. D.	0.26	4.6	367,471	155,381	137,307	35,700	504,778	191,081	Inc. GOR 1
134. Xenia North/J	2N-53W	1955	S. G. D.	0.40	4.6	783,196	634,948	211,439	84,576	994,635	719,524	1
135. Xenia West/J	2N-54W	1954	S. G. D./ W. D.	0.10	5.5	2,400,739	1,301,784	308,359	30,836	2,709,098	1,332,620	1
136. Zephyr/D	3N-51W	1972		0.08	20.0	26,680	83,213	399	32	27,079	83,245	1
COUNTY TOTAL OF ESTIMATED RESERVES								29,145,616 Bbls. 6,669,086 MCF				

Definitions of Number Code in Remarks column of Table II

1) Decline rates based on the average decline rate of the actual past 8 years' production.

2) Decline rates based on a "smoothing" out of actual past production, ranging between 7 and 10 years.

3) Decline rates based on an indicated leveling off of actual past production.

4) Decline rates chosen by interpolation based on other nearby and geologically similar fields, for those fields which have not yet leveled off.

5) Those fields for which past production has not been long enough (4 years of less) to indicate any reasonable decline rates.

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.

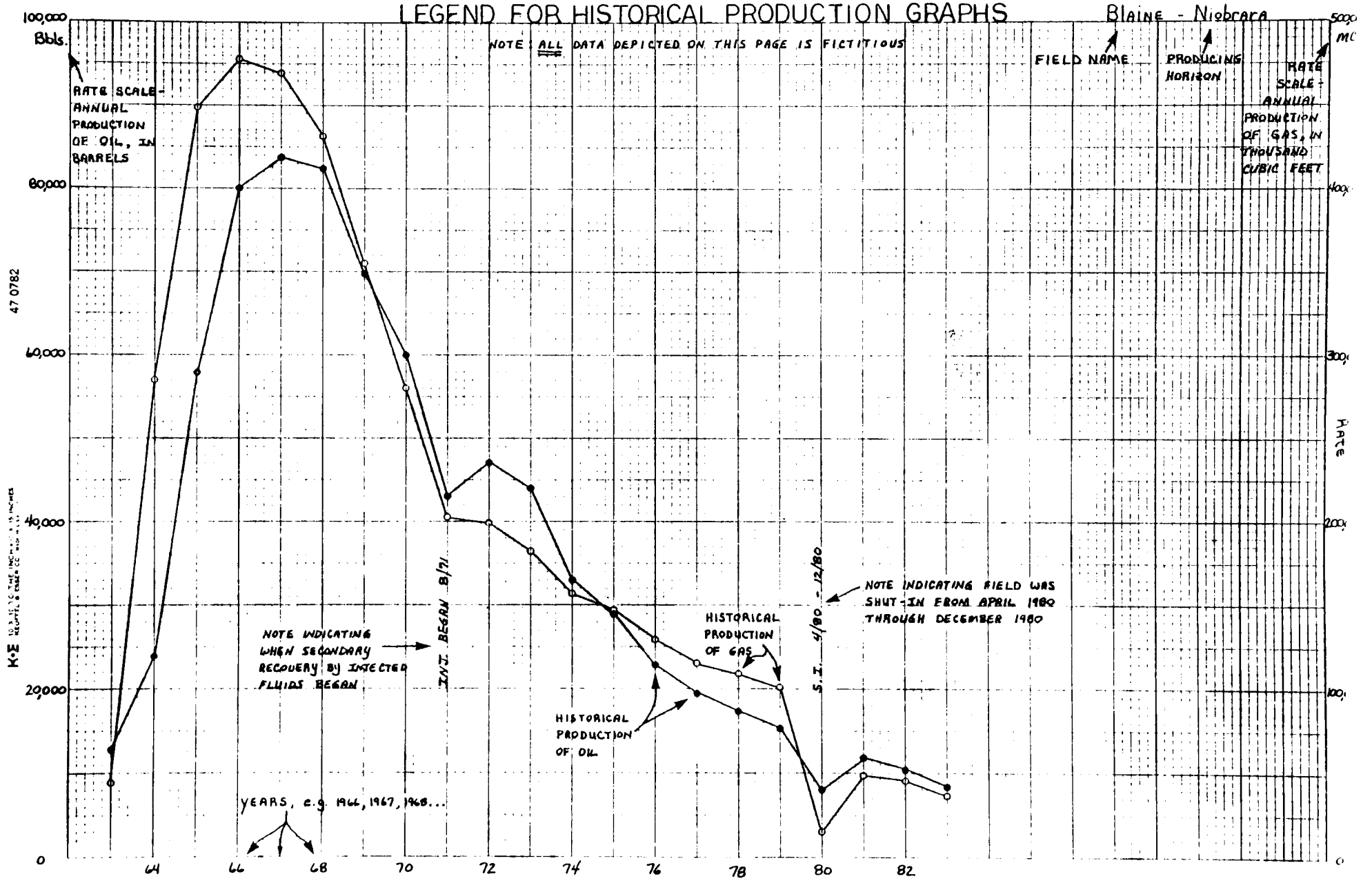
Haun, J.D., Cardwell, A.L., Herrod, W.H. and Cronoble, J.M., 1976. Oil and Gas Reserves of Colorado in Colorado School of Mines Research Institute, Mineral Industries Bulletin, v. 19, #5.

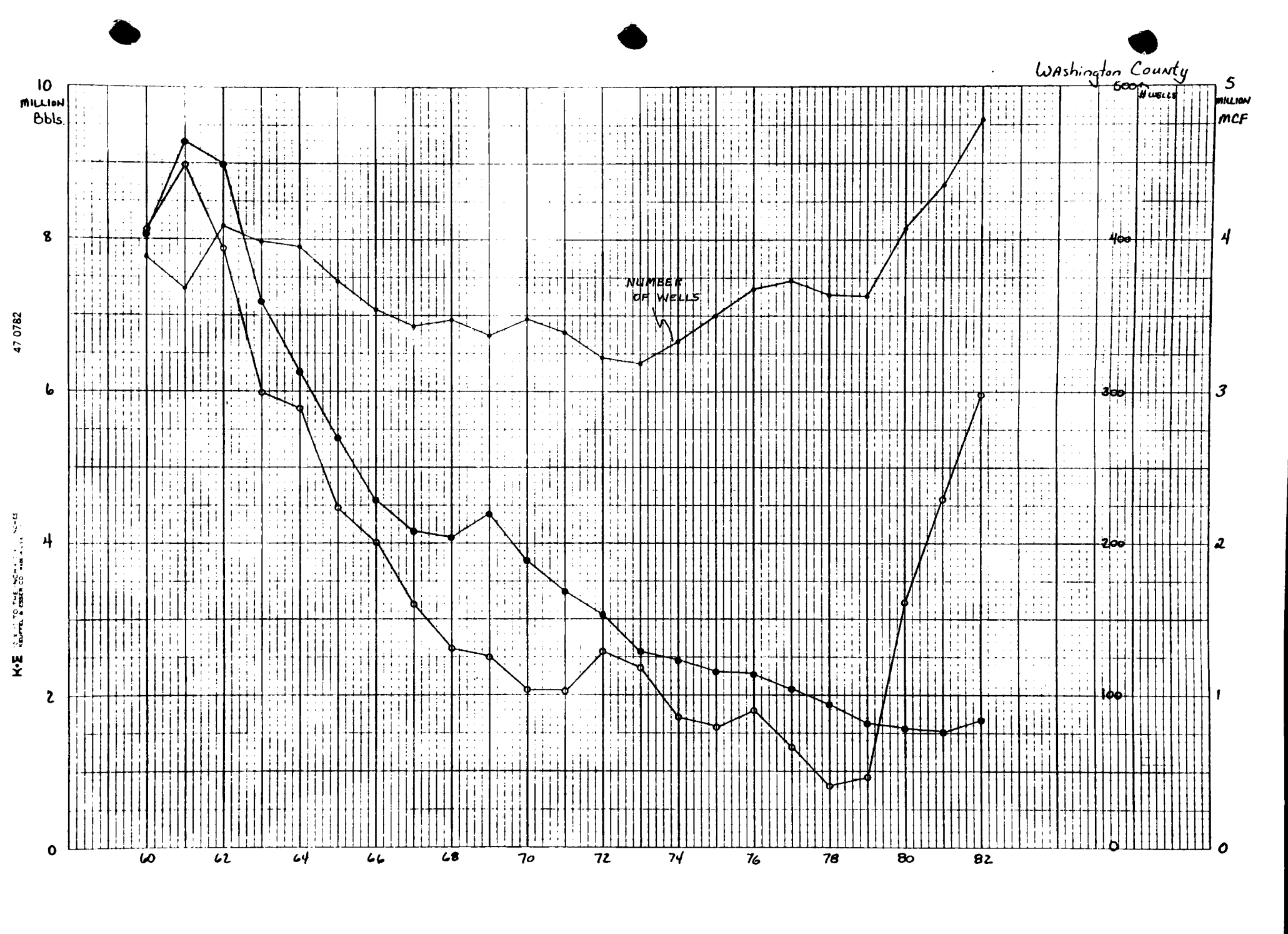
Parker, J.M., editor, 1961 Oil and Gas Field volume: Colorado-Nebraska: Rocky Mountain Association of Geologists, 389 pp.

Appendix I

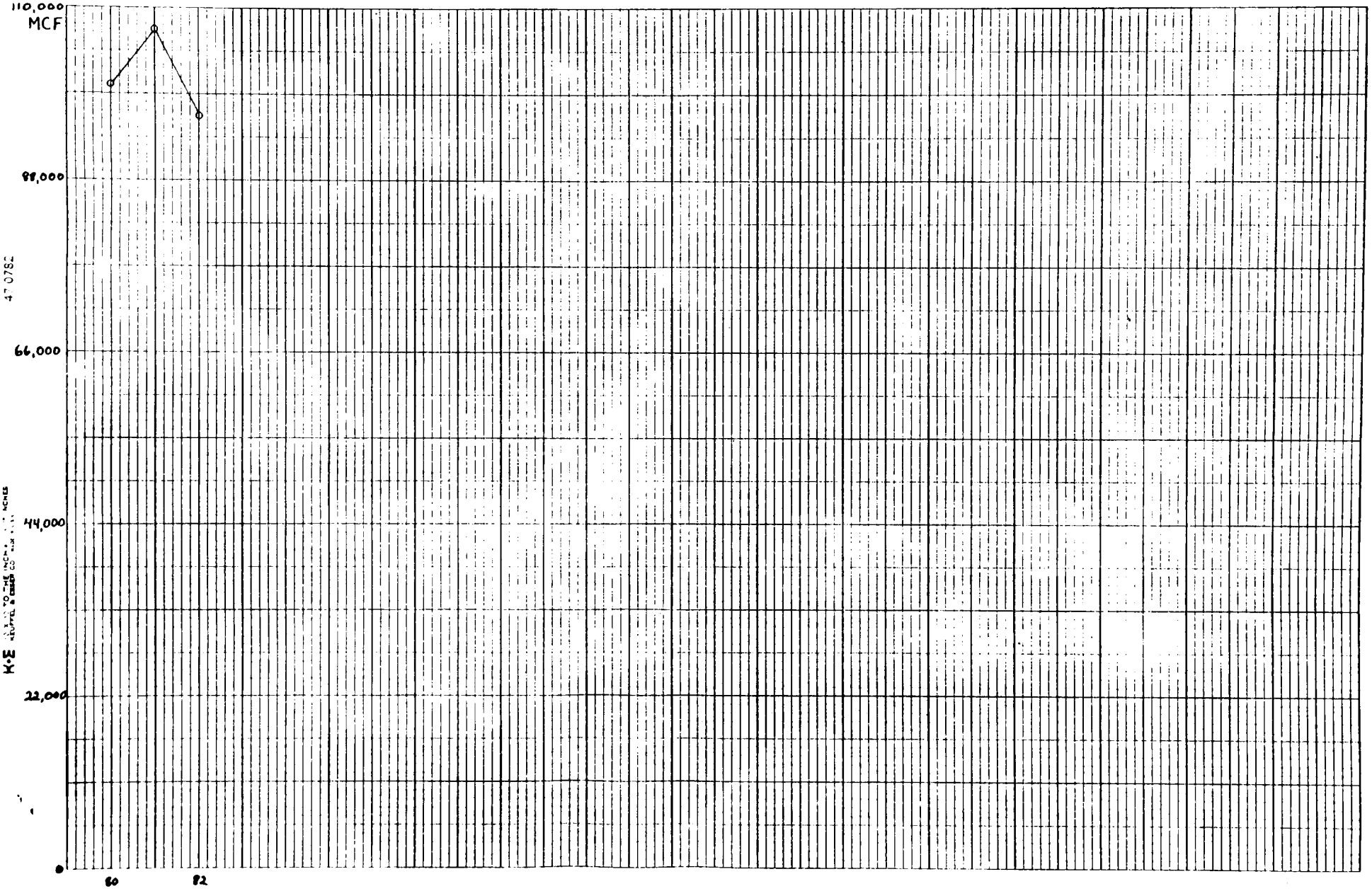
Historical production decline curve graphs for Washington County. These graphs are presented in alphabetical order by Field name and then by producing horizons within each field.

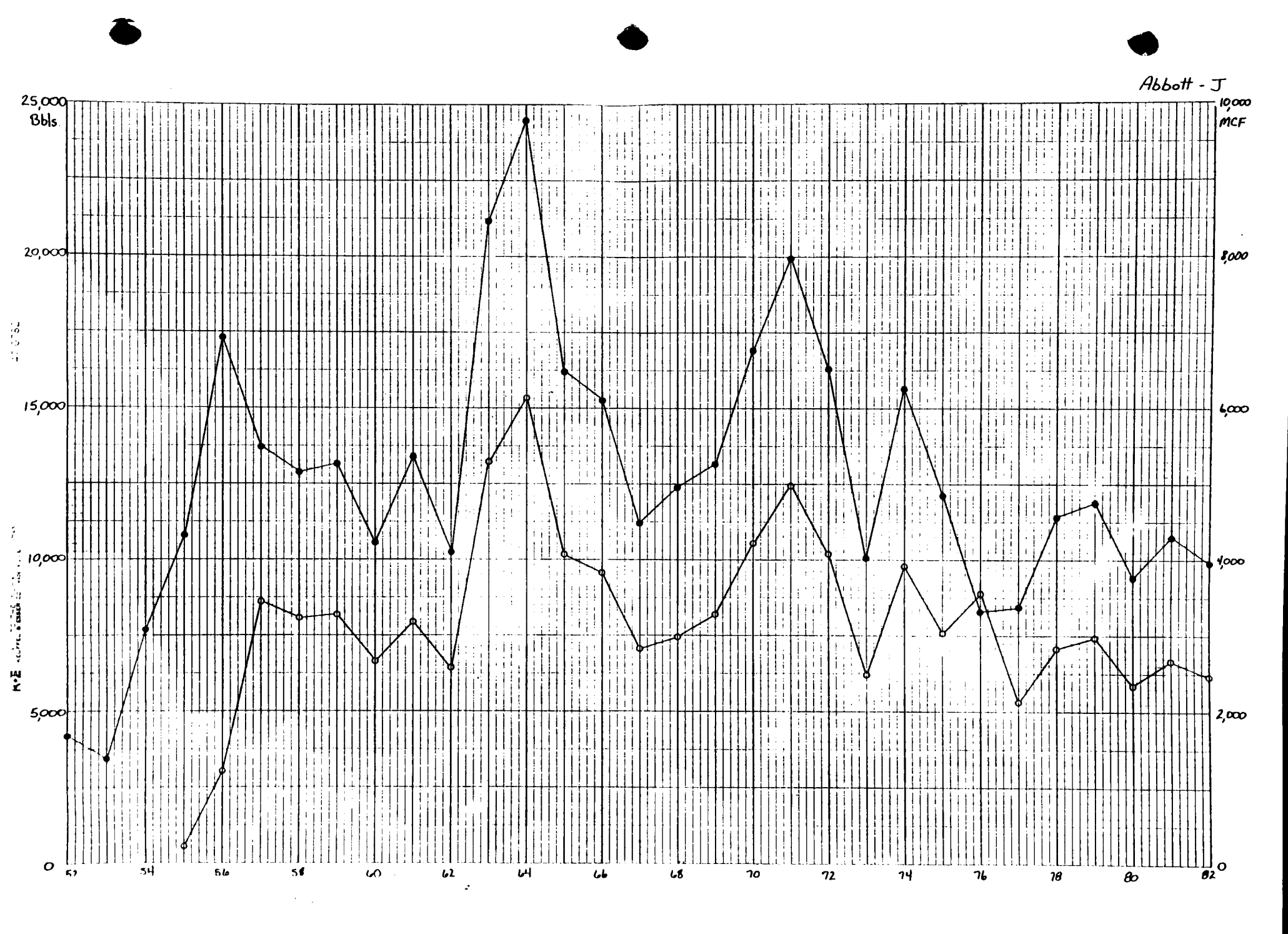
Note that only those fields actively producing as of 12-31-82 are included. Abandoned fields or field-horizons are not included.


LEGEND FOR HISTORICAL PRODUCTION GRAPHS
NOTE: ALL DATA DEPICTED ON THIS PAGE IS FICTITIOUS
Blaine - Niobrara
FIELD NAME
PRODUCING HORIZON
RATE SCALE - ANNUAL PRODUCTION OF GAS, IN THOUSAND CUBIC FEET
RATE SCALE - ANNUAL PRODUCTION OF OIL, IN BARRELS
100,000 Bbls.
80,000
60,000
40,000
20,000
0
500
400
300
200
100
0
Rate
64
66
68
70
72
74
76
78
80
82
YEARS, e.g. 1966, 1967, 1968...
NOTE INDICATING WHEN SECONDARY RECOVERY BY INJECTED FLUIDS BEGAN
INJ. BEGAN 8/71
HISTORICAL PRODUCTION OF OIL
HISTORICAL PRODUCTION OF GAS
S.I. 4/80 - 12/80
NOTE INDICATING FIELD WAS SHUT-IN FROM APRIL 1980 THROUGH DECEMBER 1980
47 0782
K·E

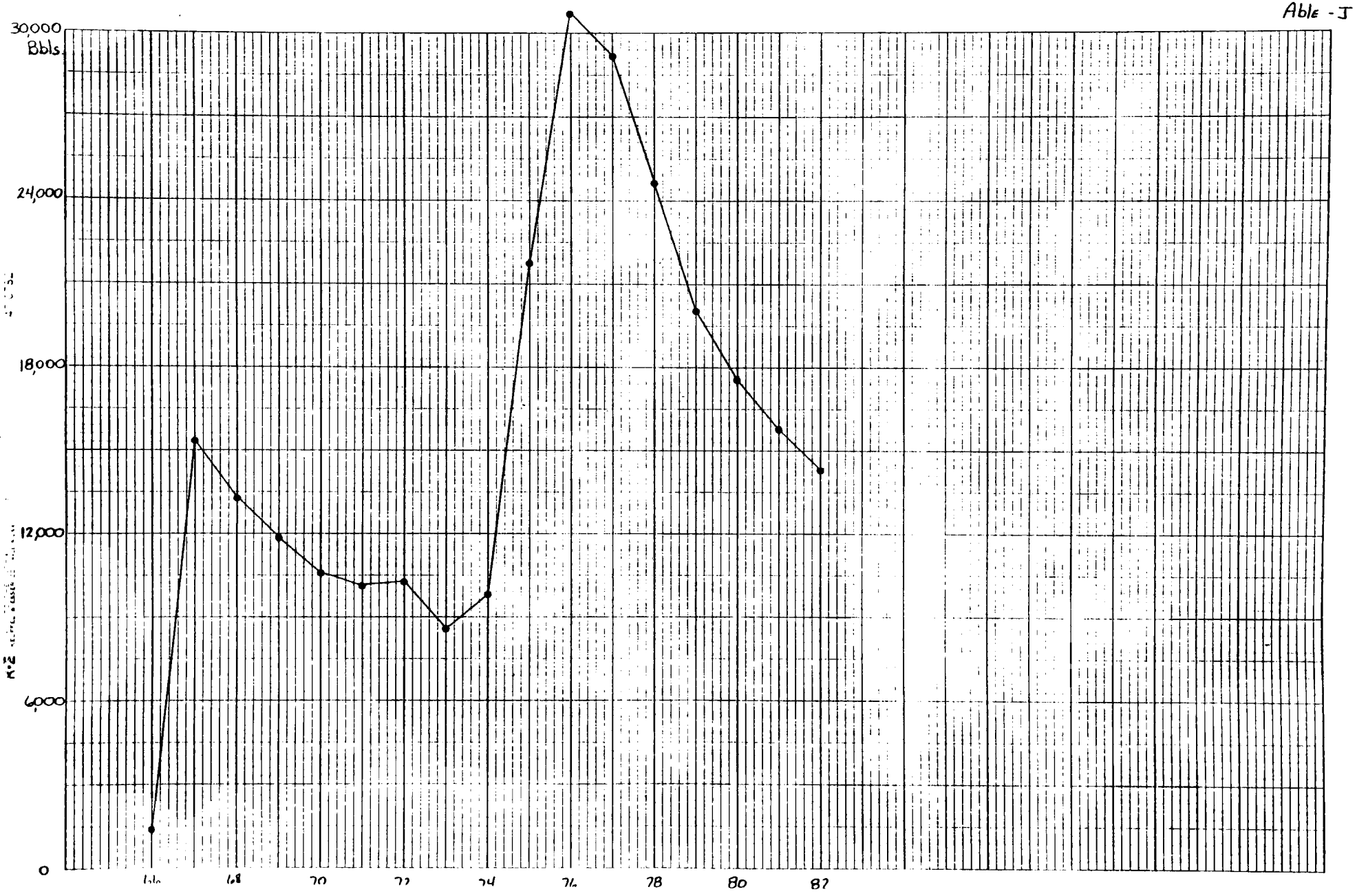

Washington County
10
MILLION
Bbls.
8
6
4
2
0
5
MILLION
MCF
4
3
2
1
0
600
WELLS
400
300
200
100
0
NUMBER
OF WELLS
60
62
64
66
68
70
72
74
76
78
80
82
47 0782
K+E

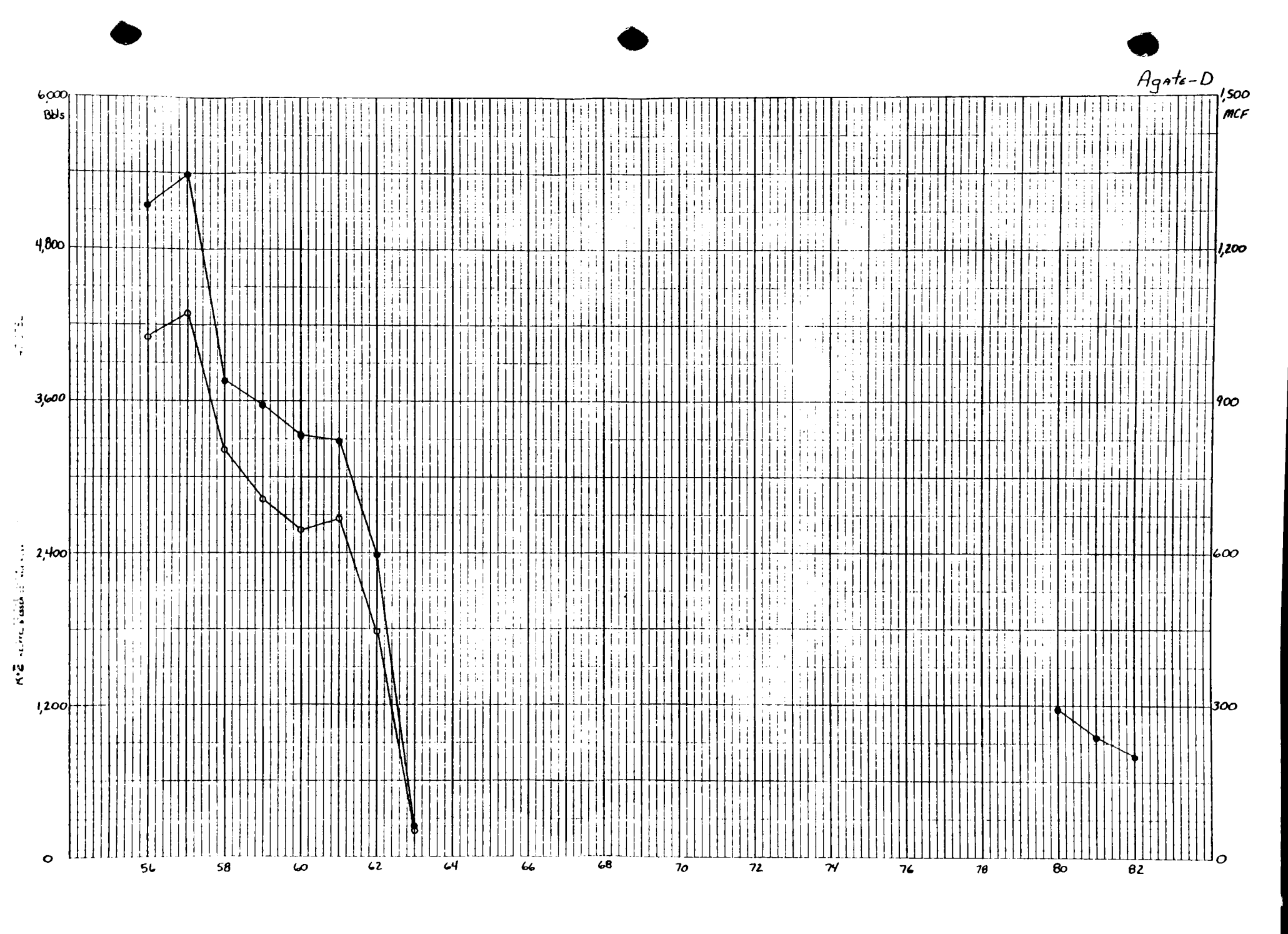
Abarr - Niobrara



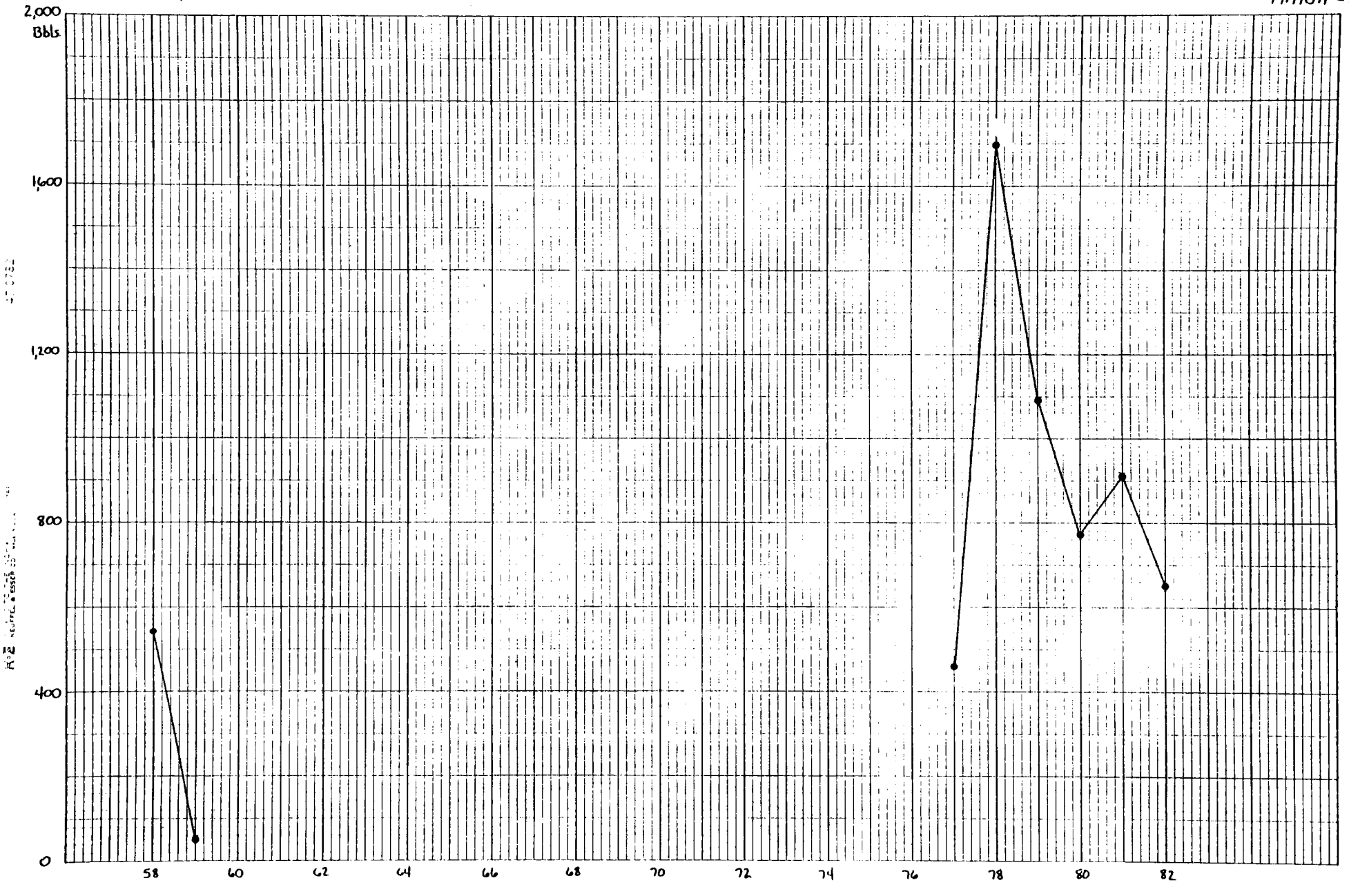

Abbott - J
25,000
Bbls
20,000
15,000
10,000
5,000
0
10,000
MCF
8,000
6,000
4,000
2,000
0
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82

Able - J

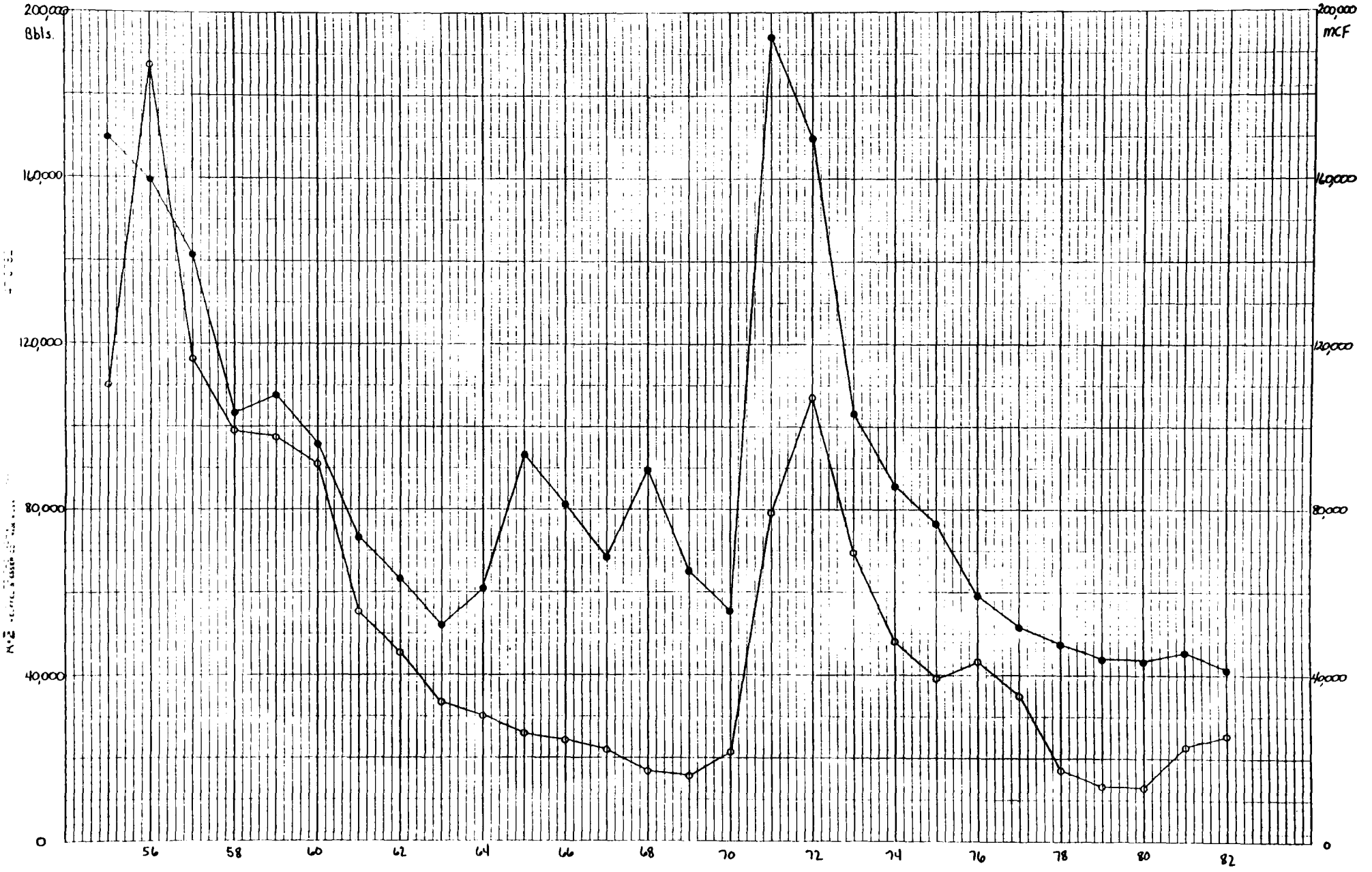



Agate-D
6,000
Bbls
4,800
3,600
2,400
1,200
0
1,500
MCF
1,200
900
600
300
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82

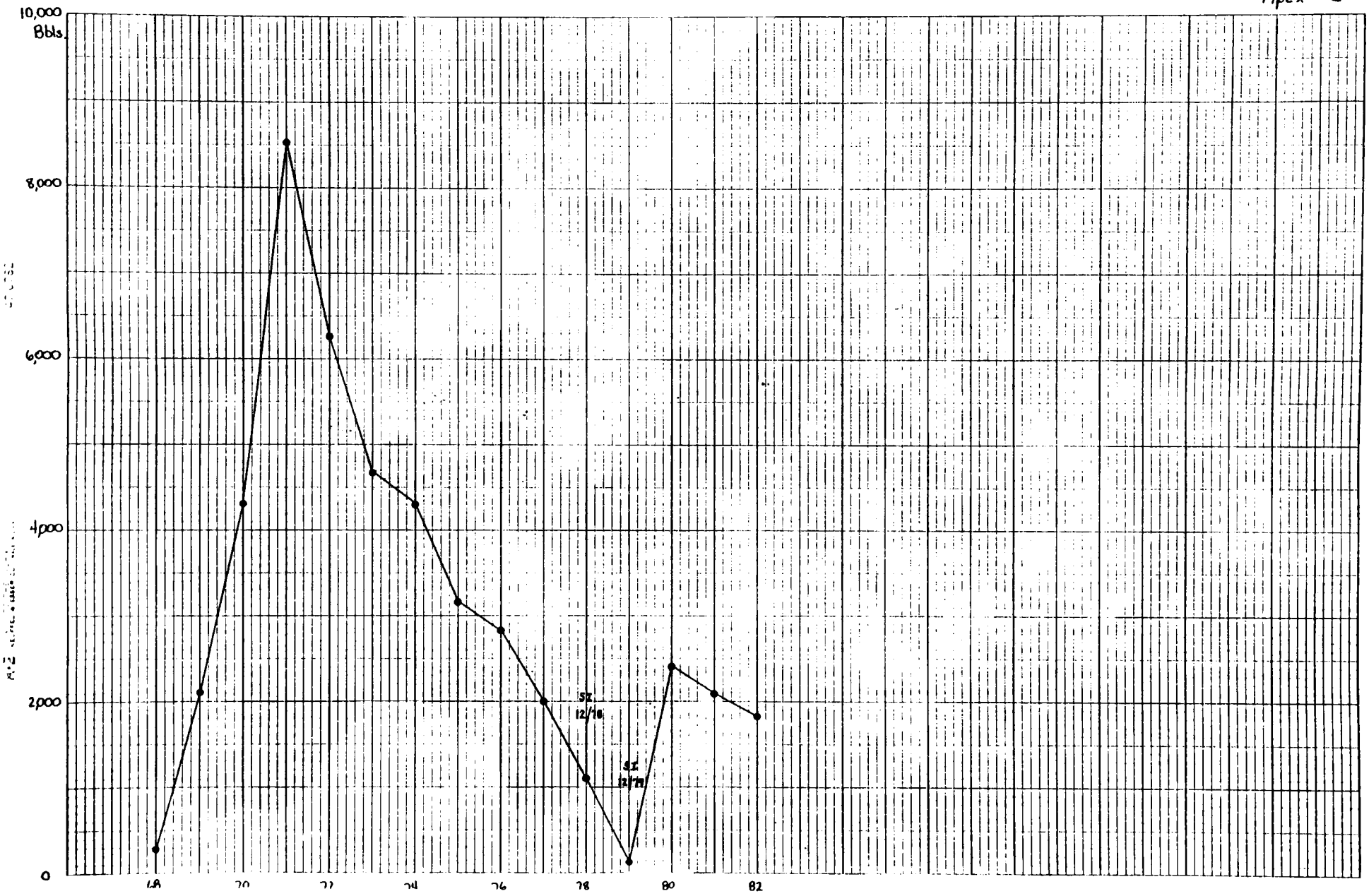
Anton - J



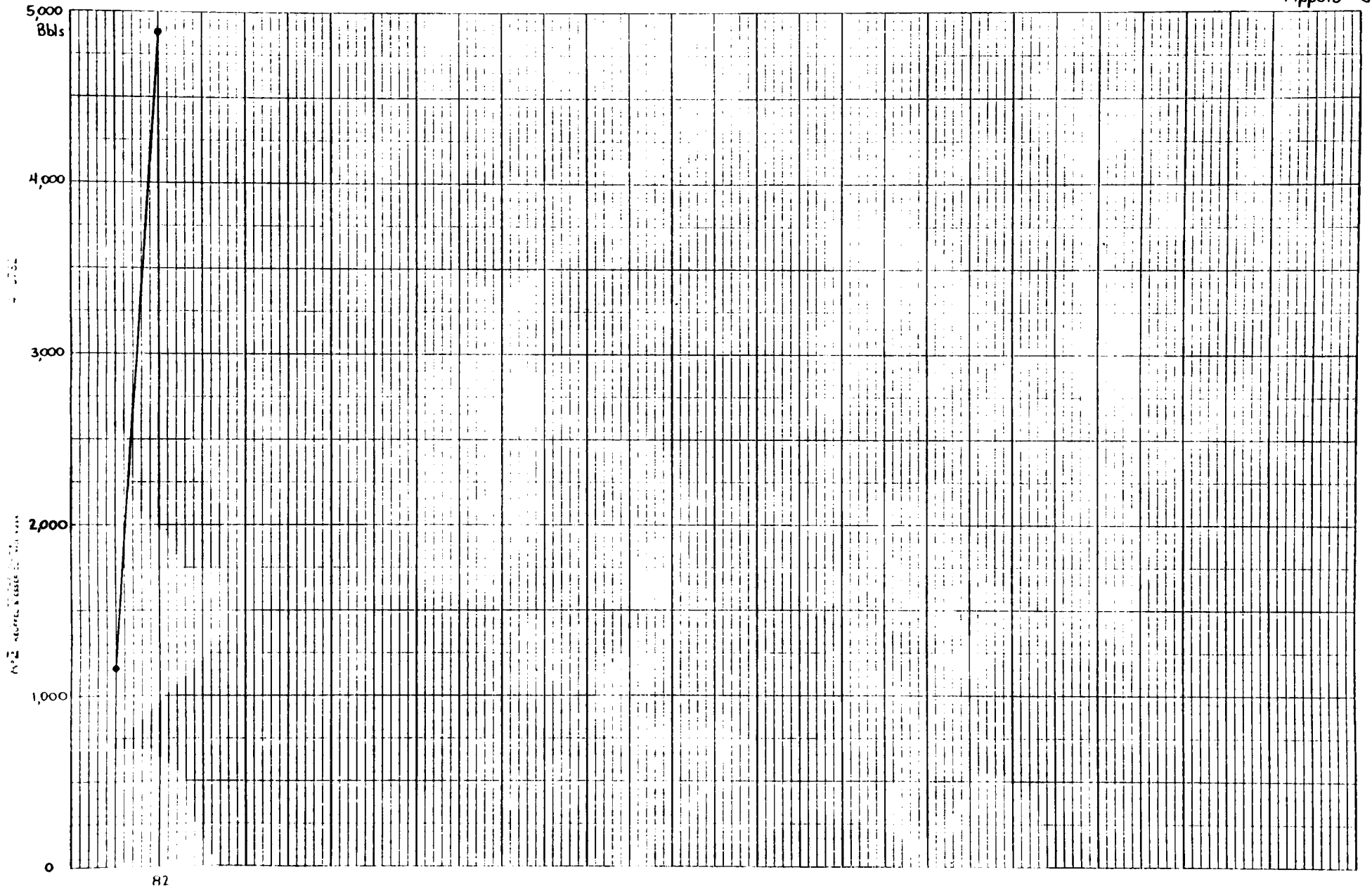
Akron East - D


200,000
Bbls.
160,000
120,000
80,000
40,000
0
200,000
MCF
160,000
120,000
80,000
40,000
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82

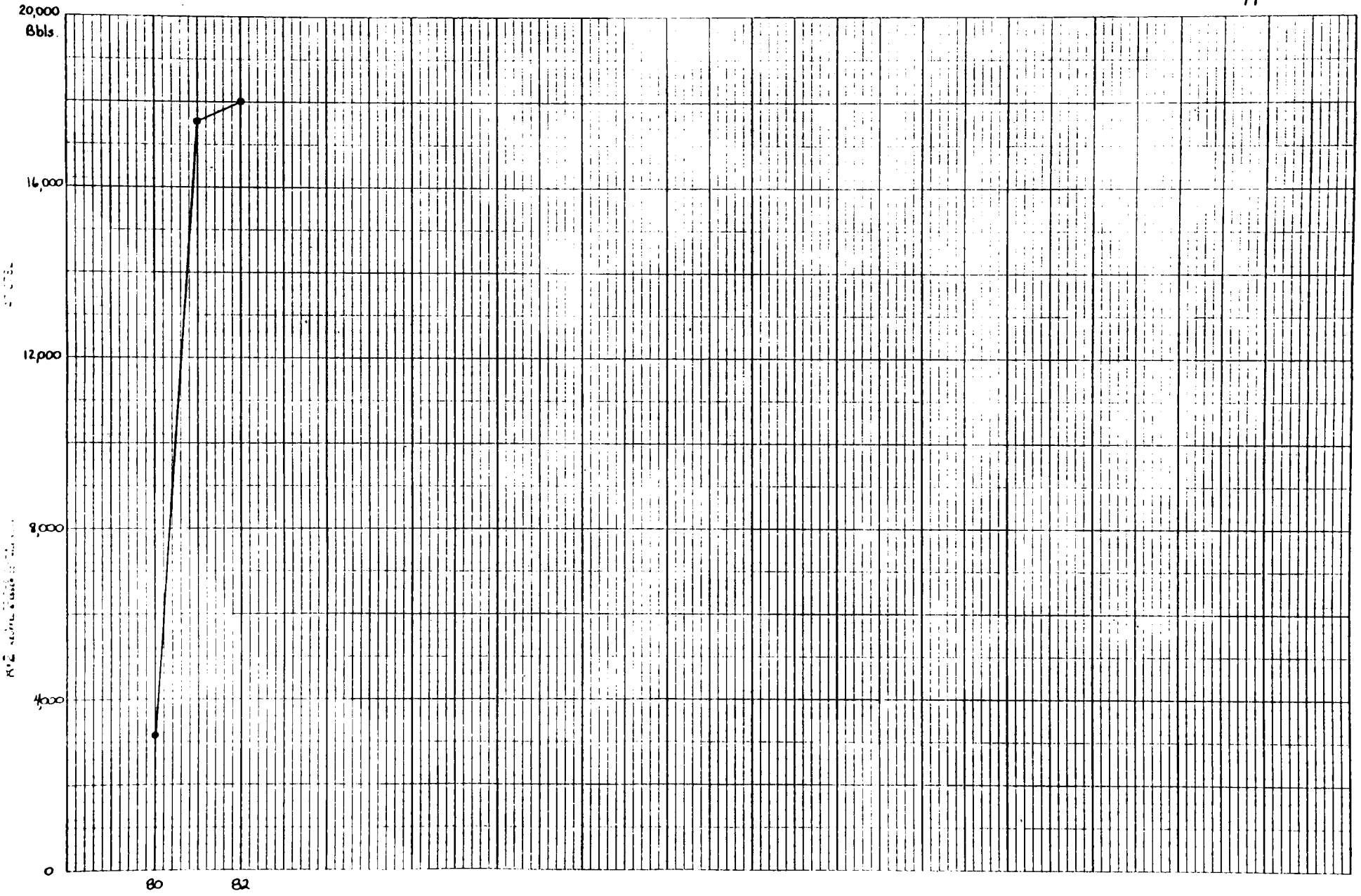
Apex - J

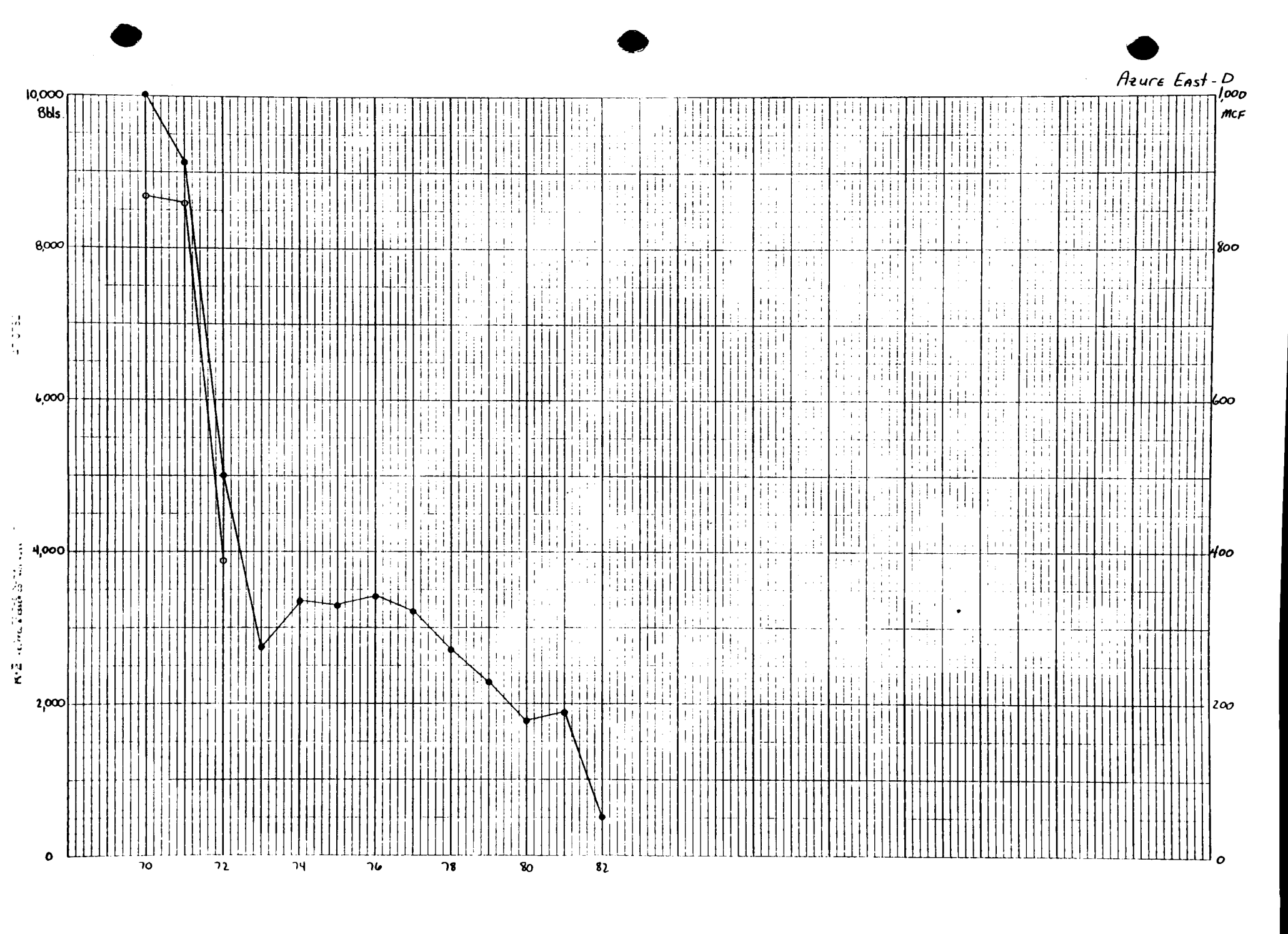


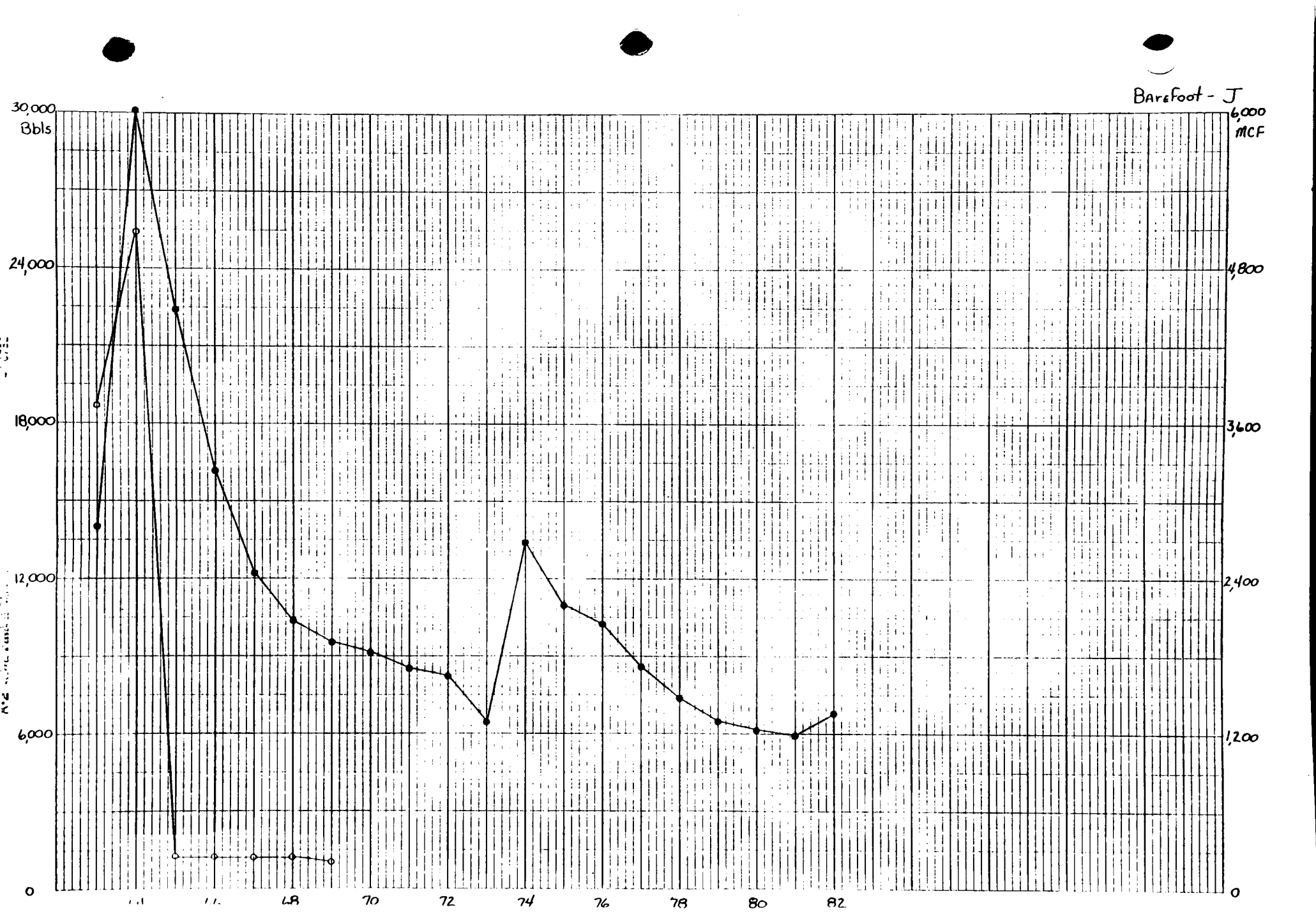
Appolo - J

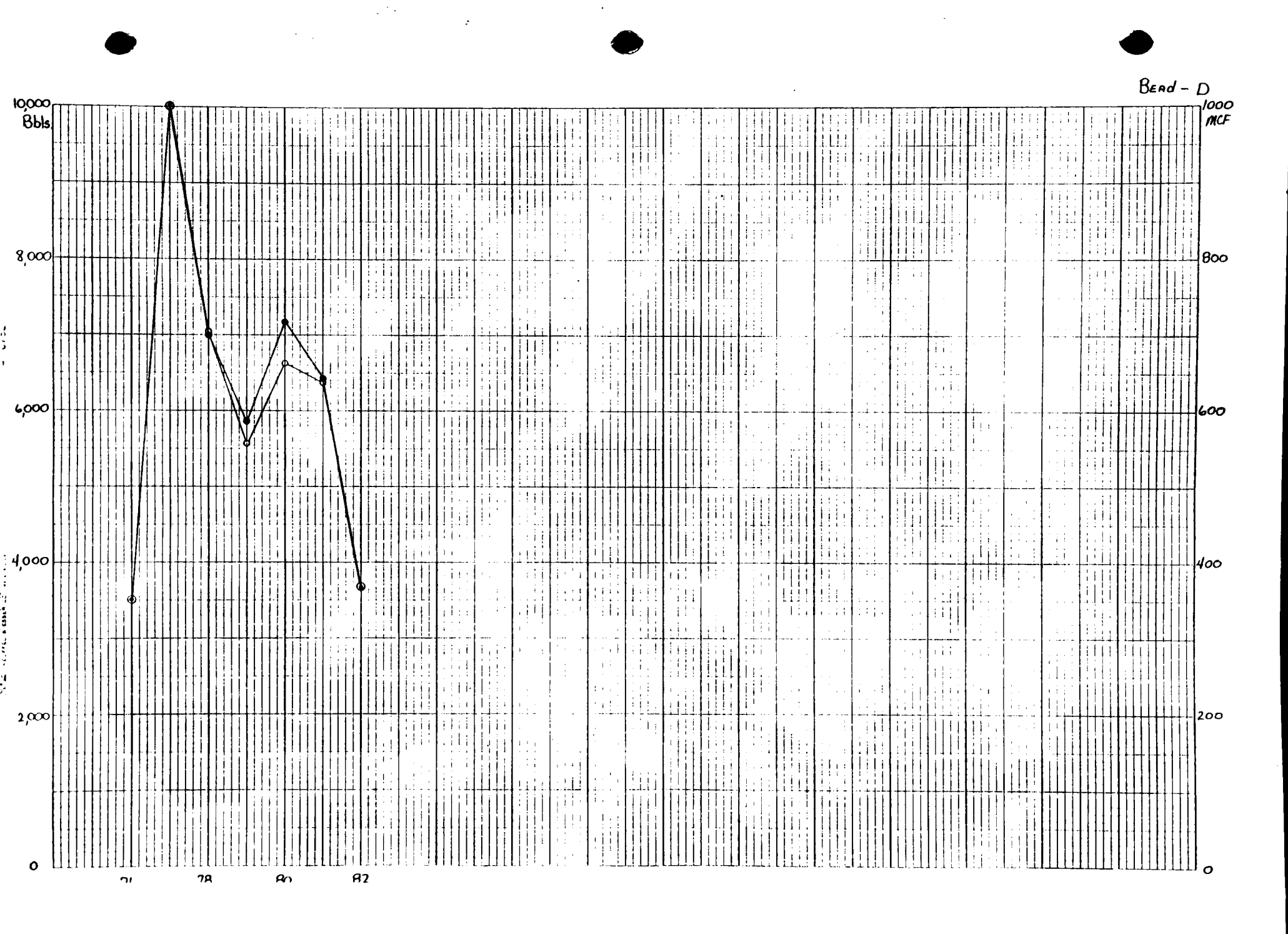


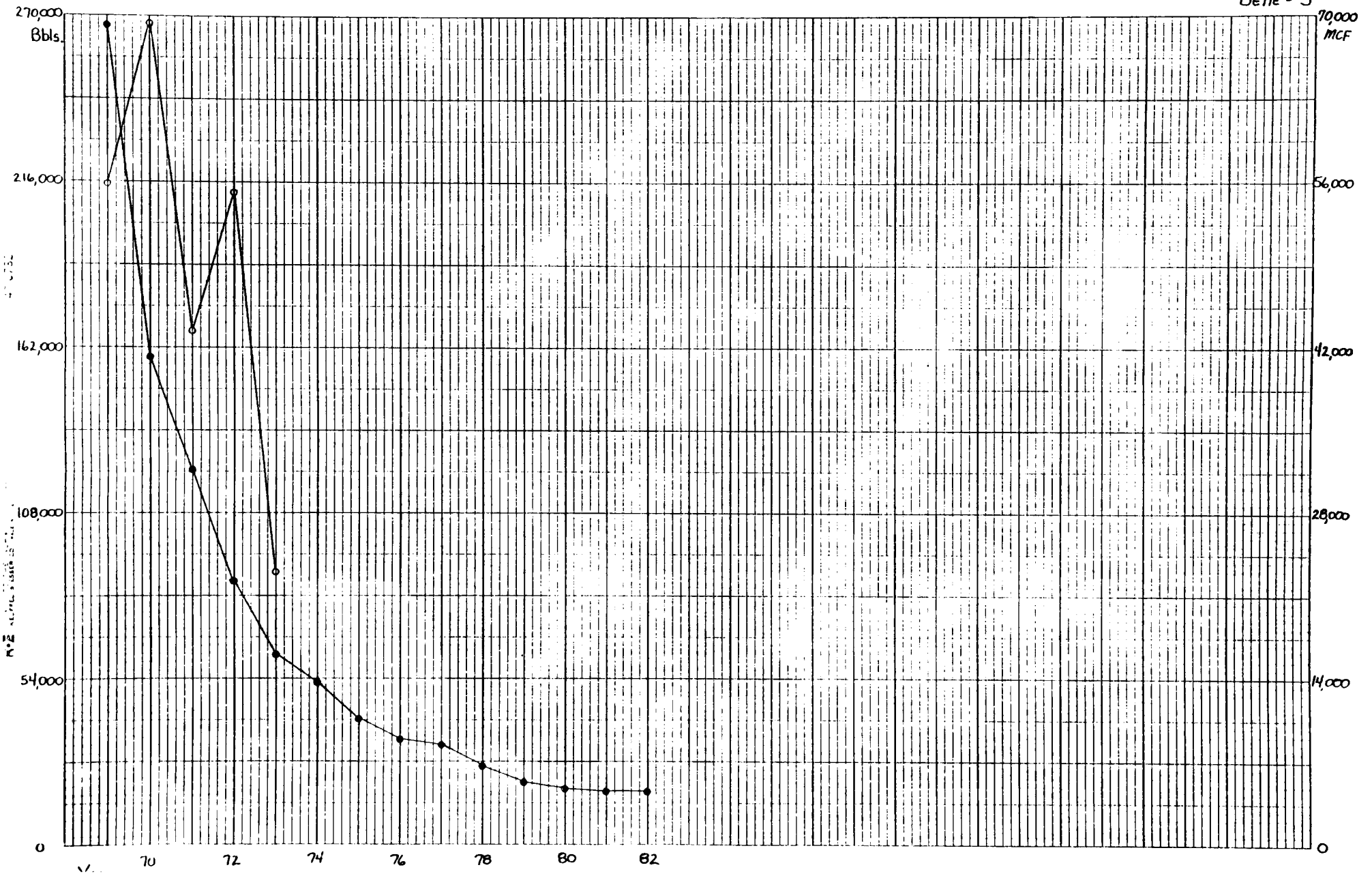
Appaloosa - J

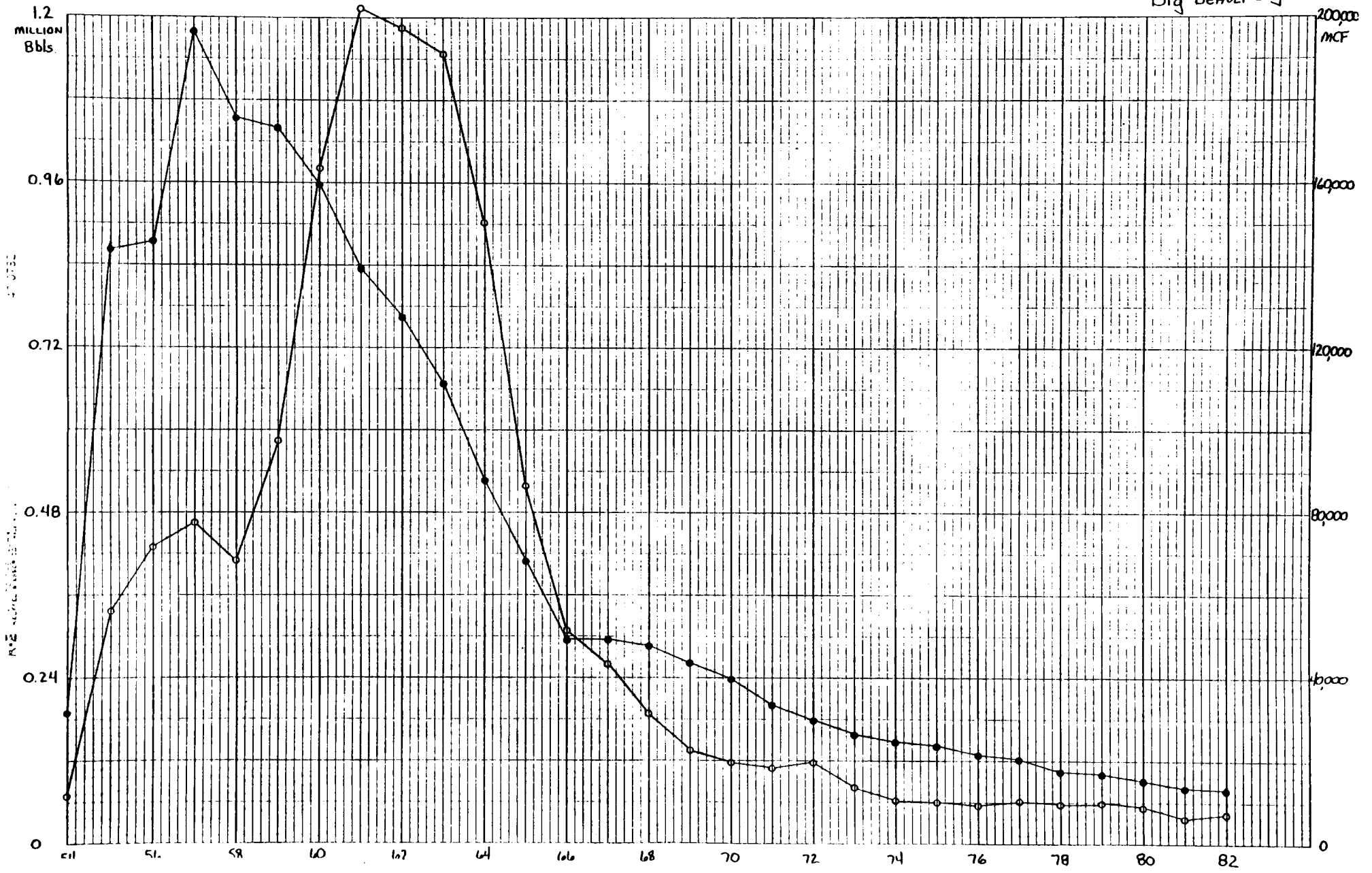


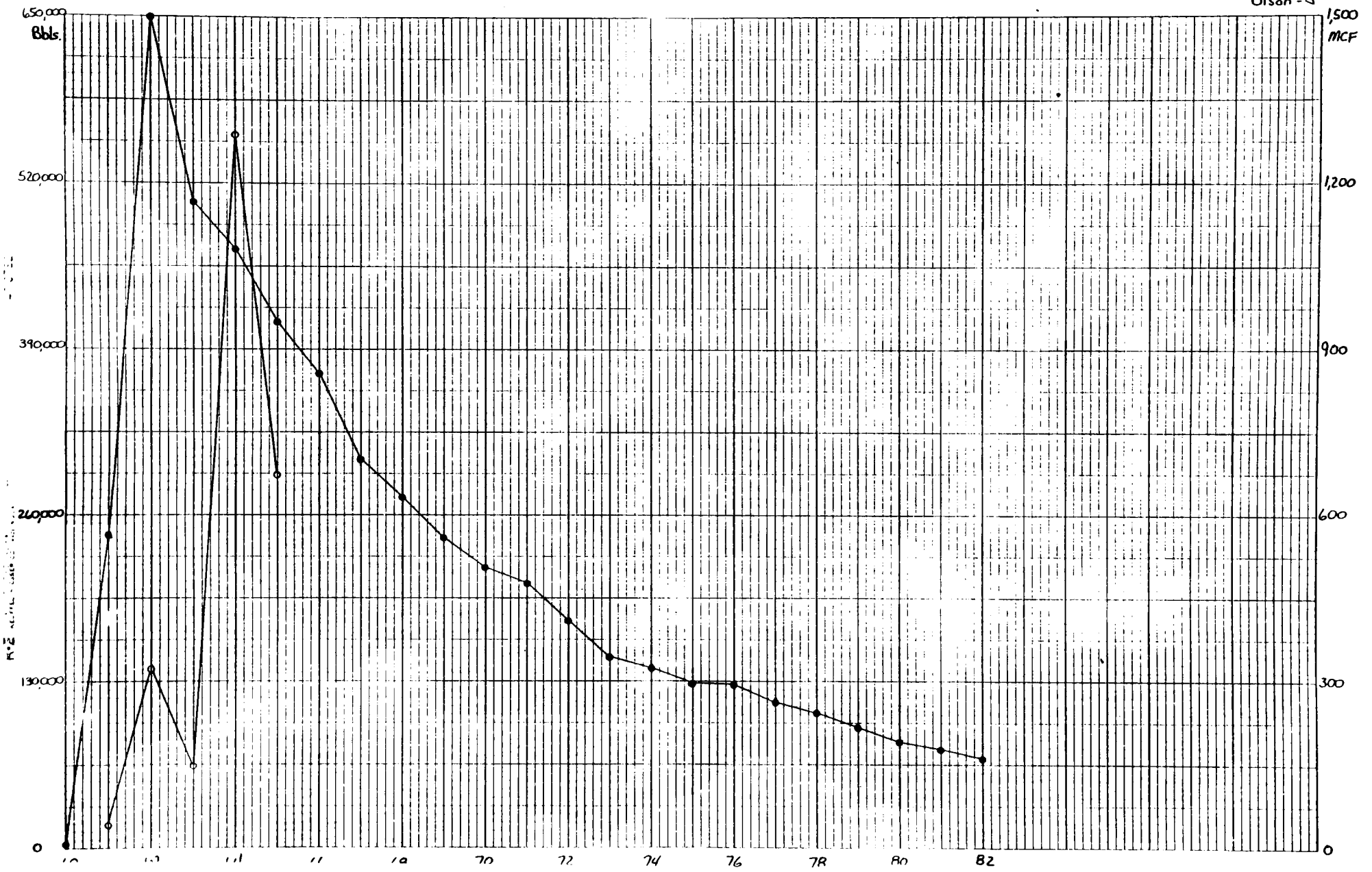

Azure East - D
10,000
Bbls
8,000
6,000
4,000
2,000
0
1,000
MCF
800
600
400
200
0
70
72
74
76
78
80
82


Barefoot - J
30,000
Bbls
24,000
18,000
12,000
6,000
0
6,000
MCF
4,800
3,600
2,400
1,200
0
68
70
72
74
76
78
80
82

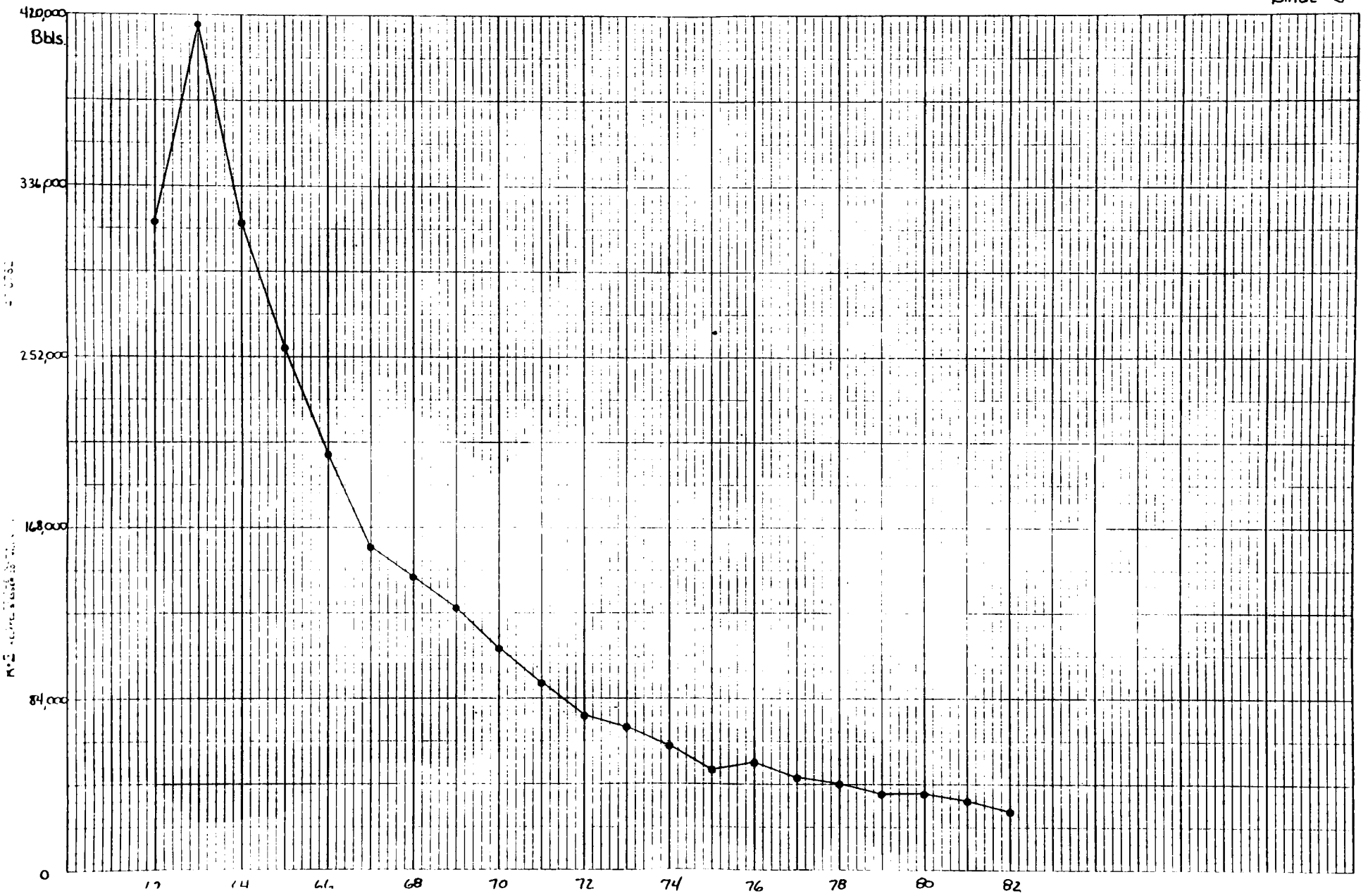

Bead - D
10,000
Bbls.
8,000
6,000
4,000
2,000
0
1000
MCF
800
600
400
200
0
71
78
80
82


Belle - J
270,000
Bbls.
216,000
162,000
108,000
54,000
0
70,000
MCF
56,000
42,000
28,000
14,000
0
70
72
74
76
78
80
82

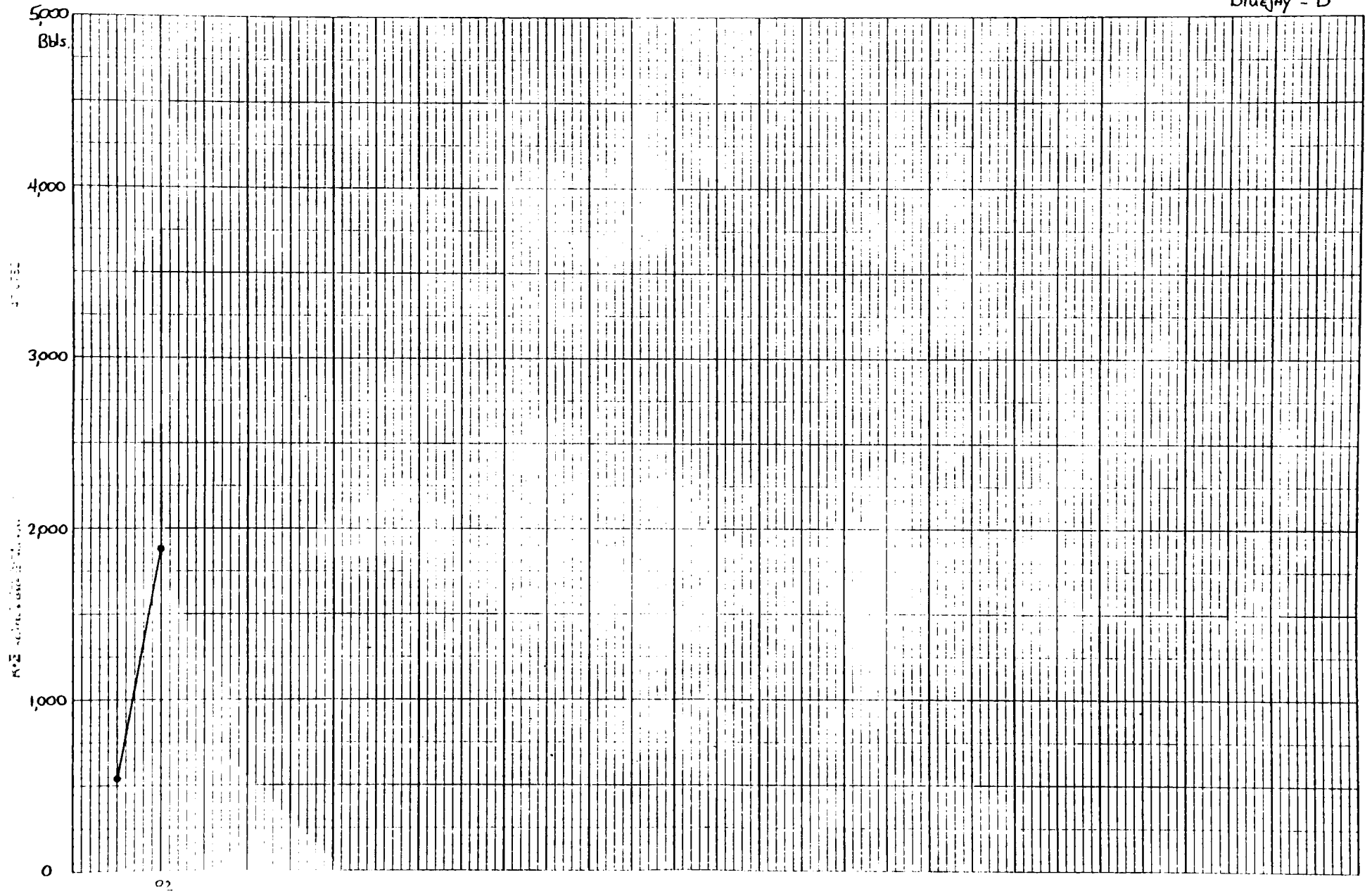

Big Beaver - J
1.2
MILLION
Bbls
0.96
0.72
0.48
0.24
0
200,000
MCF
160,000
120,000
80,000
40,000
0
70
72
74
76
78
80
82

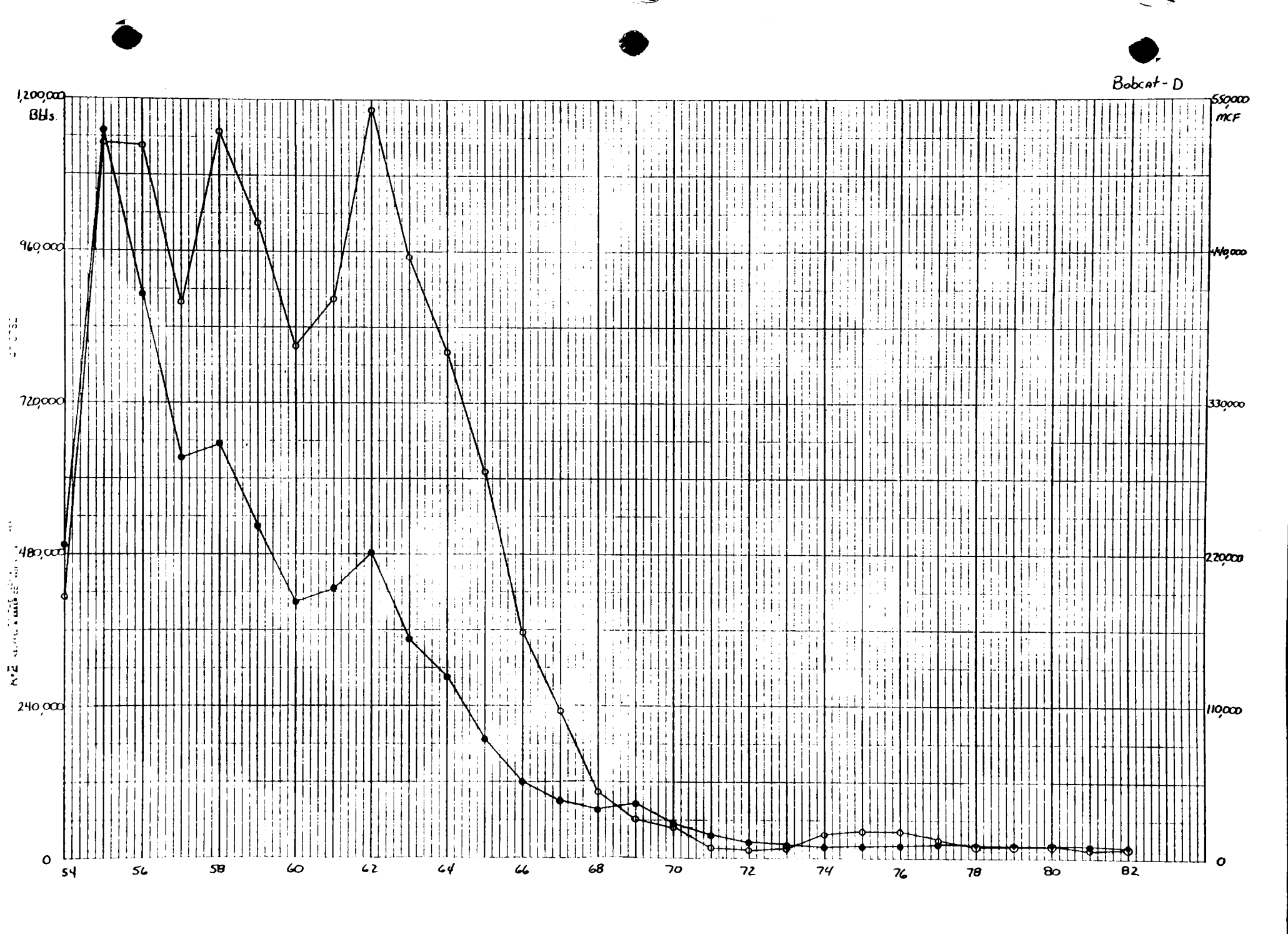

Bison - J
650,000
Bbls.
520,000
390,000
260,000
130,000
0
1,500
MCF
1,200
900
600
300
0
70
72
74
76
78
80
82

Blade - J

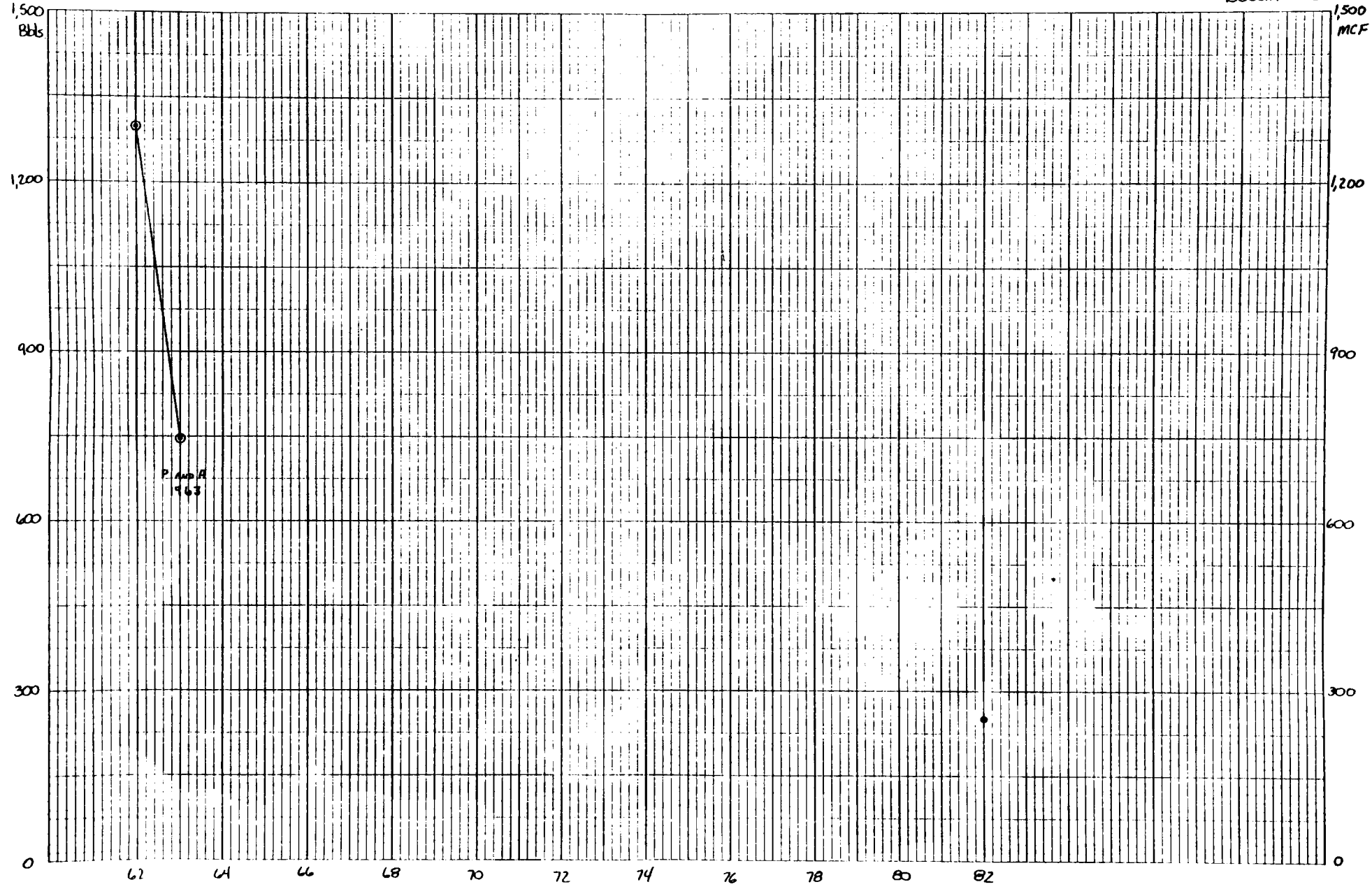

420,000
Bbls
336,000
252,000
168,000
84,000
0
68
70
72
74
76
78
80
82

Bluejay - D

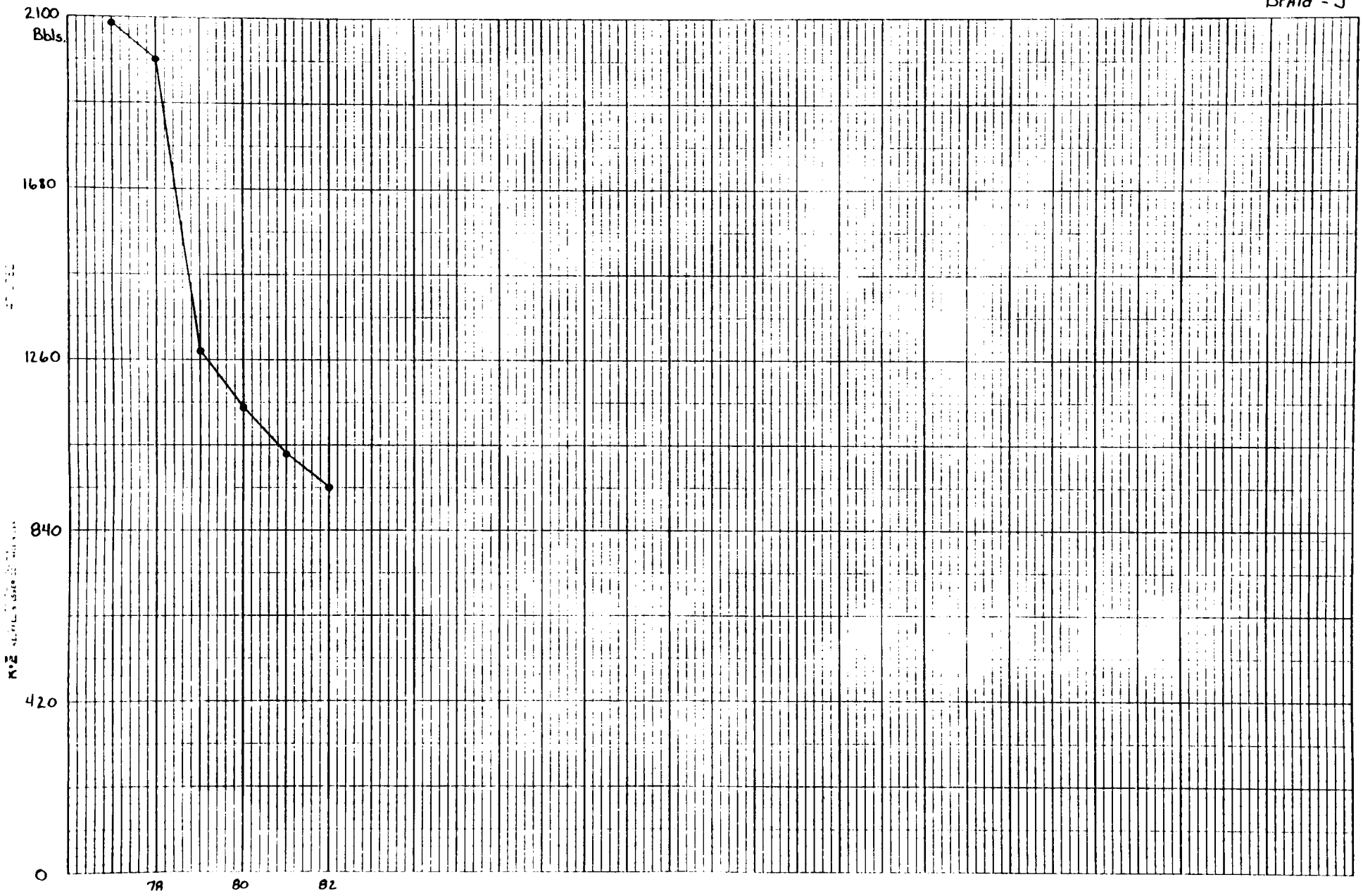



Bobcat - D
1,200,000
BBls
960,000
720,000
480,000
240,000
0
550000
MCF
440,000
330,000
220,000
110,000
0
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82

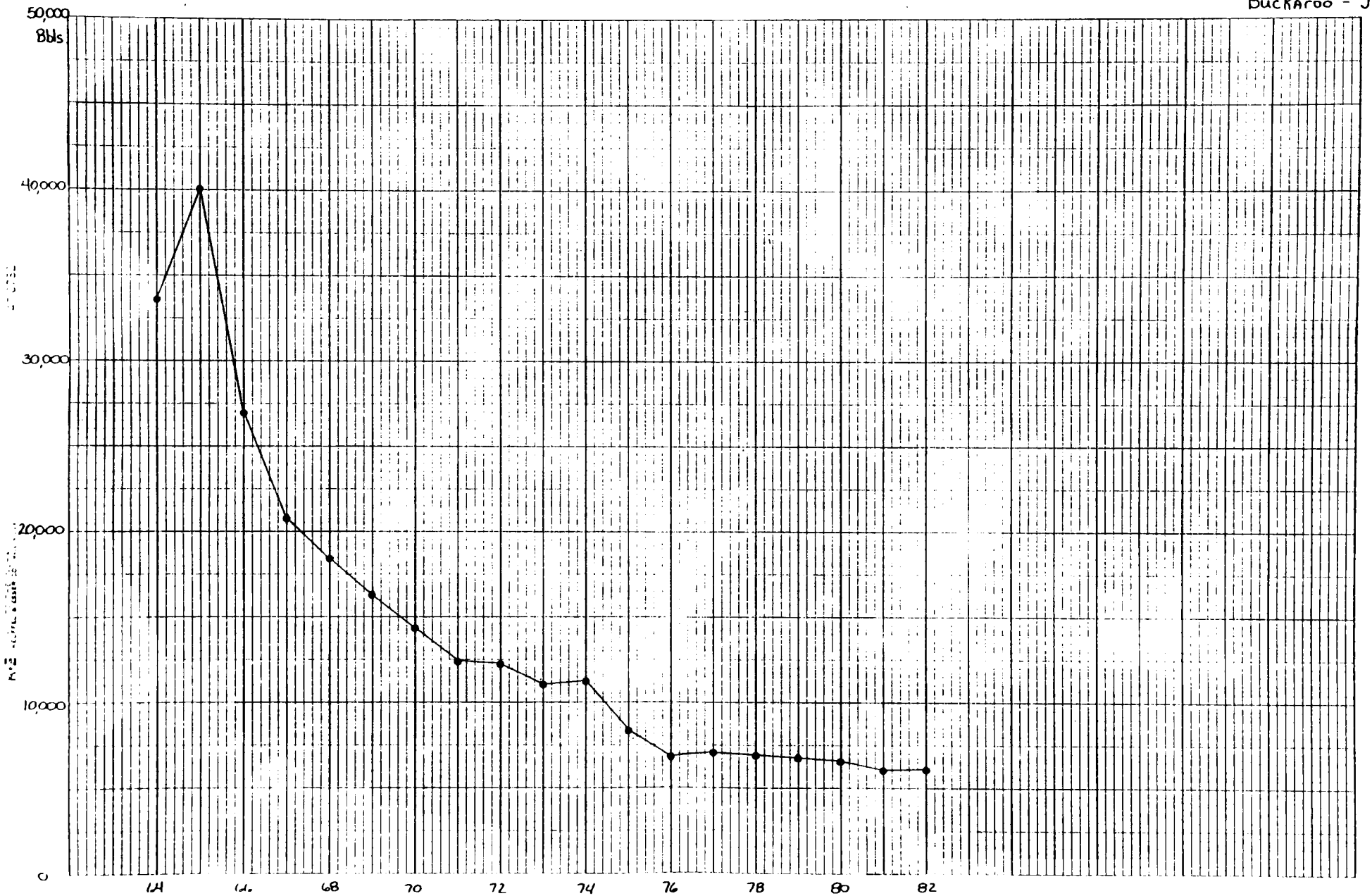
Bobcat - J

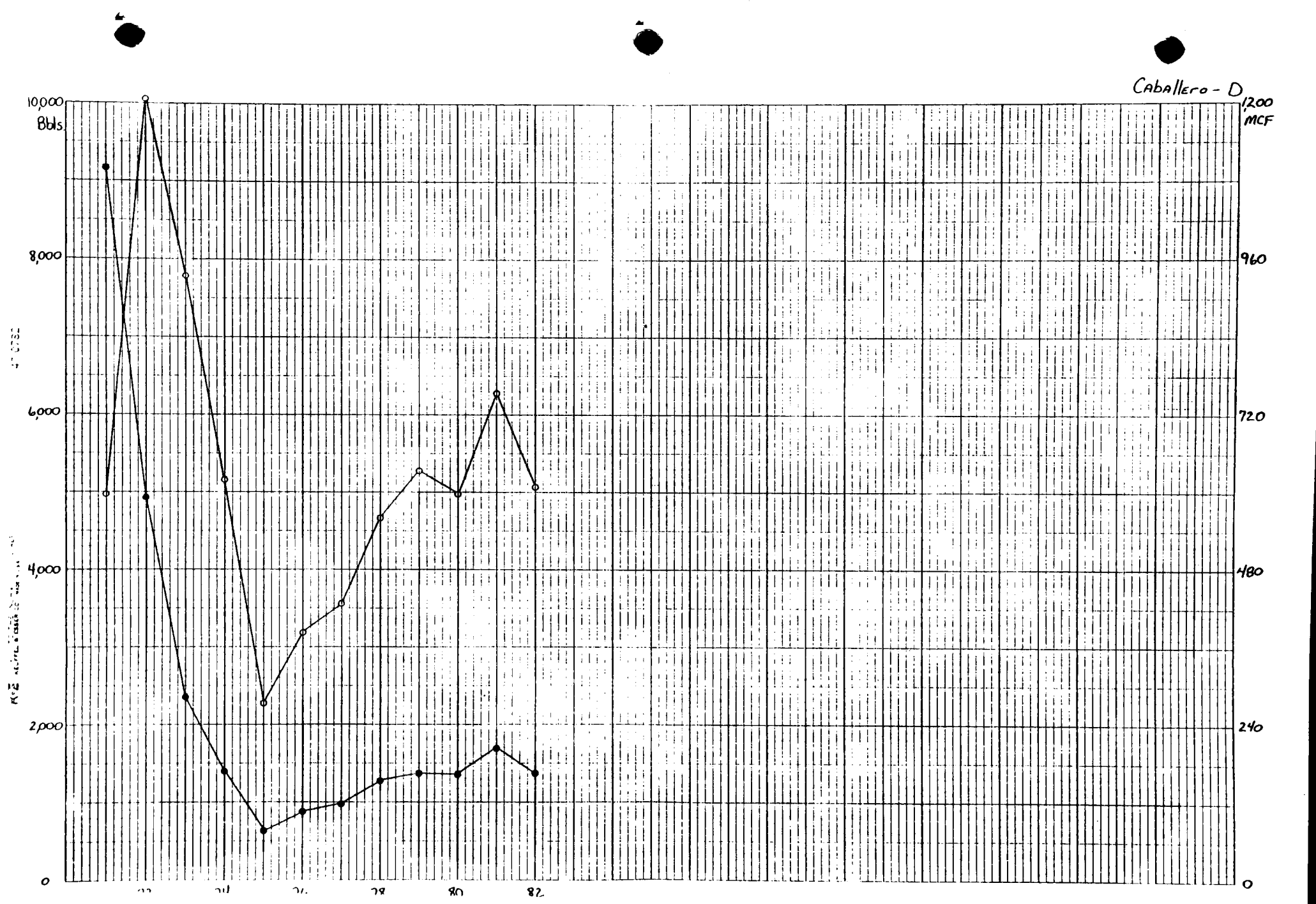

1,500 Bbls
1,200
900
600
300
0
1,500 MCF
1,200
900
600
300
0
P and A 1963
62
64
66
68
70
72
74
76
78
80
82

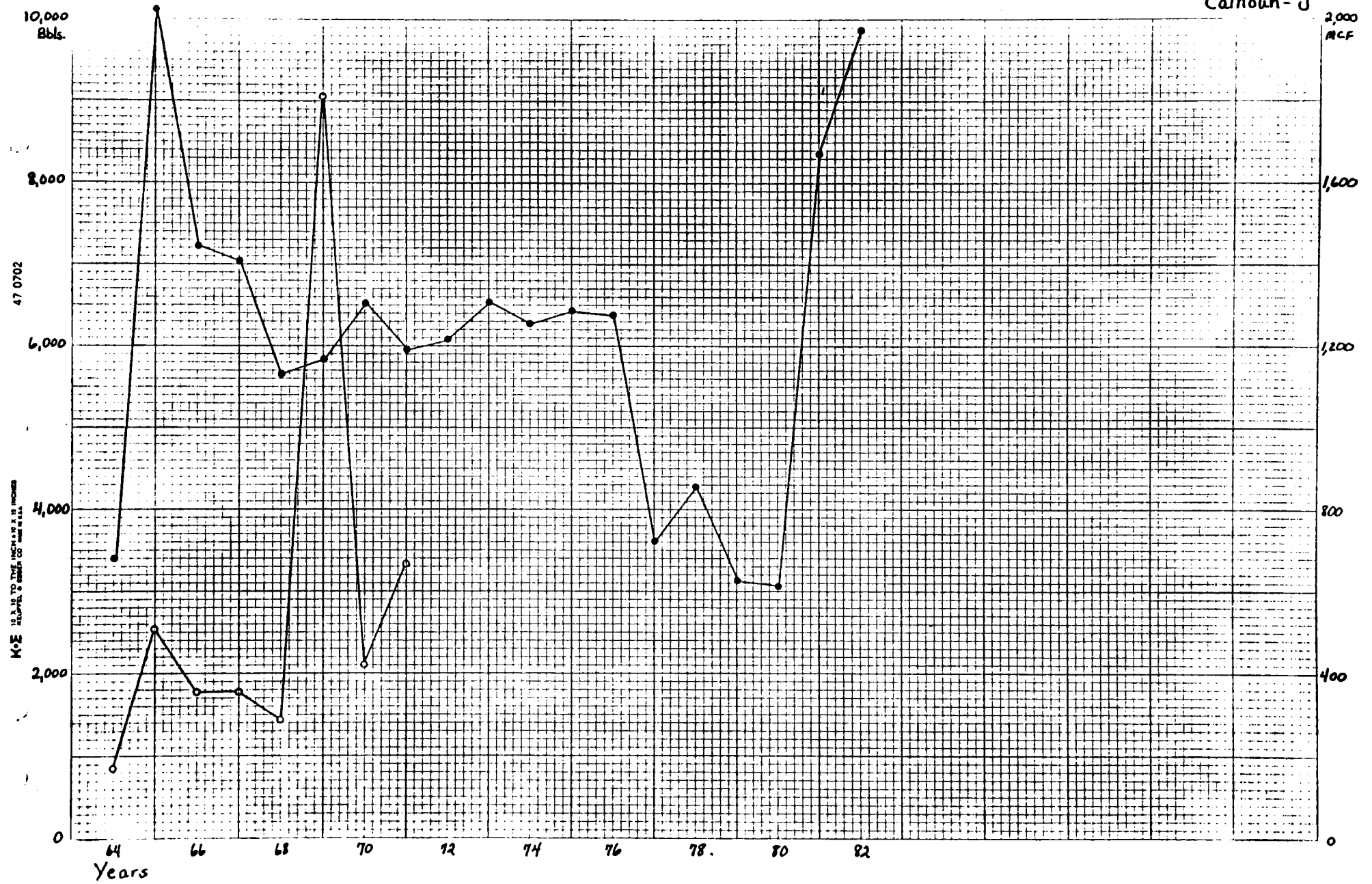
Braid - J

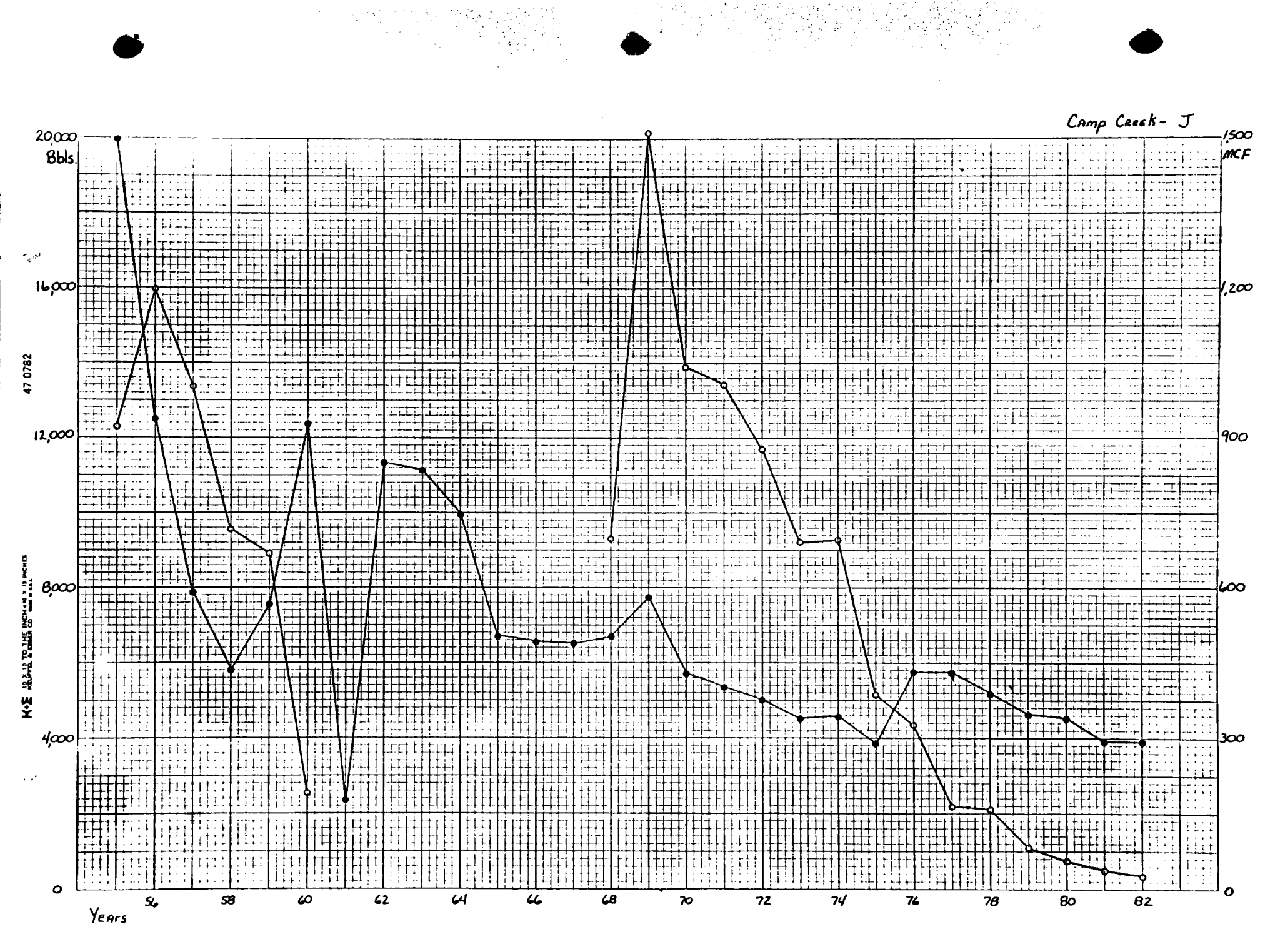


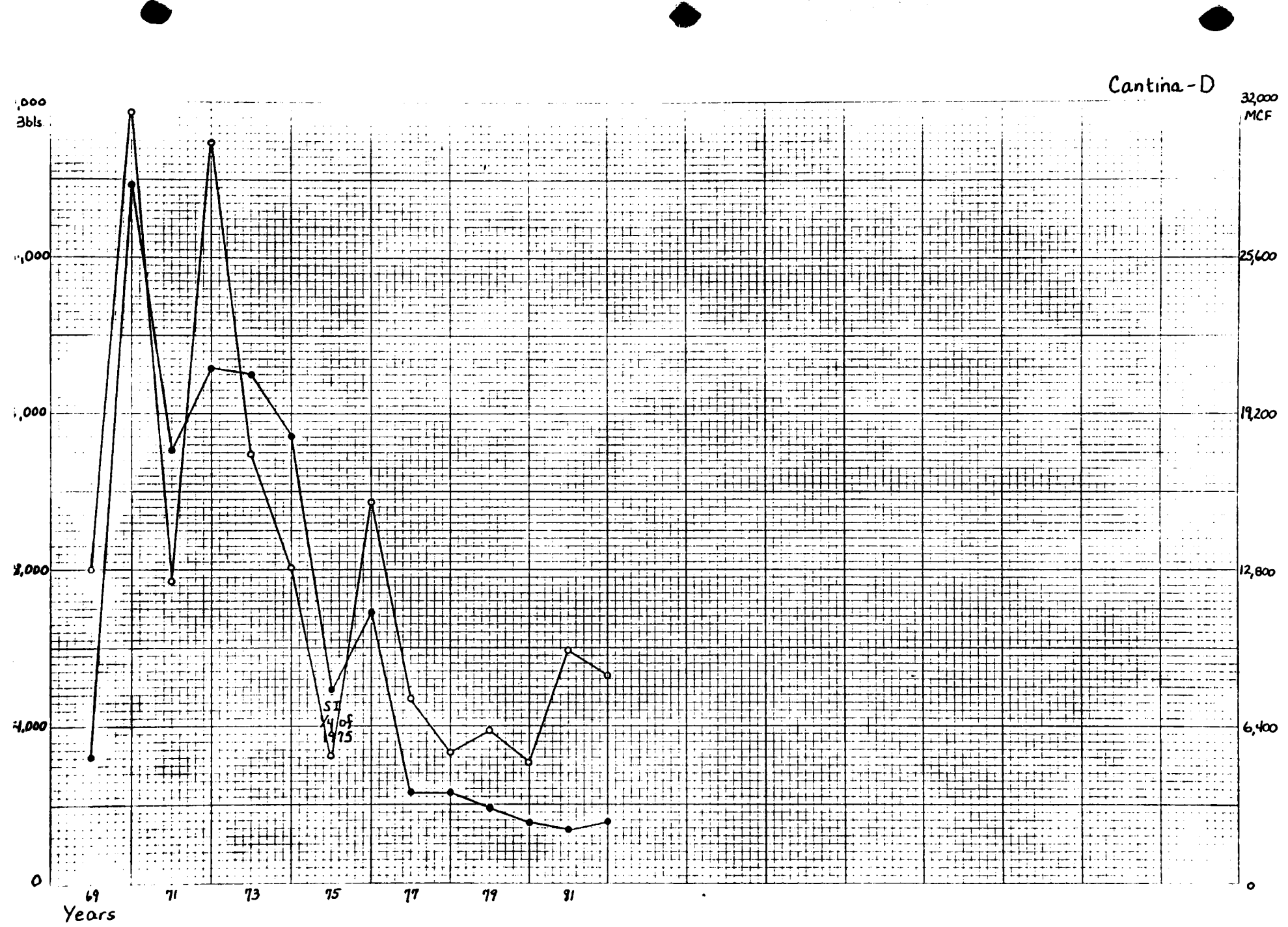
Buckaroo - J



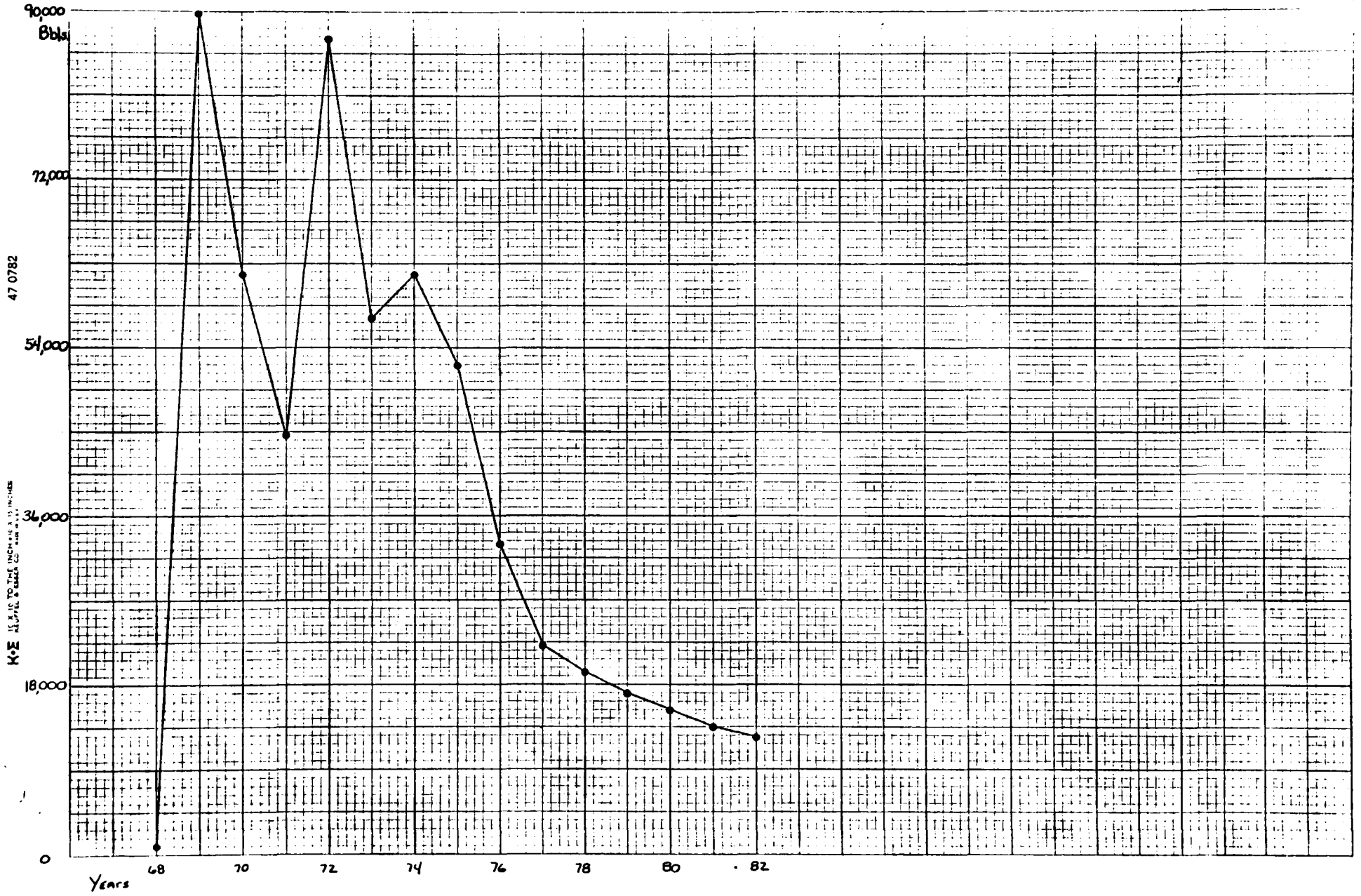

Caballero - D
10,000
Bbls
8,000
6,000
4,000
2,000
0
1,200
MCF
960
720
480
240
0
78
80
82

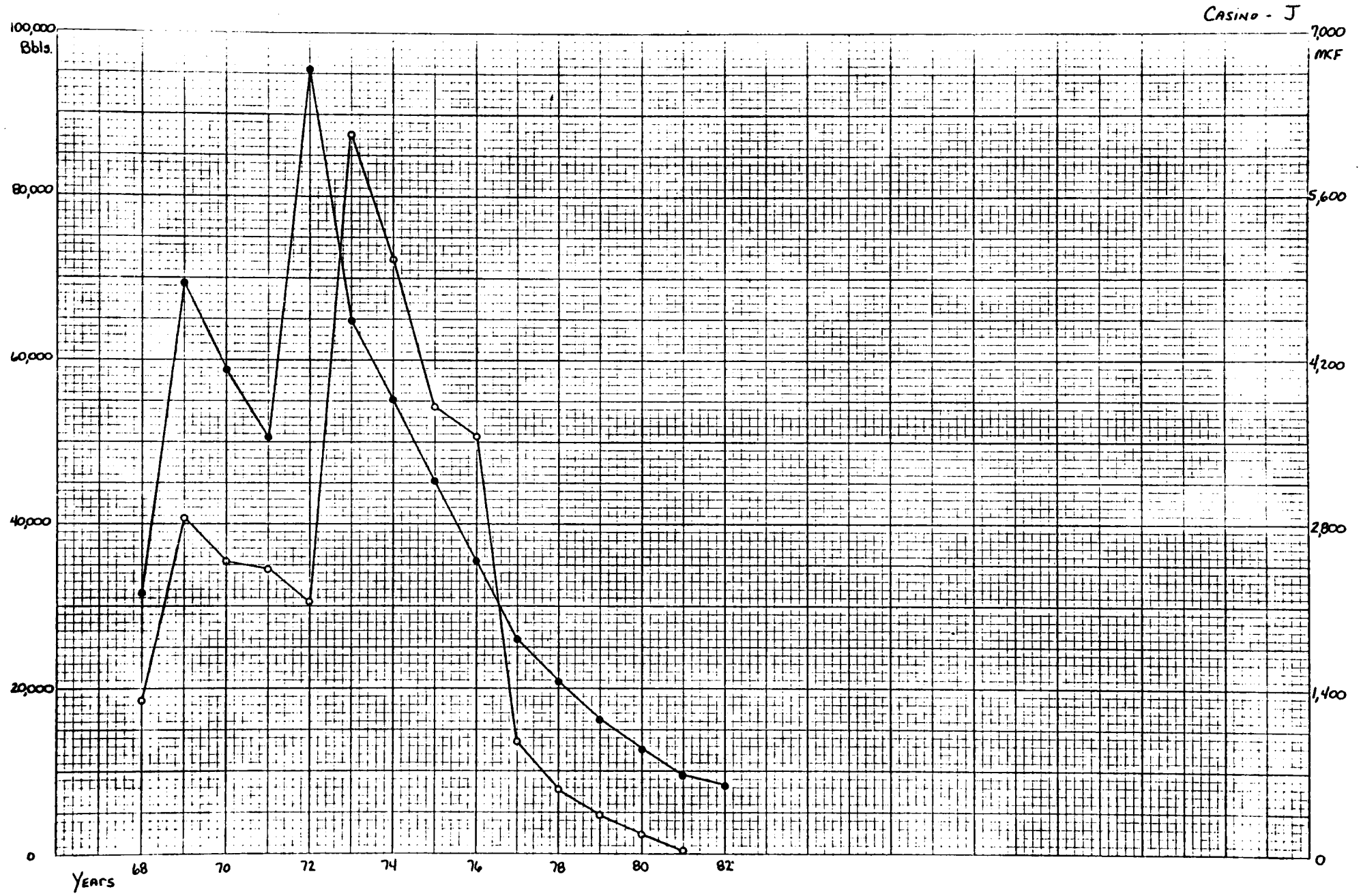

Calhoun - J
10,000 Bbls.
8,000
6,000
4,000
2,000
0
2,000 MCF
1,600
1,200
800
400
0
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K+E

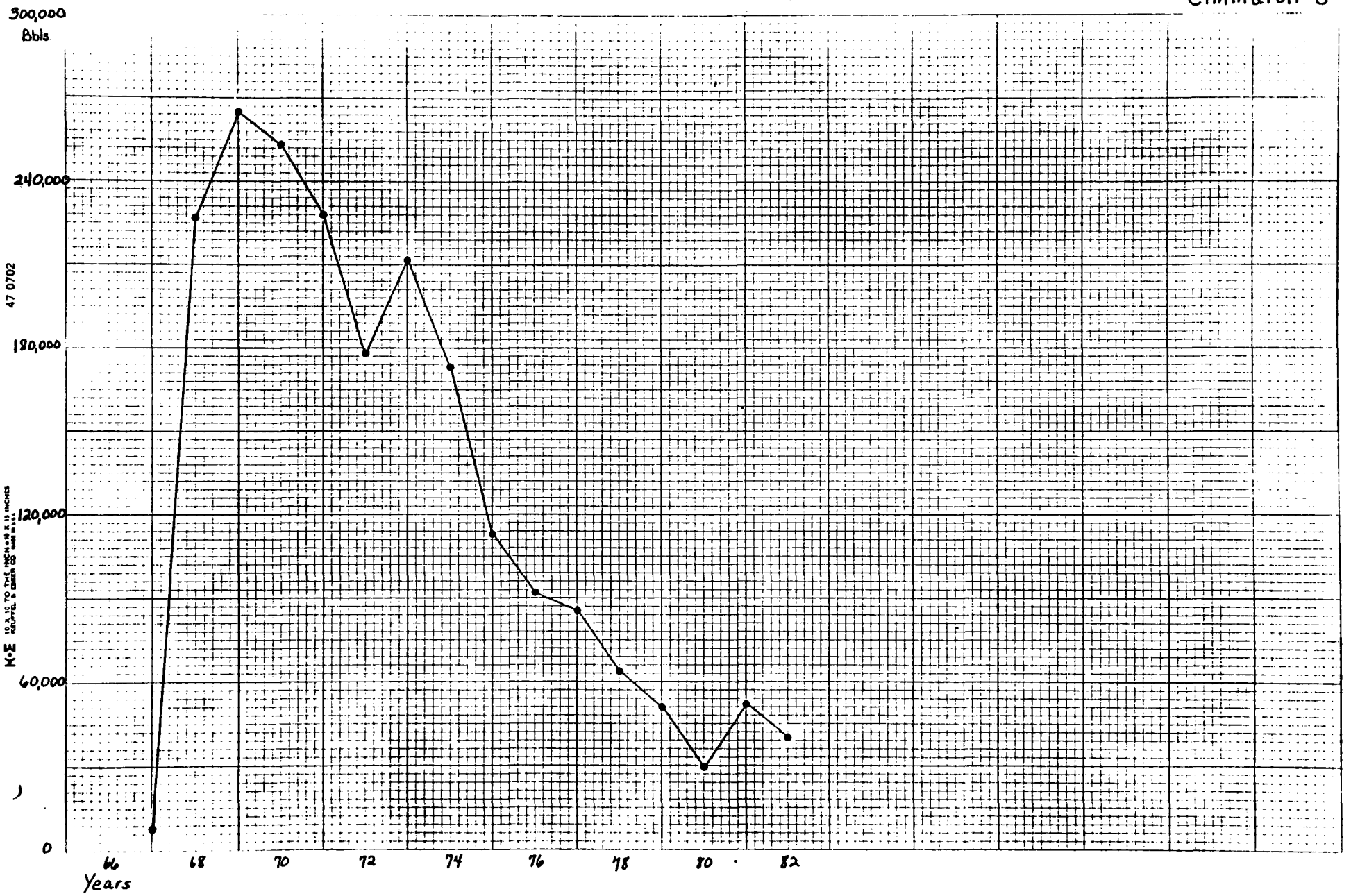

Camp Creek - J
20,000
8bls.
16,000
12,000
8,000
4,000
0
1,500
MCF
1,200
900
600
300
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0782
K&E

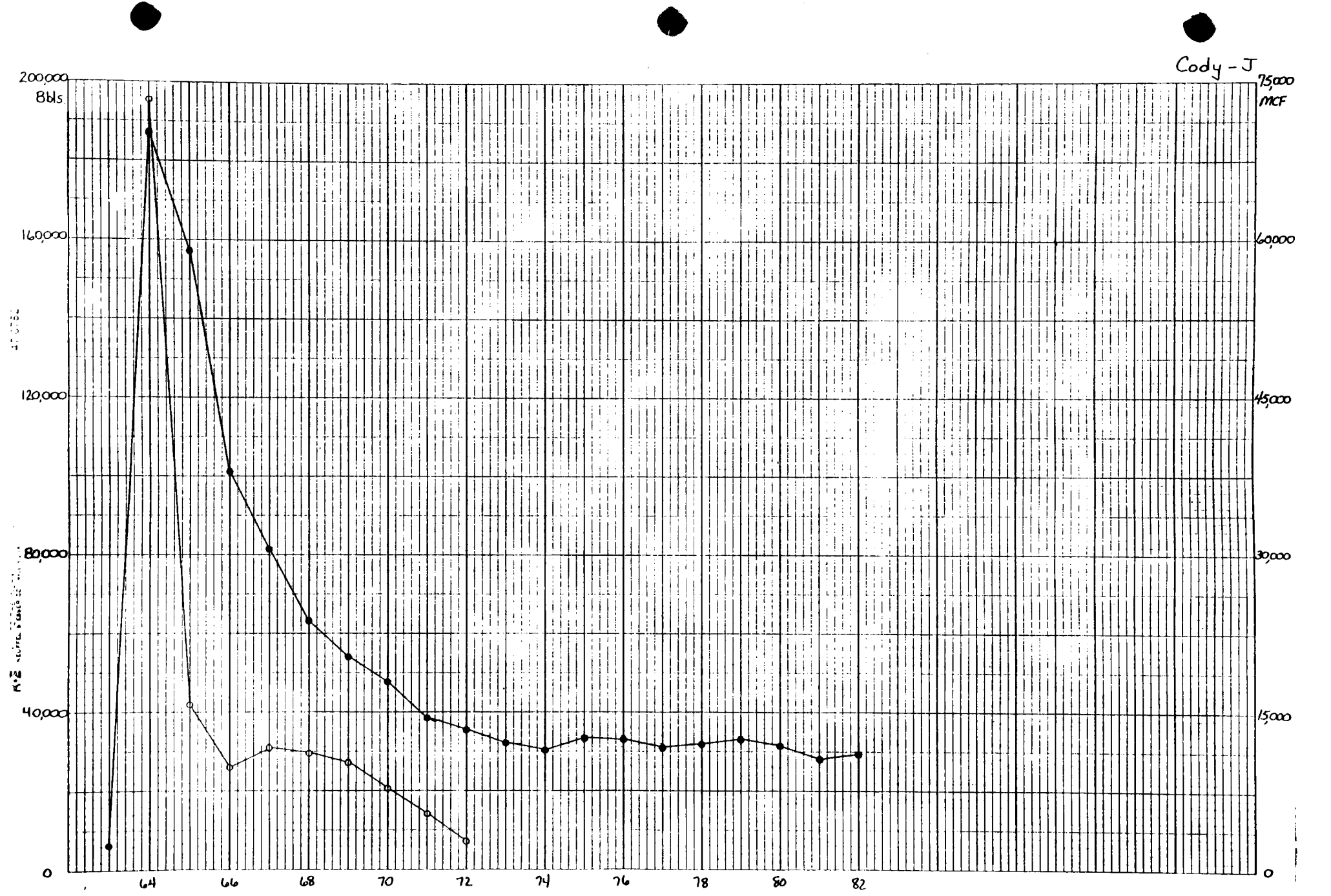

Cantina-D
,000
3bls
,000
,000
2,000
4,000
0
32,000
MCF
25,600
19,200
12,800
6,400
0
69
71
73
75
77
79
81
Years
SI
¼ of
1975

Caribou - J

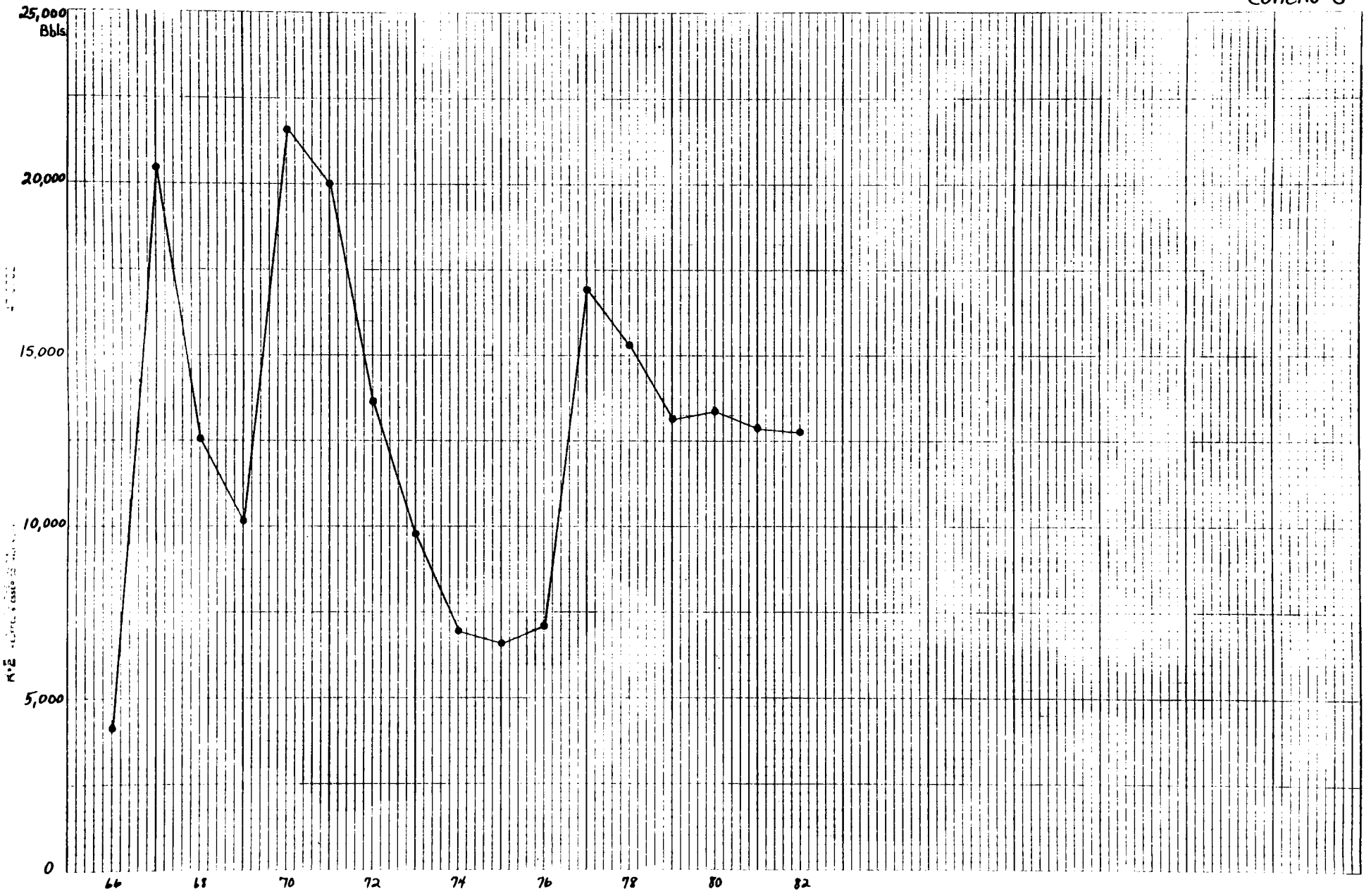

90,000
Bbls
72,000
54,000
36,000
18,000
0
68
70
72
74
76
78
80
82
Years
47 0782
K·E


CASINO - J
100,000
Bbls.
80,000
60,000
40,000
20,000
0
7,000
MCF
5,600
4,200
2,800
1,400
0
68
70
72
74
76
78
80
82
YEARS

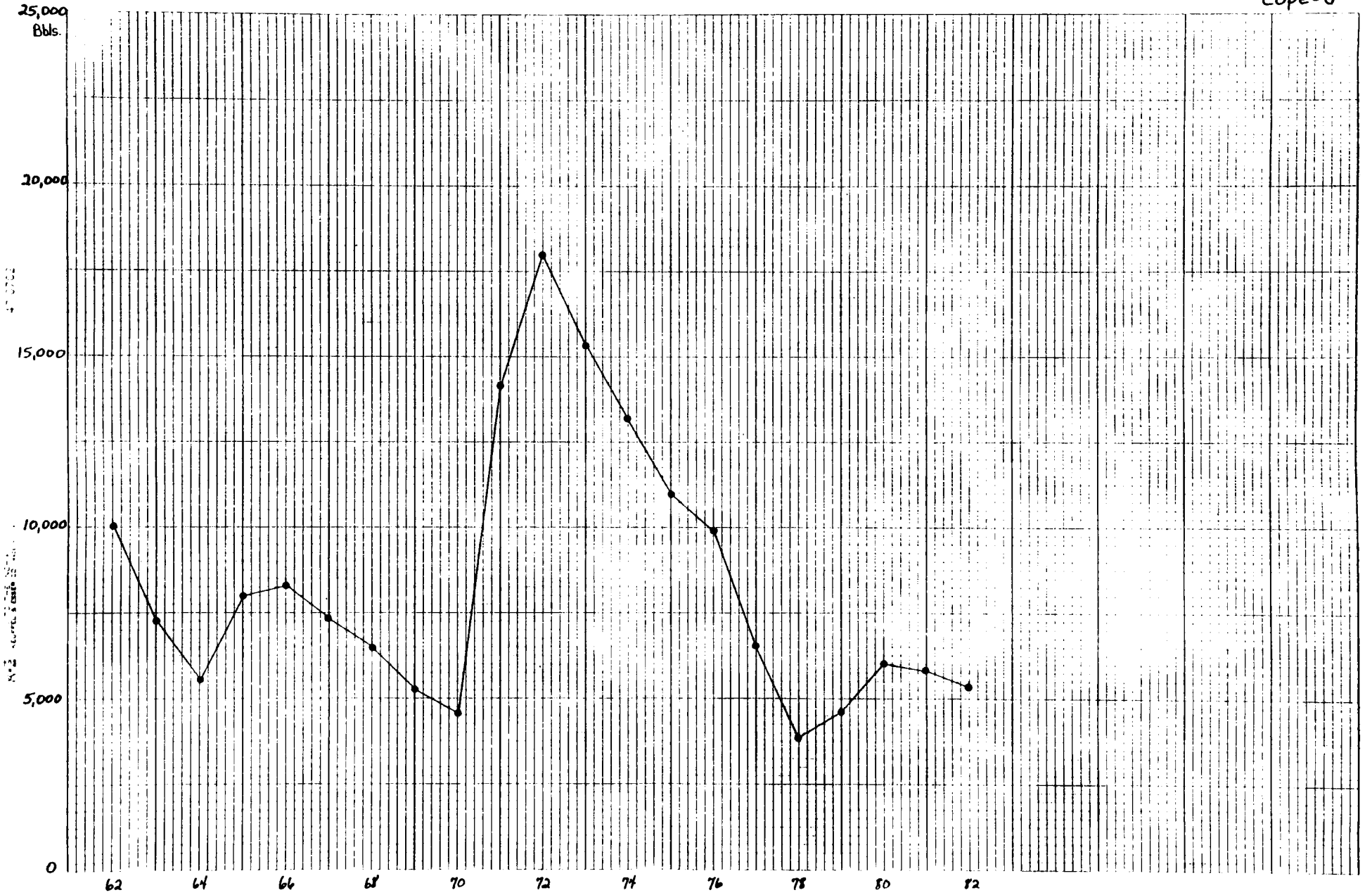

Cimmaron-J
300,000
Bbls
240,000
180,000
120,000
60,000
0
66
68
70
72
74
76
78
80
82
Years
47 0702
K+E


Cody - J
200,000
Bbls
160,000
120,000
80,000
40,000
0
75,000
MCF
60,000
45,000
30,000
15,000
0
64
66
68
70
72
74
76
78
80
82

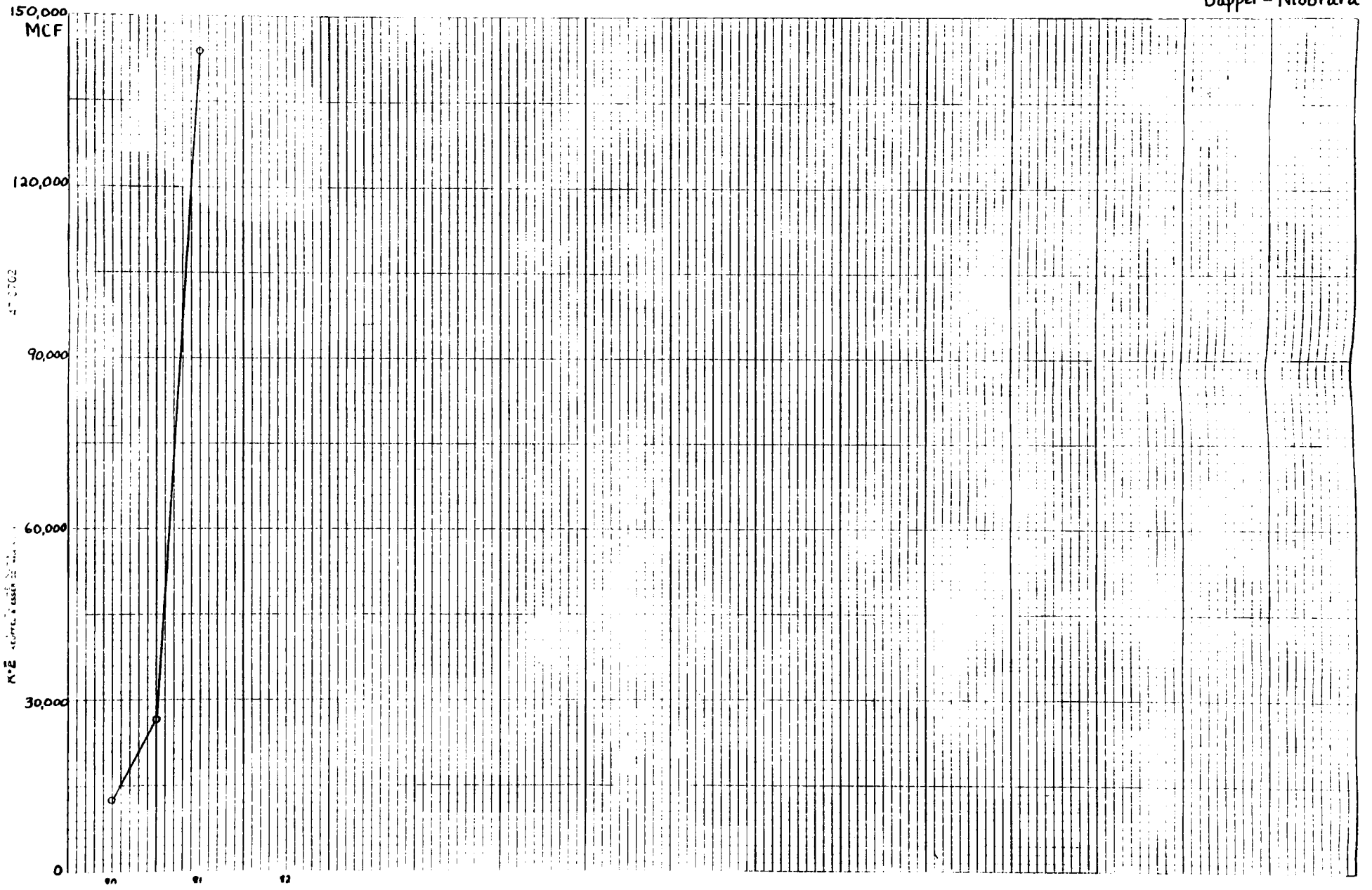
Concho-J

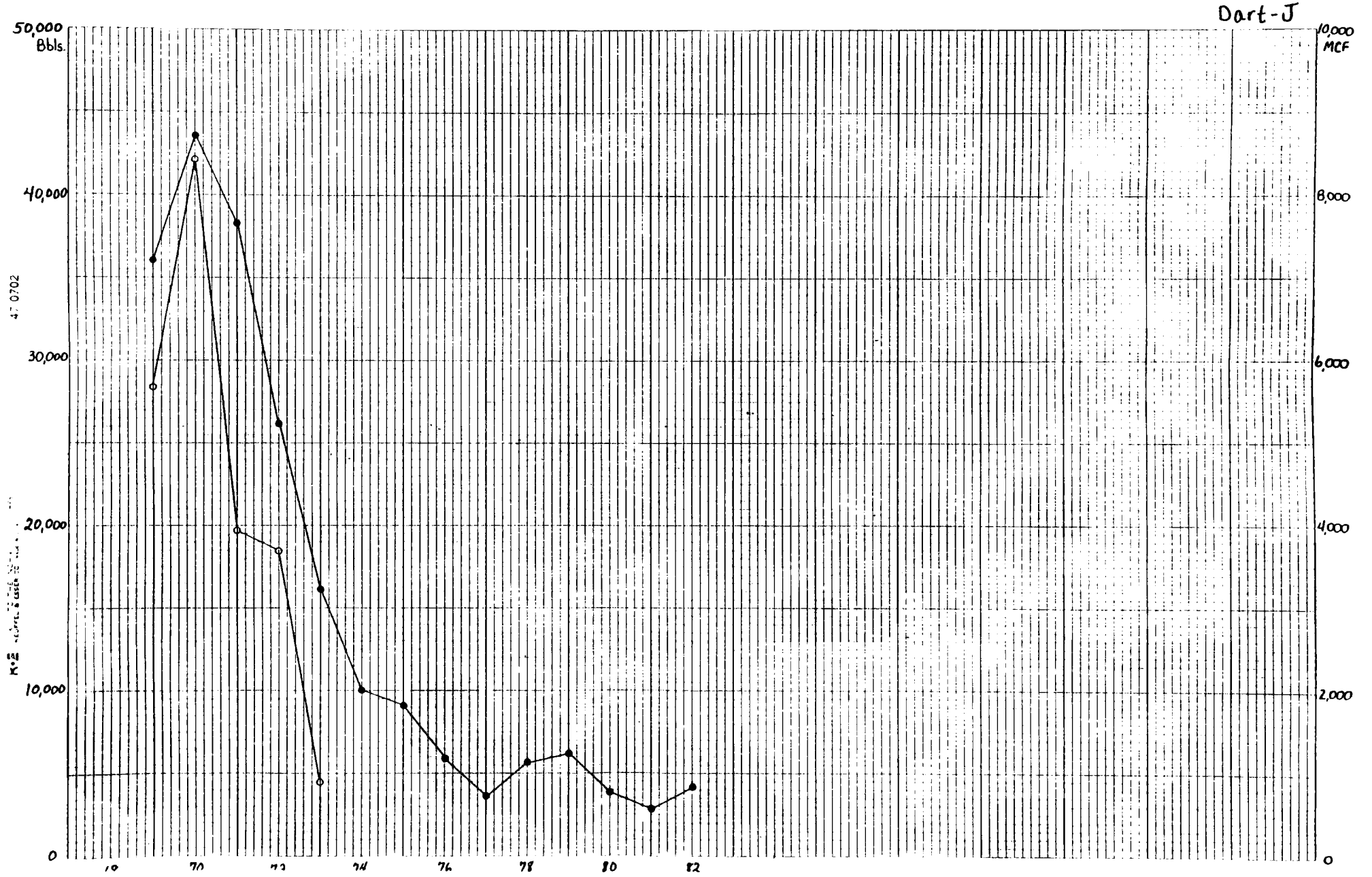


Cope-J

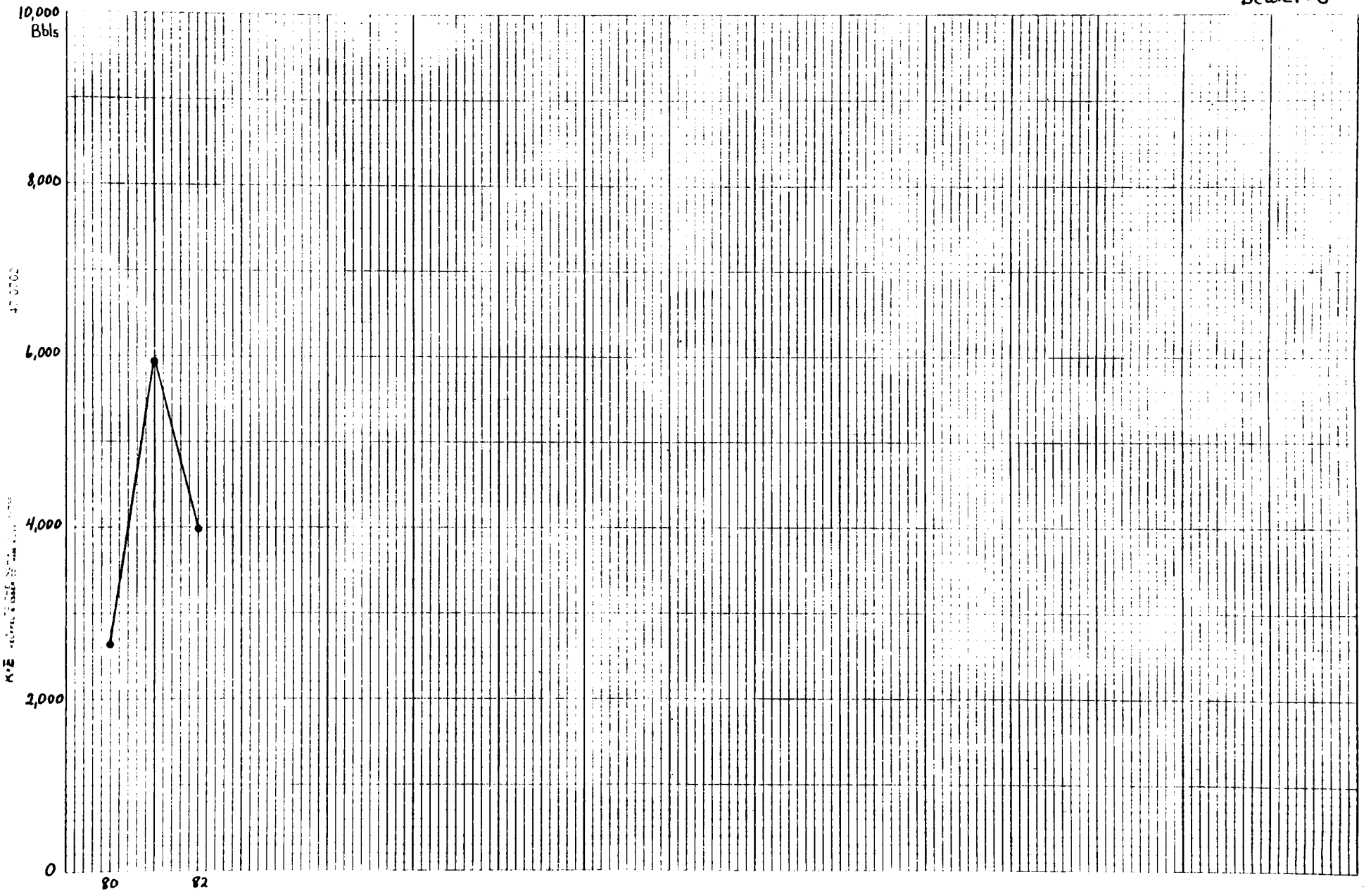

25,000
Bbls.
20,000
15,000
10,000
5,000
0
62
64
66
68
70
72
74
76
78
80
82

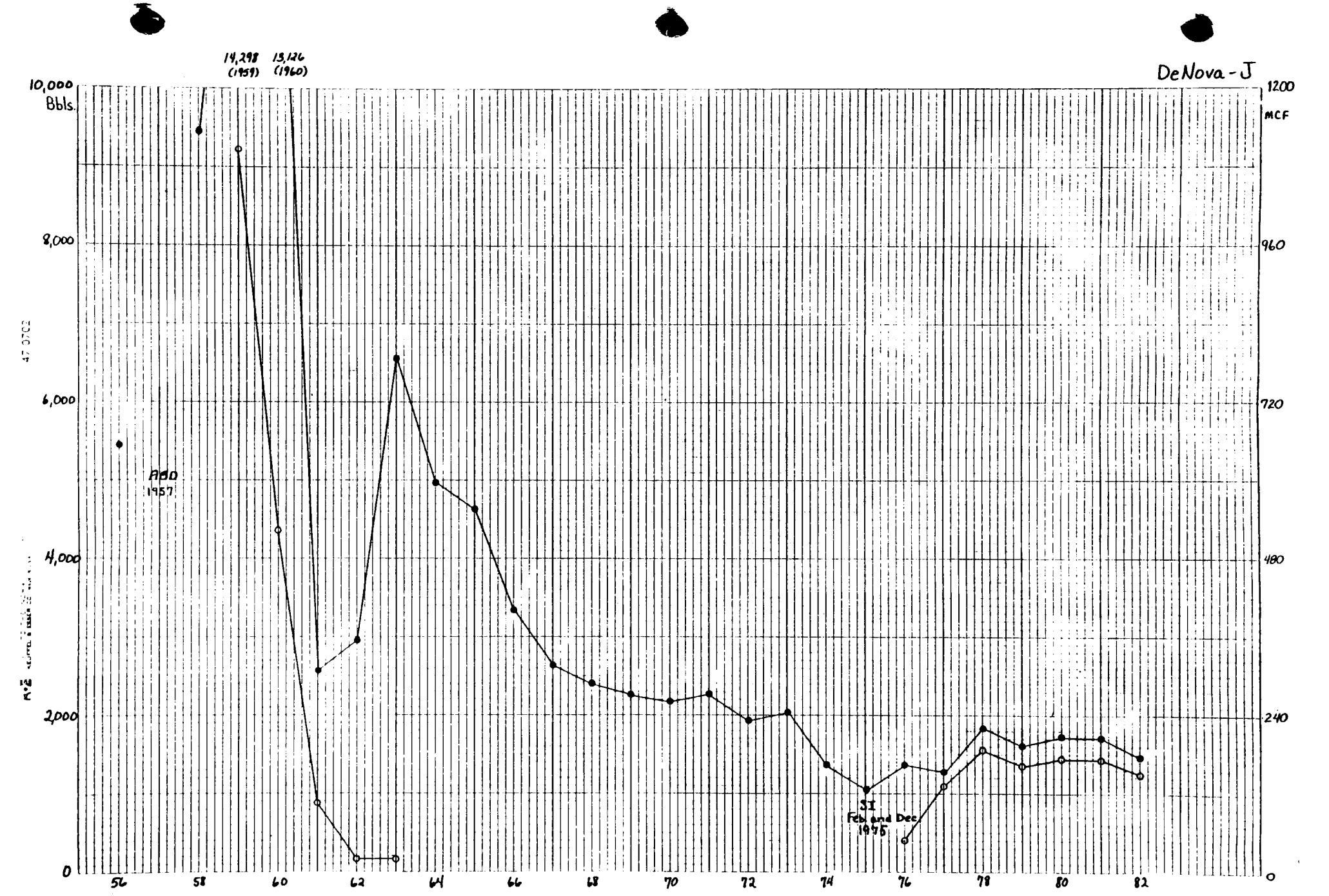
Dapper-Niobrara



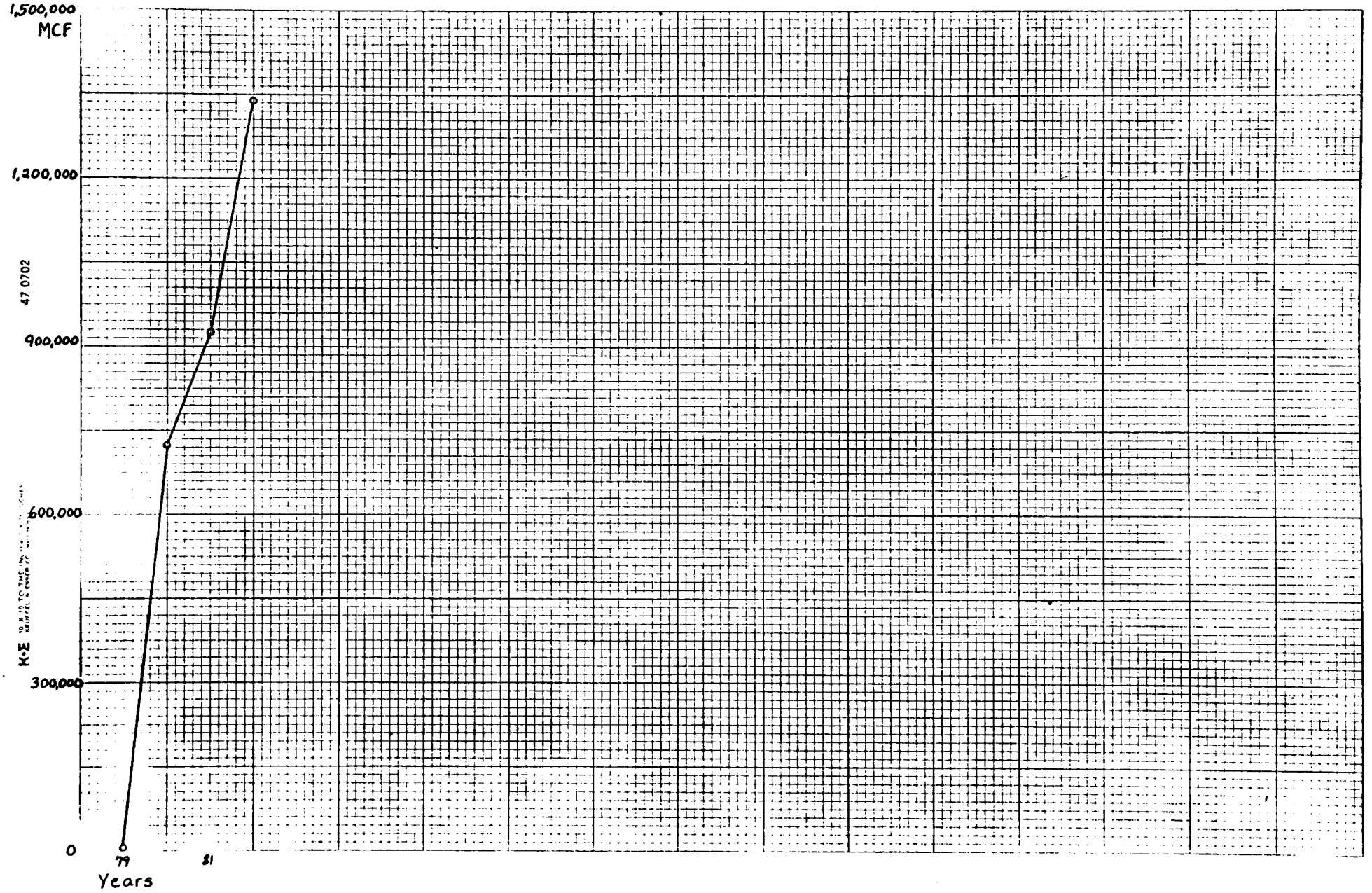

Dart-J
50,000 Bbls.
40,000
30,000
20,000
10,000
0
10,000 MCF
8,000
6,000
4,000
2,000
0
70
72
74
76
78
80
82
47 0702

Dealer-J

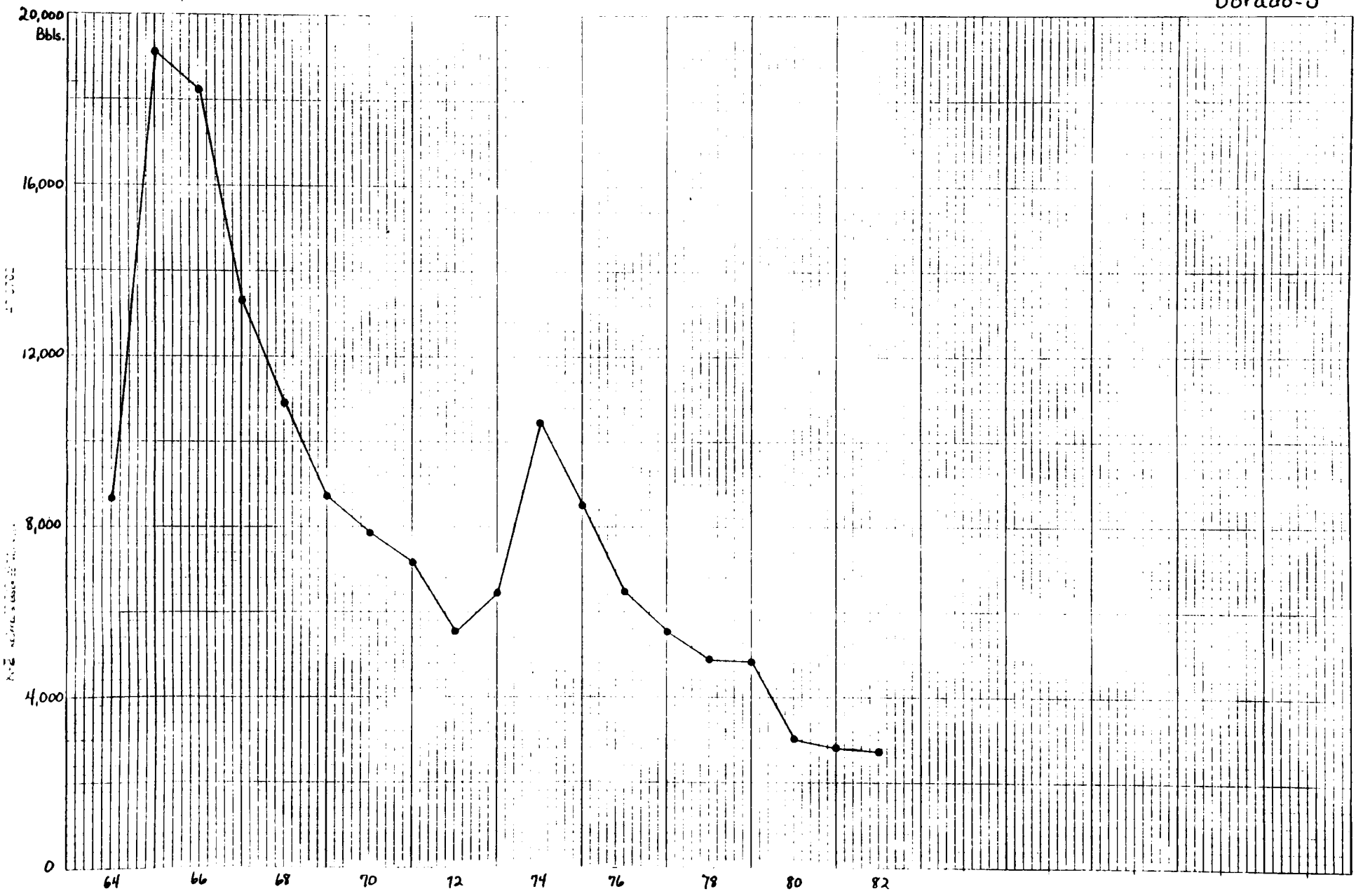



DeNova - J
14,298 (1959)
13,126 (1960)
10,000 Bbls.
8,000
6,000
4,000
2,000
0
1200 MCF
960
720
480
240
0
ABO 1957
SI Feb and Dec 1975
56
58
60
62
64
66
68
70
72
74
76
78
80
82

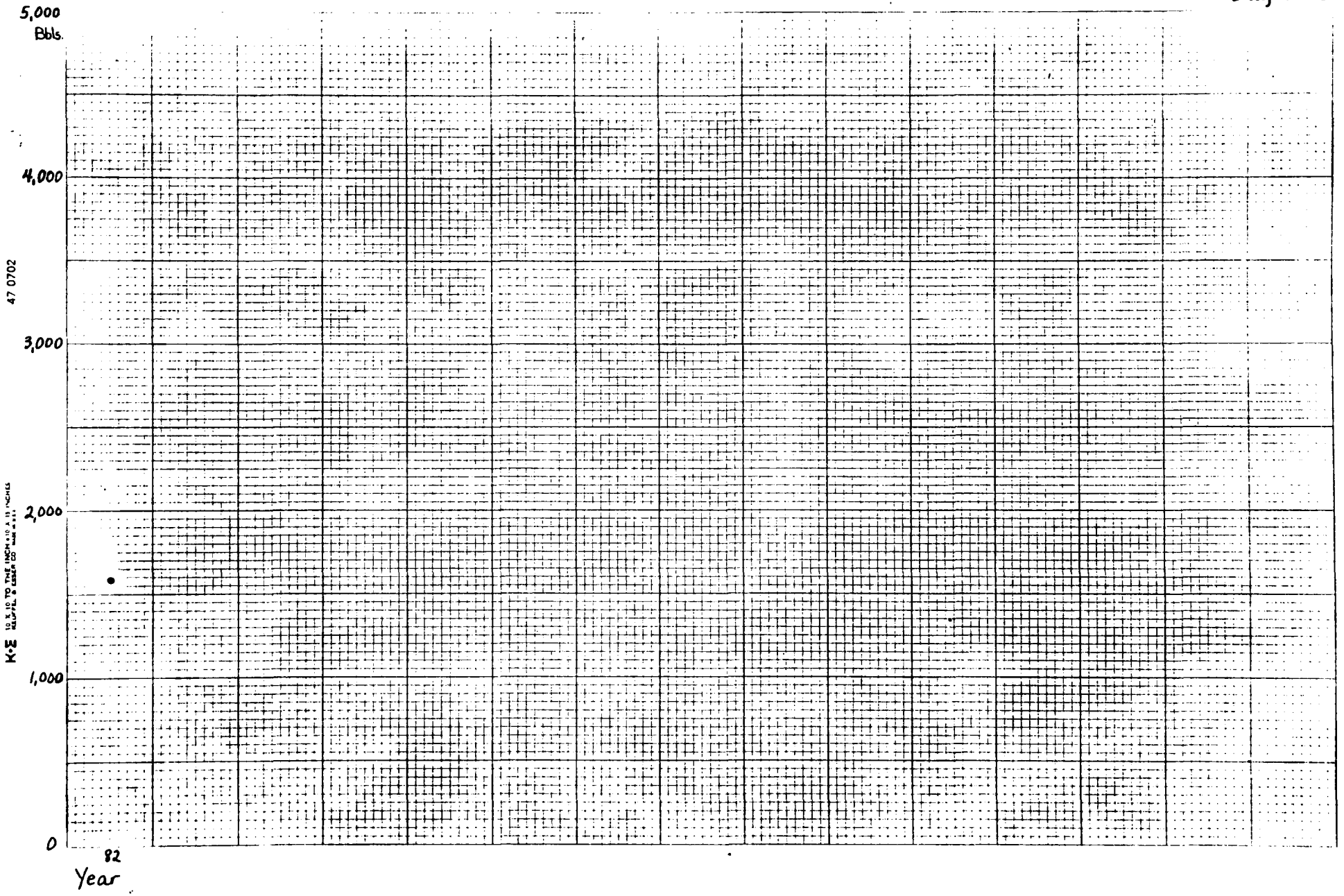
DeNova-Niobrara



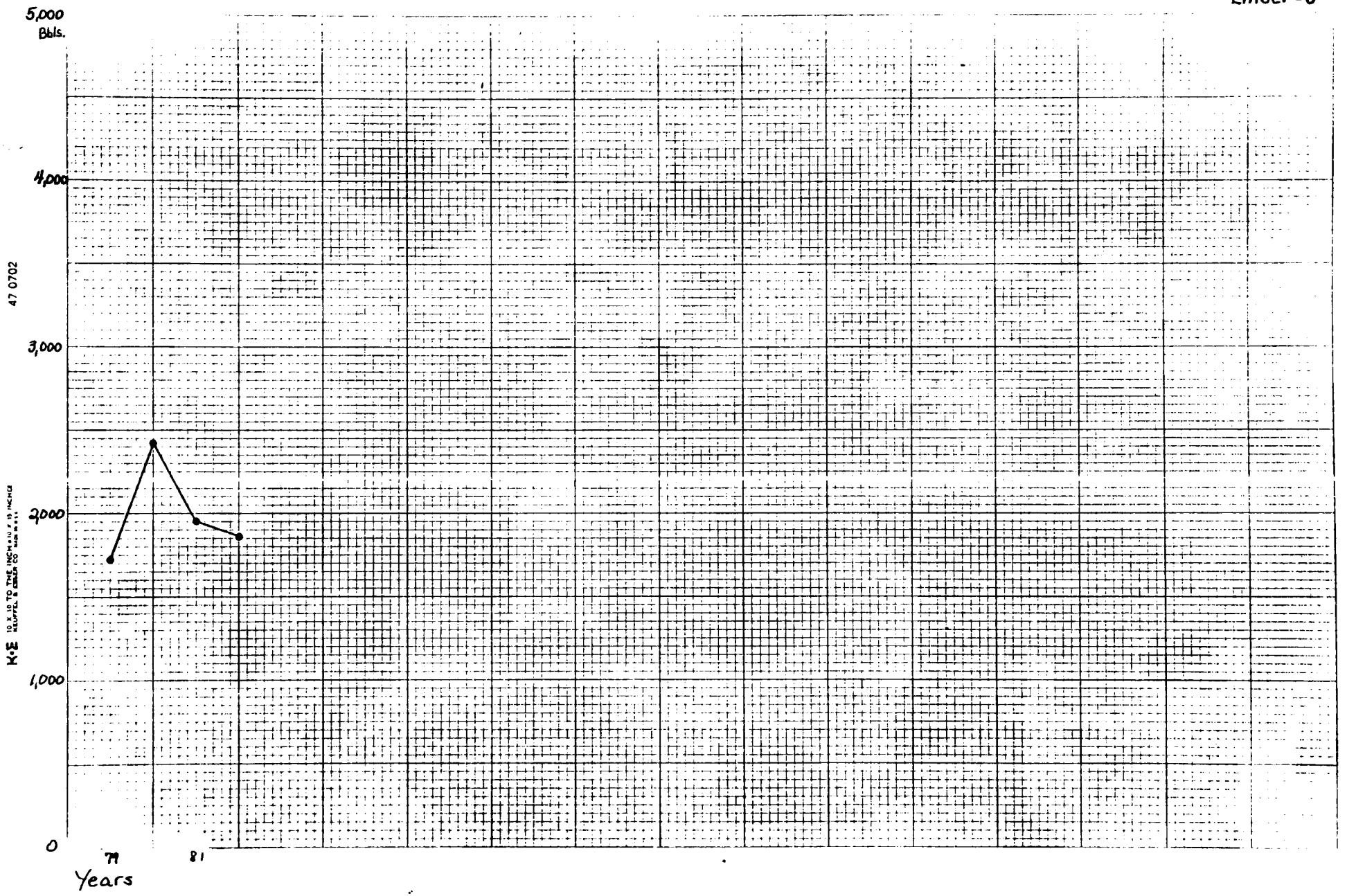
Dorado-J



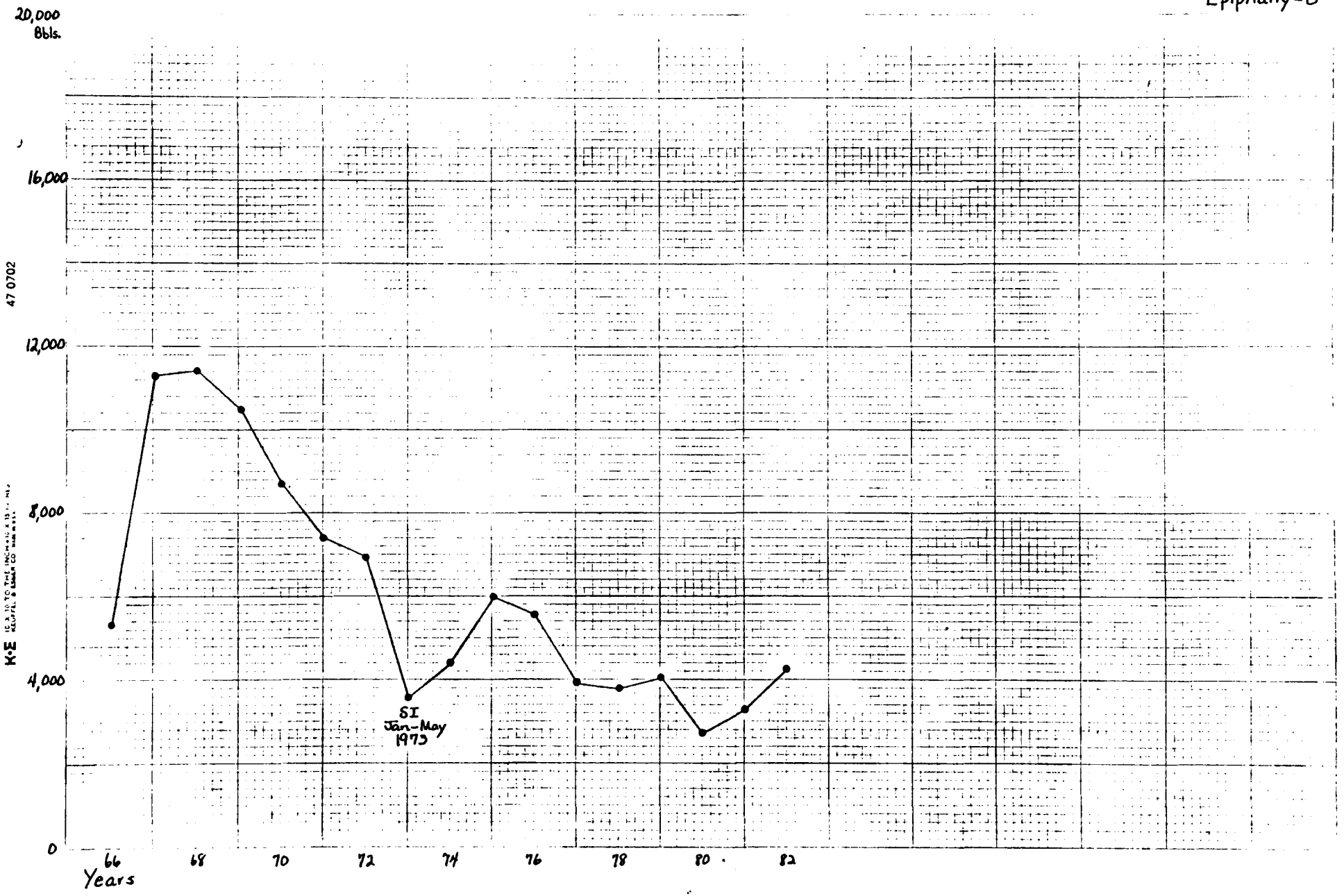
Dugout-D


5,000
Bbls.
4,000
3,000
2,000
1,000
0
82
Year
47 0702
K·E
10 X 10 TO THE INCH 10 X 15 INCHES
KEUFFEL & ESSER CO

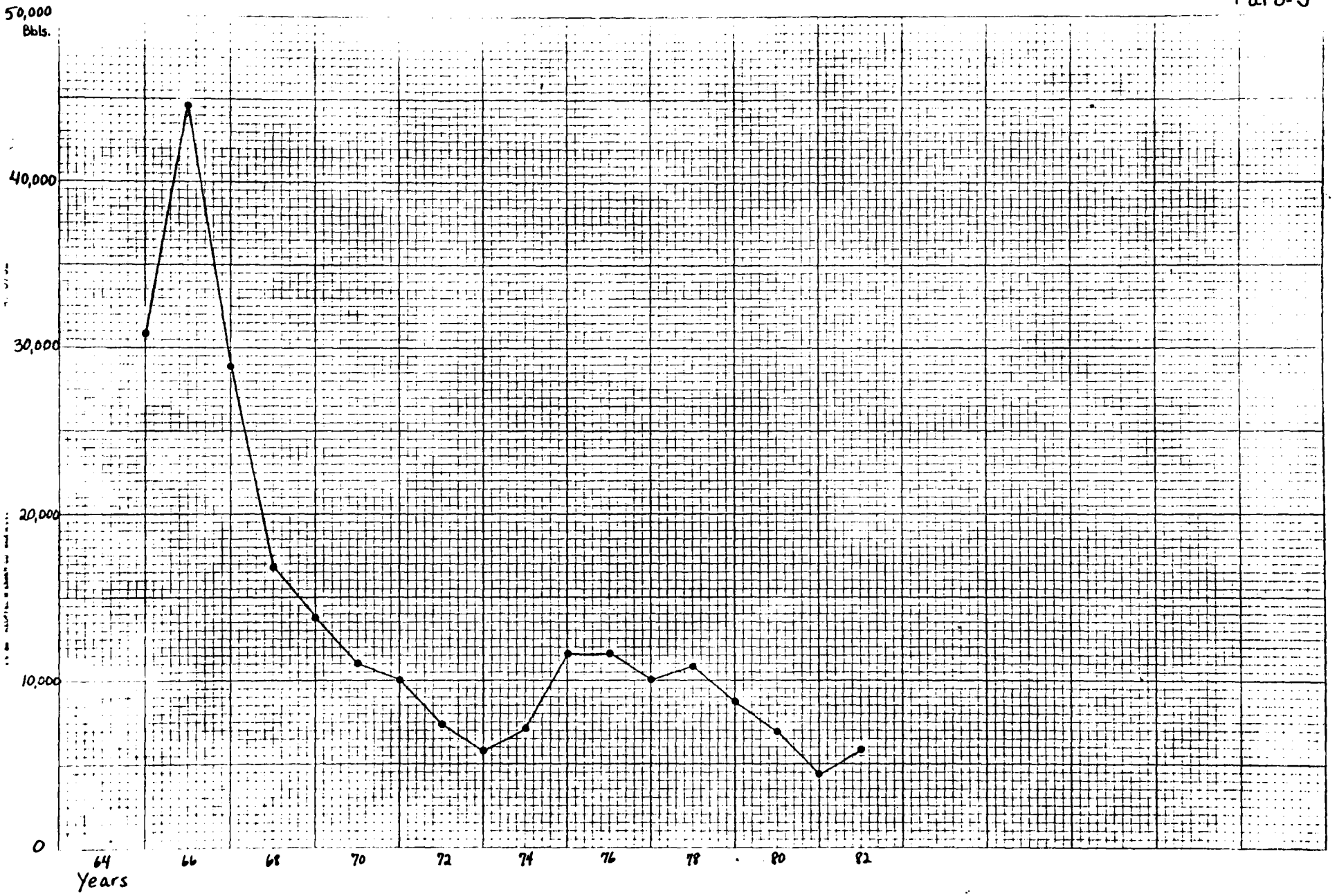
Ember-J



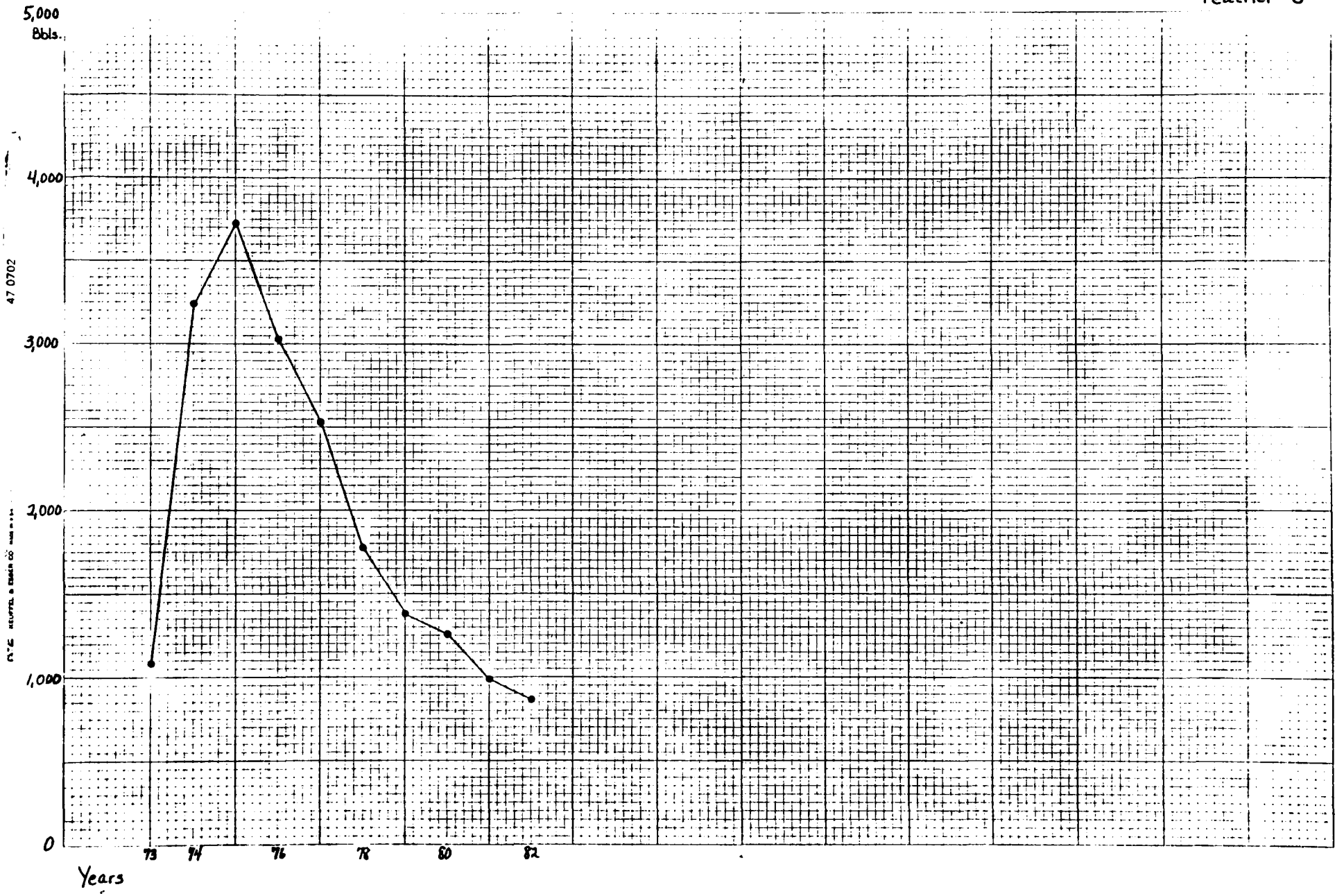
Epiphany-J


20,000
Bbls.
16,000
12,000
8,000
4,000
0
66
68
70
72
74
76
78
80
82
Years
SI
Jan-May
1975
47 0702
K&E

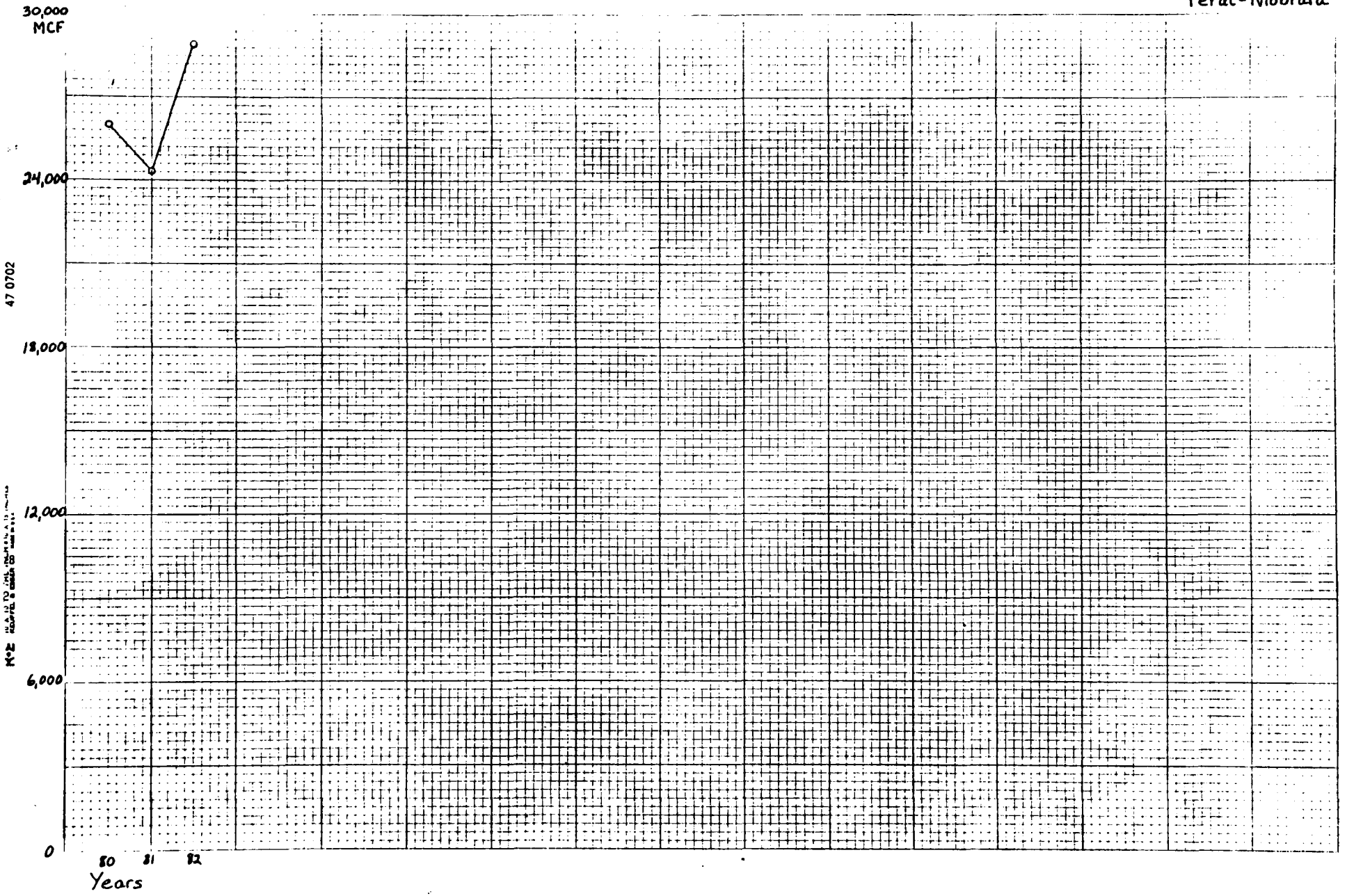
Faro-J


50,000
Bbls.
40,000
30,000
20,000
10,000
0
64
66
68
70
72
74
76
78
80
82
Years

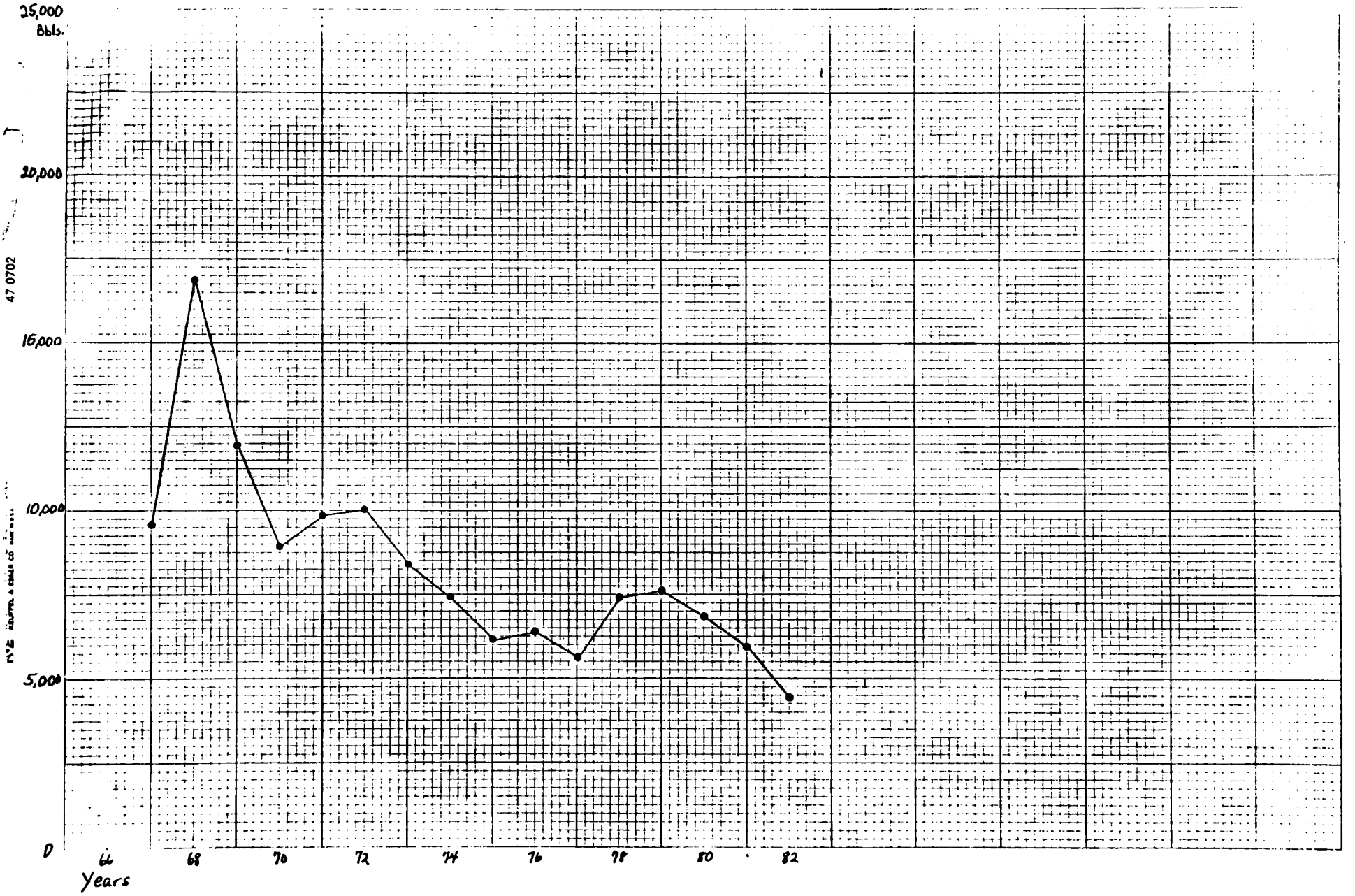
Feather- J



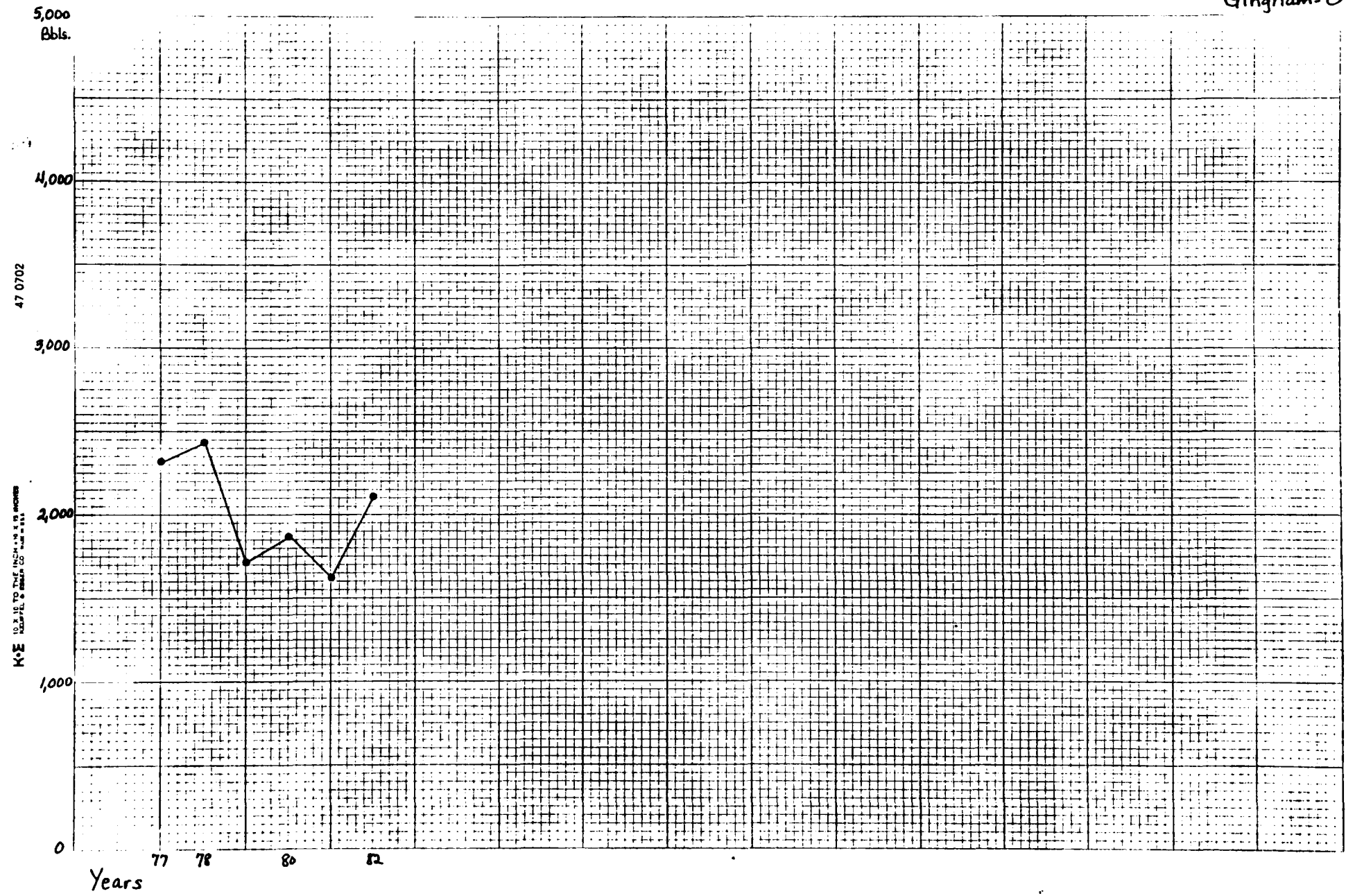
Feral - Niobrara



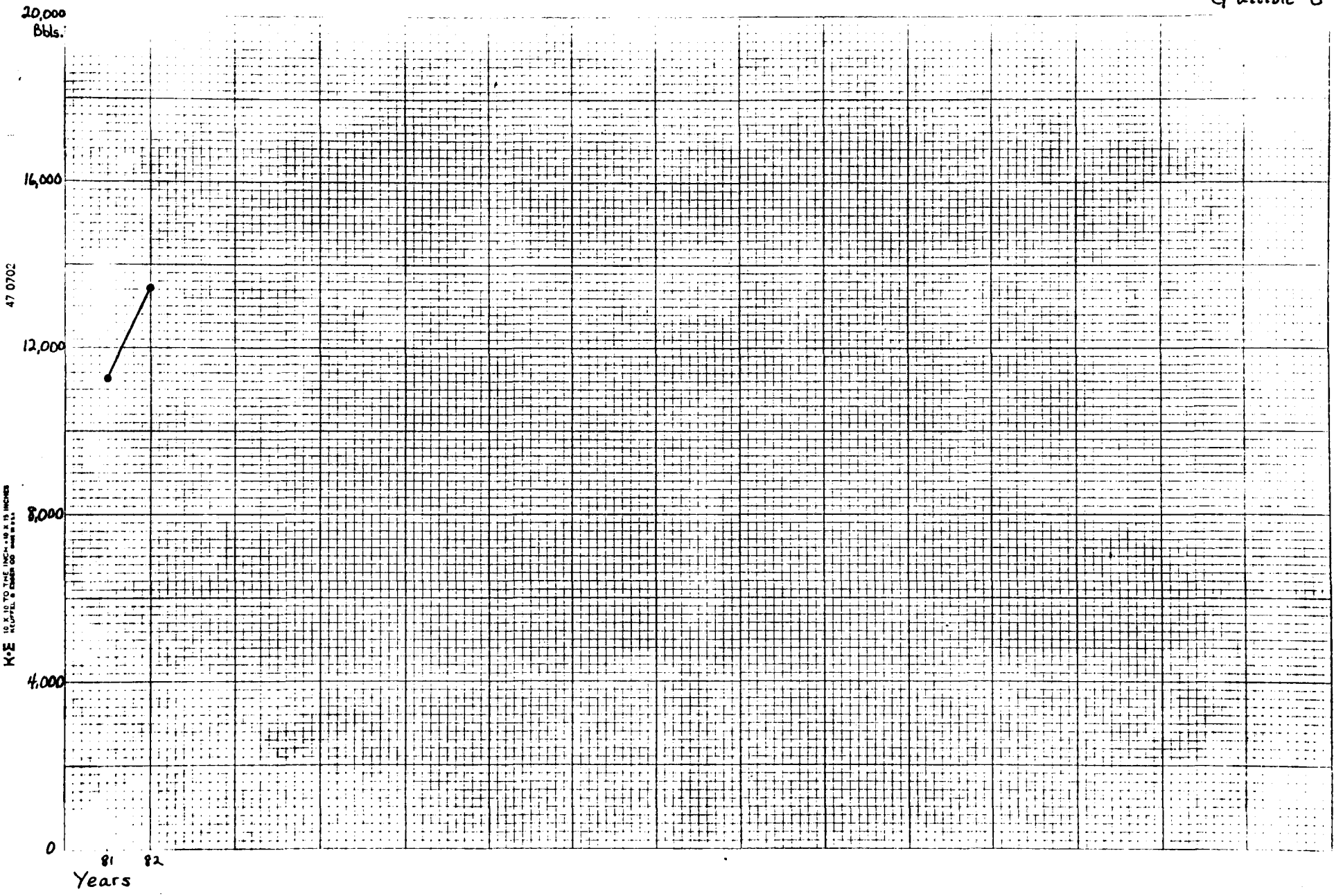
Fiesta-J

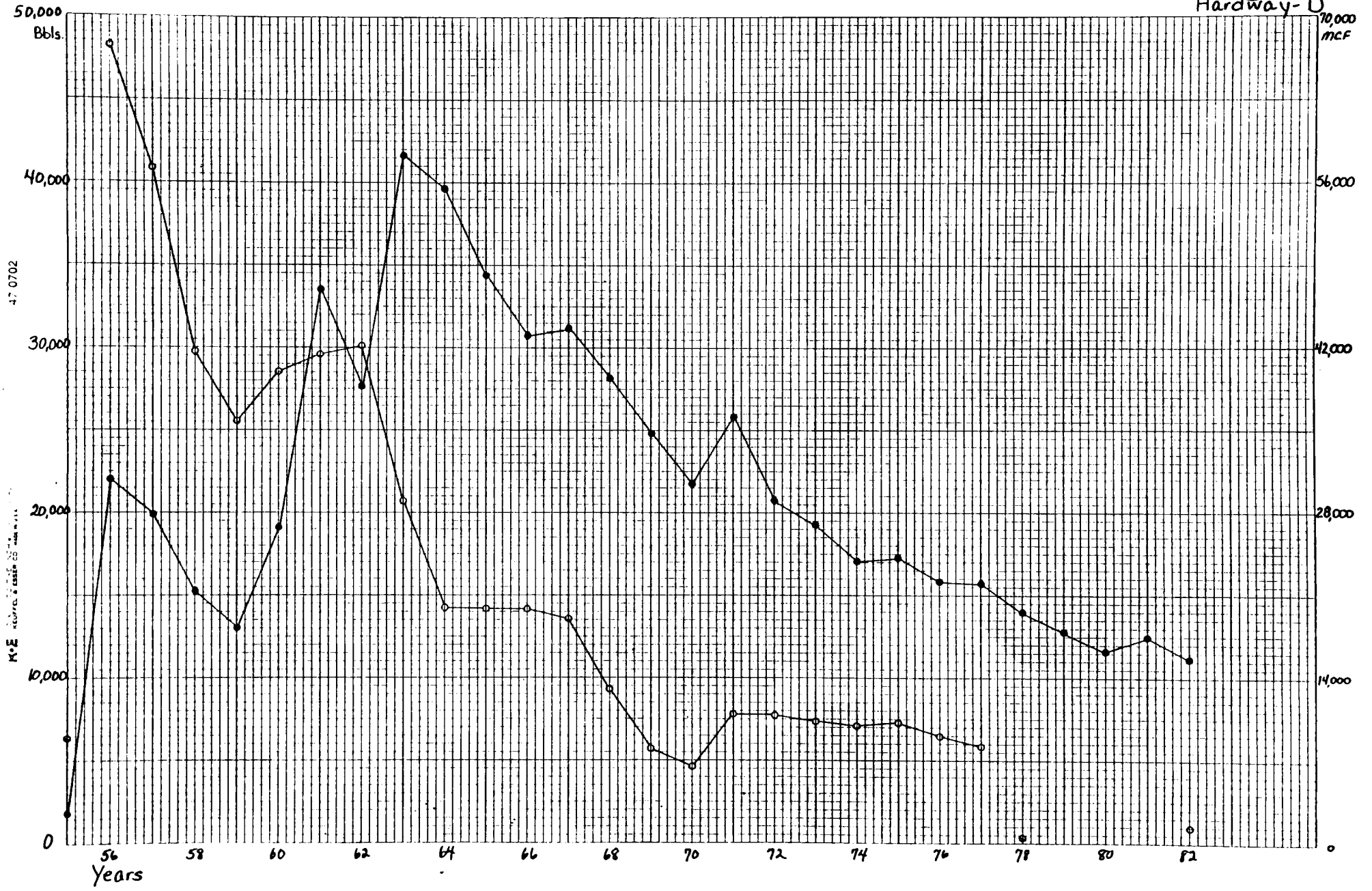

25,000
Bbls.
20,000
15,000
10,000
5,000
0
66
68
70
72
74
76
78
80
82
Years

Gingham-D

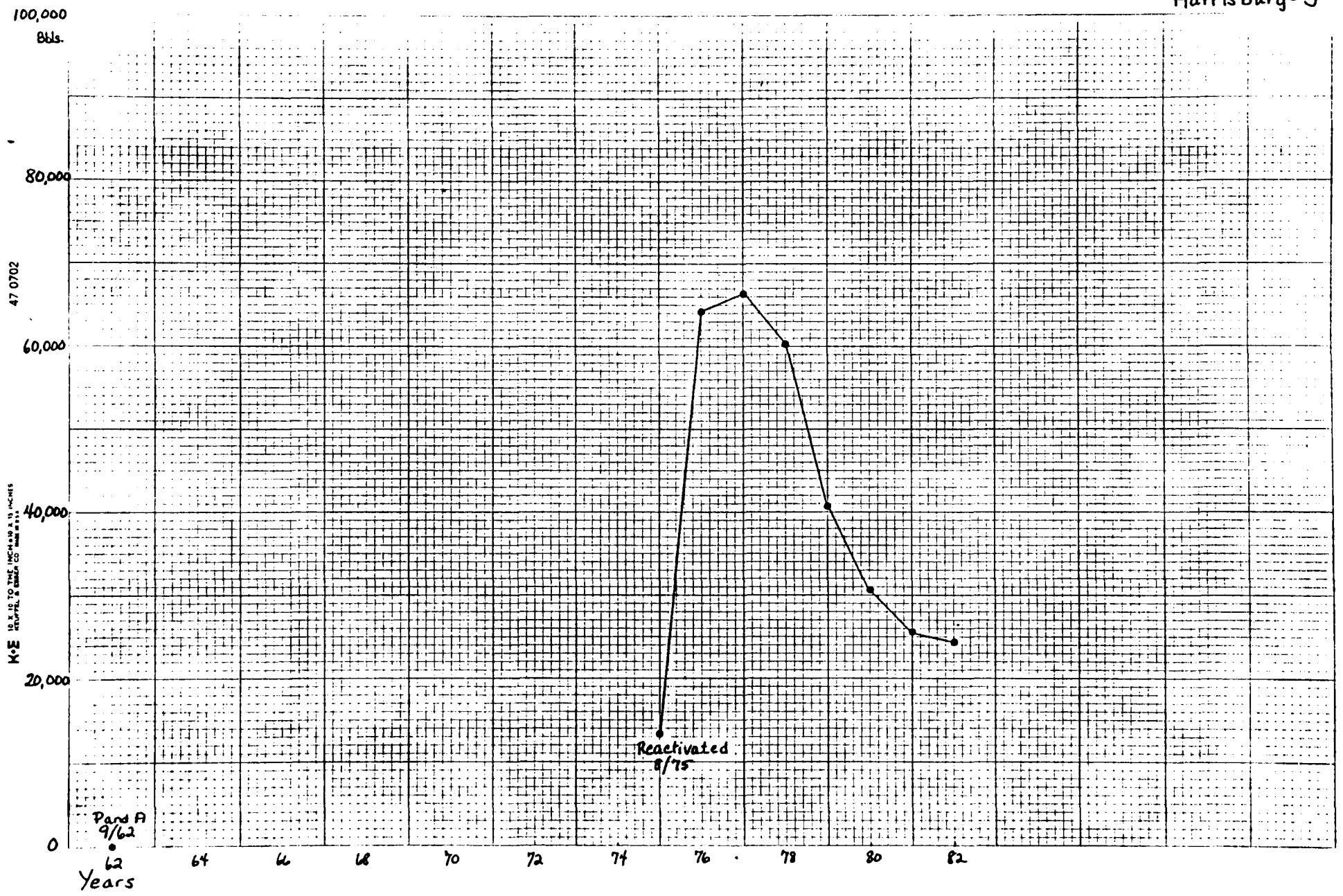


Gullible - J



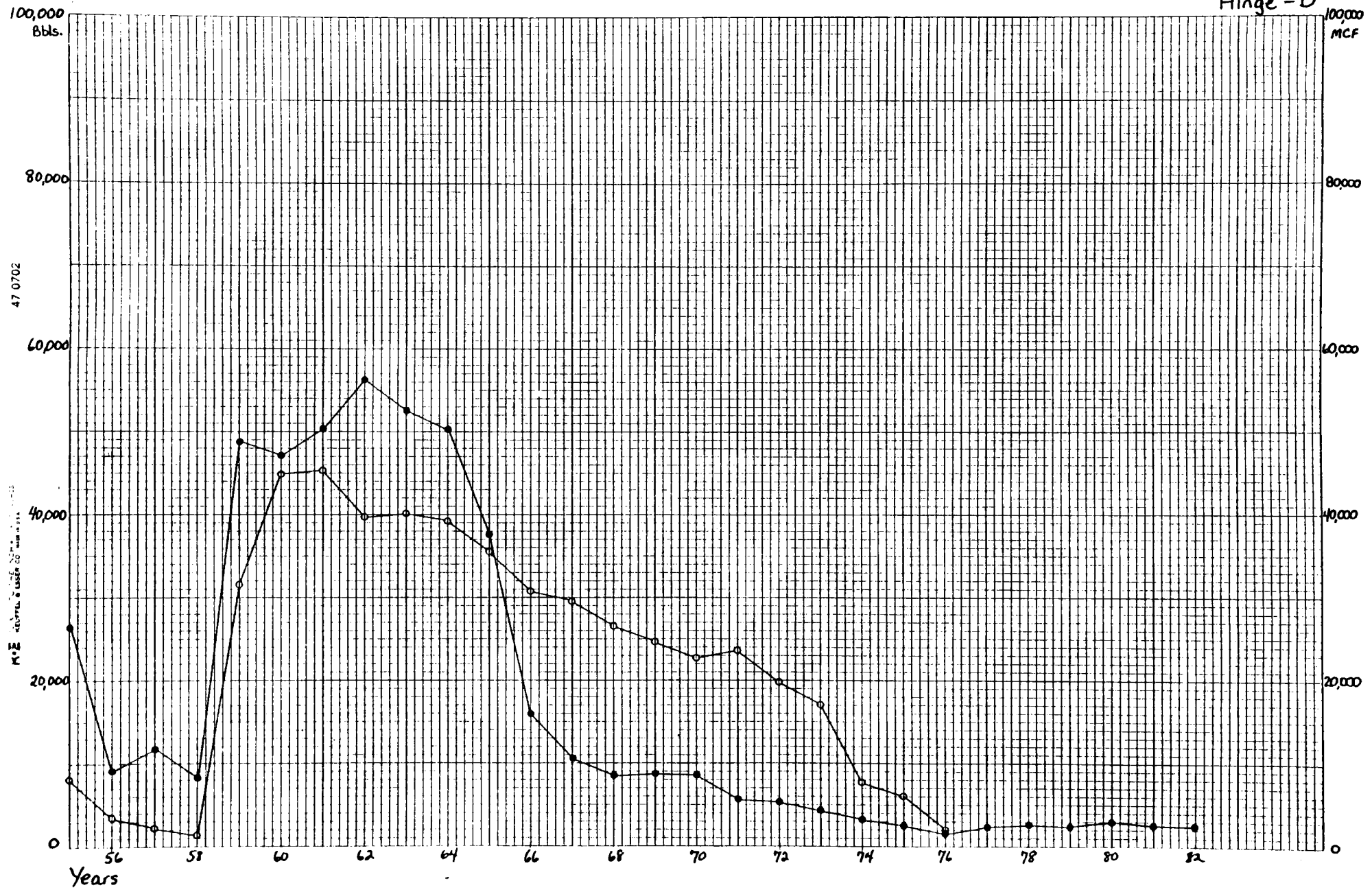

Hardway-D
50,000
Bbls.
40,000
30,000
20,000
10,000
0
70,000
MCF
56,000
42,000
28,000
14,000
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

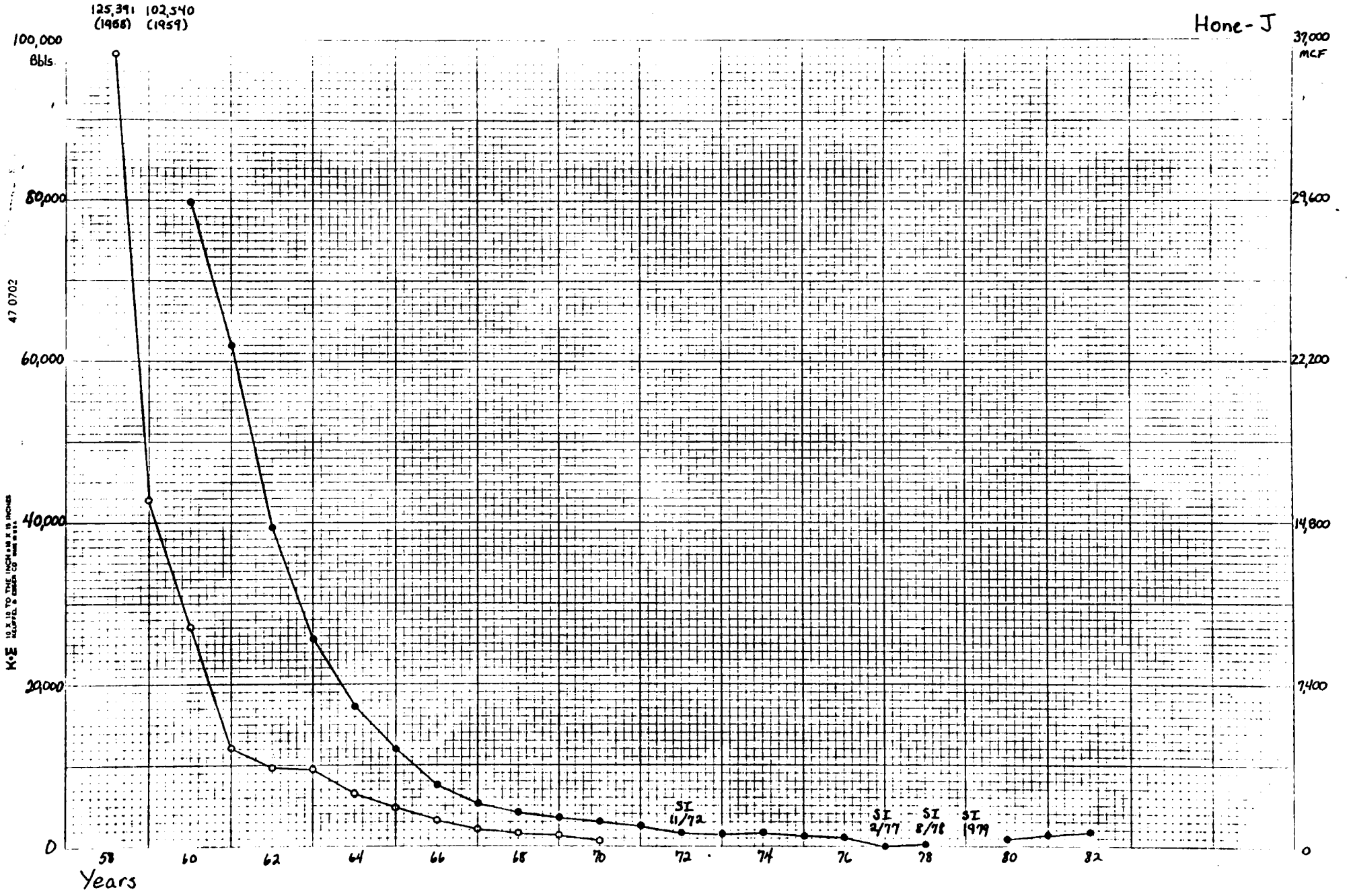
Harrisburg - J



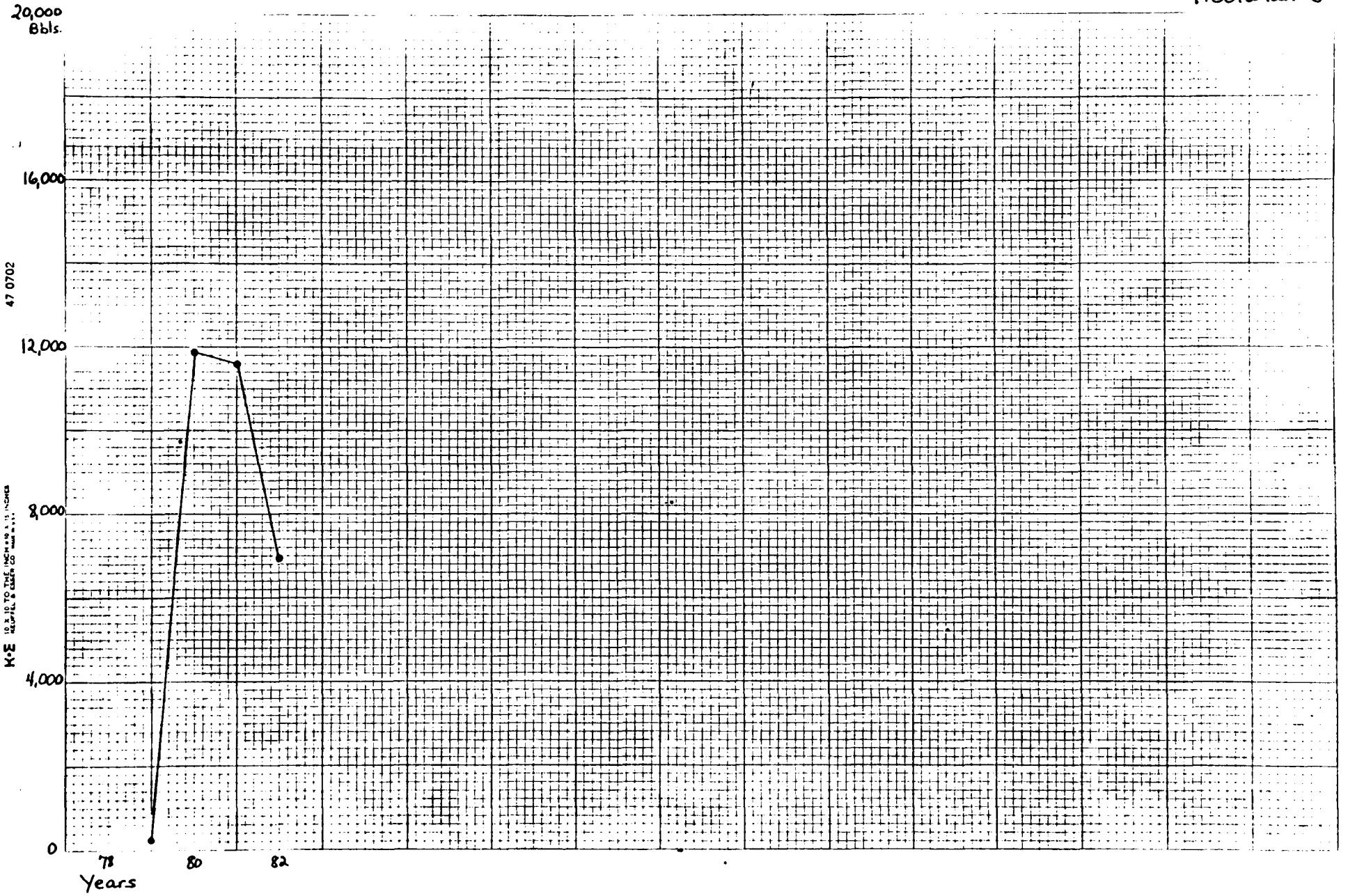
47 0702

K+E 10 X 10 TO THE INCH 10 X 15 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

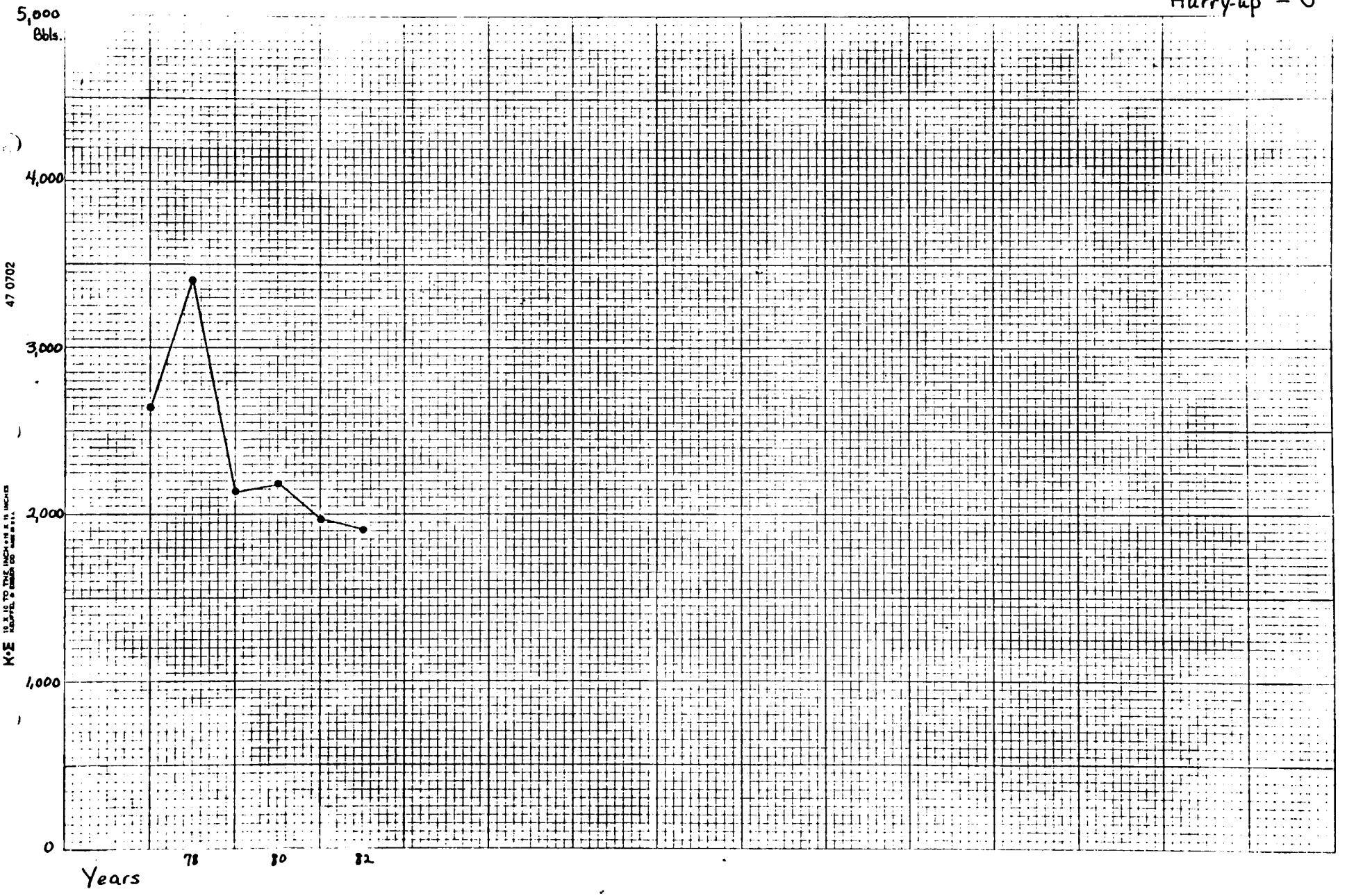

Hinge - D
100,000 Bbls.
80,000
60,000
40,000
20,000
0
100,000 MCF
80,000
60,000
40,000
20,000
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

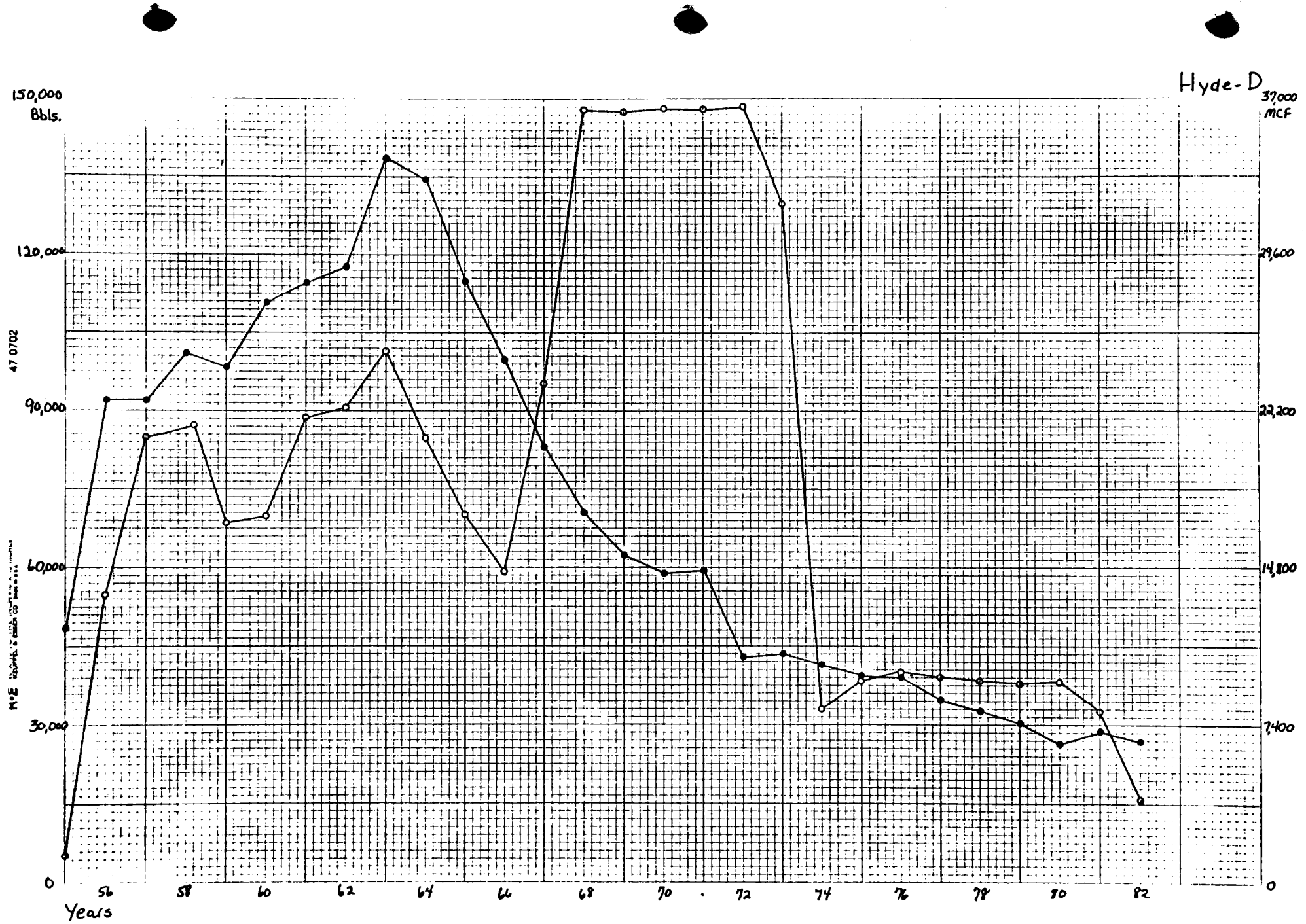

125,391 (1958)
102,540 (1959)
Hone-J
100,000 Bbls
80,000
60,000
40,000
20,000
0
37,000 MCF
29,600
22,200
14,800
7,400
0
SI 11/72
SI 2/77
SI 8/78
SI 1979
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K·E 10 X 10 TO THE INCH 46 80 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

Hoolahan-J

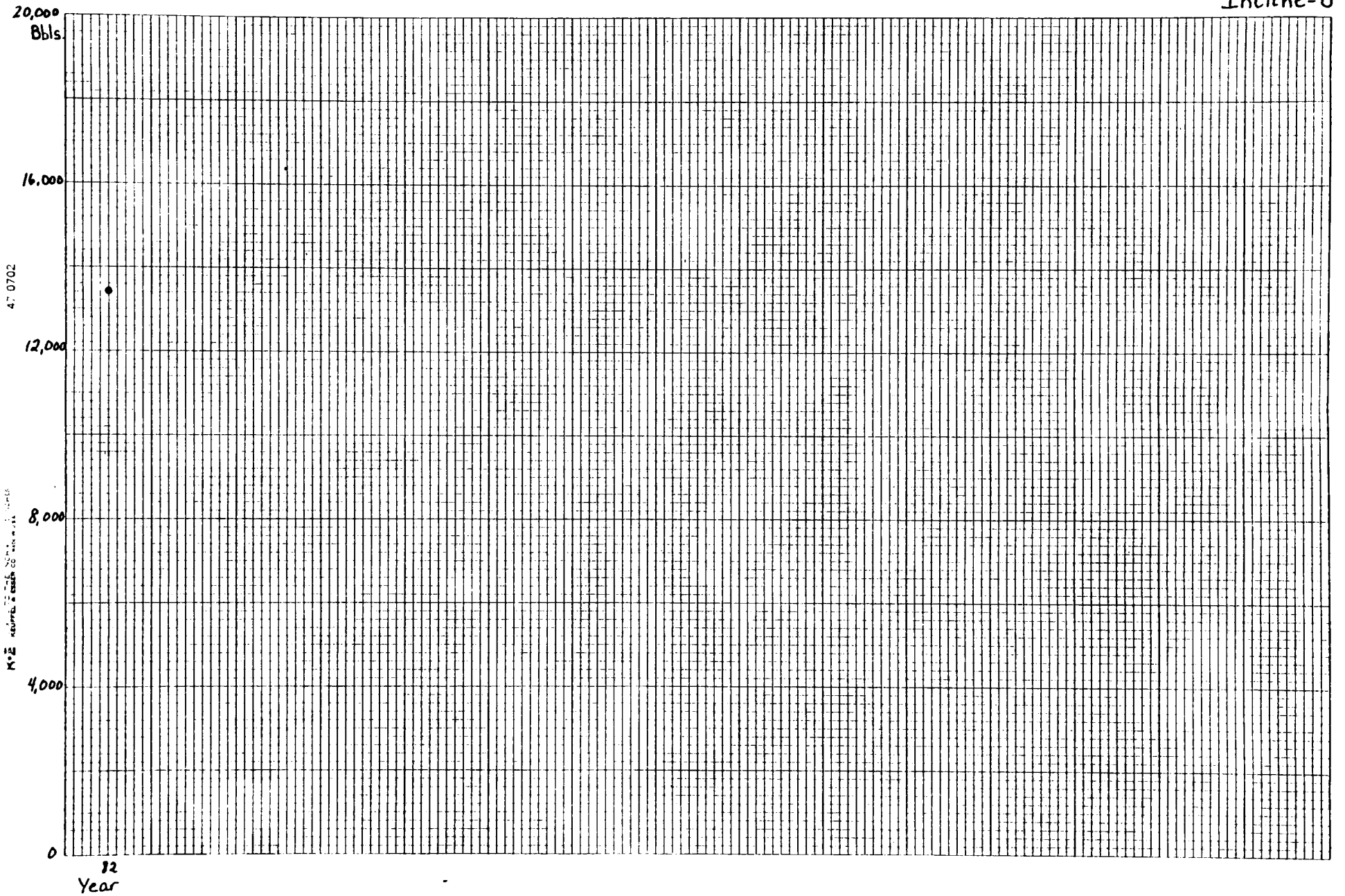


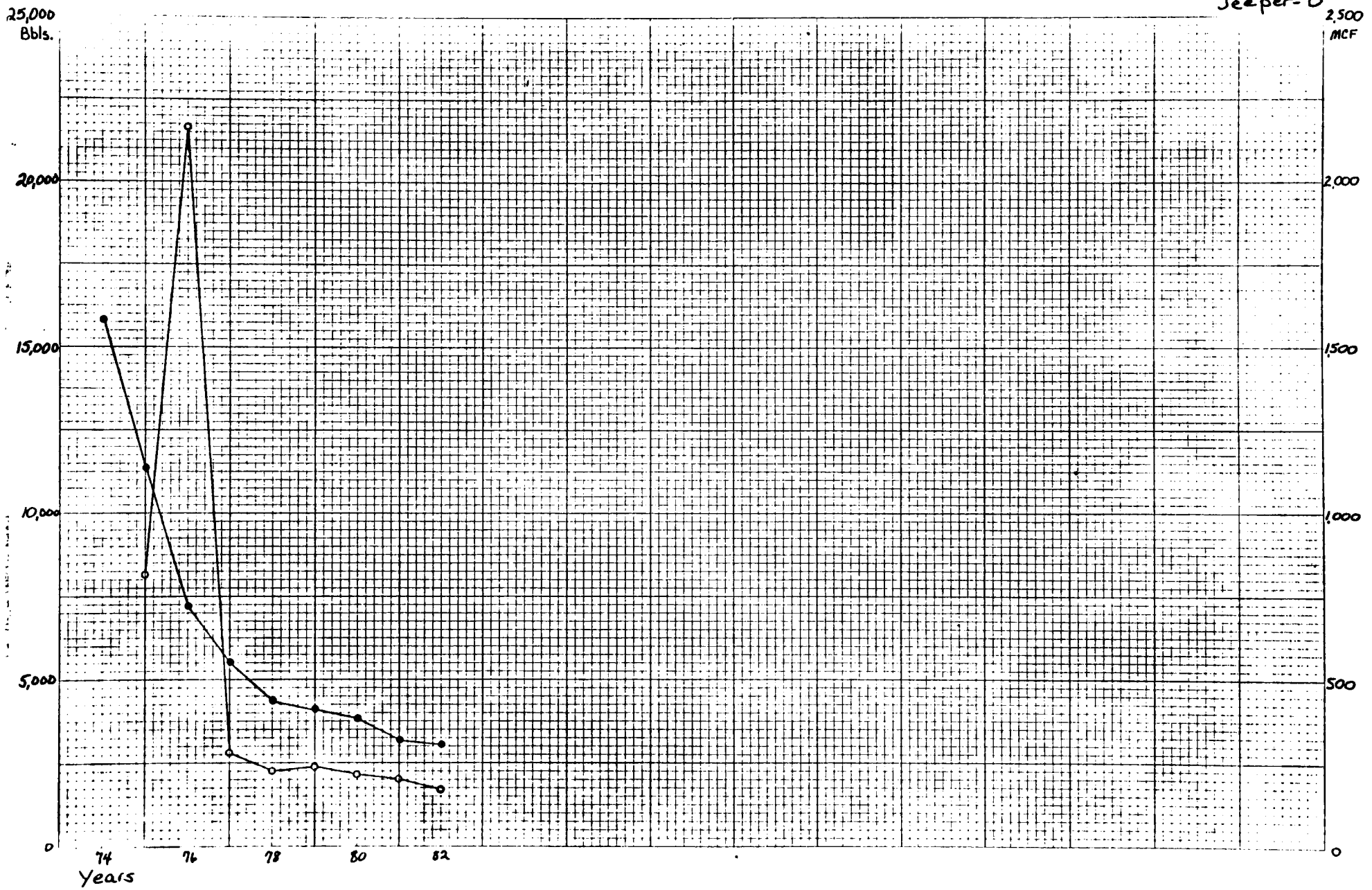
Hurry-up – J

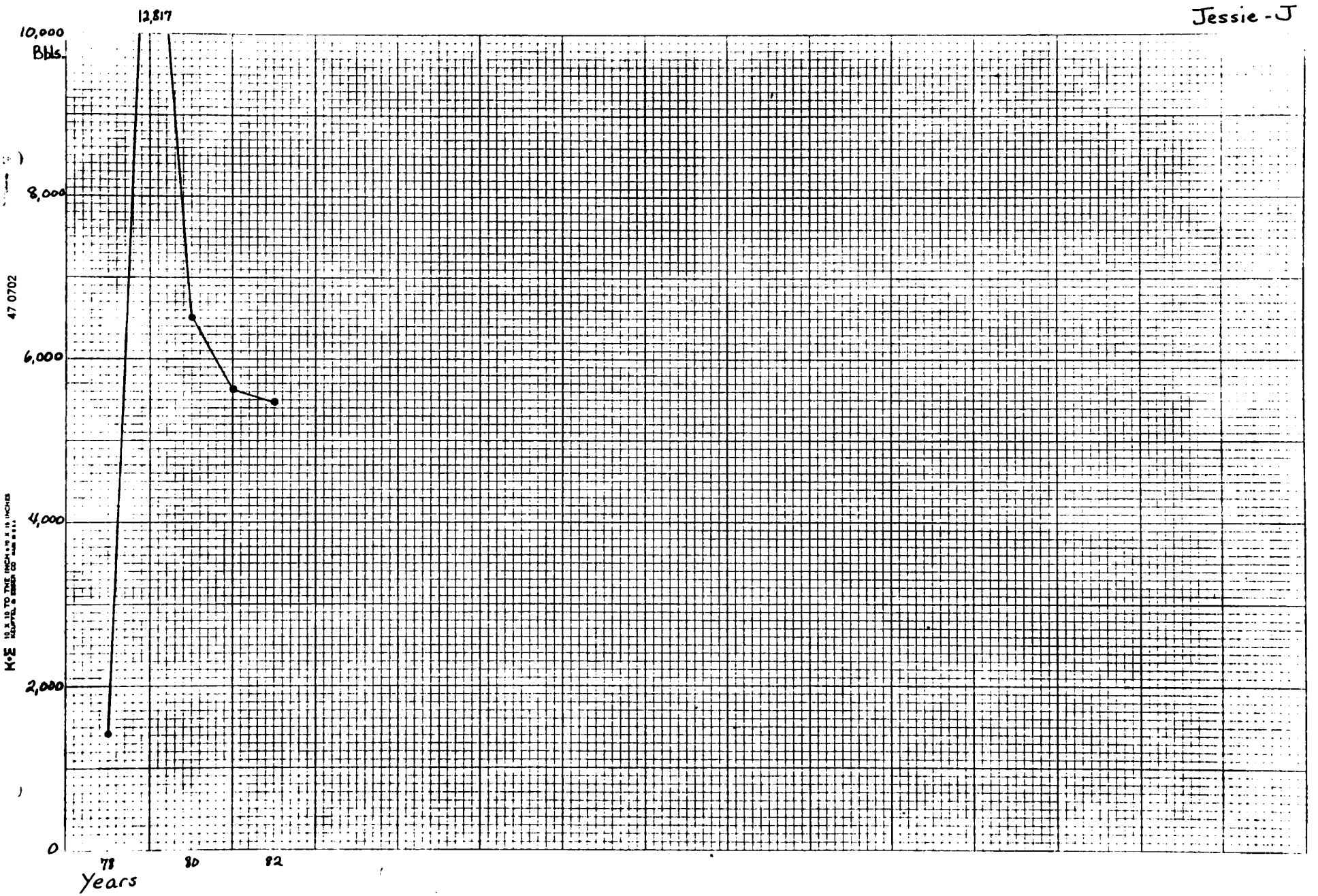



Hyde-D
150,000
Bbls.
120,000
90,000
60,000
30,000
0
37,000
MCF
29,600
22,200
14,800
7,400
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702

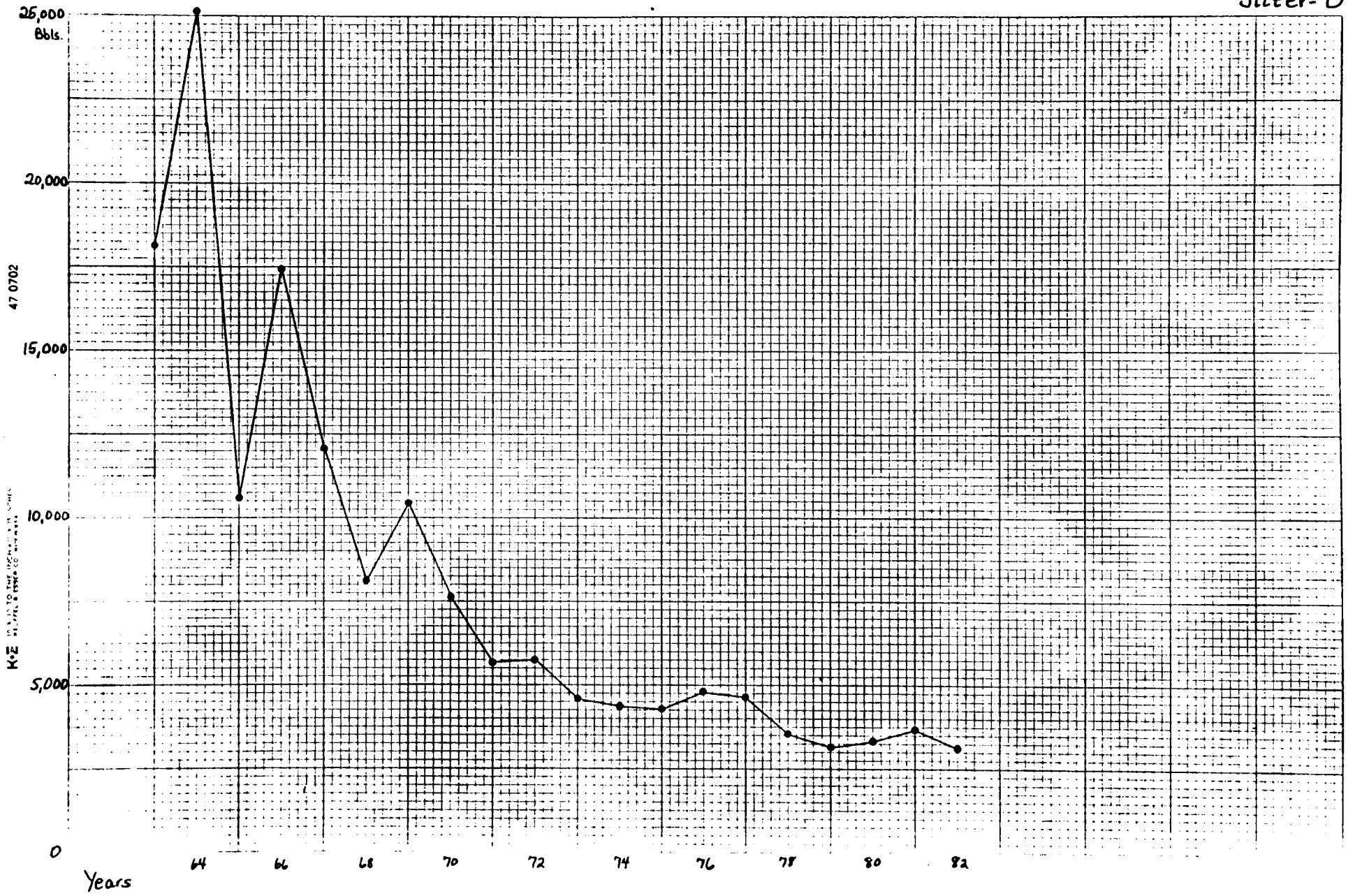
Incline-J

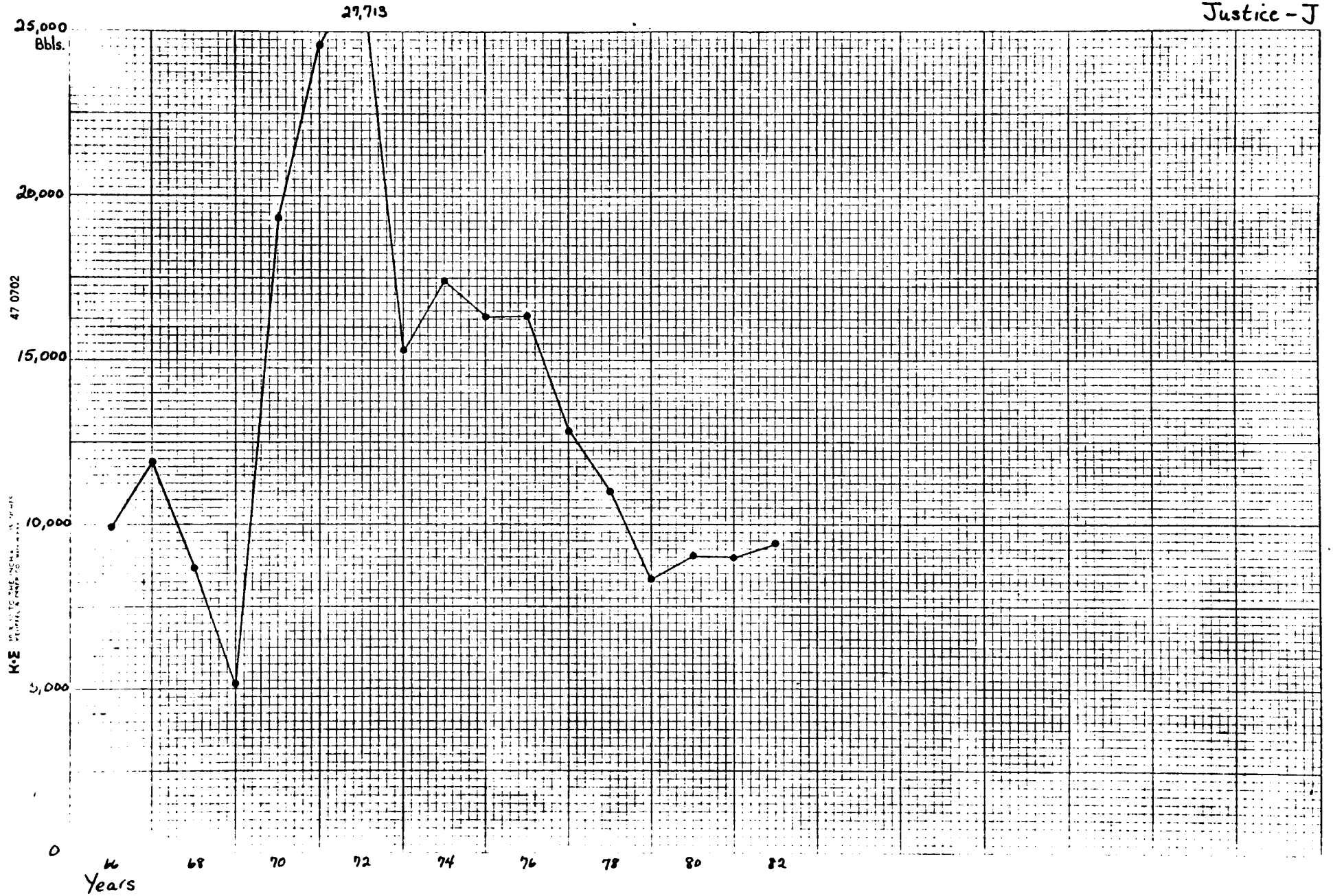



Jeeper-D
25,000
Bbls.
20,000
15,000
10,000
5,000
0
2,500
MCF
2,000
1,500
1,000
500
0
74
76
78
80
82
Years

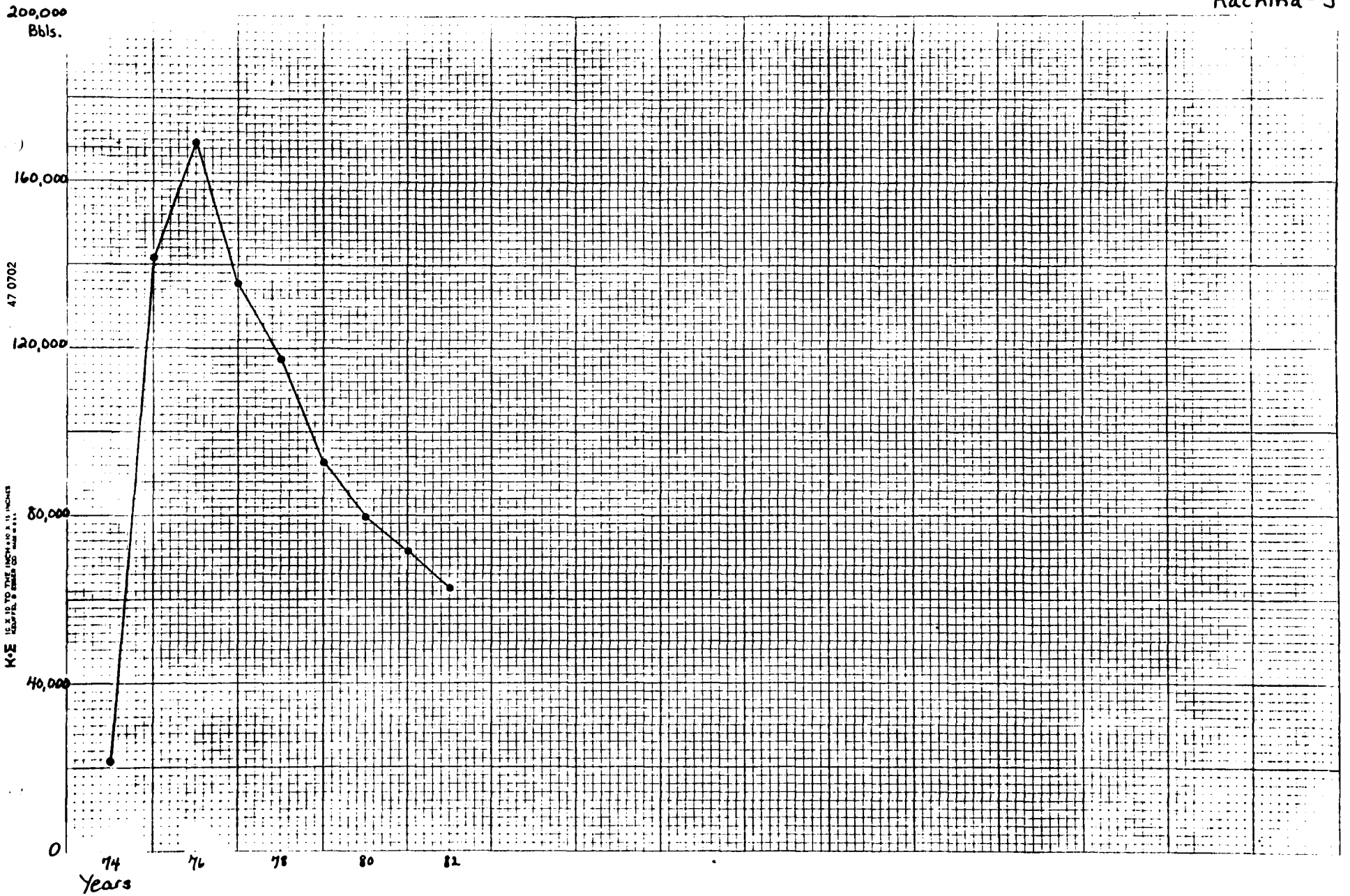

Jessie - J
12,817
10,000
Bbls.
8,000
6,000
4,000
2,000
0
78
80
82
Years
47 0702
K•E

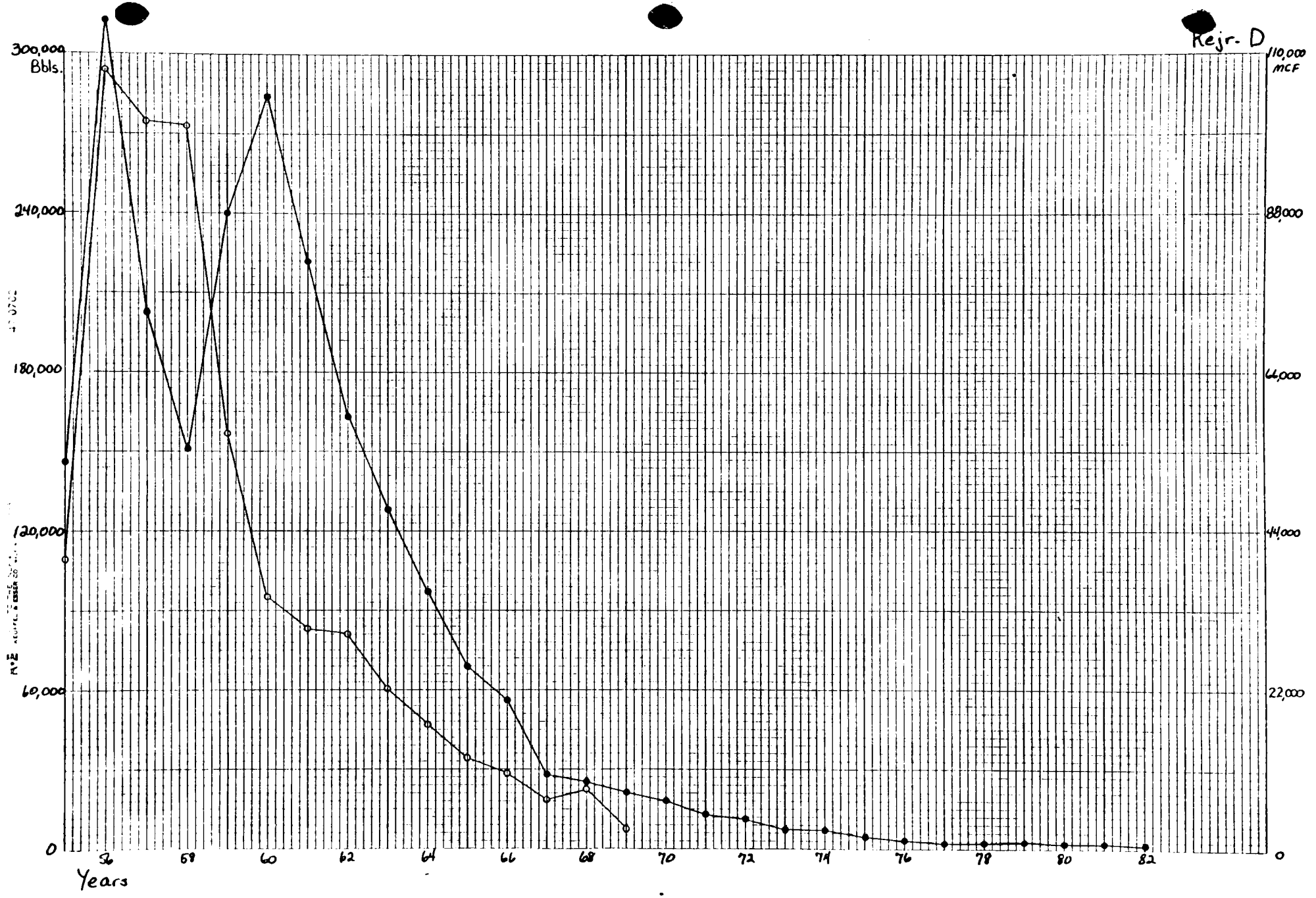
Jitter- D

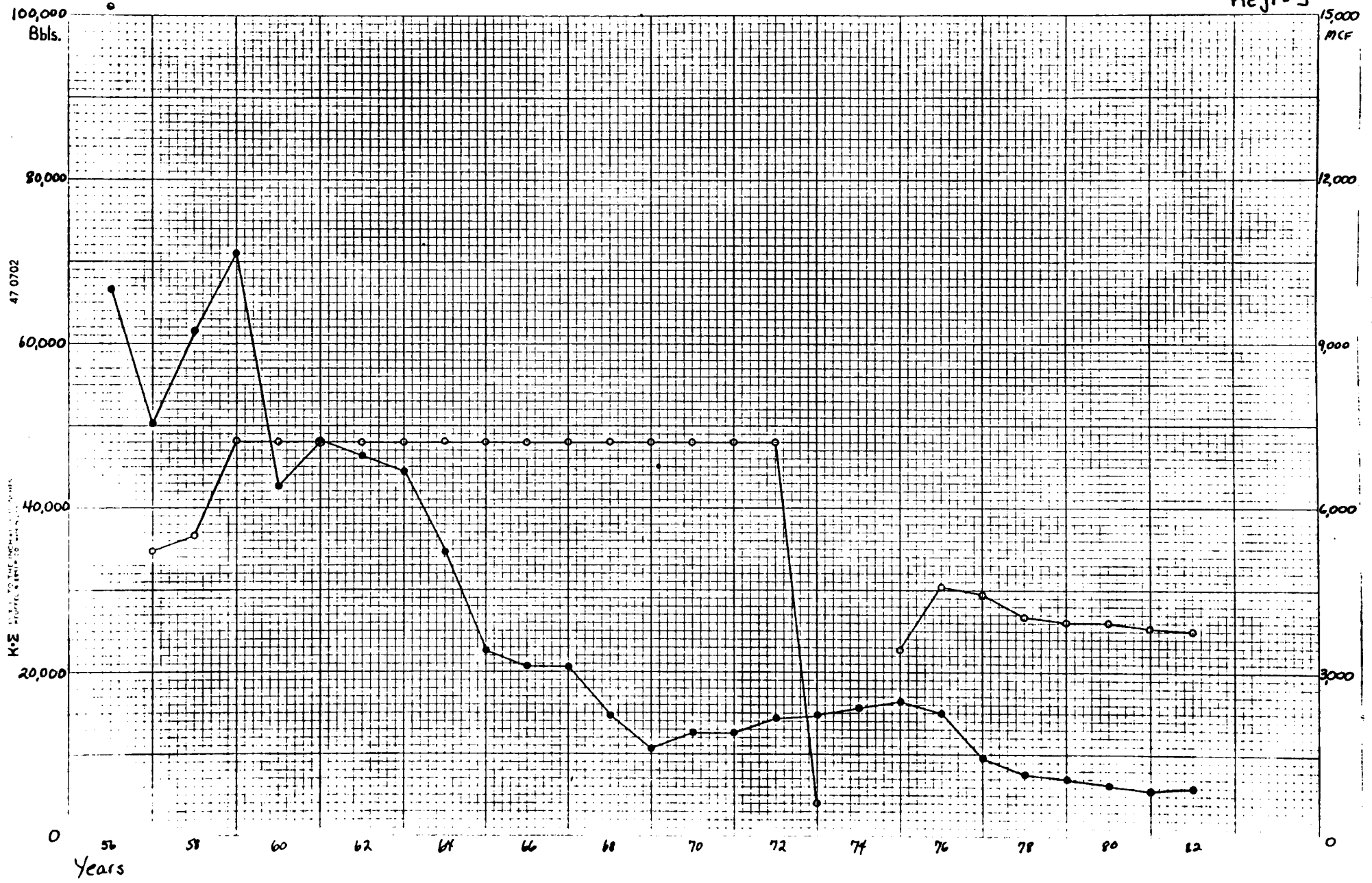

26,000
Bbls.
20,000
15,000
10,000
5,000
0
47 0702
K&E
64
66
68
70
72
74
76
78
80
82
Years

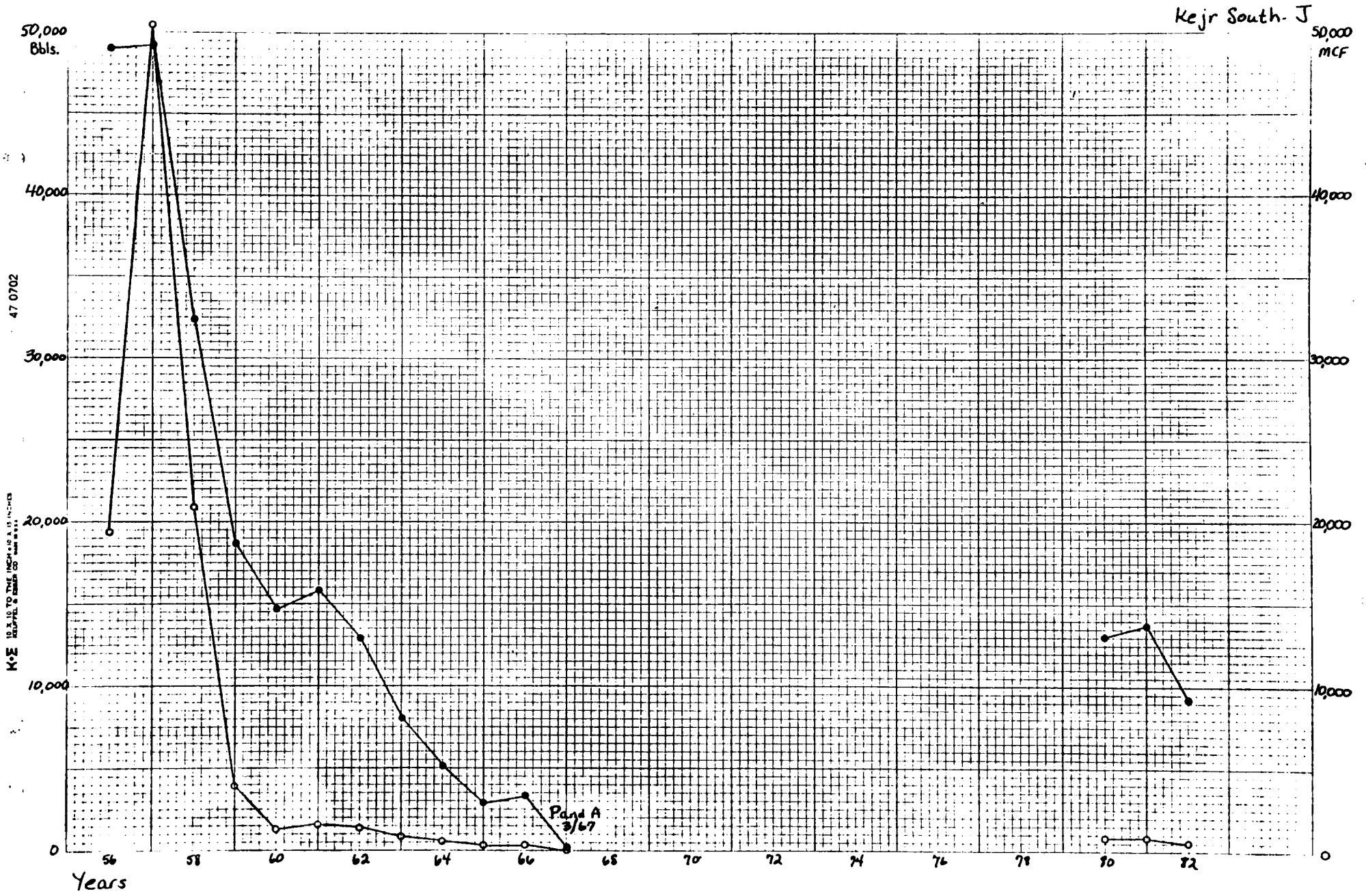

27,713
Justice - J
25,000
Bbls.
20,000
15,000
10,000
5,000
0
47 0702
66
68
70
72
74
76
78
80
82
Years

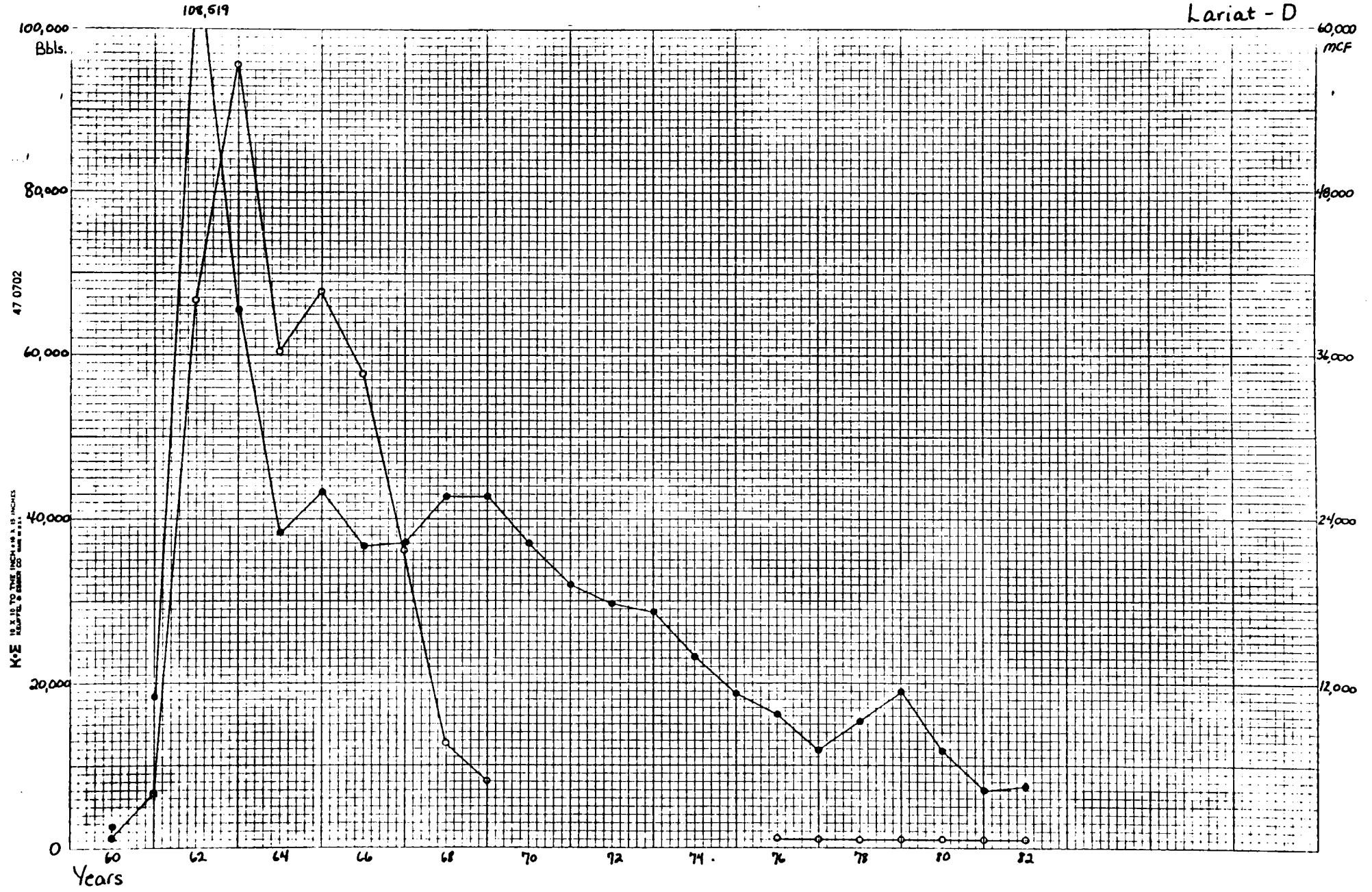
Kachina - J

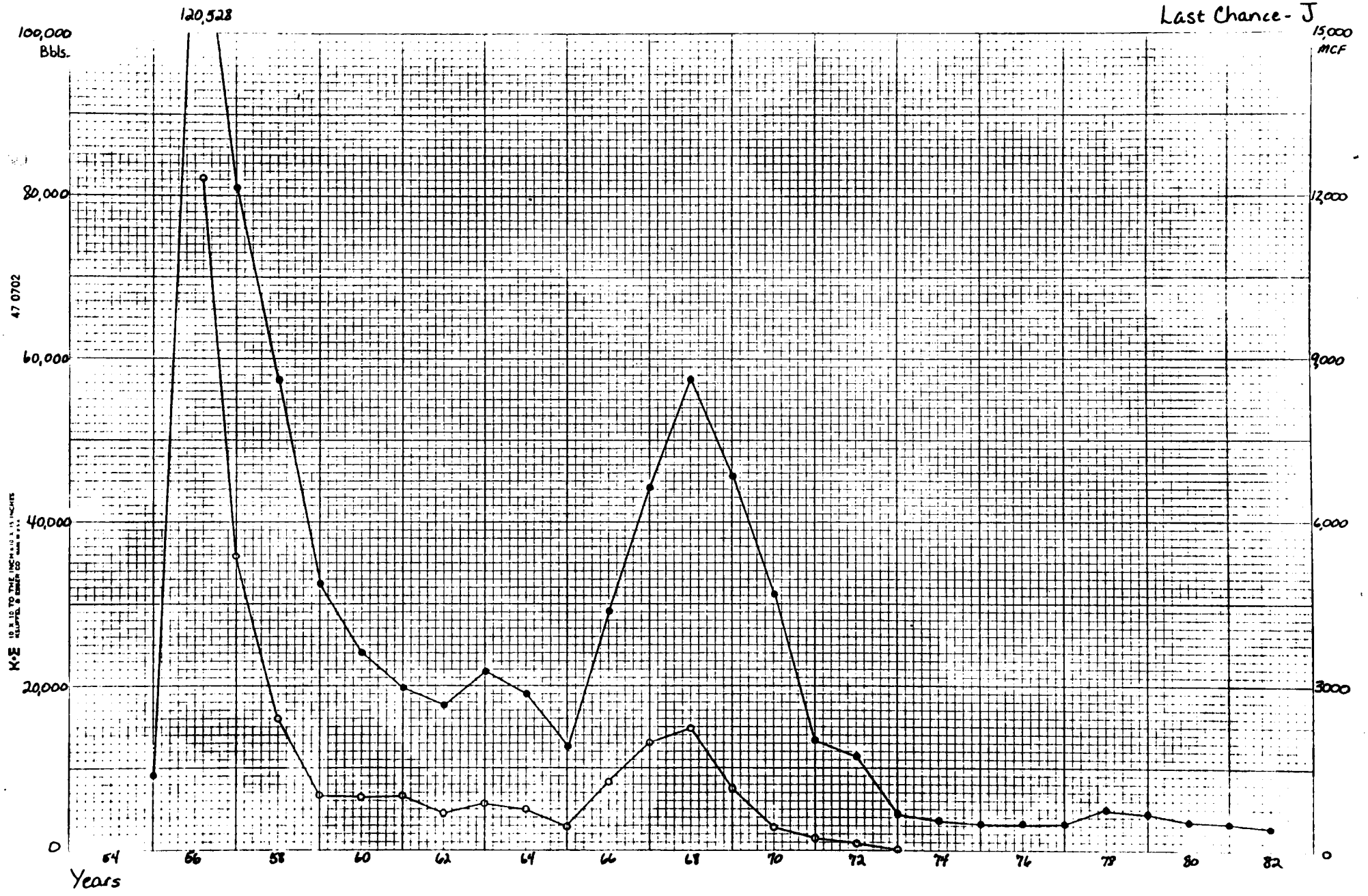

200,000
Bbls.
160,000
120,000
80,000
40,000
0
74
76
78
80
82
Years
47 0702
K·E

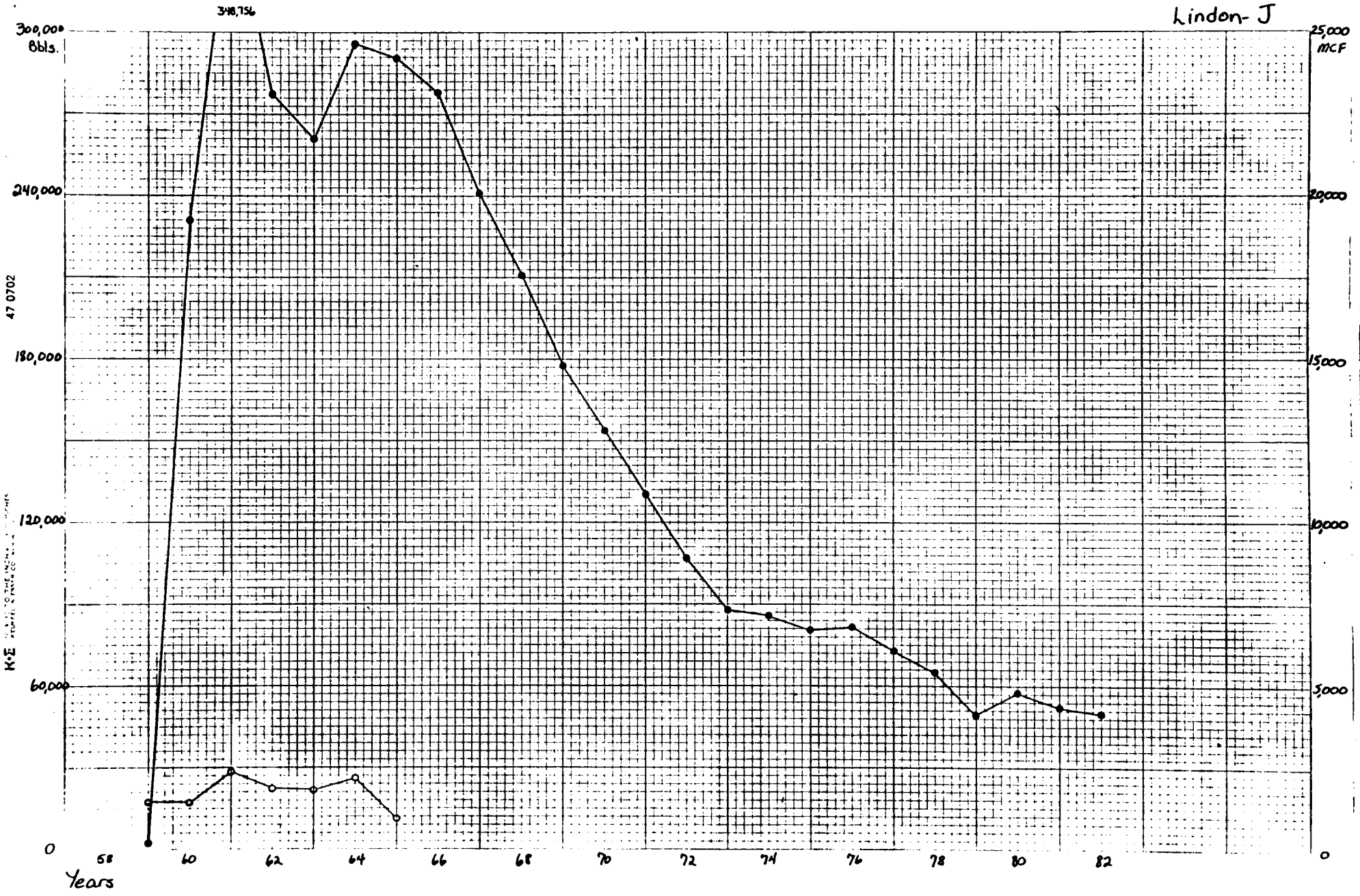

Rejr. D
300,000
Bbls.
240,000
180,000
120,000
60,000
0
110,000
MCF
88,000
66,000
44,000
22,000
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

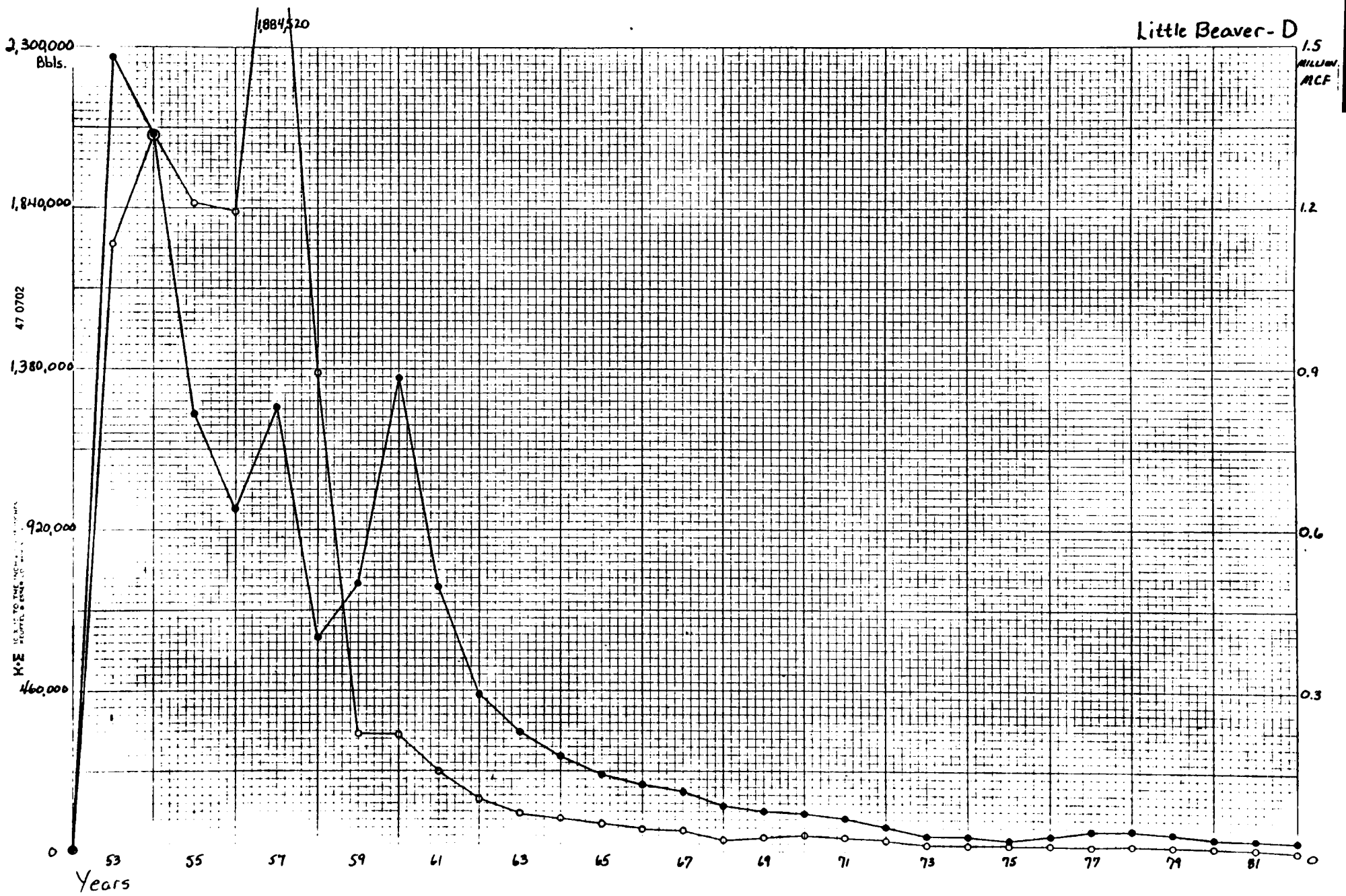

Kejr-J
100,000
Bbls.
80,000
60,000
40,000
20,000
0
15,000
MCF
12,000
9,000
6,000
3,000
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K-E

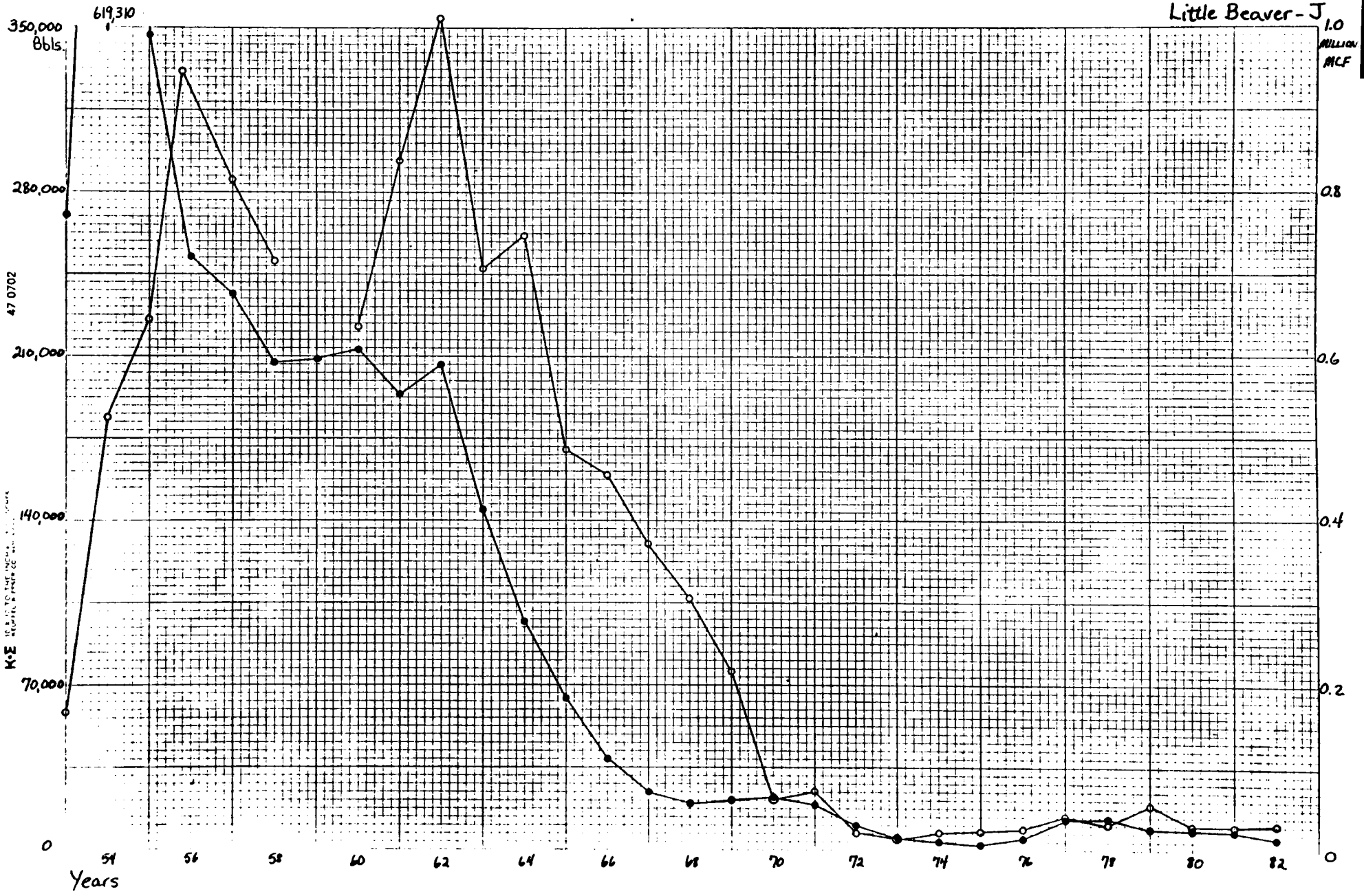

Kejr South- J
50,000 Bbls.
50,000 MCF
40,000
30,000
20,000
10,000
0
47 0702
K·E 10 X 10 TO THE INCH • 5 X 5 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
Pond A 3/67

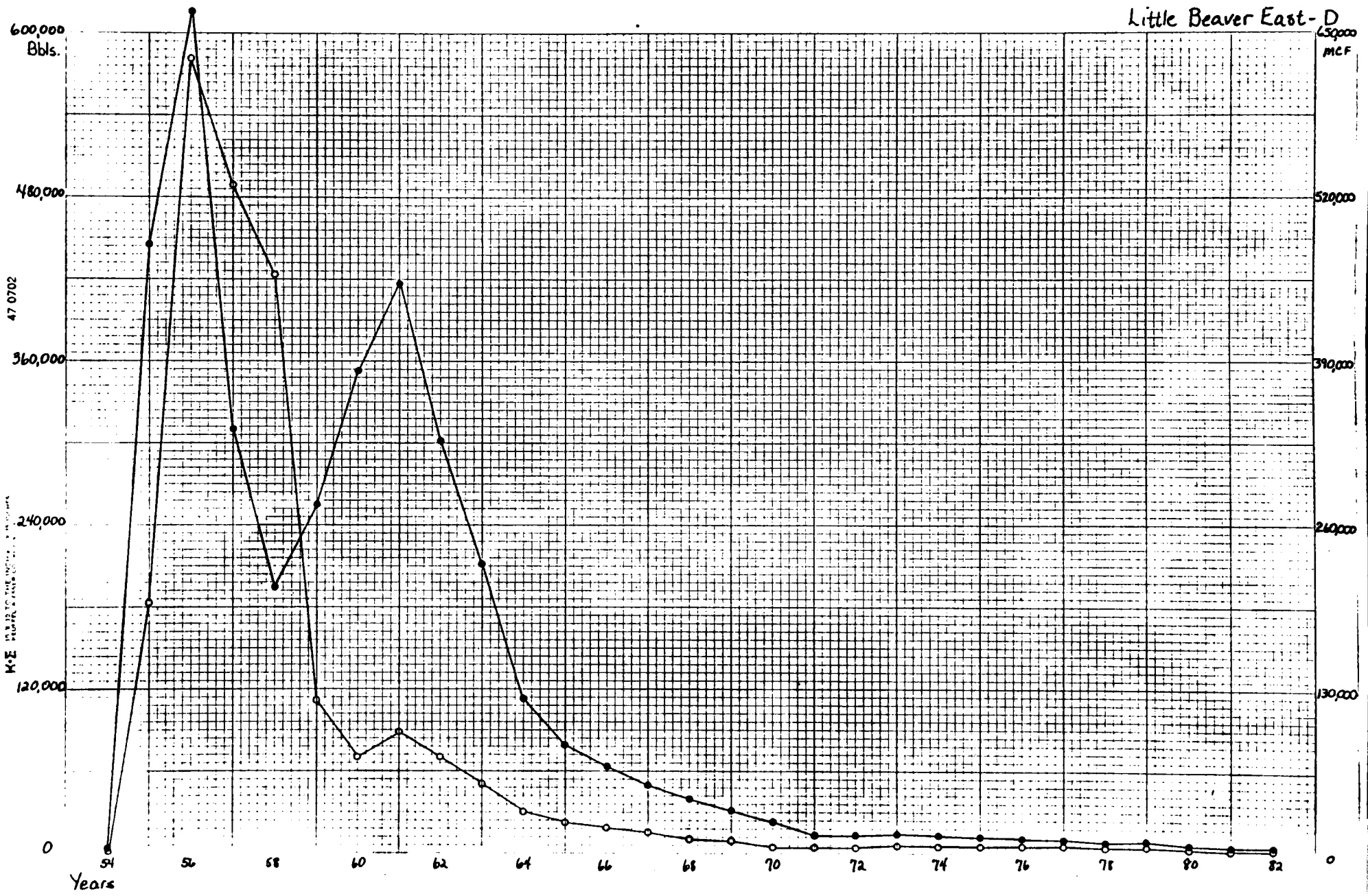

Lariat - D
108,519
100,000
Bbls.
80,000
60,000
40,000
20,000
0
60,000
MCF
48,000
36,000
24,000
12,000
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K&E

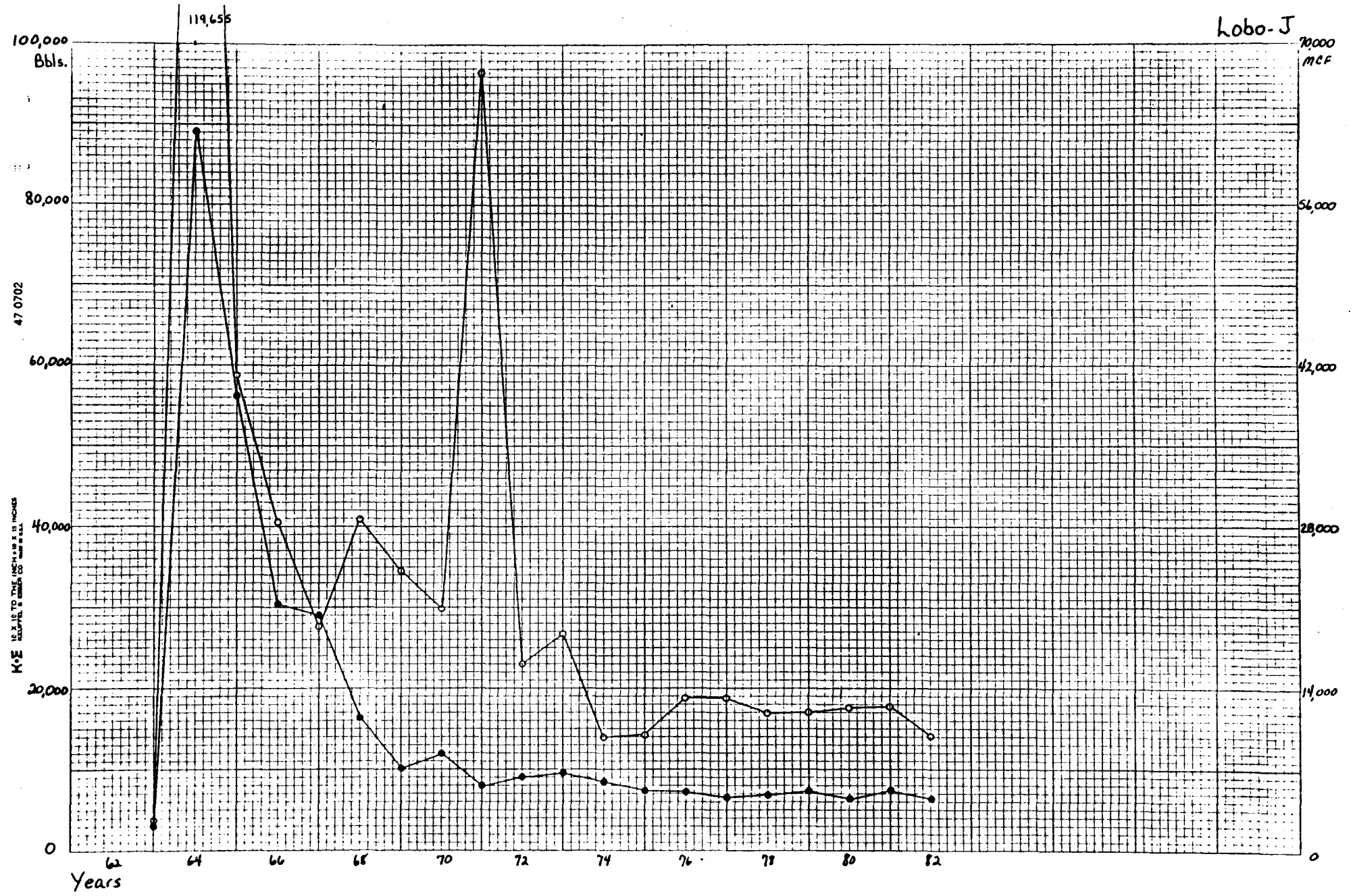

Last Chance - J
120,528
100,000 Bbls.
15,000 MCF
80,000
60,000
40,000
20,000
0
12,000
9,000
6,000
3000
0
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K&E


348,756
Lindon-J
300,000
Bbls.
240,000
180,000
120,000
60,000
0
25,000
MCF
20,000
15,000
10,000
5,000
0
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K+E

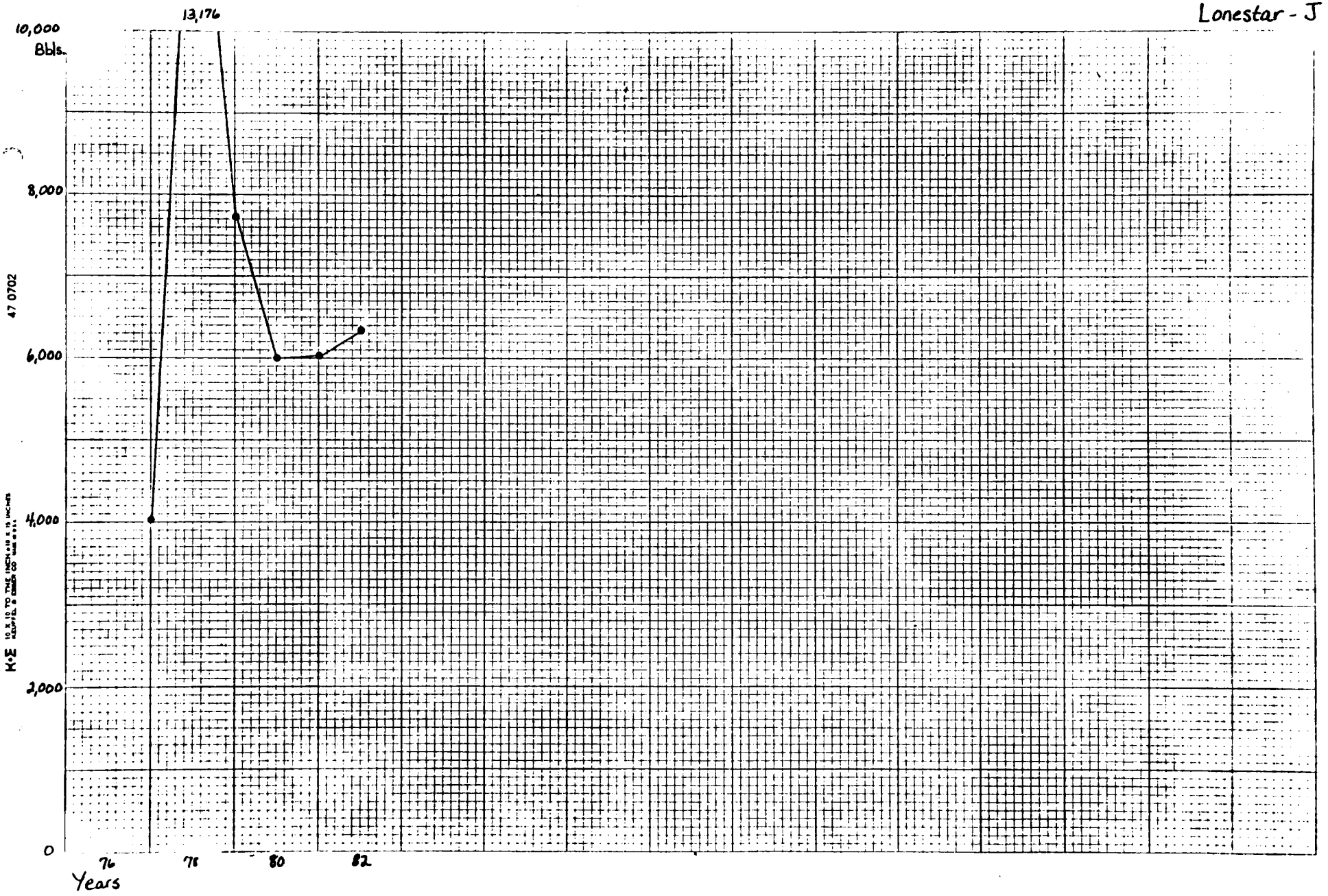

Little Beaver - D
1,884,520
2,300,000 Bbls.
1,840,000
1,380,000
920,000
460,000
0
1.5 MILLION MCF
1.2
0.9
0.6
0.3
0
47 0702
K·E
53
55
57
59
61
63
65
67
69
71
73
75
77
79
81
Years

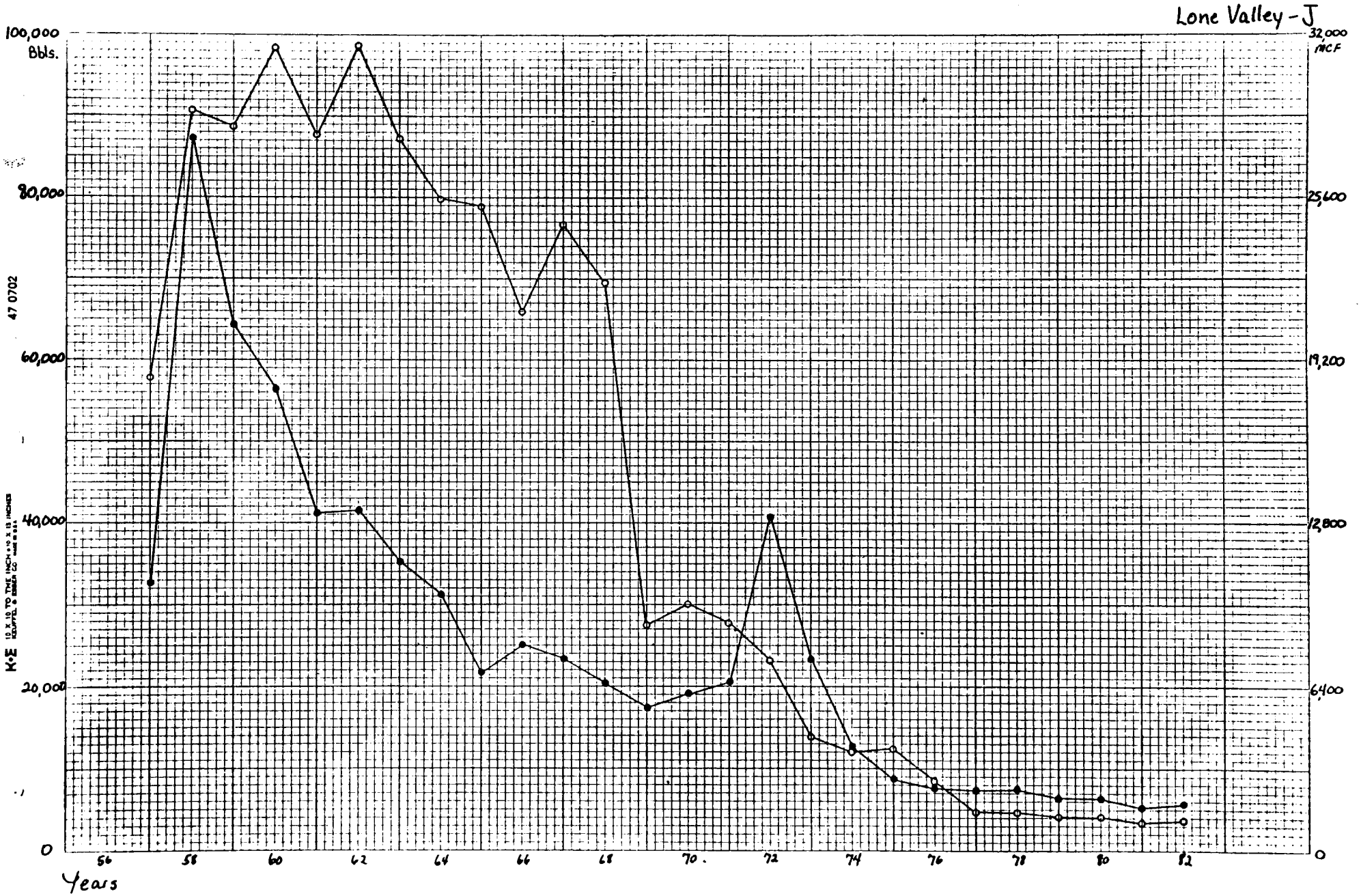

Little Beaver - J
619,310
350,000
Bbls.
280,000
210,000
140,000
70,000
0
1.0
MILLION
MCF
0.8
0.6
0.4
0.2
0
47 0702
K·E
51
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years


Little Beaver East - D
600,000
Bbls.
480,000
360,000
240,000
120,000
0
650,000
mcf
520,000
390,000
260,000
130,000
0
47 0702
K+E
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

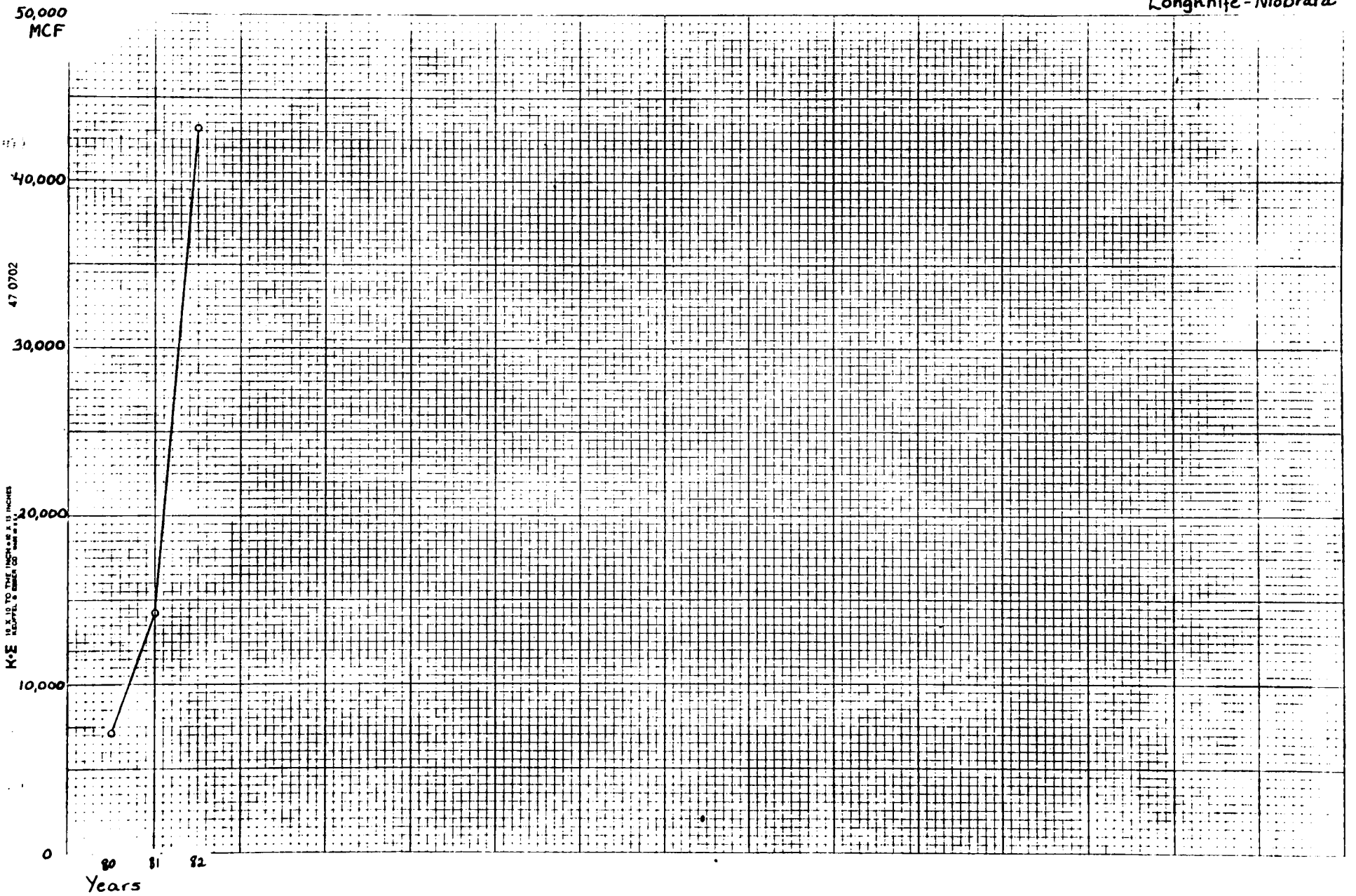

Lobo-J
119,655
100,000
Bbls.
80,000
60,000
40,000
20,000
0
70,000
MCF
56,000
42,000
28,000
14,000
0
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K·E

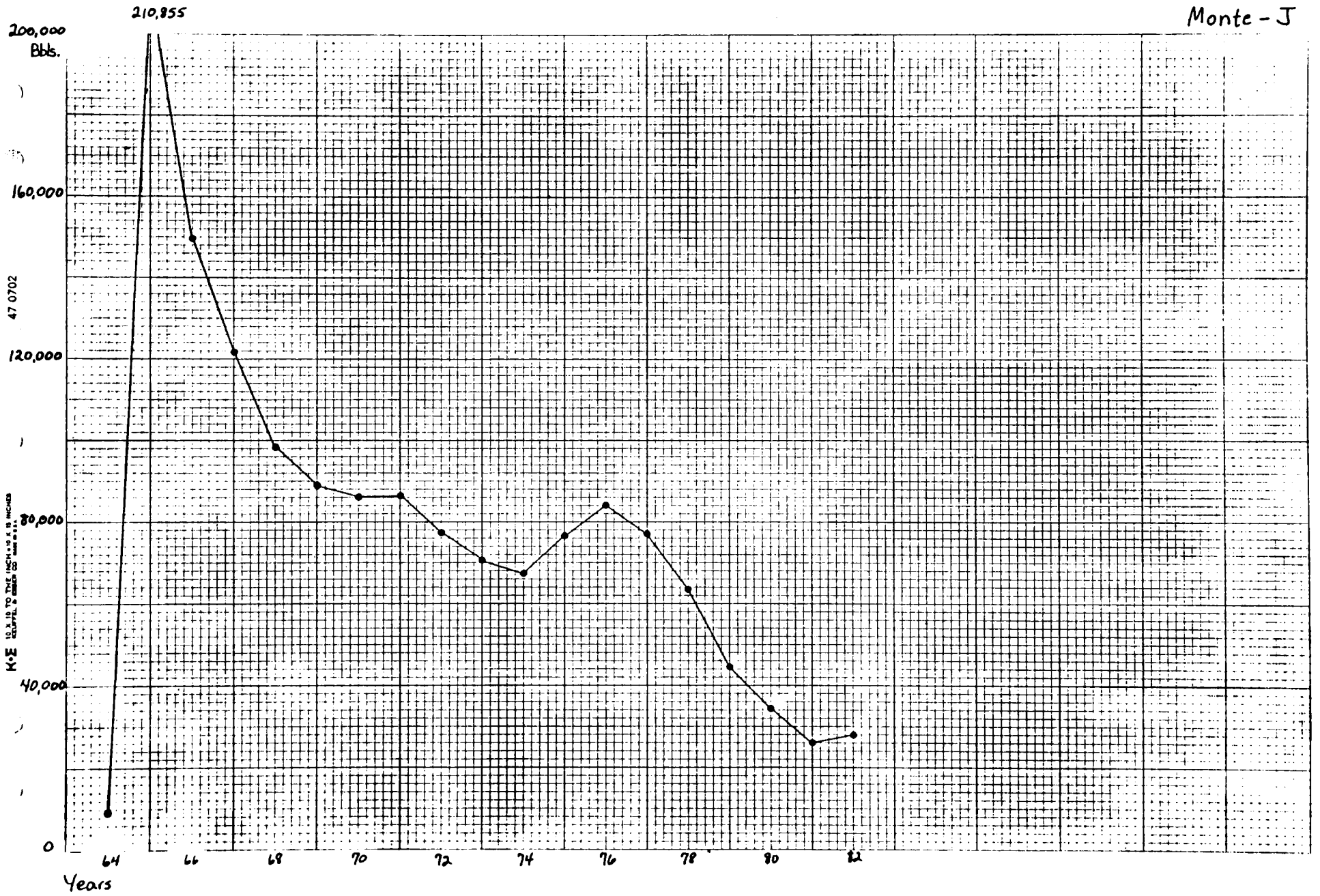
Lonestar - J

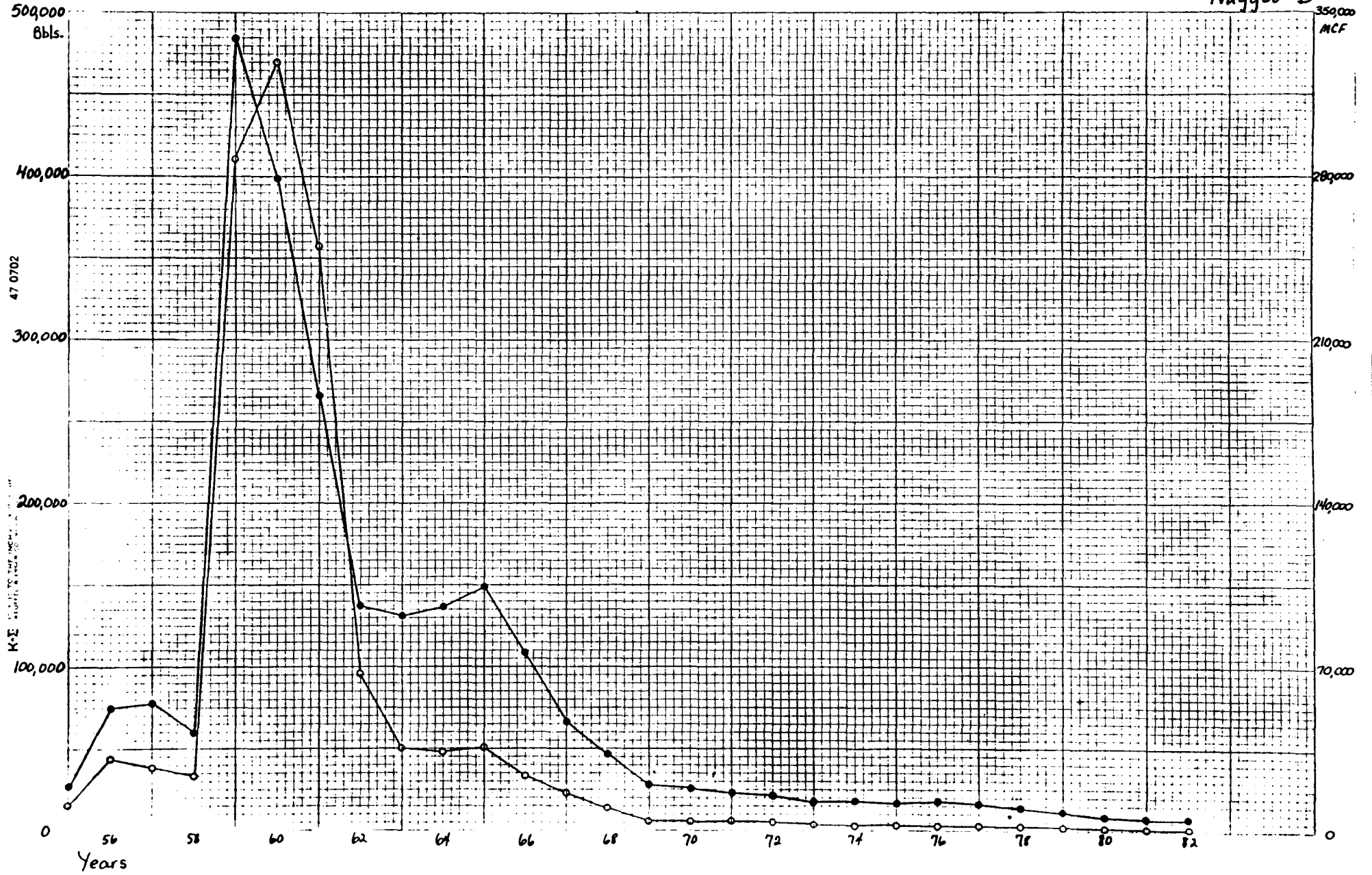

13,176
10,000
Bbls.
8,000
6,000
4,000
2,000
0
76
78
80
82
Years
47 0702
K+E

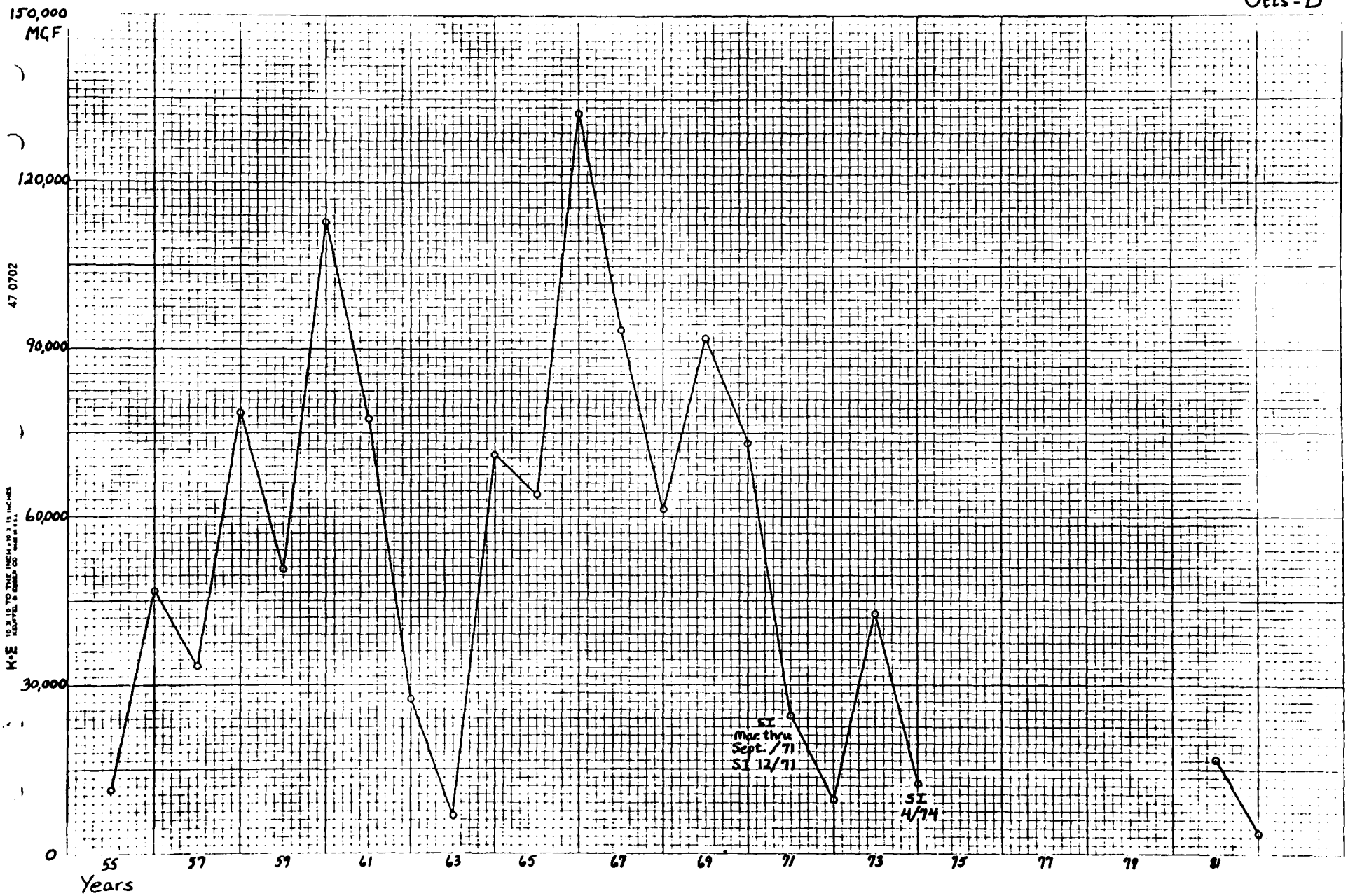

Lone Valley - J
100,000
Bbls.
80,000
60,000
40,000
20,000
0
32,000
MCF
25,600
19,200
12,800
6400
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K·E
10 X 10 TO THE INCH • 10 X 15 INCHES

Longknife - Niobrara

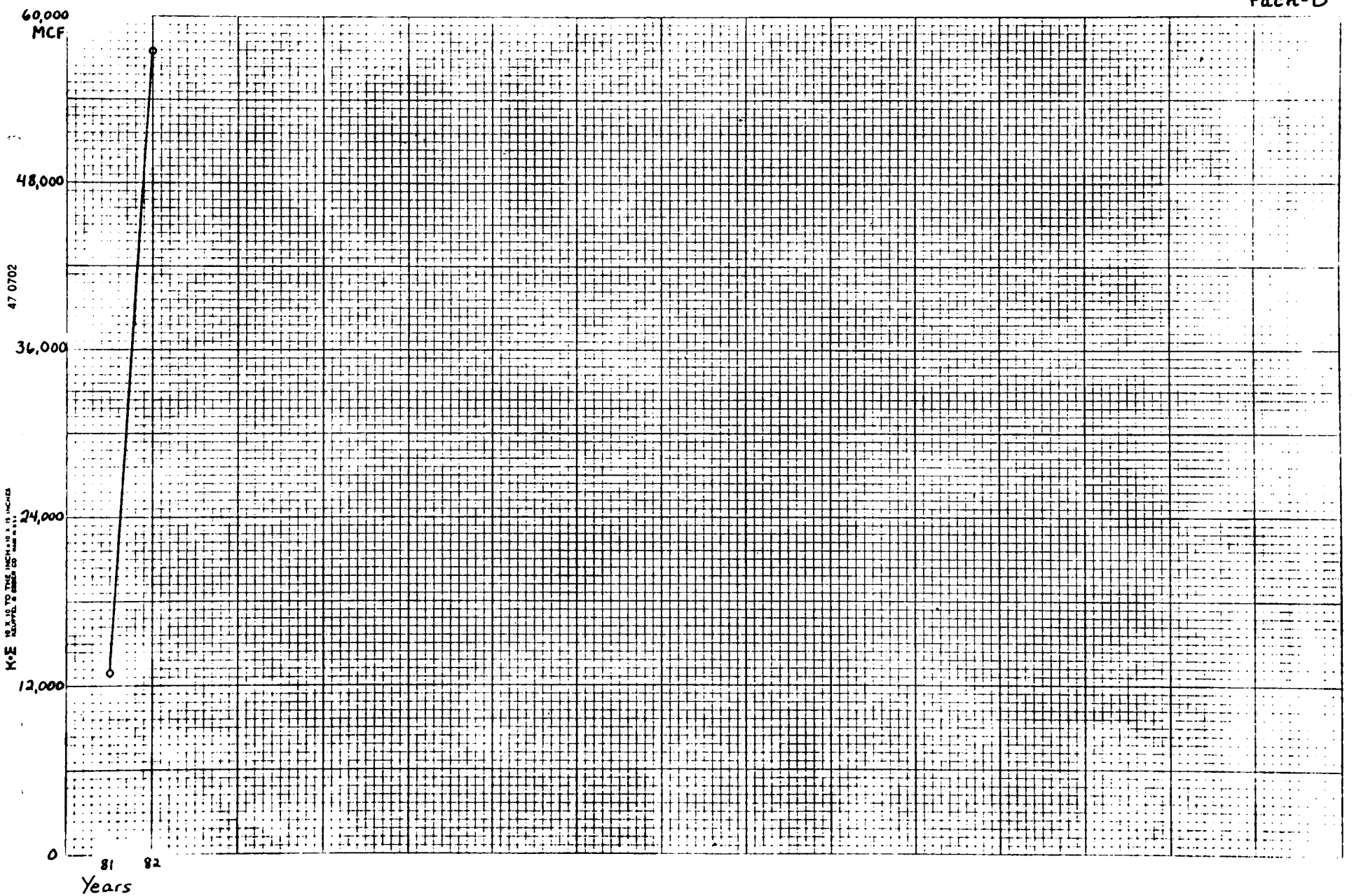



Monte - J
210,855
200,000
Bbls.
160,000
120,000
80,000
40,000
0
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K·E 10 X 10 TO THE INCH • 10 X 15 INCHES

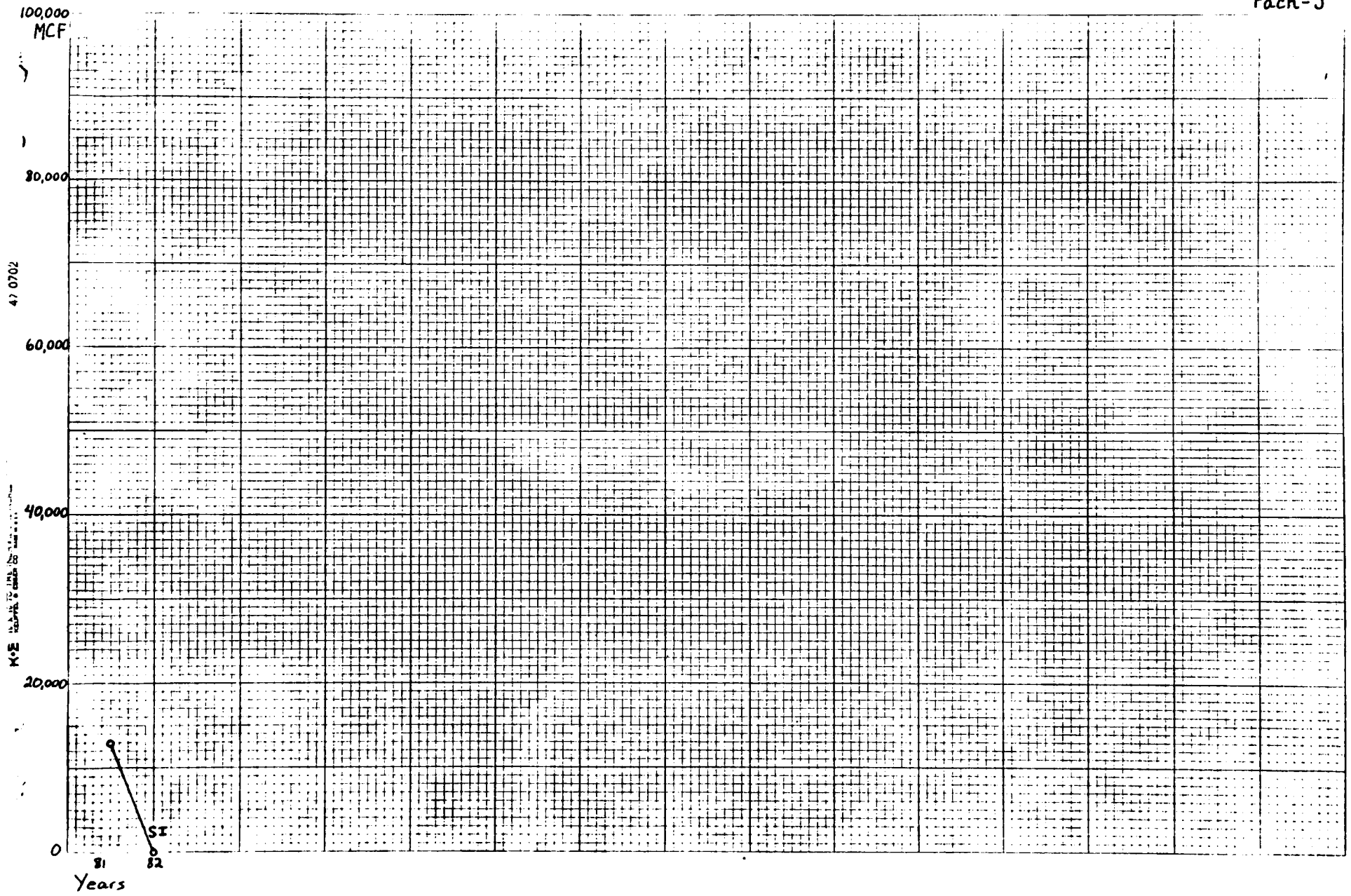

Nugget - D
500,000
Bbls.
400,000
300,000
200,000
100,000
0
350,000
MCF
280,000
210,000
140,000
70,000
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702


Otis-D
150,000
MCF
120,000
90,000
60,000
30,000
0
55
57
59
61
63
65
67
69
71
73
75
77
79
81
Years
SI
Mac thru
Sept. /71
SI 12/71
SI
4/74
47 0702
K·E

Pack-D

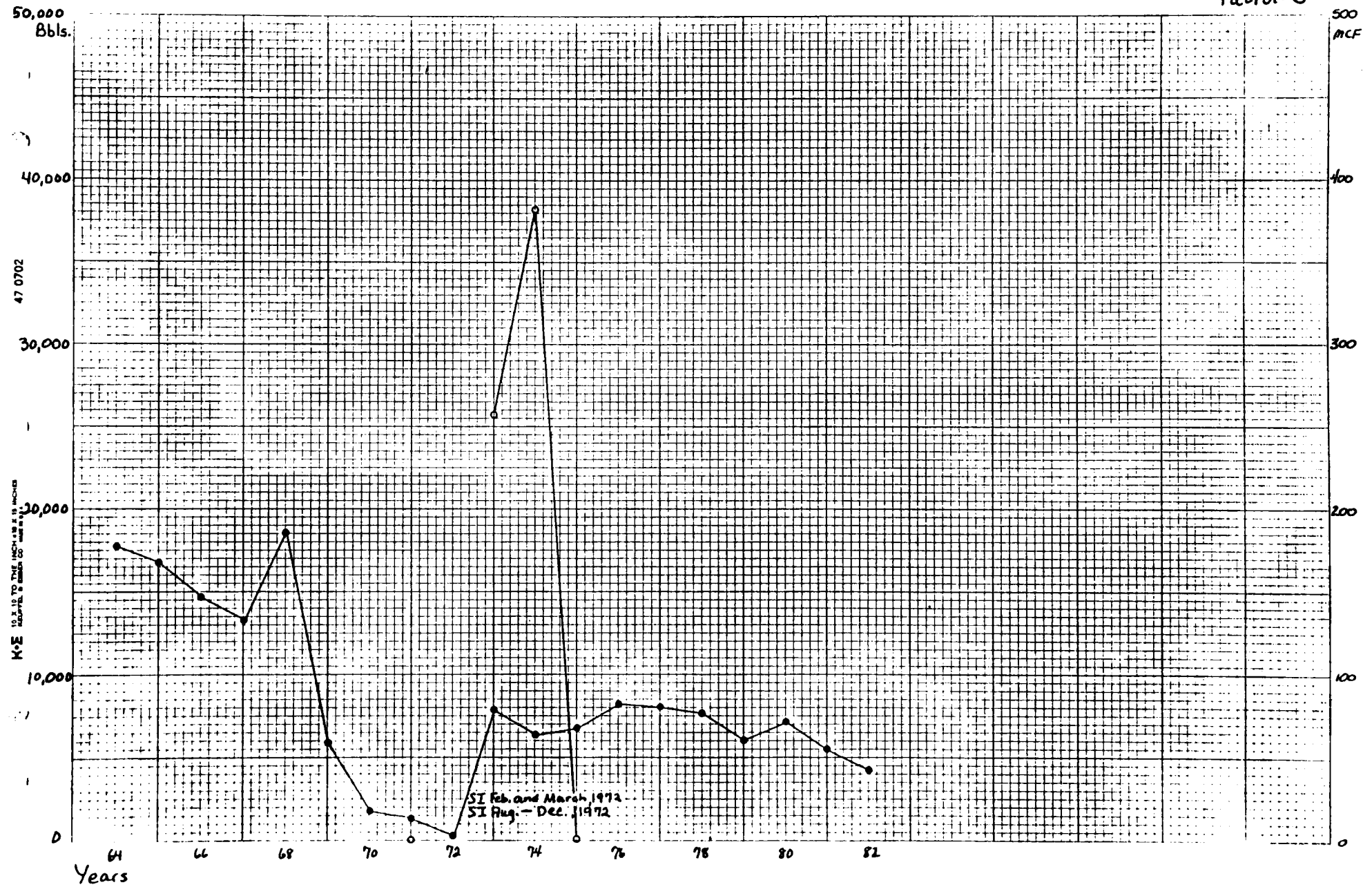


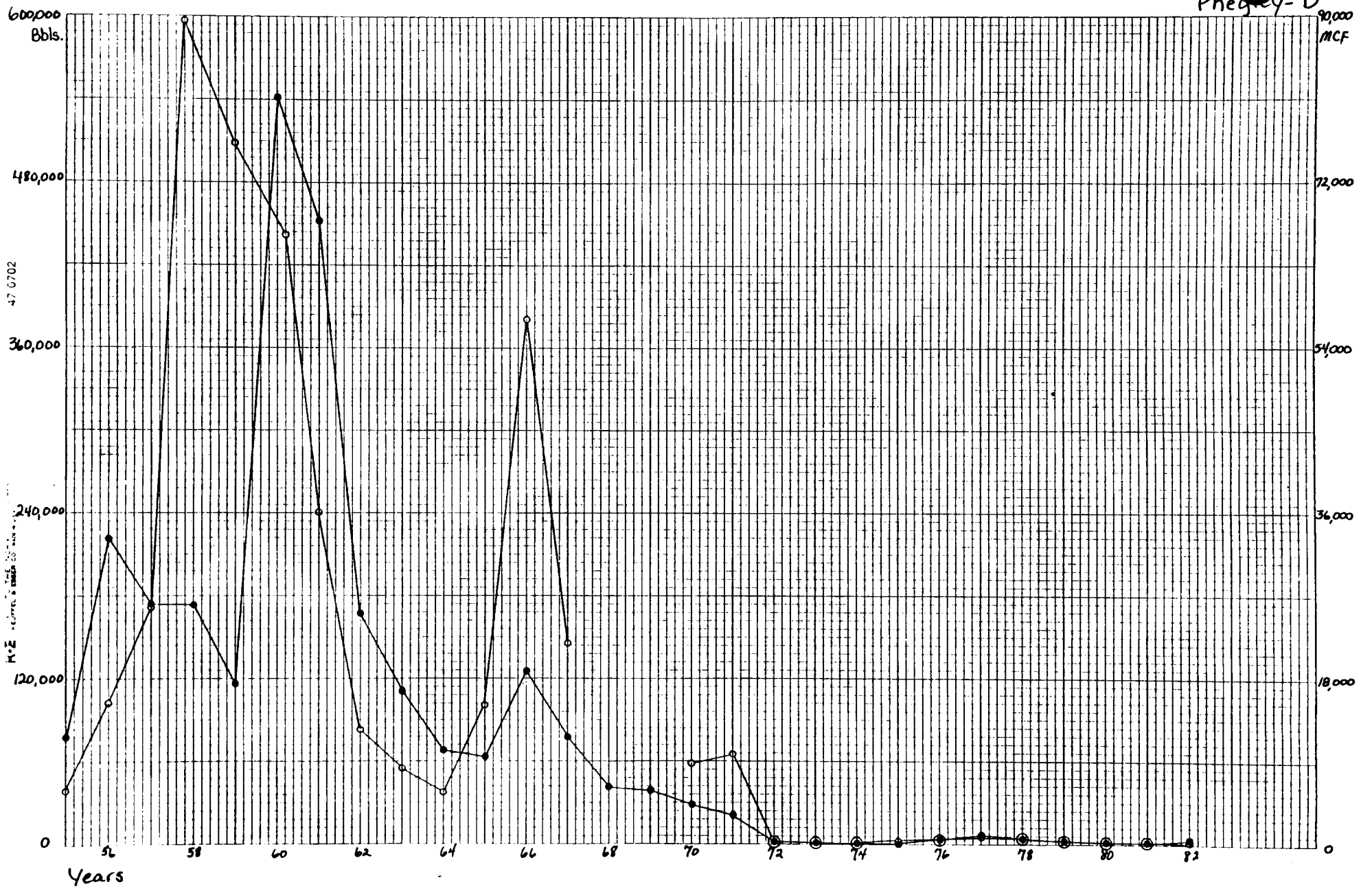
Pack-J

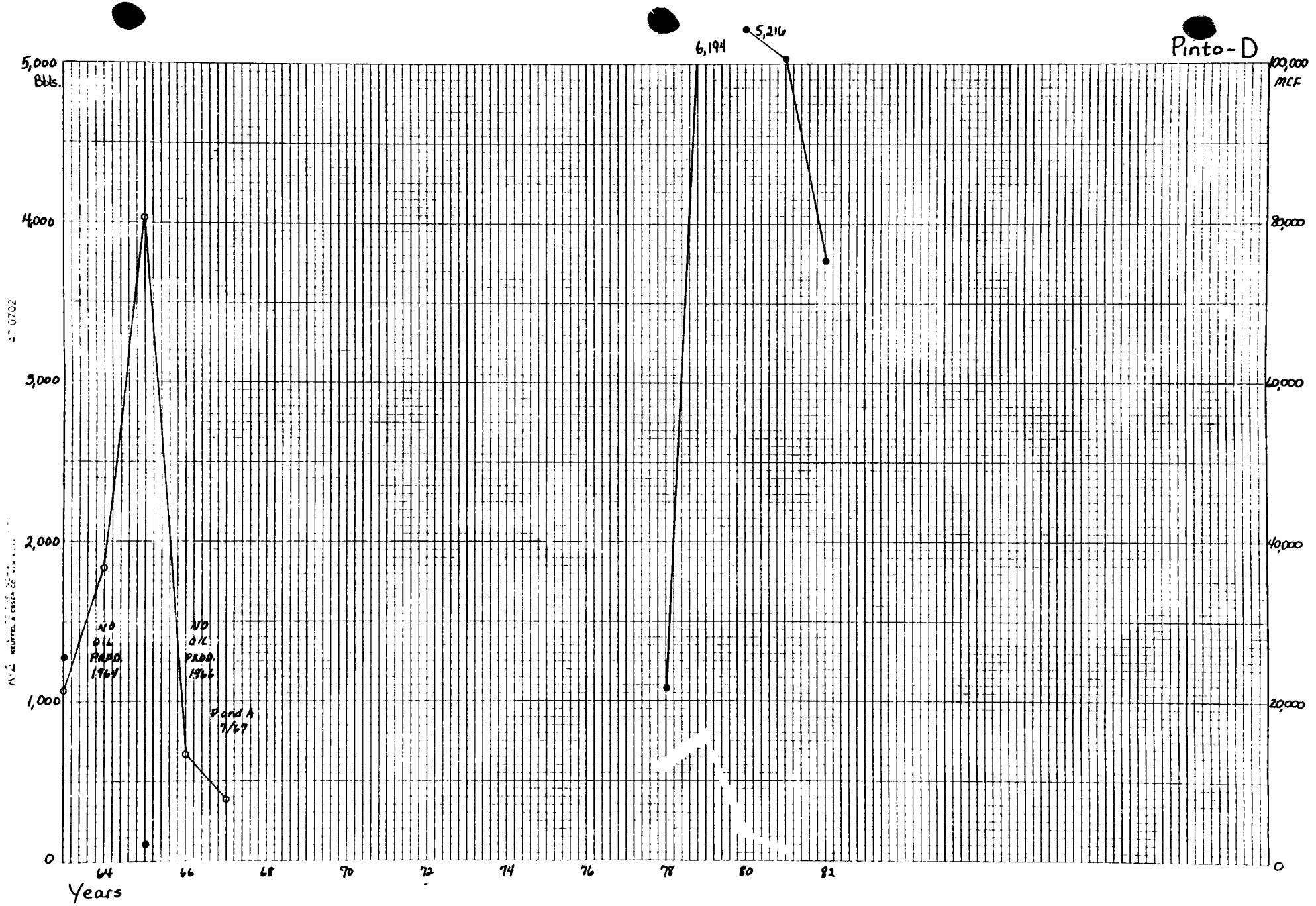


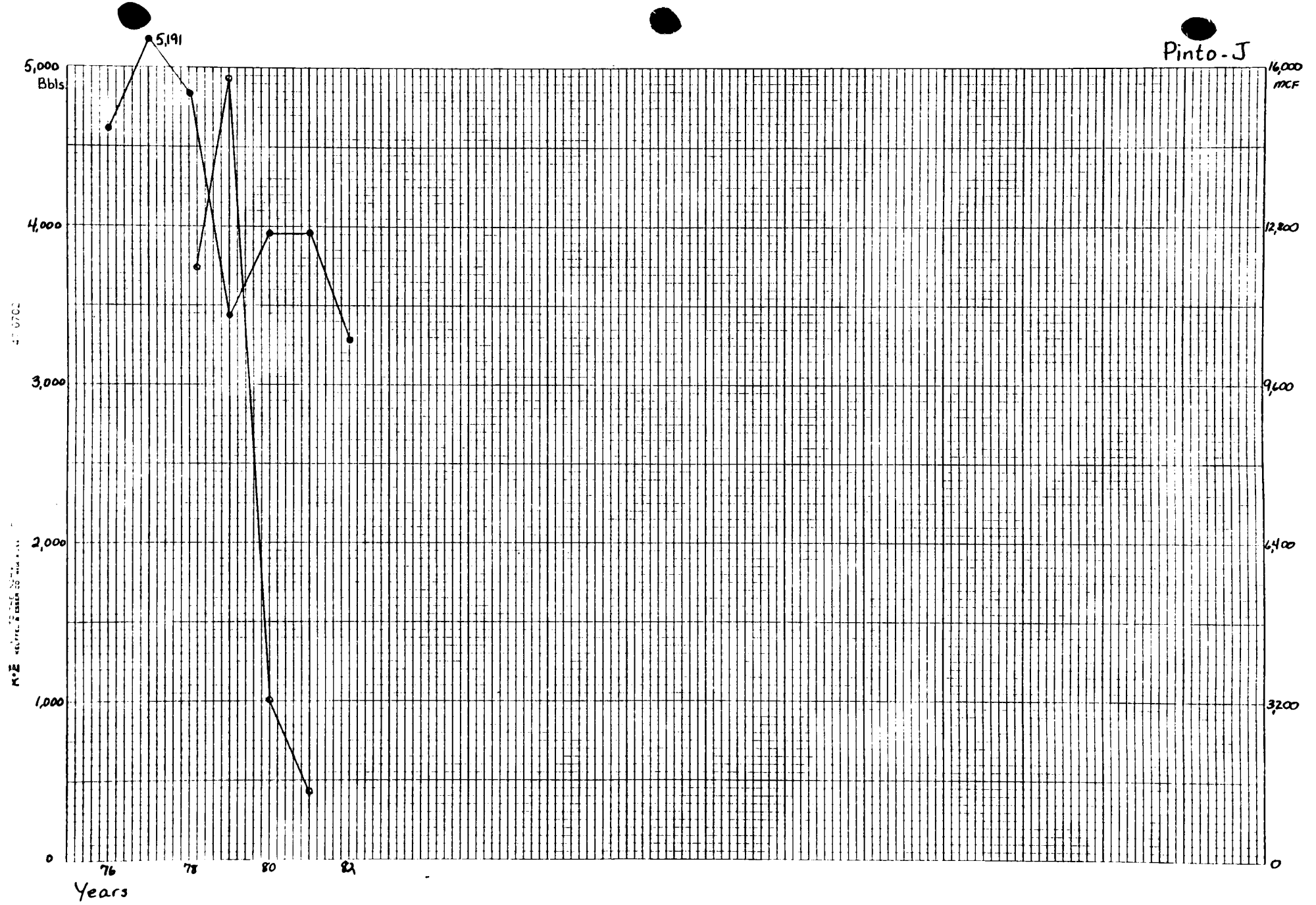
eg

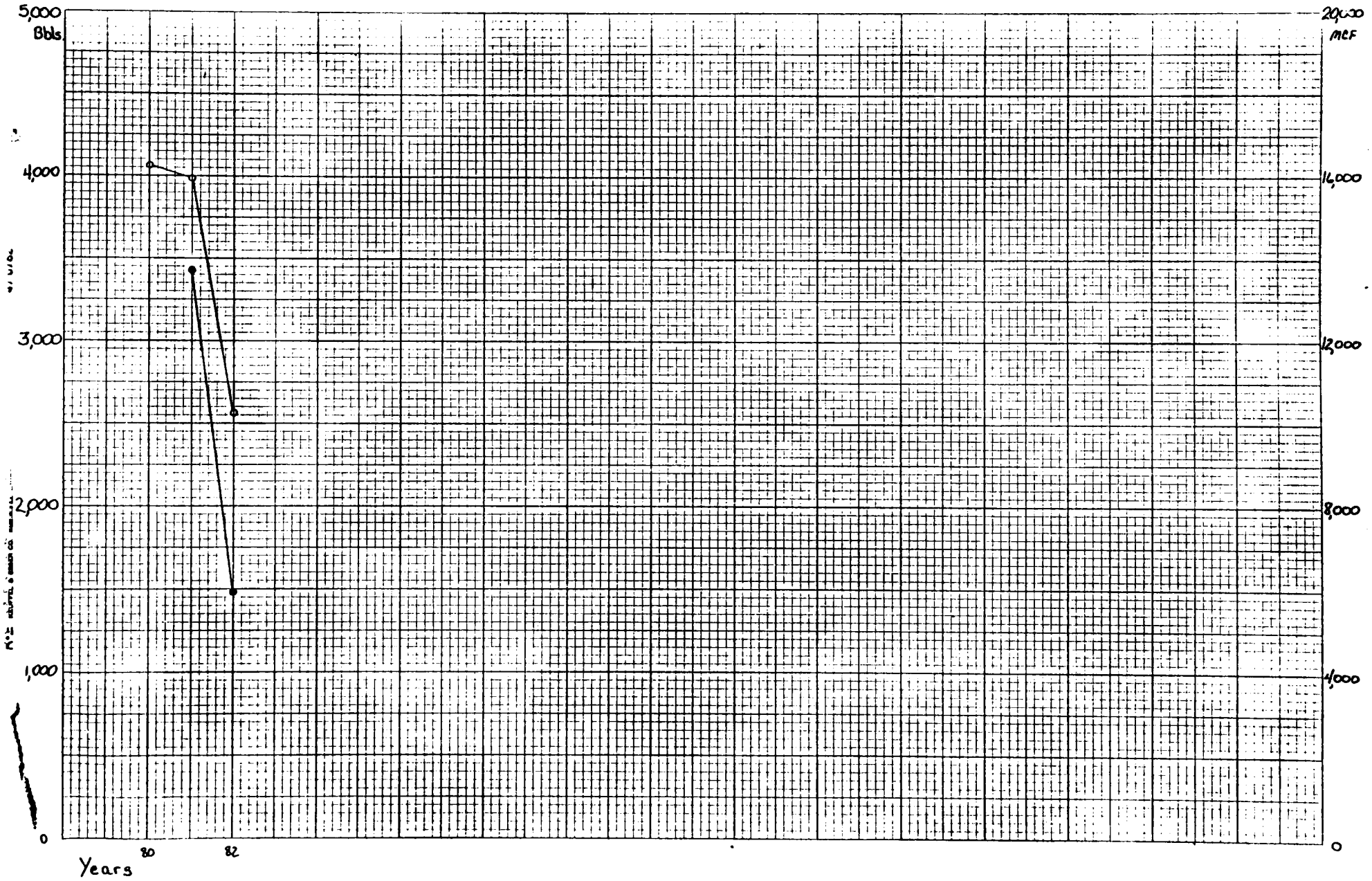
Patrol-J


50,000
Bbls.
40,000
30,000
20,000
10,000
0
500
MCF
400
300
200
100
0
64
66
68
70
72
74
76
78
80
82
Years
SI Feb. and March, 1972
SI Aug. – Dec., 1972
47 0702
K·E

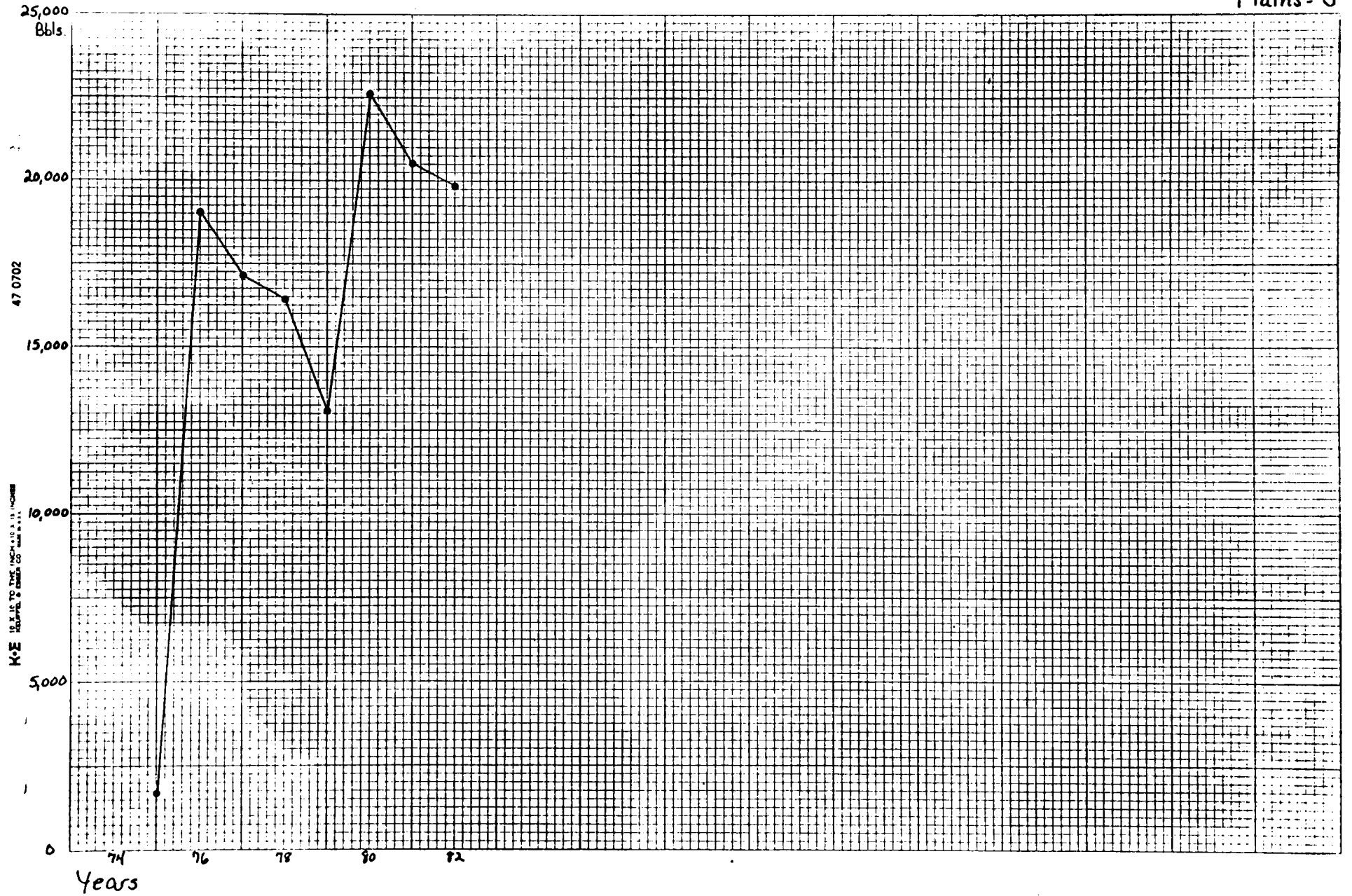

Phegley- D
600,000
Bbls.
480,000
360,000
240,000
120,000
0
90,000
MCF
72,000
54,000
36,000
18,000
0
52
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

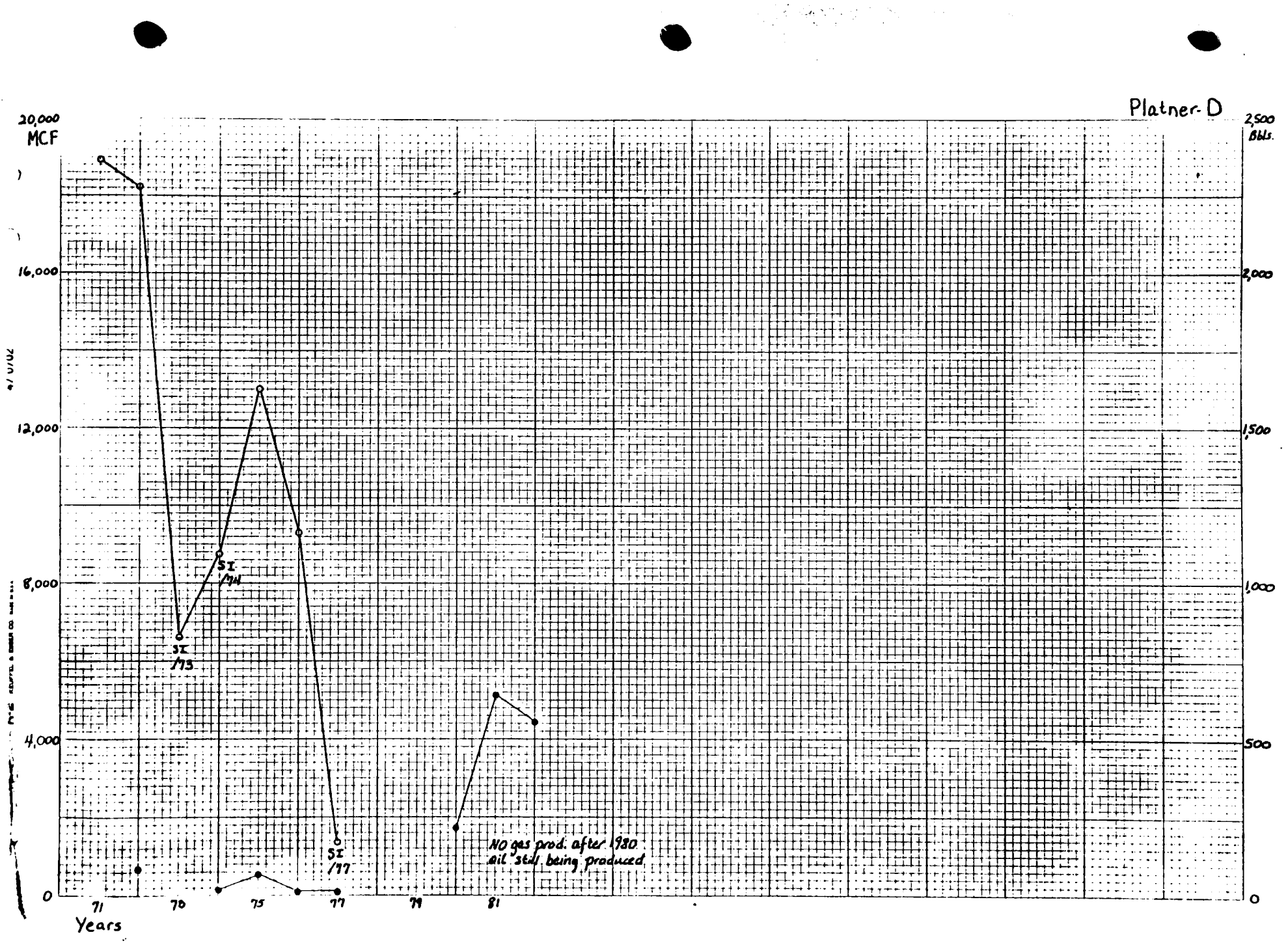

Pinto-D
5,000 Bbls.
4,000
3,000
2,000
1,000
0
100,000 MCF
80,000
60,000
40,000
20,000
0
6,194
5,216
NO OIL PROD. 1964
NO OIL PROD. 1966
P and A 7/67
64
66
68
70
72
74
76
78
80
82
Years

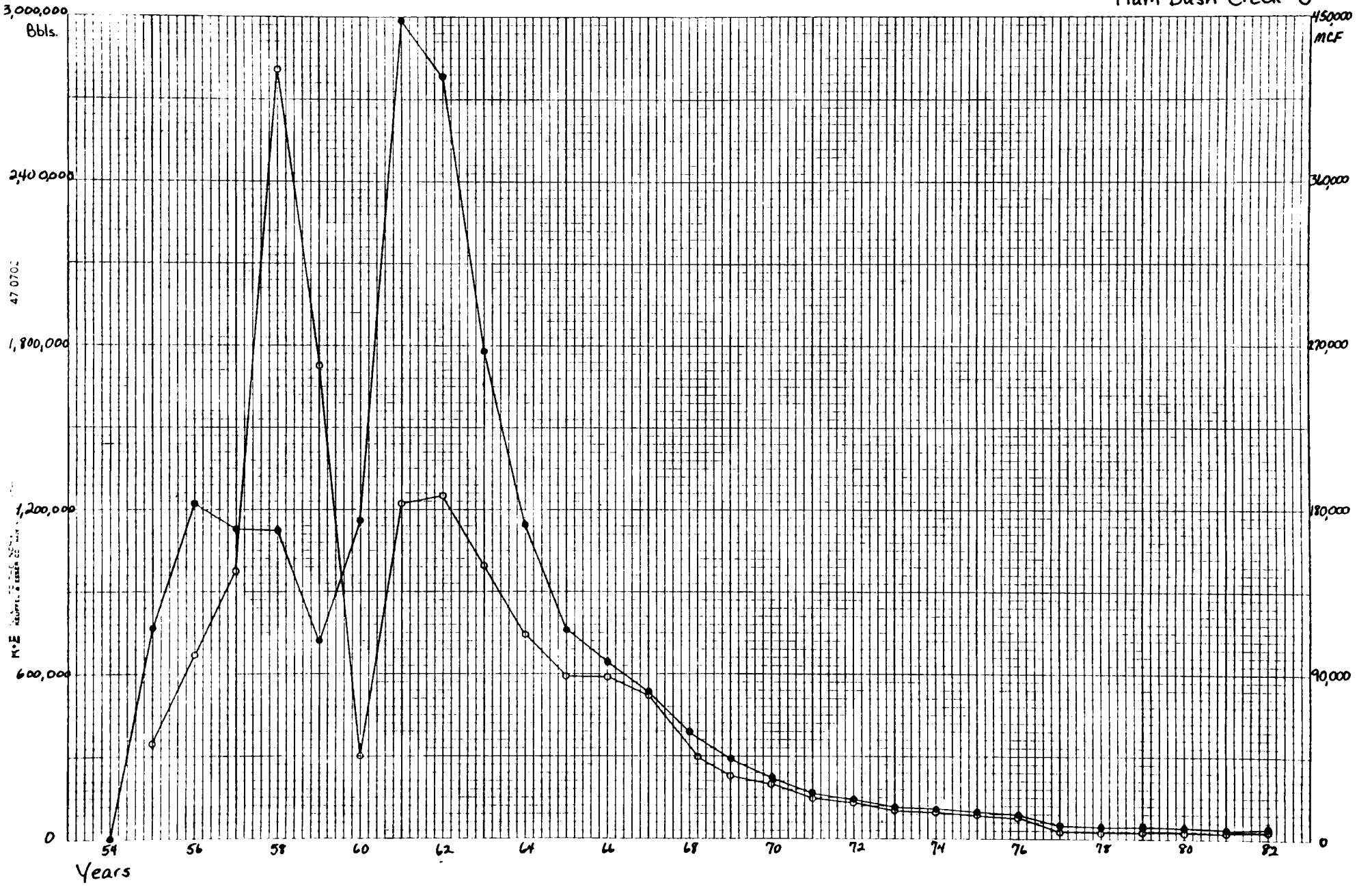

Pinto-J
5,191
5,000
Bbls.
4,000
3,000
2,000
1,000
0
16,000
MCF
12,800
9,600
6,400
3,200
0
76
78
80
82
Years


Pinto North - J
5,000
Bbls.
4,000
3,000
2,000
1,000
0
20,000
MCF
16,000
12,000
8,000
4,000
0
80
82
Years

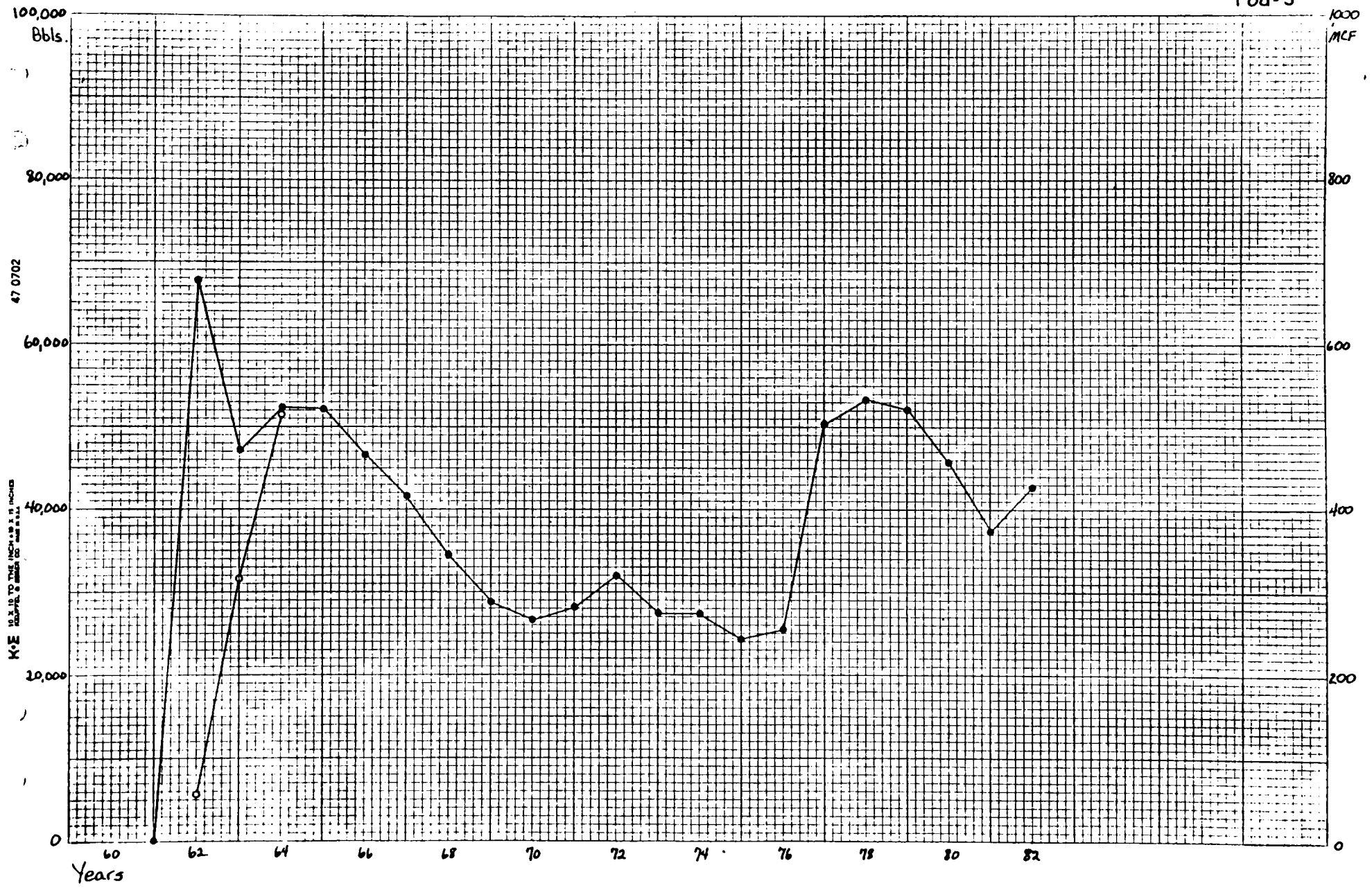
Plains - J


25,000
Bbls.
20,000
15,000
10,000
5,000
0
74
76
78
80
82
Years
47 0702
K&E

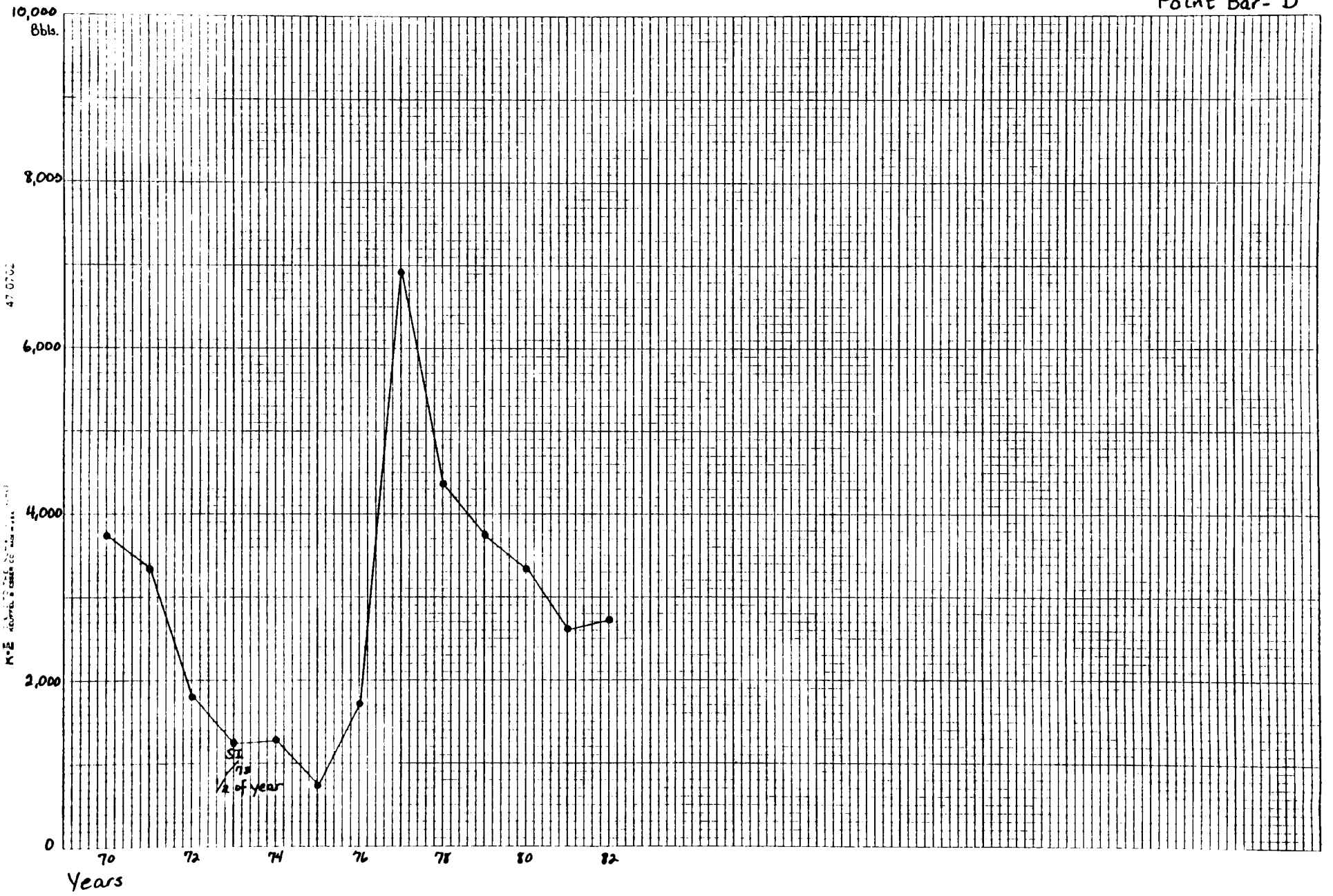

Platner-D
20,000
MCF
16,000
12,000
8,000
4,000
0
2,500
Bbls.
2,000
1,500
1,000
500
0
SI
/73
SI
/74
SI
/77
NO gas prod. after 1980.
oil still being produced.
71
70
75
77
79
81
Years

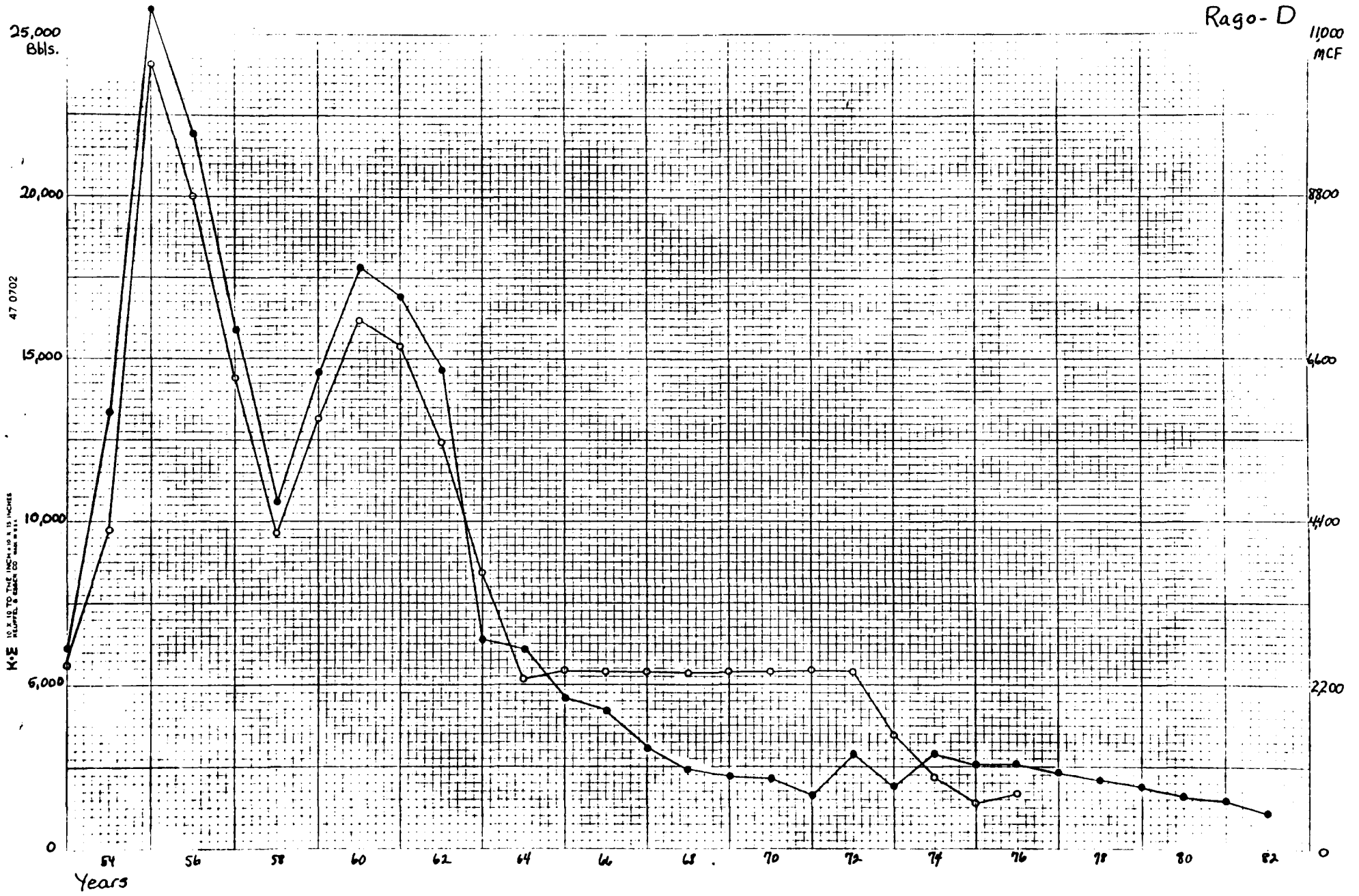

Plum Bush Creek - J
3,000,000
Bbls.
2,400,000
1,800,000
1,200,000
600,000
0
450,000
MCF
360,000
270,000
180,000
90,000
0
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

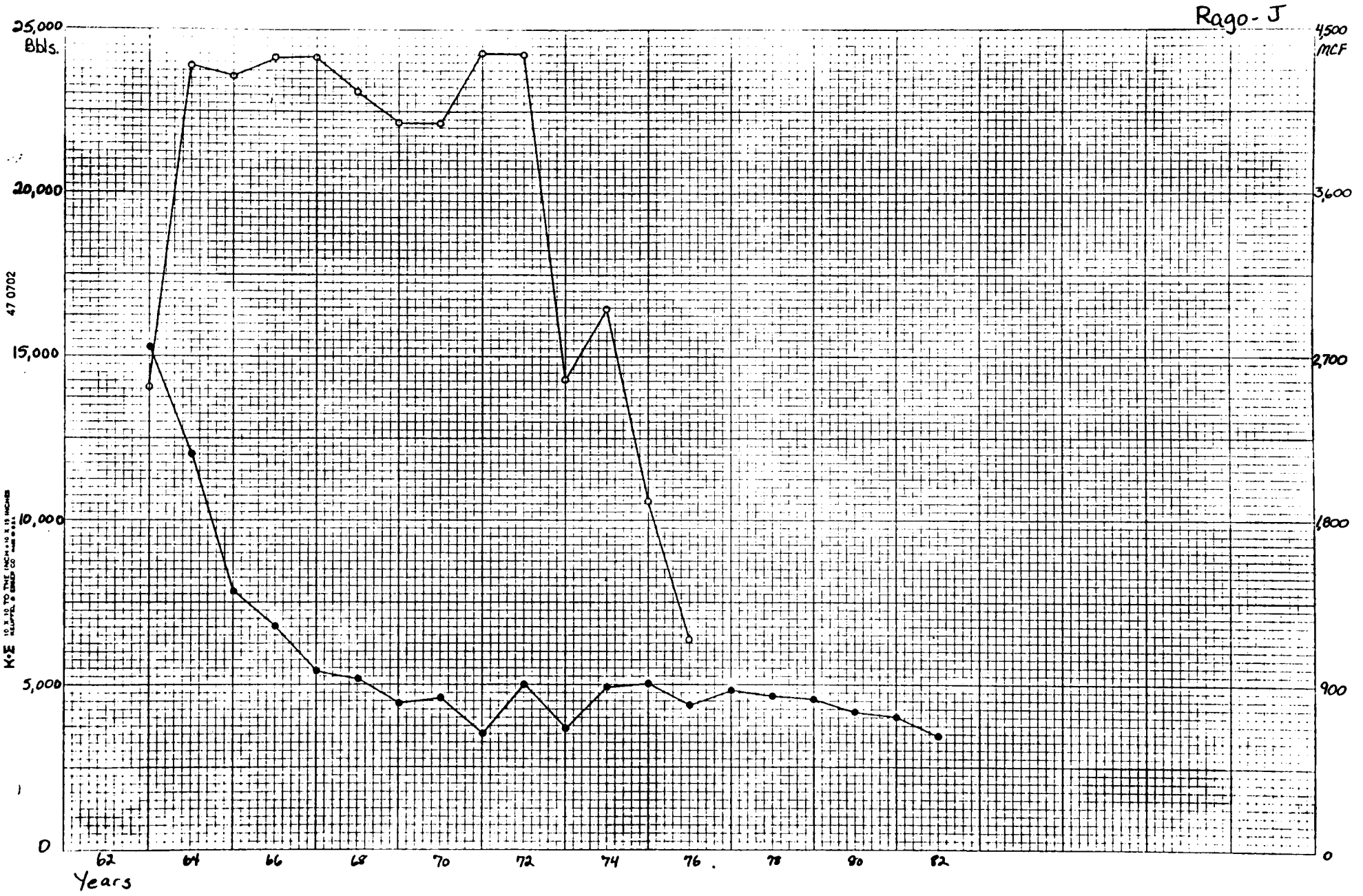
Pod-J

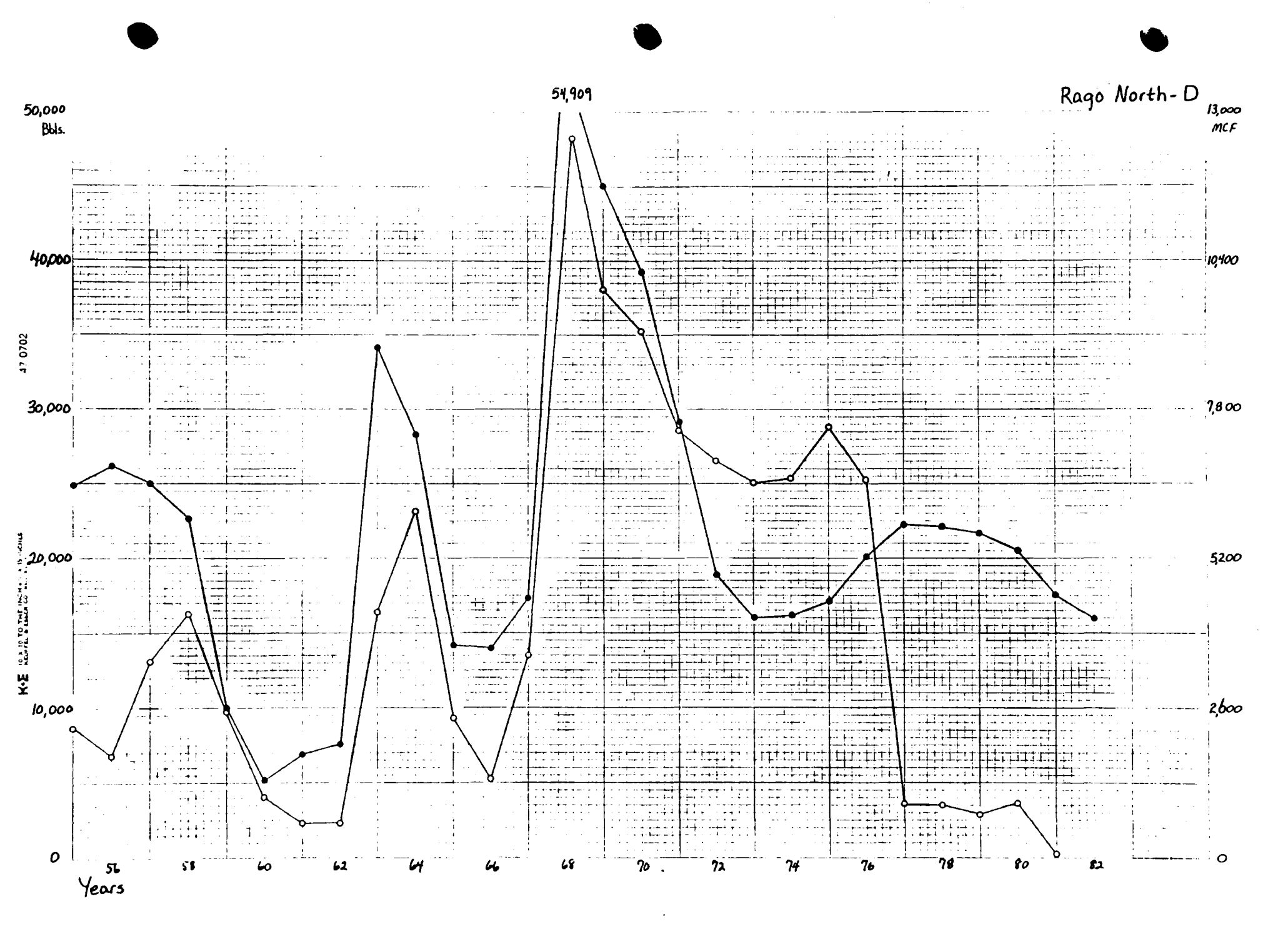

100,000
Bbls.
80,000
60,000
40,000
20,000
0
1000
MCF
800
600
400
200
0
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K&E

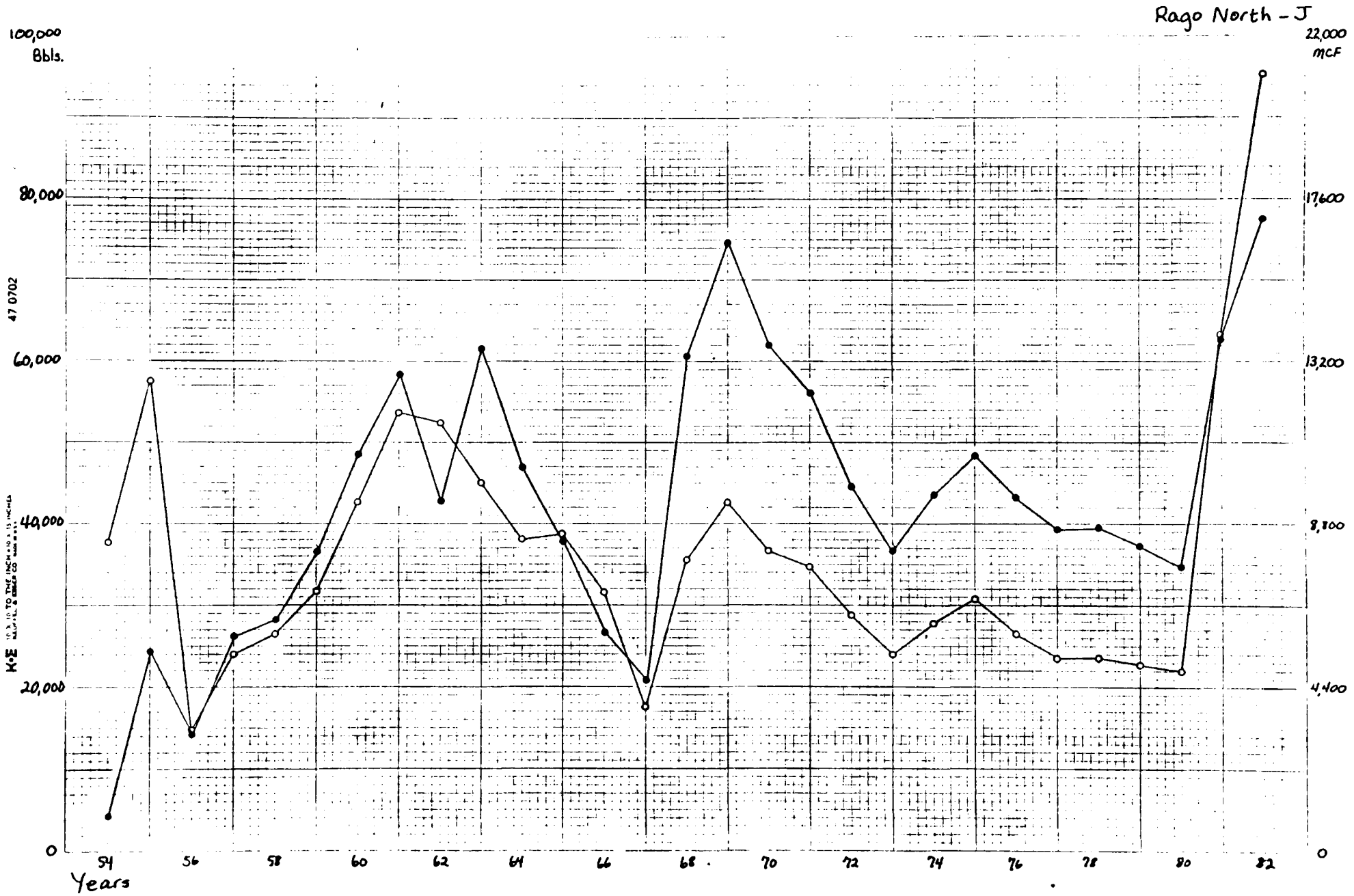
Point Bar- D

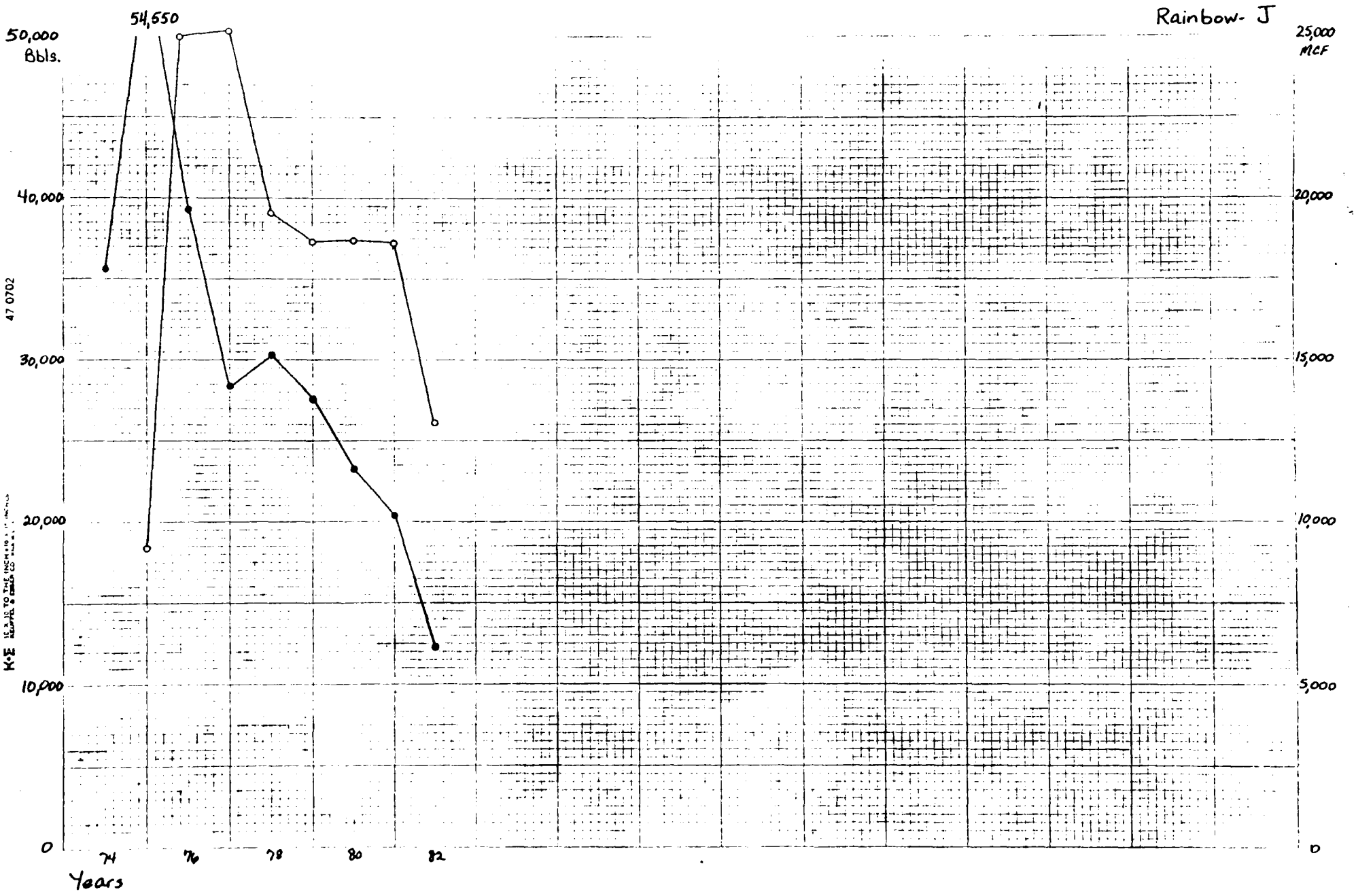

10,000
Bbls.
8,000
6,000
4,000
2,000
0
70
72
74
76
78
80
82
Years
SII
'78
½ of year

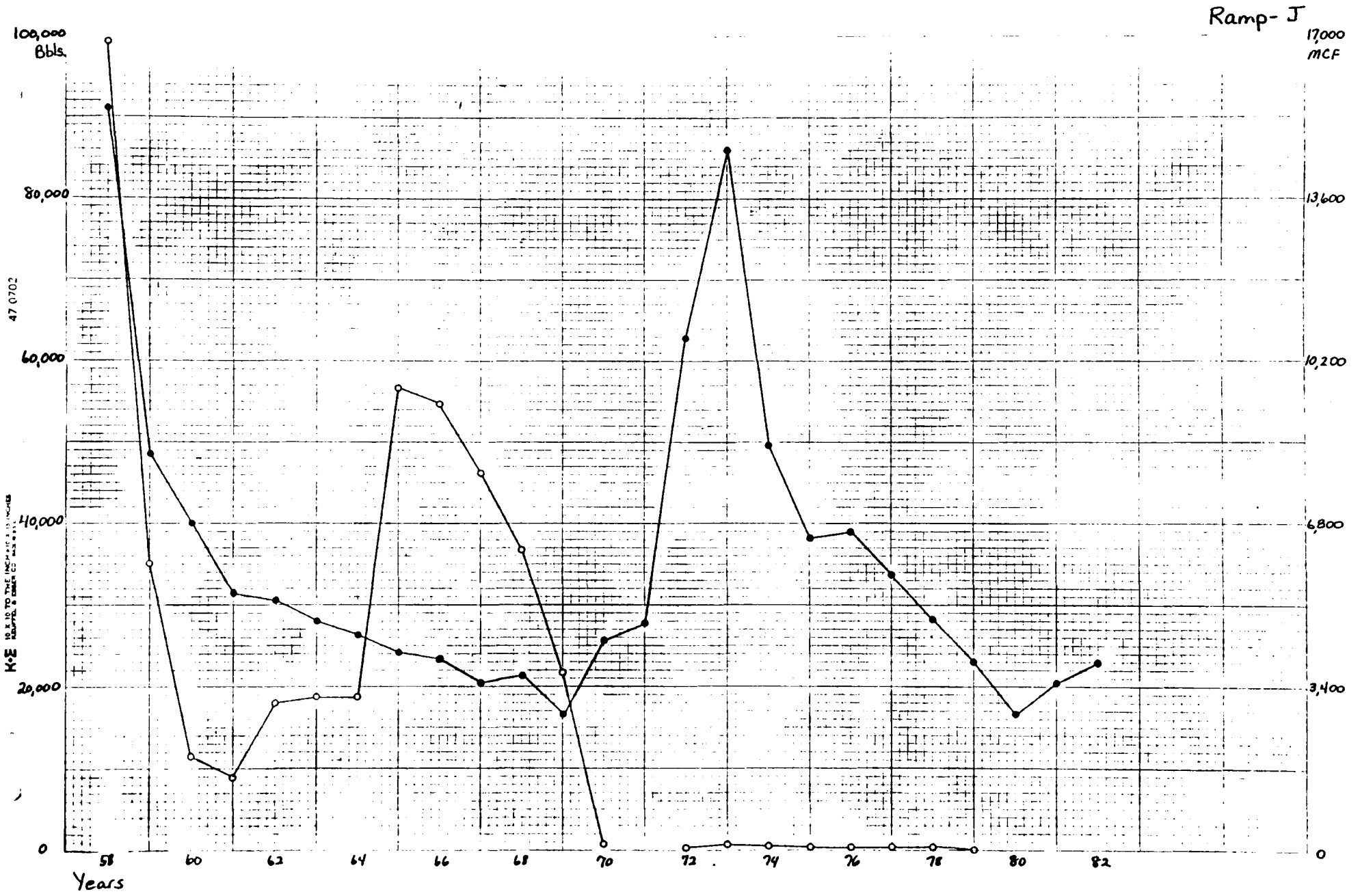

Rago-D
25,000 Bbls.
20,000
15,000
10,000
6,000
0
11,000 MCF
8800
6600
4400
2200
0
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K&E

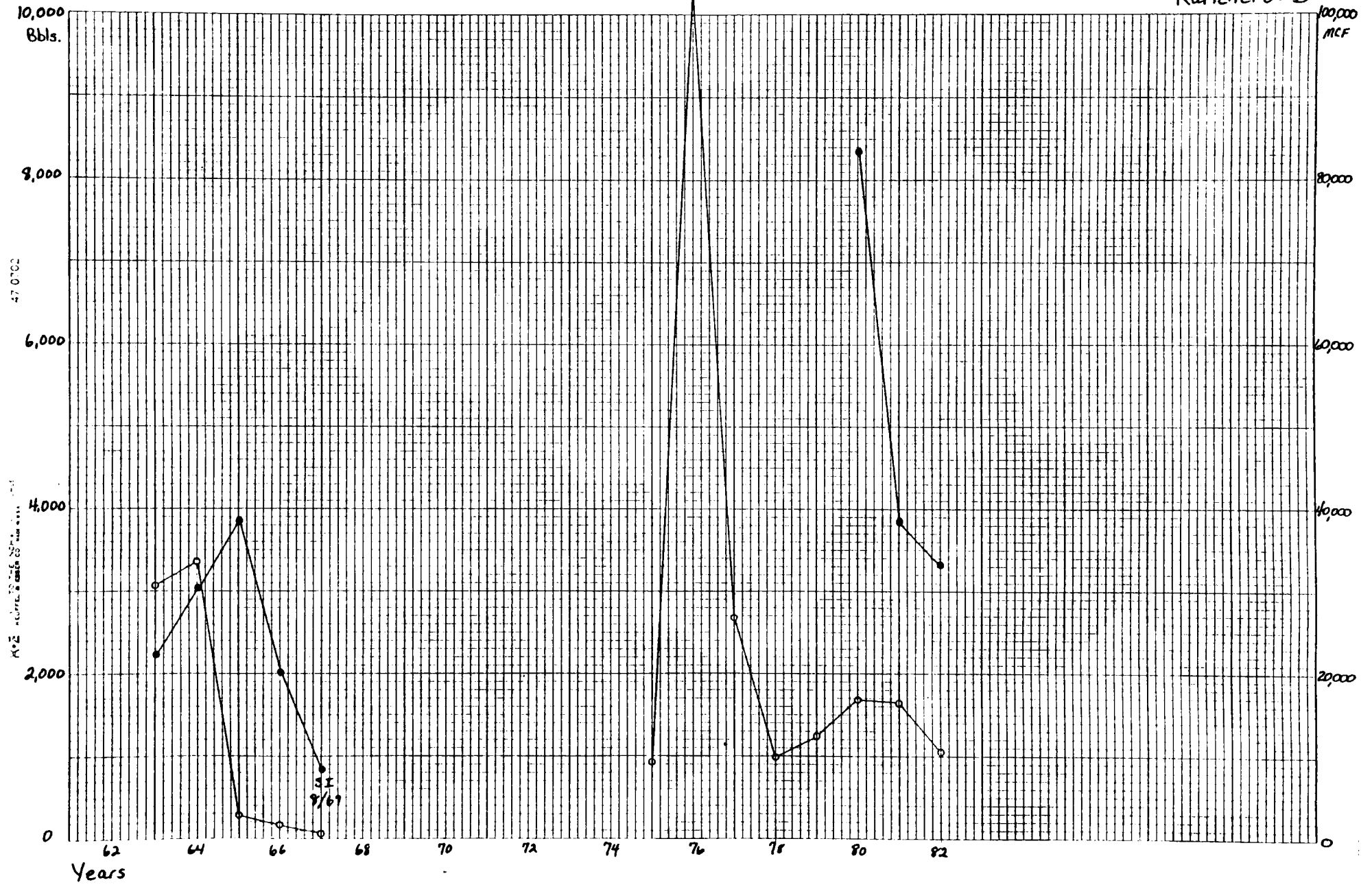

Rago - J
25,000
Bbls.
20,000
15,000
10,000
5,000
0
4,500
MCF
3,600
2,700
1,800
900
0
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K·E

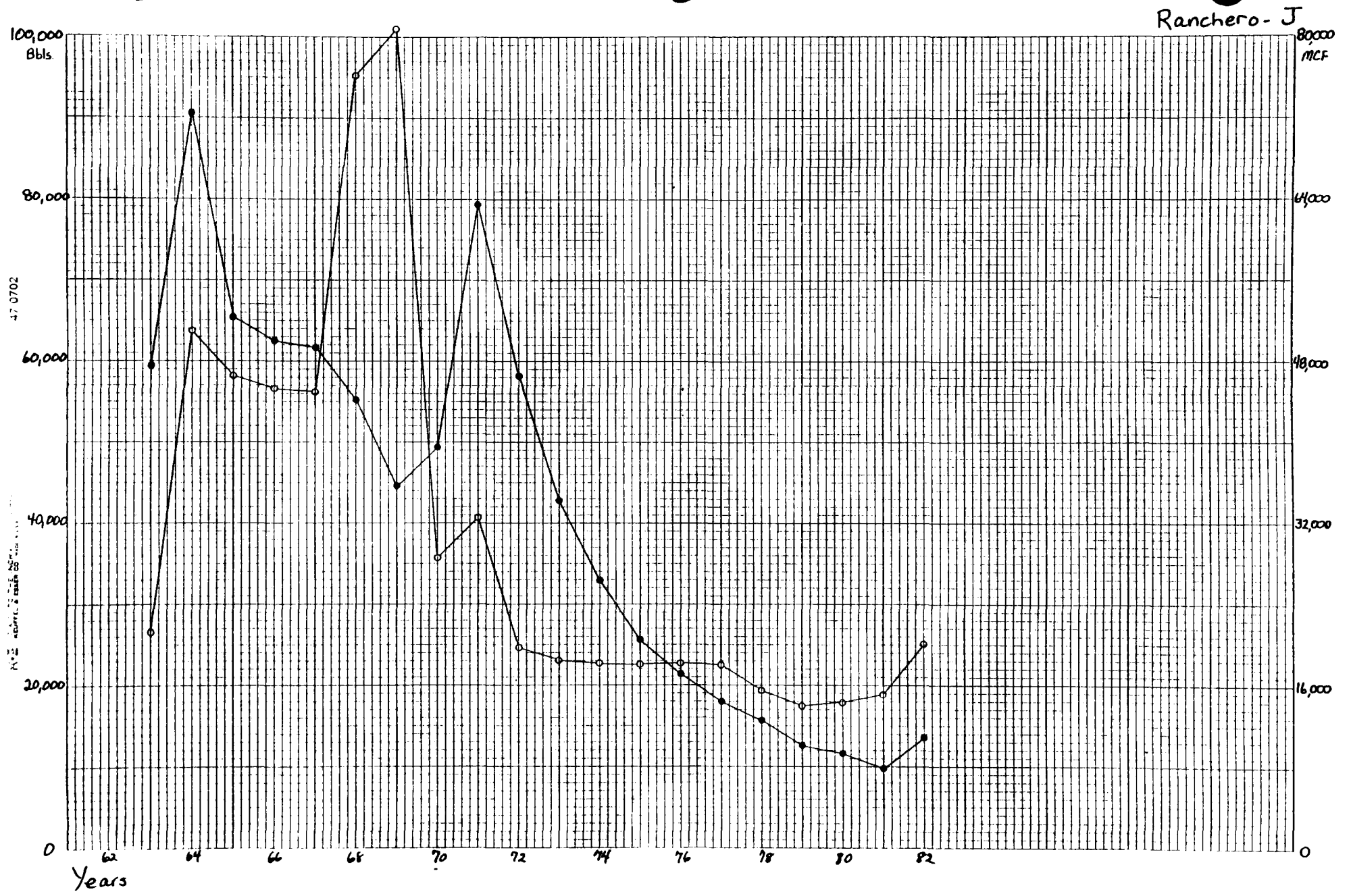

Rago North-D
54,909
50,000 Bbls.
40,000
30,000
20,000
10,000
0
13,000 MCF
10,400
7,800
5,200
2,600
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

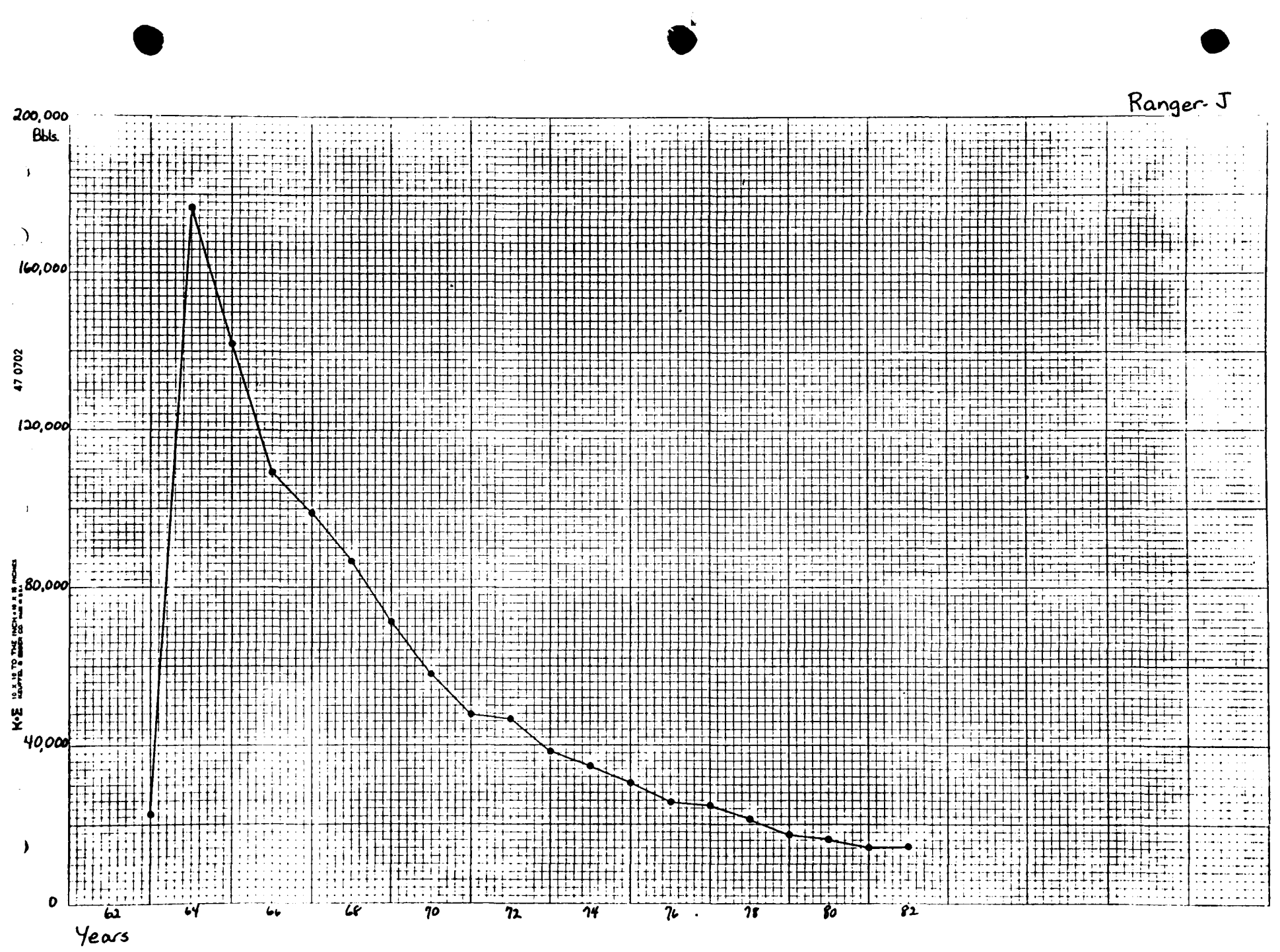

Rago North - J
100,000
Bbls.
80,000
60,000
40,000
20,000
0
22,000
MCF
17,600
13,200
8,800
4,400
0
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K·E

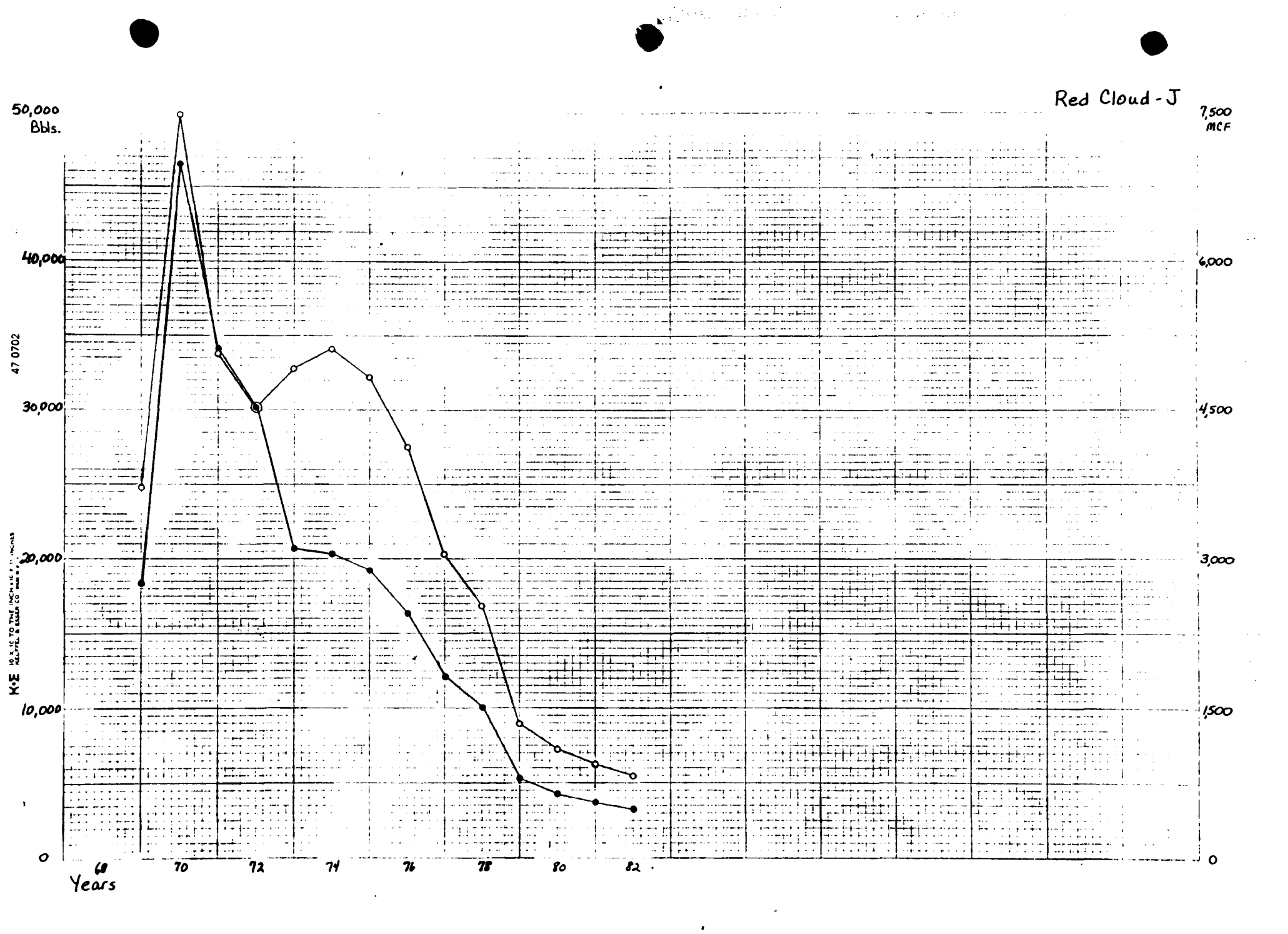

Rainbow- J
54,550
50,000 Bbls.
40,000
30,000
20,000
10,000
0
25,000 MCF
20,000
15,000
10,000
5,000
0
74
76
78
80
82
Years
47 0702
K·E

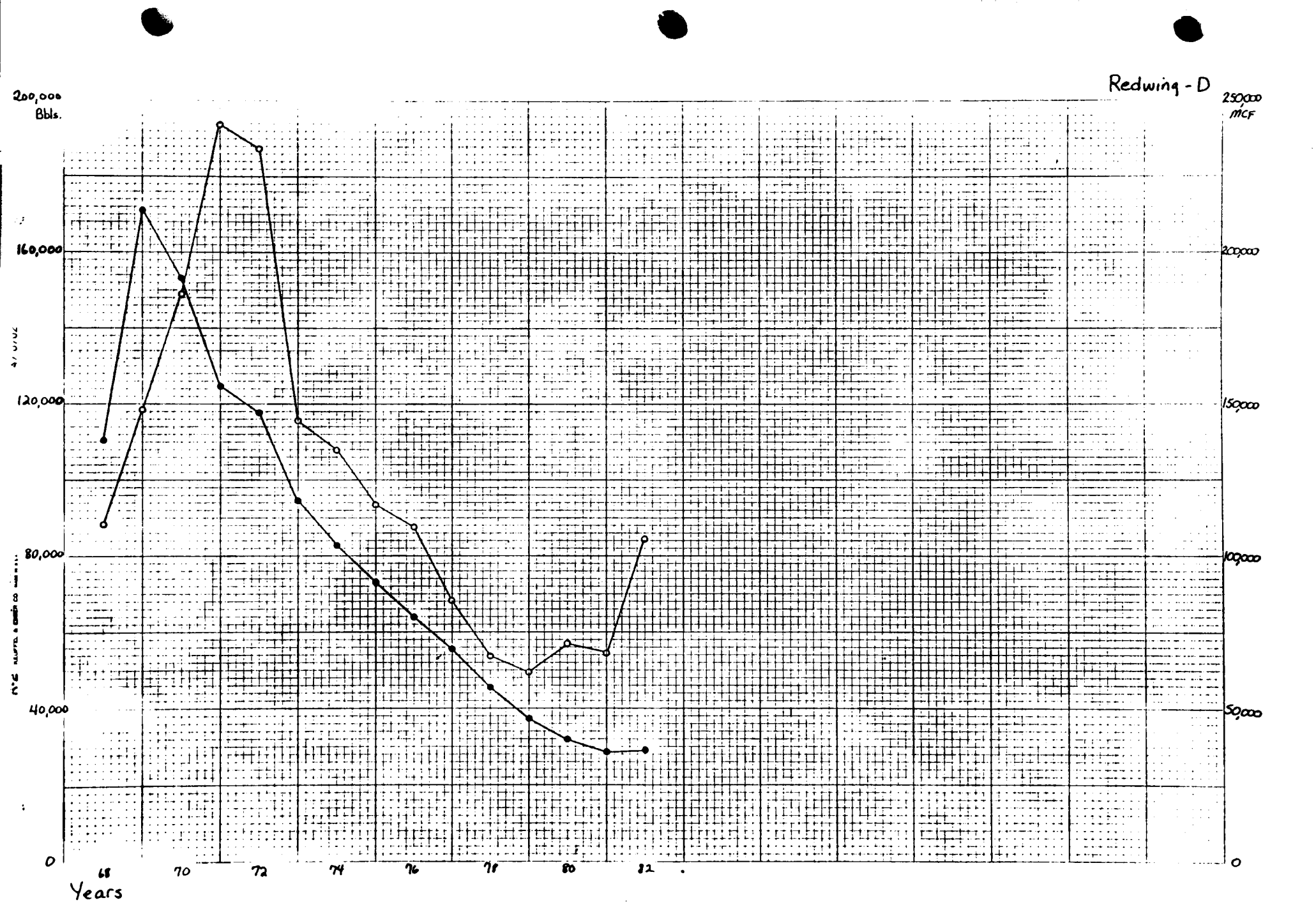

Ramp- J
100,000 Bbls.
80,000
60,000
40,000
20,000
0
17,000 MCF
13,600
10,200
6,800
3,400
0
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K-E

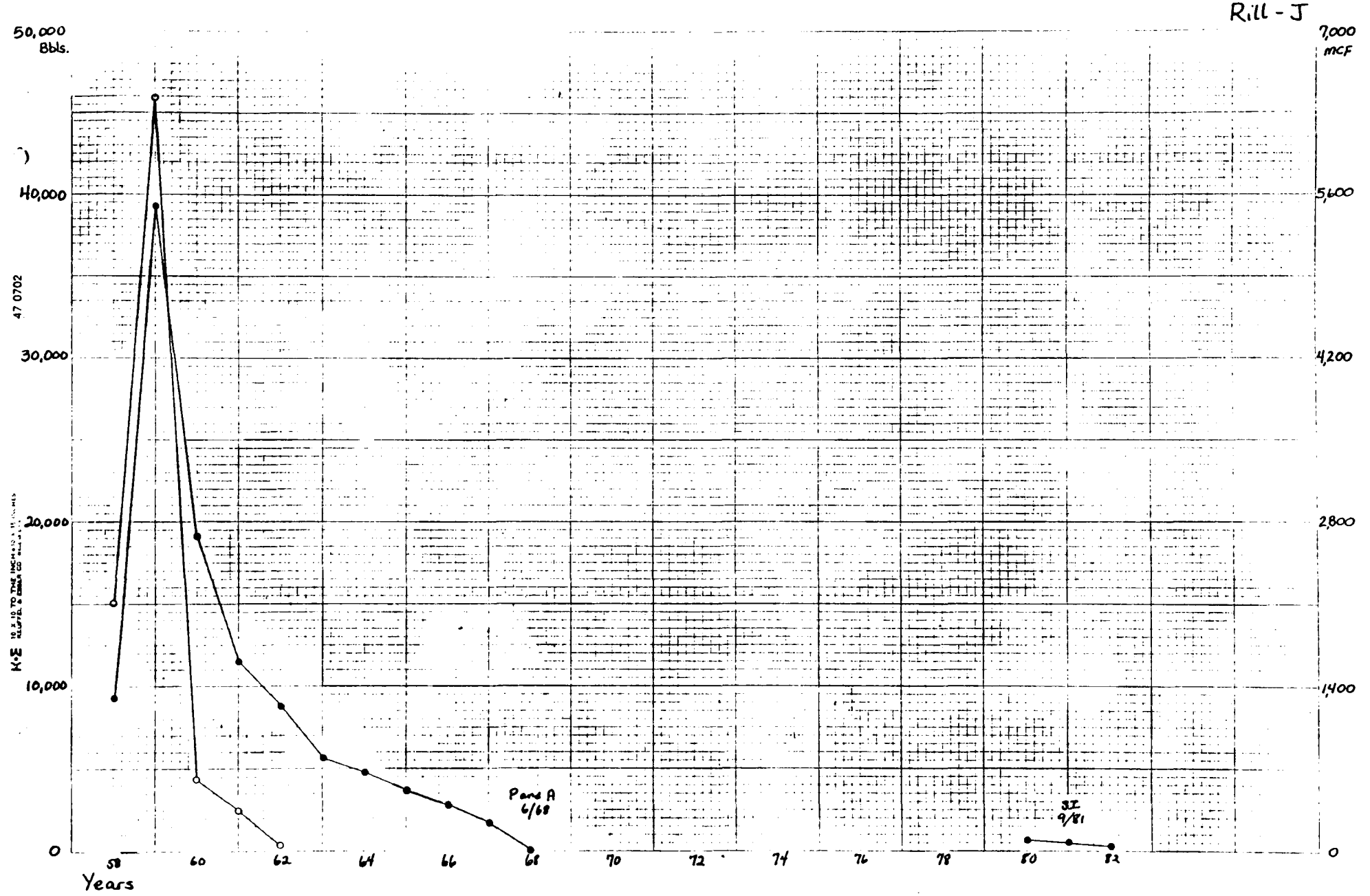

Rancheria - D
10,000
Bbls.
8,000
6,000
4,000
2,000
0
100,000
MCF
80,000
60,000
40,000
20,000
0
SI
8/69
62
64
66
68
70
72
74
76
78
80
82
Years

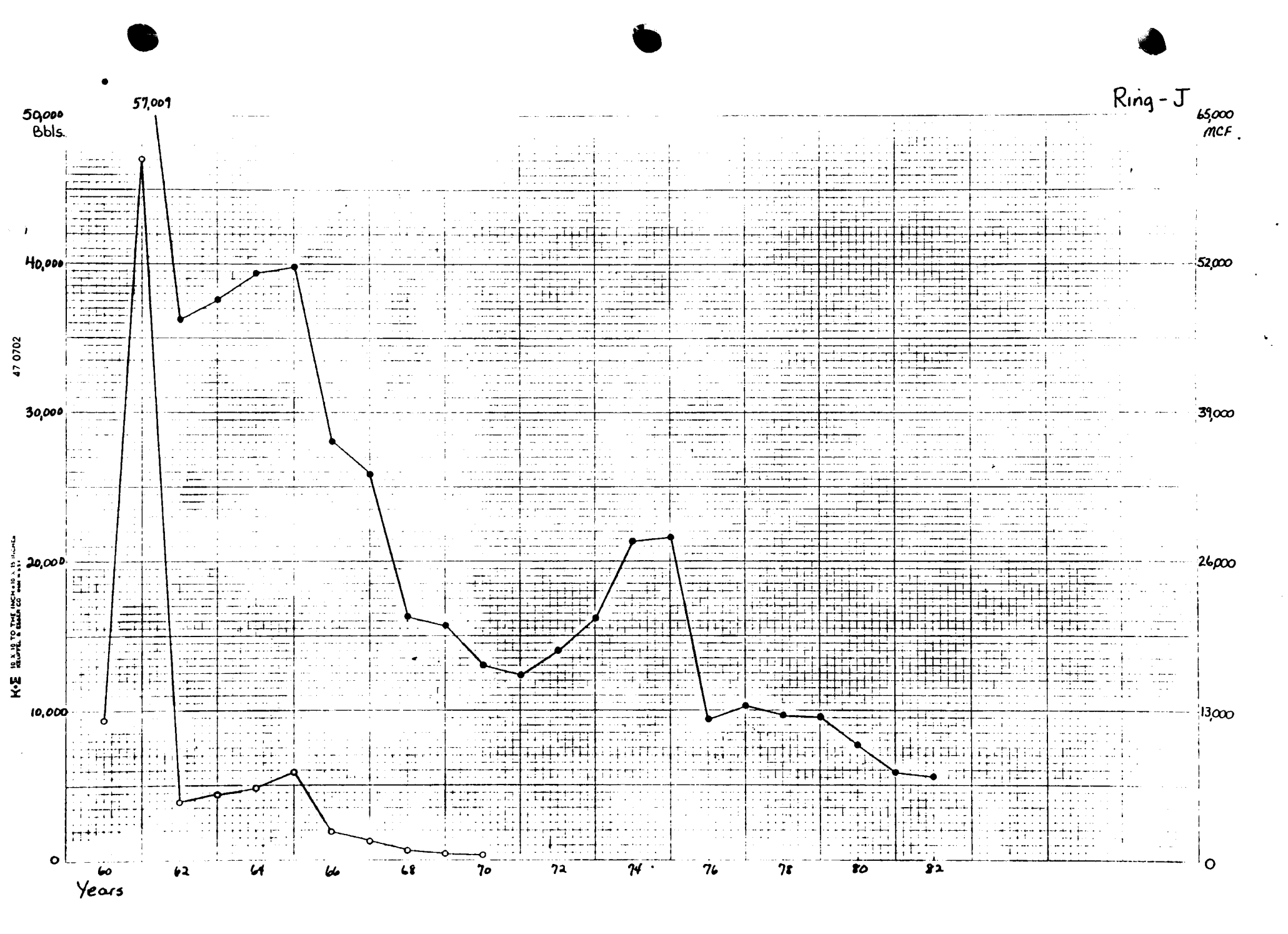

Ranchero - J
100,000
Bbls.
80,000
60,000
40,000
20,000
0
80,000
MCF
64,000
48,000
32,000
16,000
0
62
64
66
68
70
72
74
76
78
80
82
Years

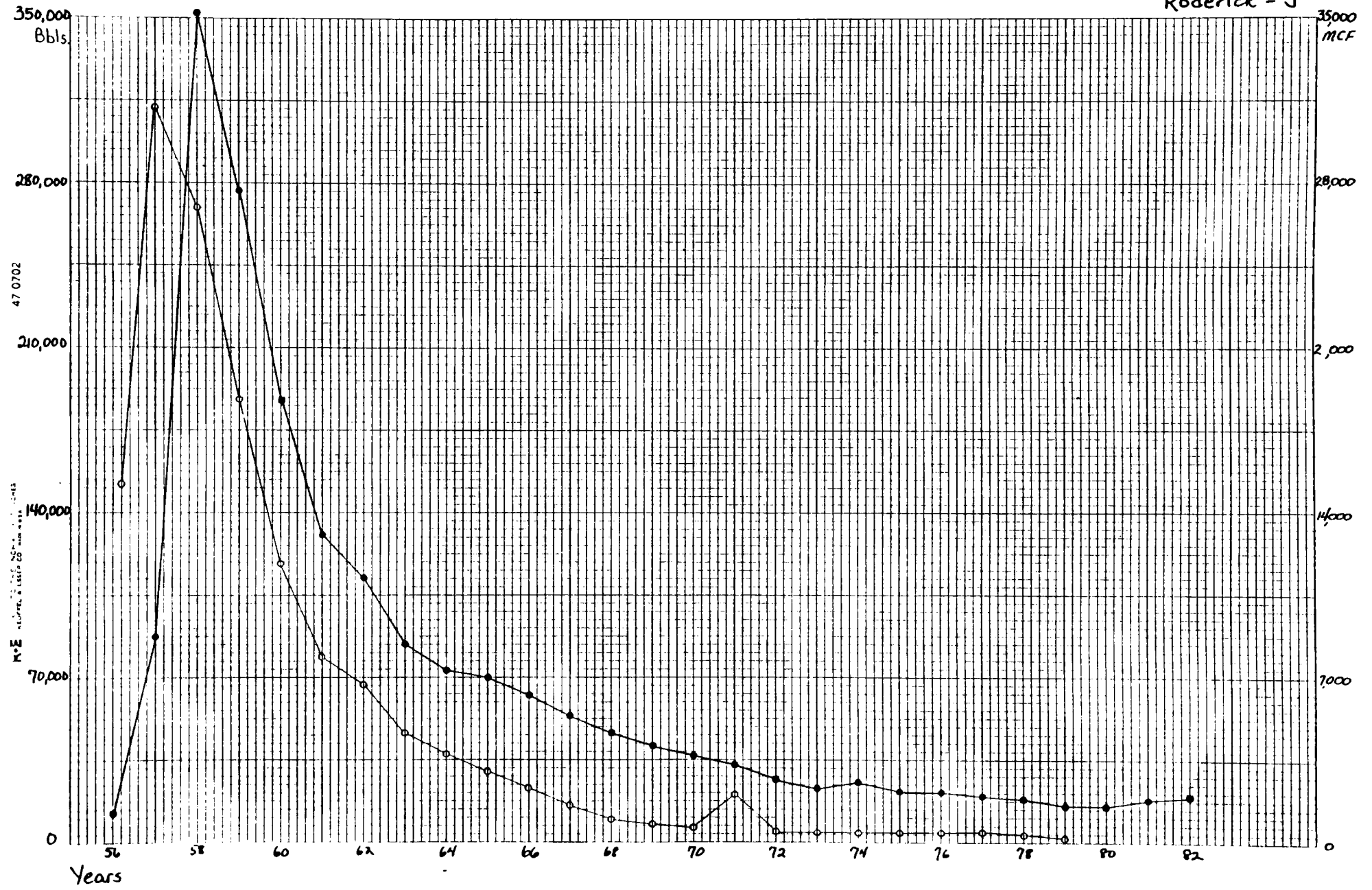

Ranger-J
200,000
Bbls.
160,000
120,000
80,000
40,000
0
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K&E

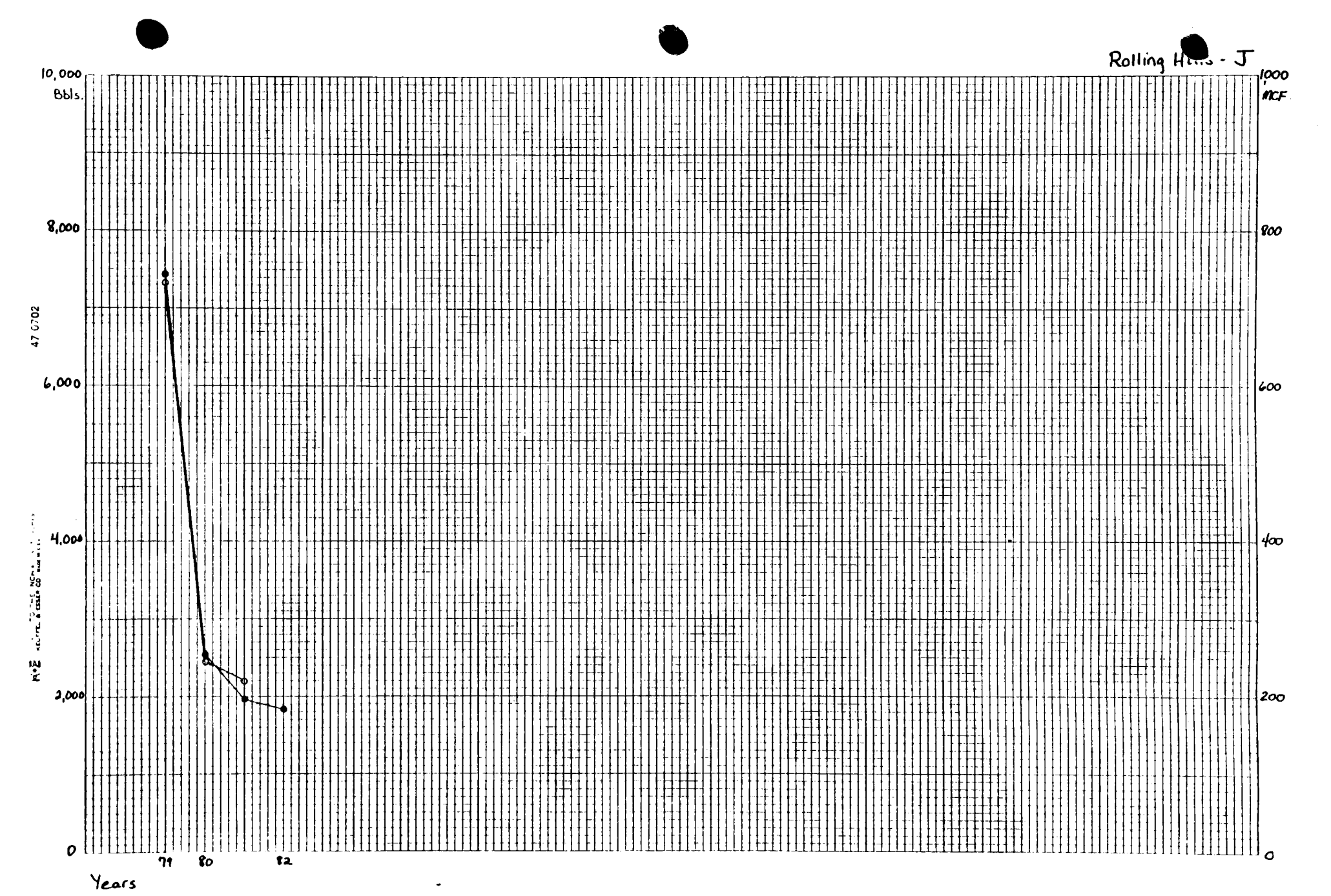

Red Cloud - J
50,000 Bbls.
40,000
30,000
20,000
10,000
0
7,500 MCF
6,000
4,500
3,000
1,500
0
68
70
72
74
76
78
80
82
Years
47 0702
K·E


Redwing - D
200,000
Bbls.
160,000
120,000
80,000
40,000
0
250,000
MCF
200,000
150,000
100,000
50,000
0
68
70
72
74
76
78
80
82
Years

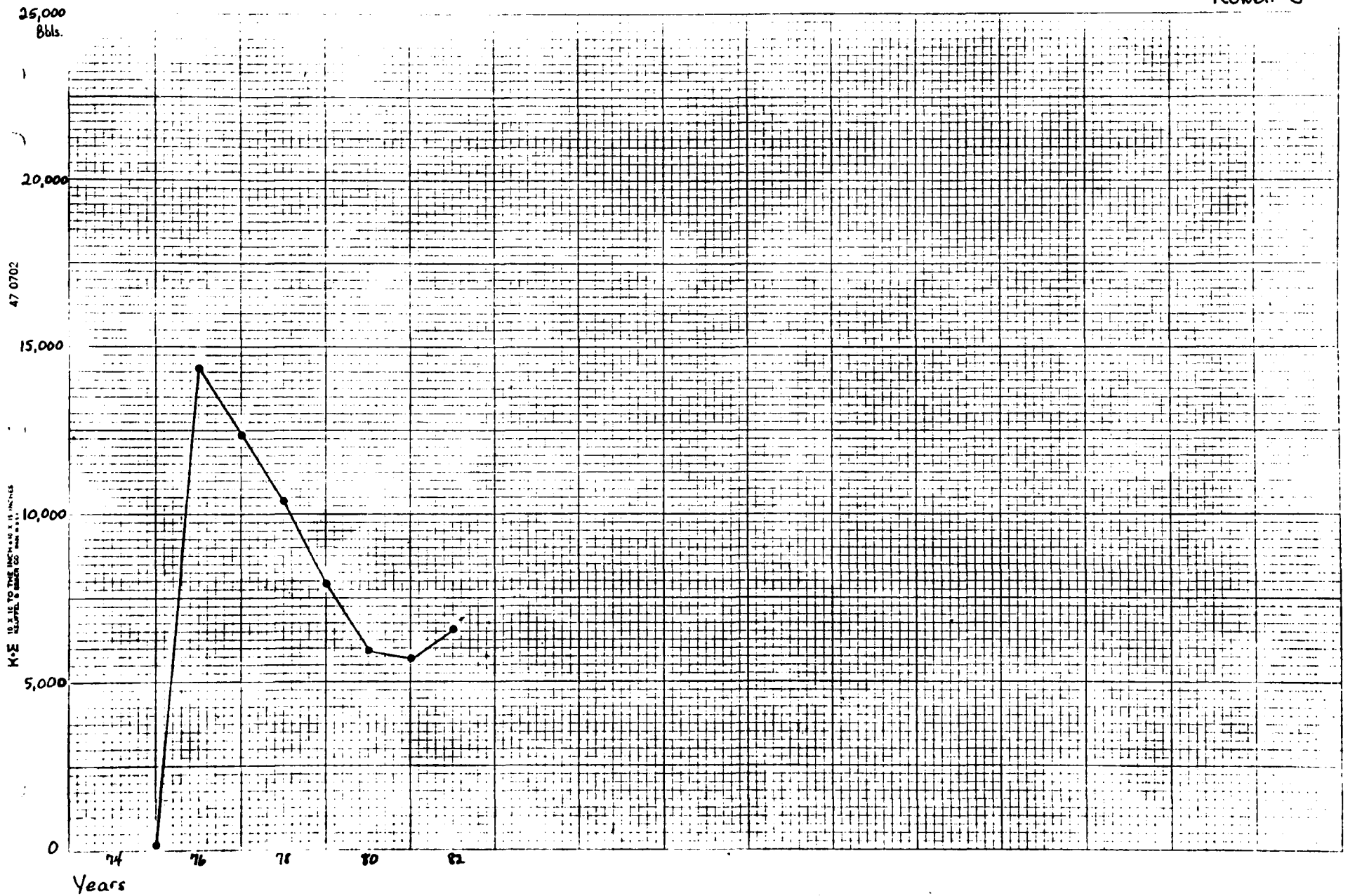

Rill - J
50,000 Bbls.
40,000
30,000
20,000
10,000
0
7,000 mcf
5,600
4,200
2,800
1,400
0
47 0702
K·E
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
Pane A 6/68
SI 9/81

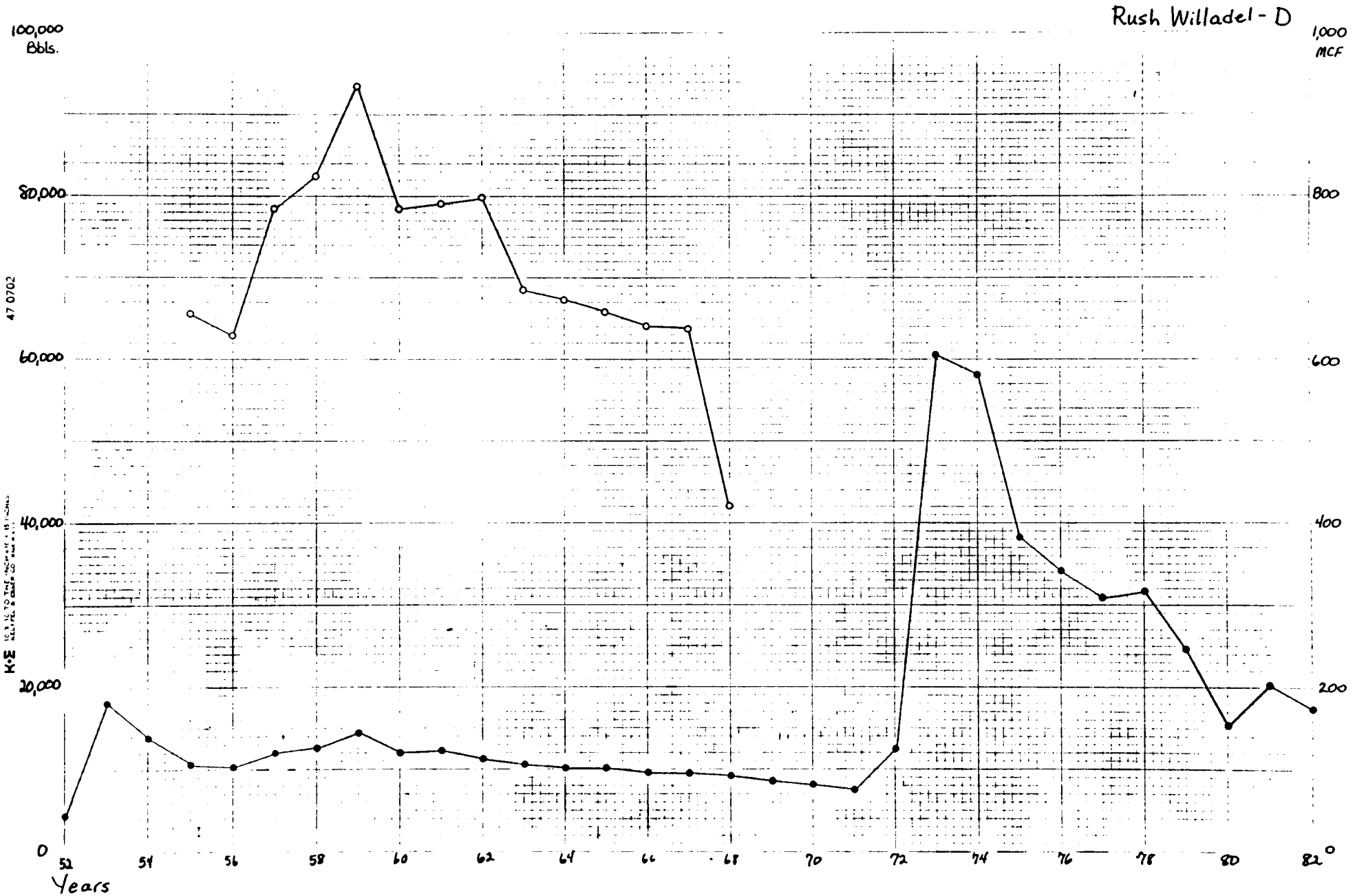

Ring - J
57,009
50,000 Bbls.
65,000 MCF
40,000
52,000
30,000
39,000
20,000
26,000
10,000
13,000
0
0
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K·E


Roderick - J
350,000
Bbls.
280,000
210,000
140,000
70,000
0
35000
MCF
28,000
2,000
14,000
7,000
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702

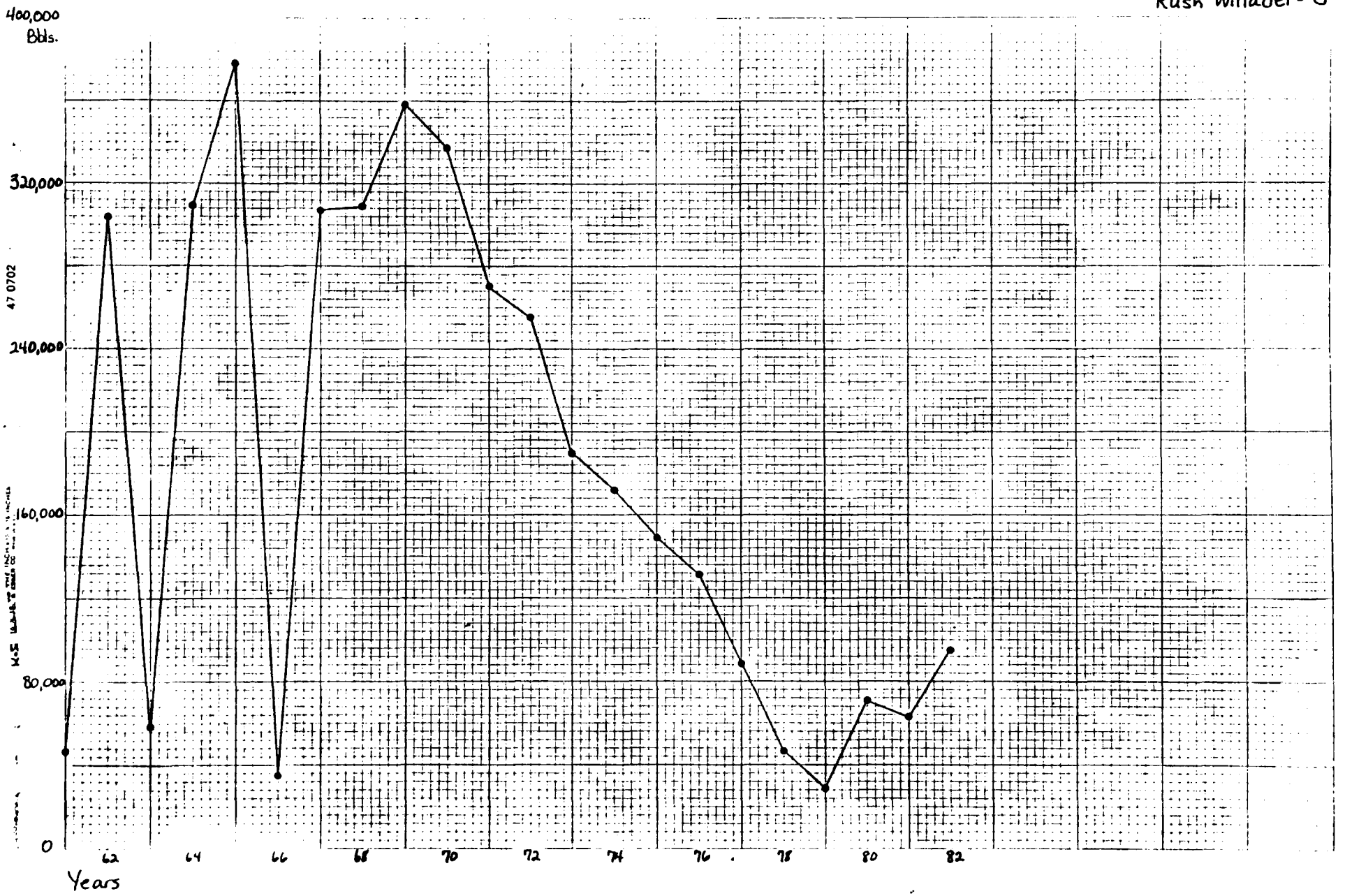

Rolling Hills - J
10,000
Bbls.
8,000
6,000
4,000
2,000
0
1000
MCF
800
600
400
200
0
79
80
82
Years

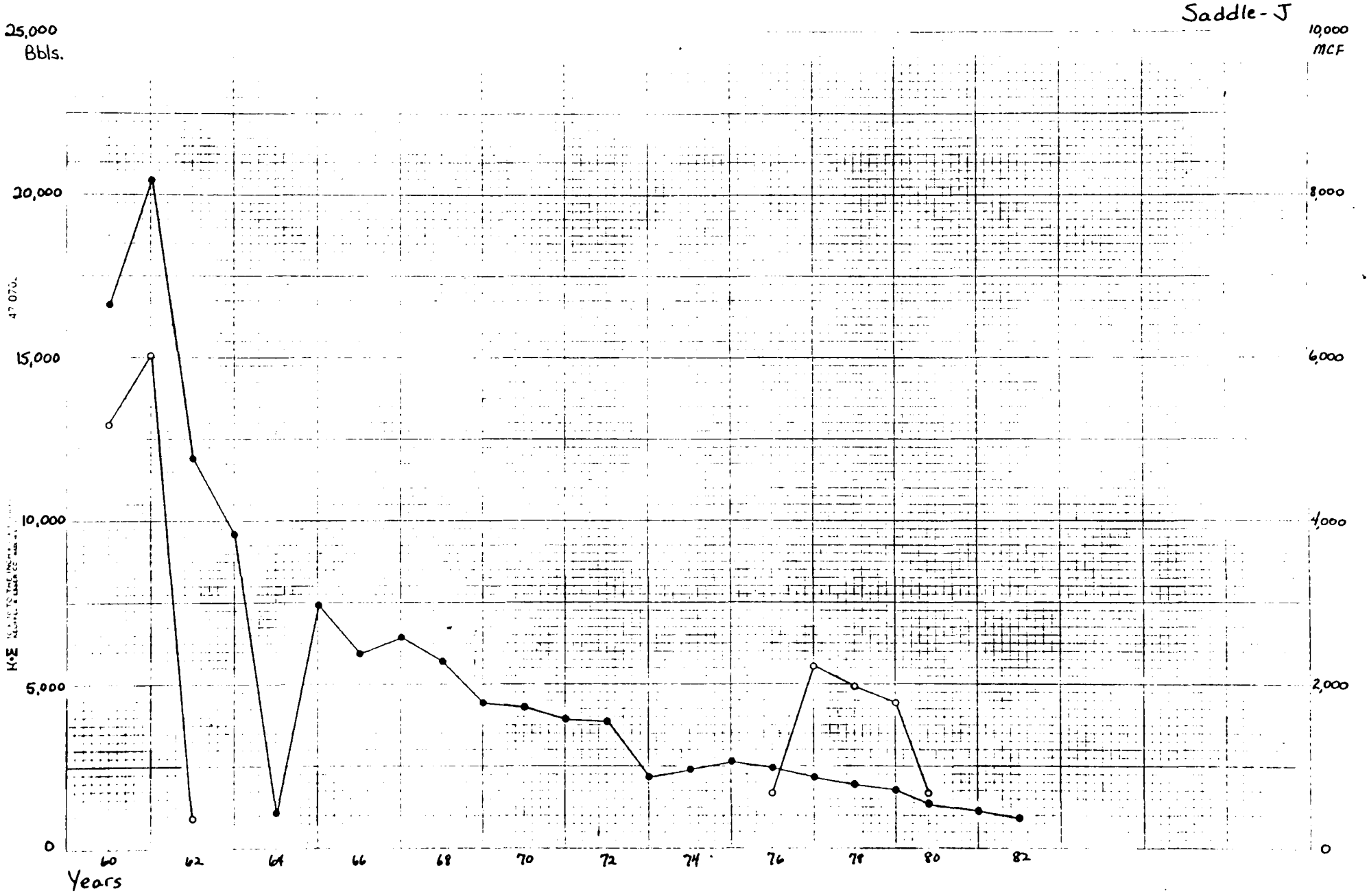
Rowell - J


25,000
Bbls.
20,000
15,000
10,000
5,000
0
74
76
78
80
82
Years
47 0702
K&E

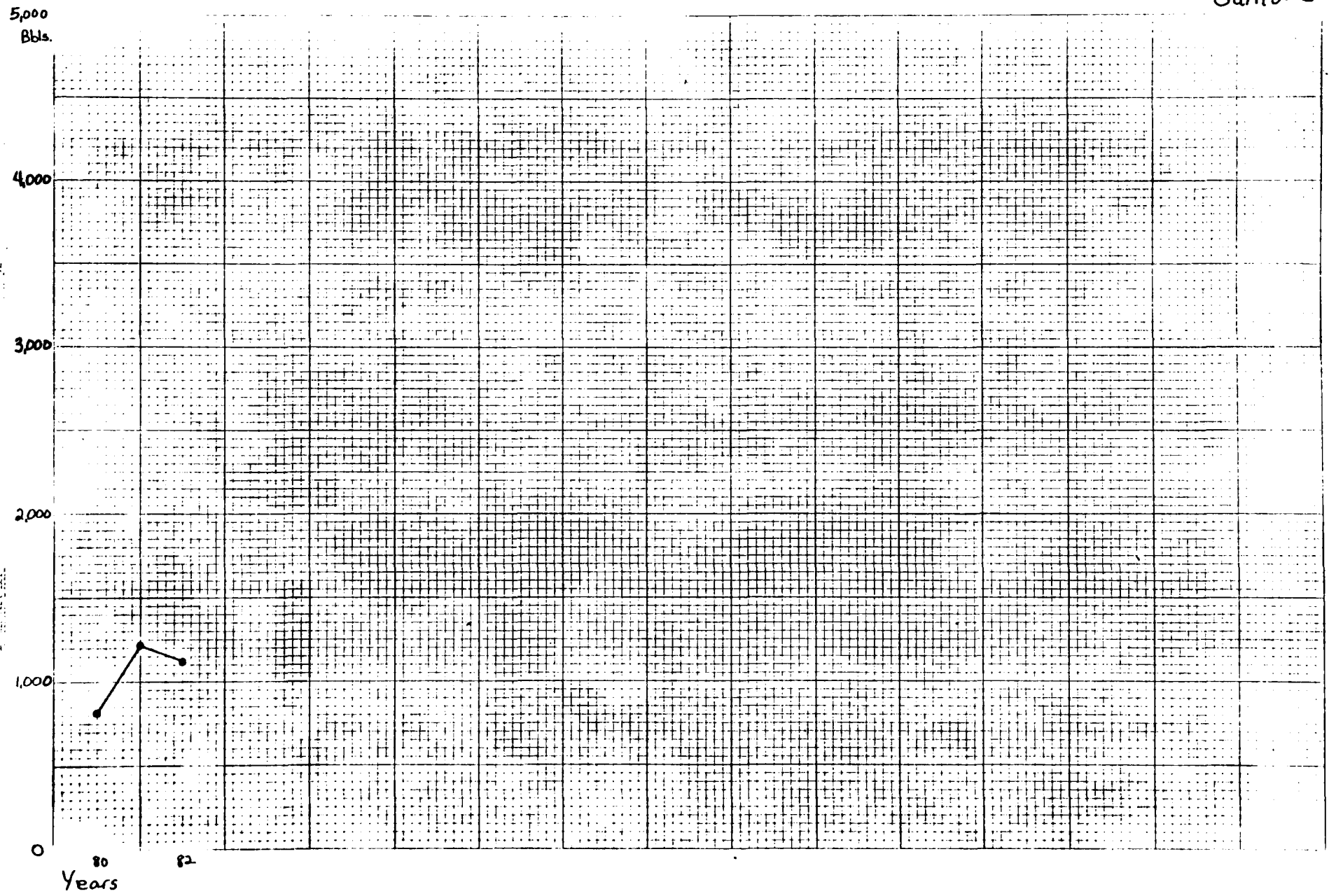

Rush Willadel - D
100,000 Bbls.
80,000
60,000
40,000
20,000
0
1,000 MCF
800
600
400
200
0
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K&E

Rush Willadel - J

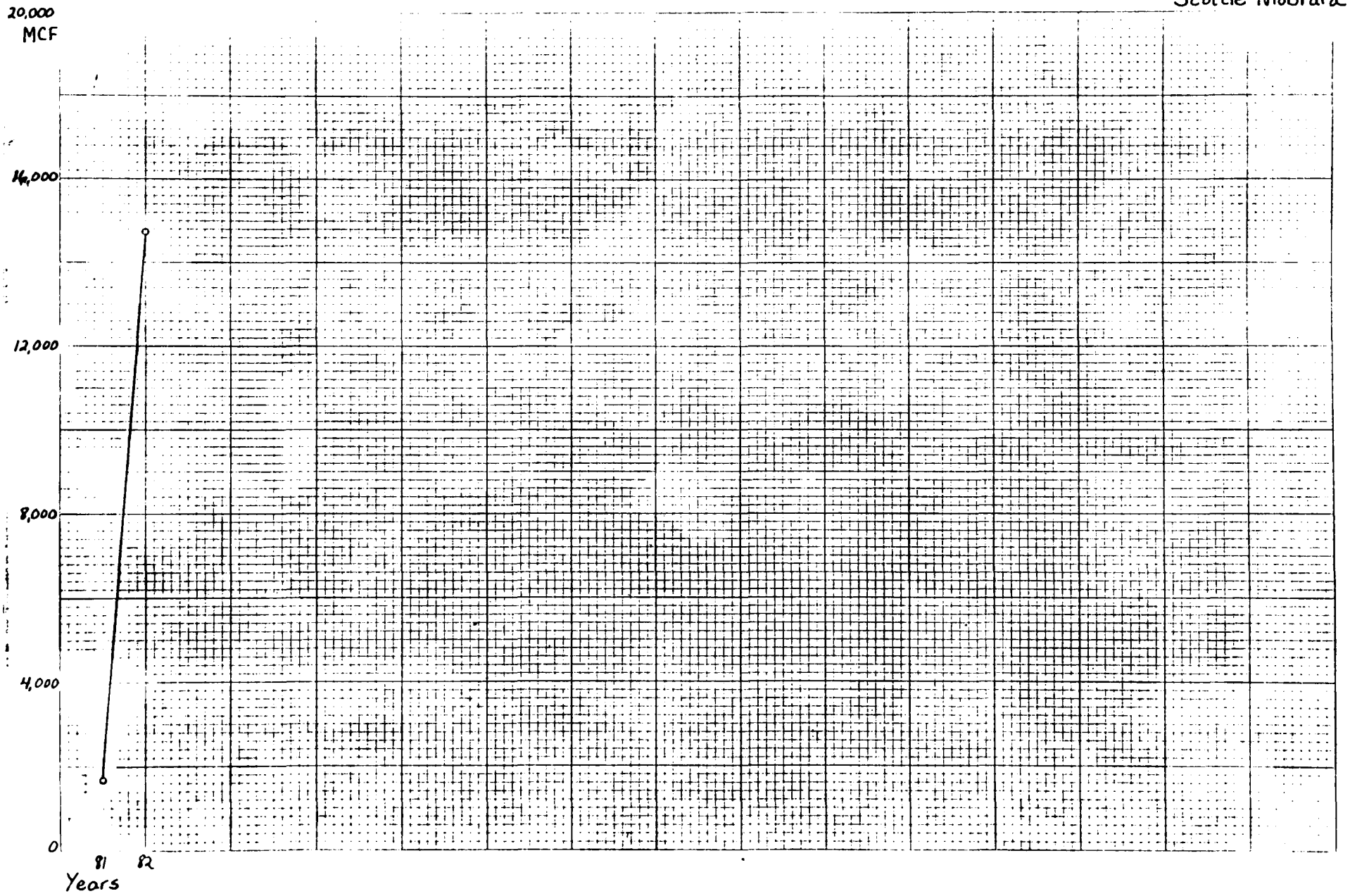



Saddle-J
25,000
Bbls.
20,000
15,000
10,000
5,000
0
10,000
MCF
8,000
6,000
4,000
2,000
0
60
62
64
66
68
70
72
74
76
78
80
82
Years

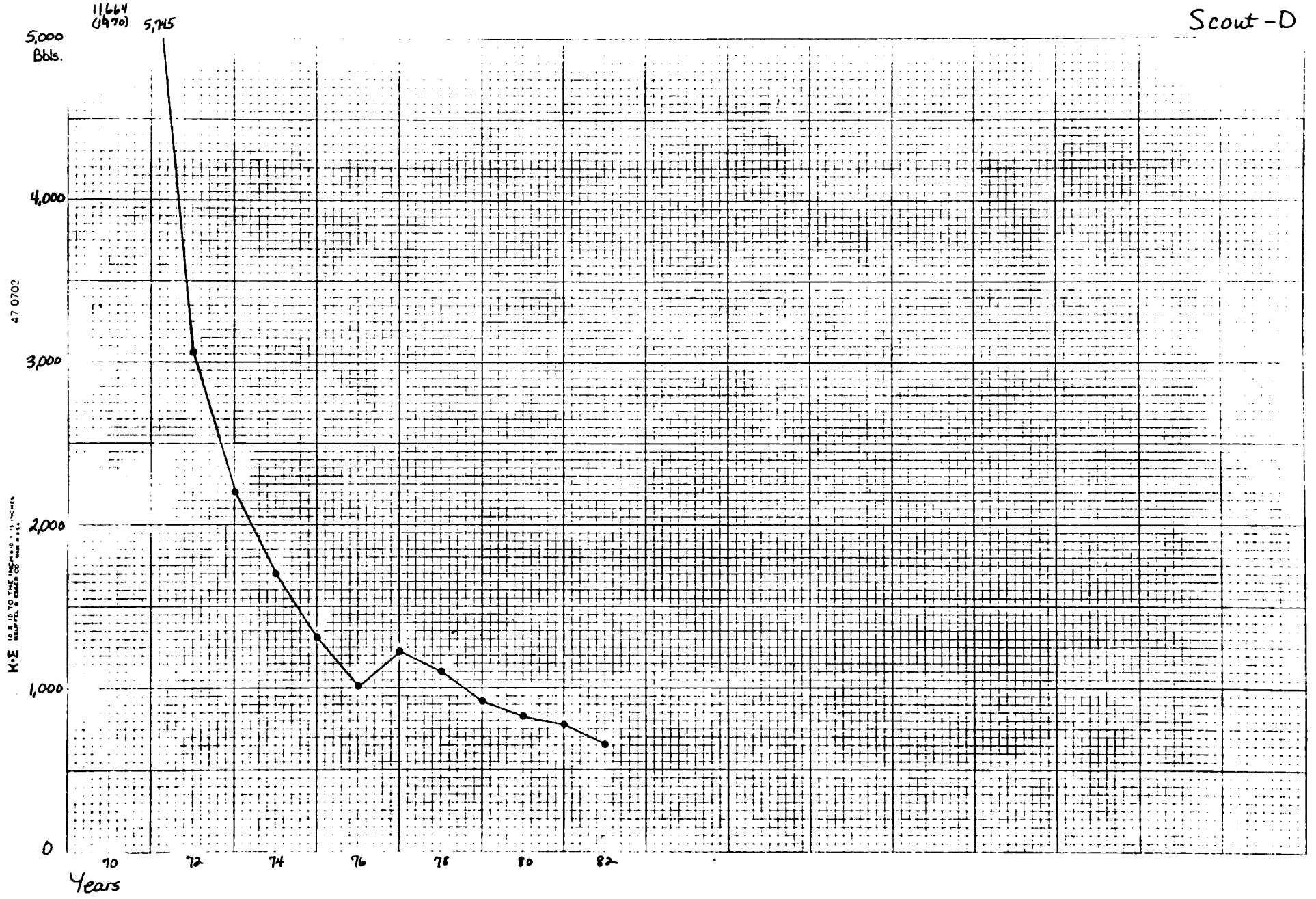
Santo-J

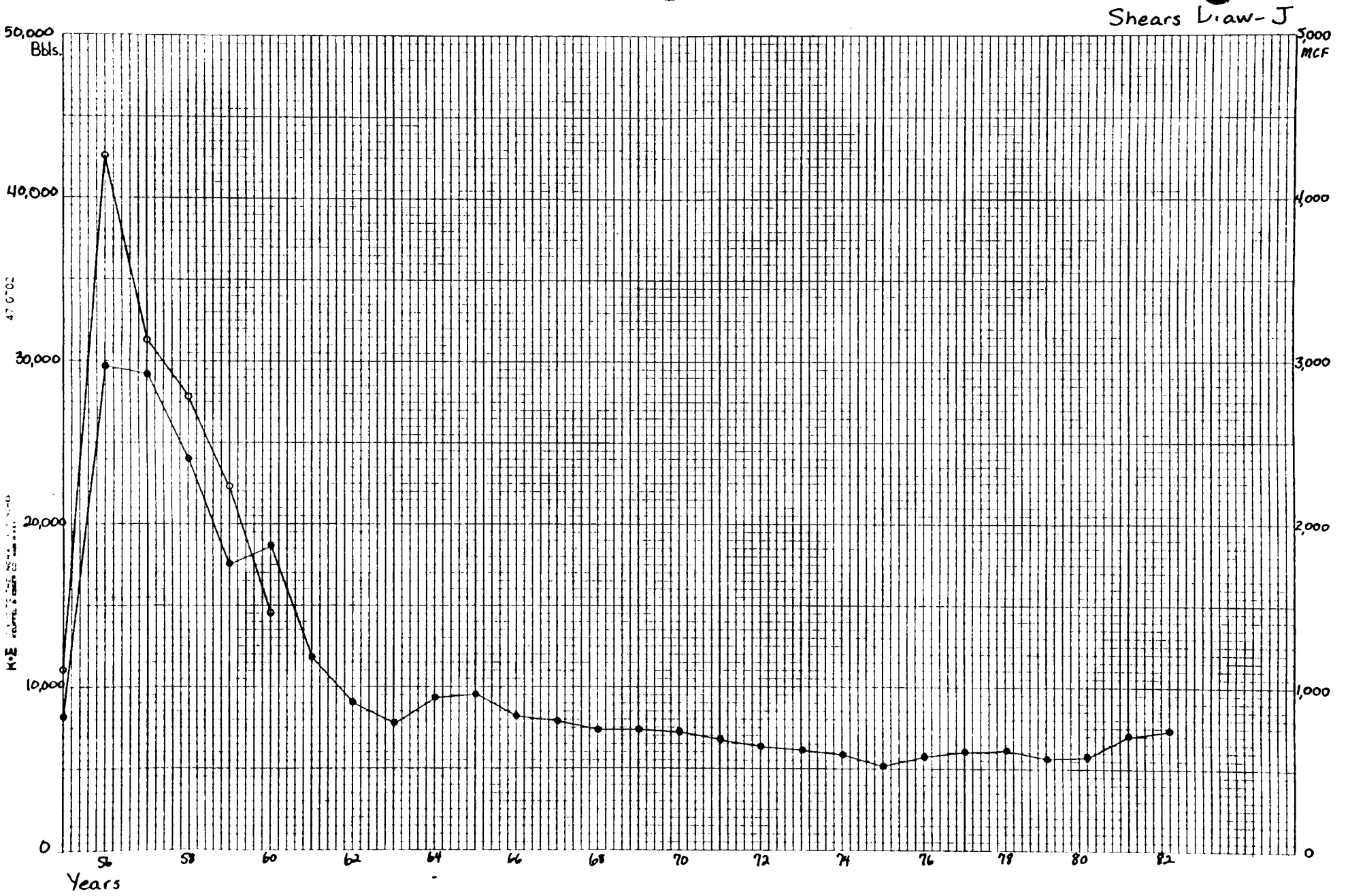


Scottie-Niobrara

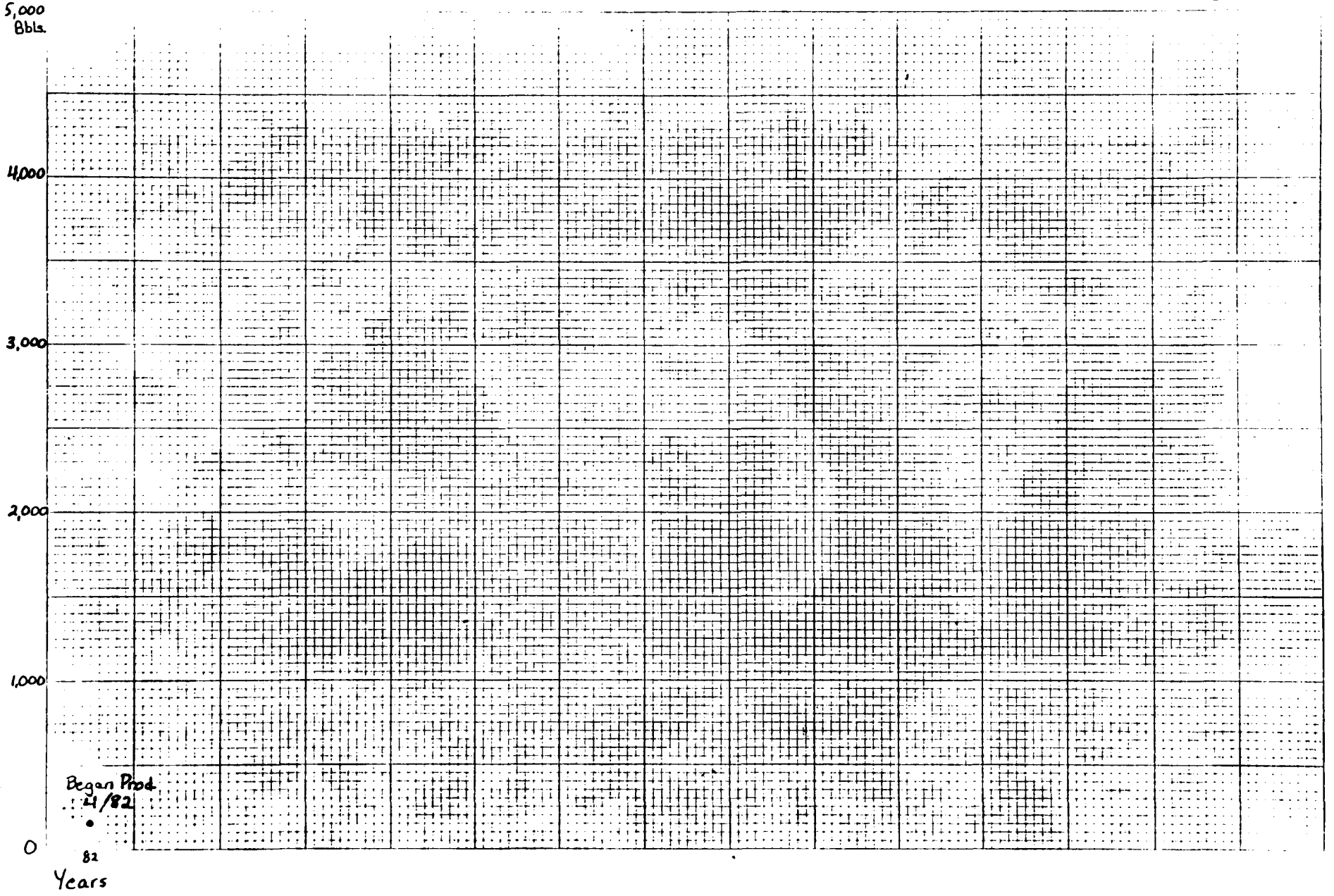


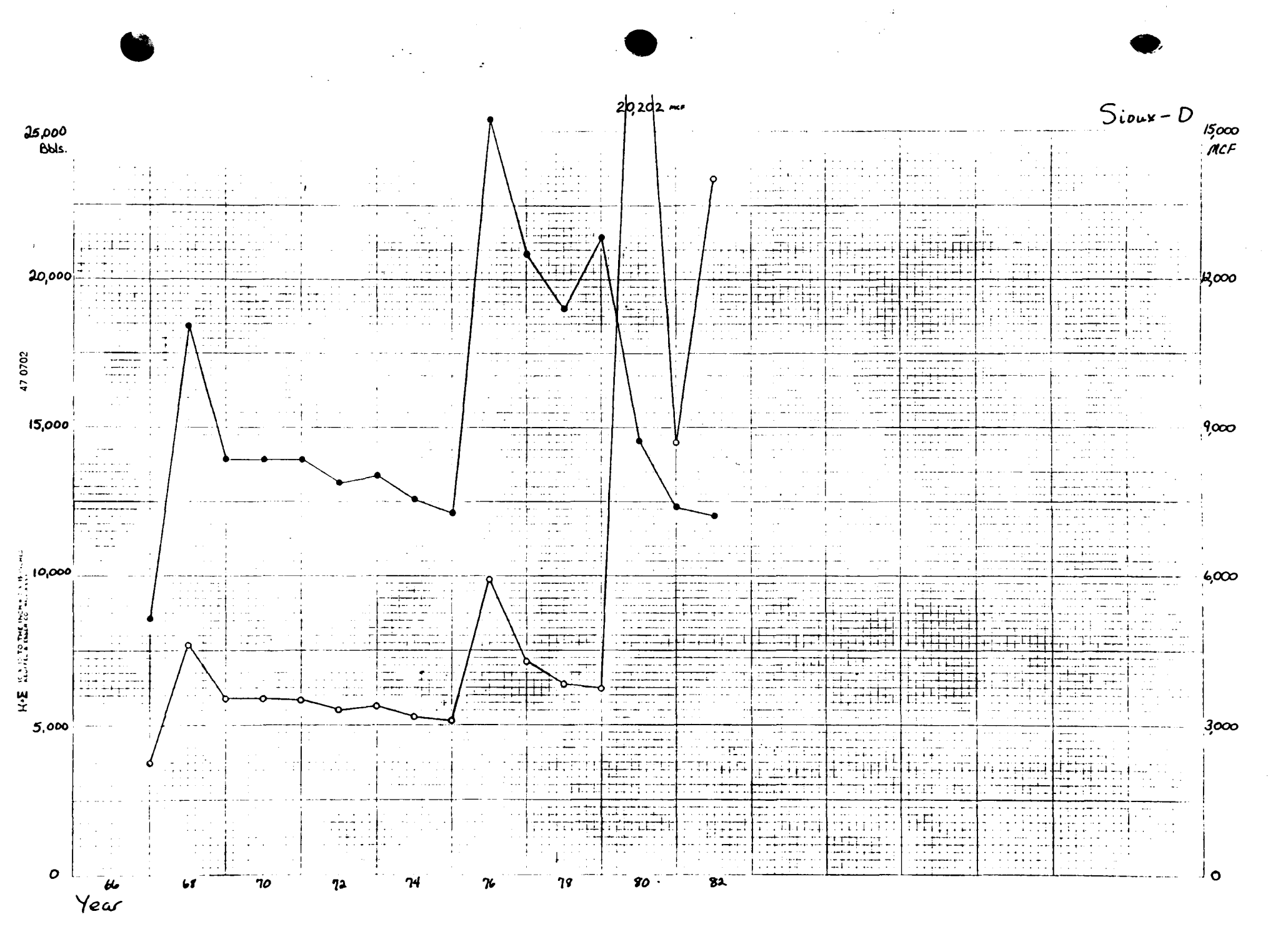
Scout-D

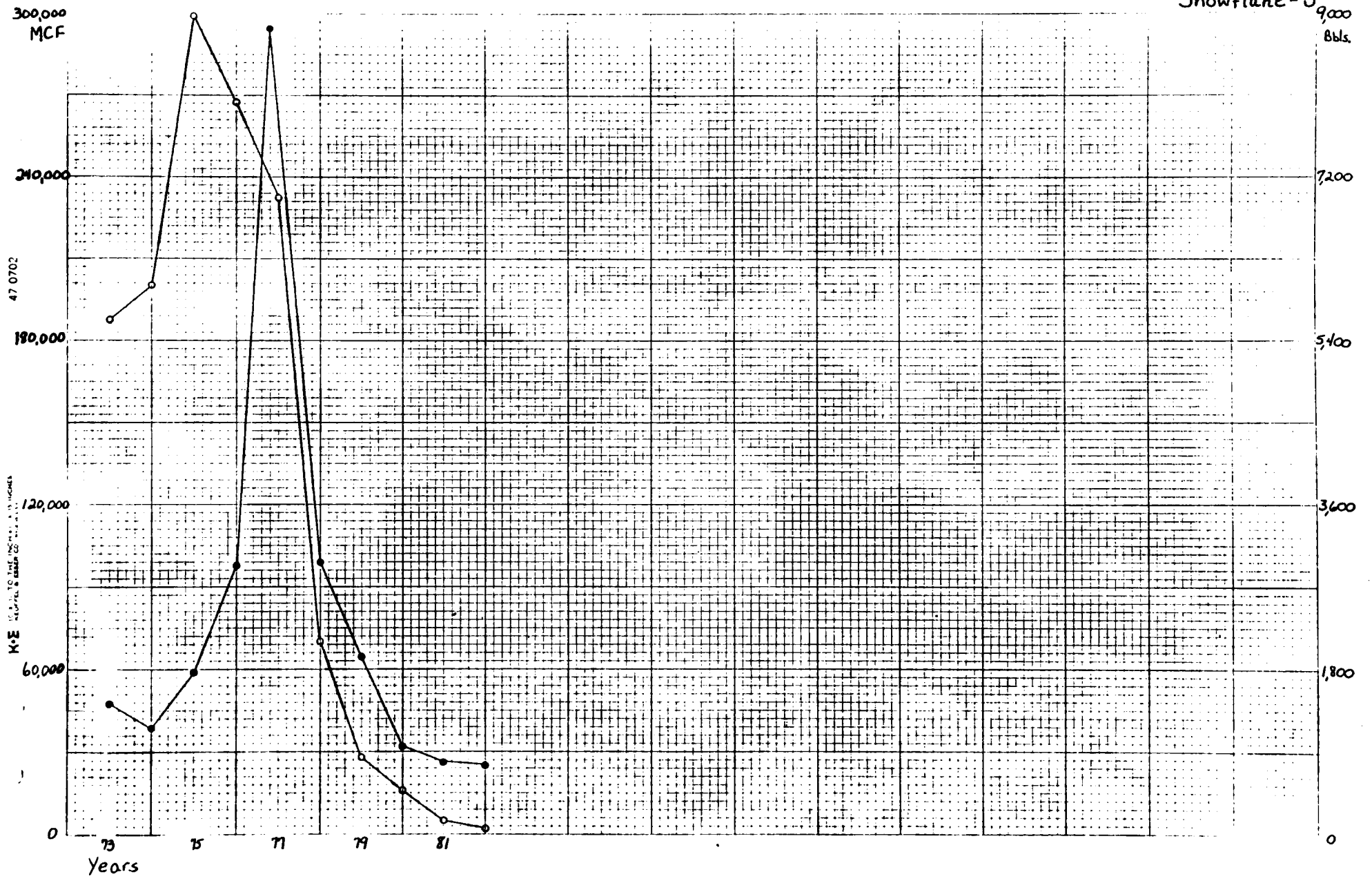

11,664
(1970)
5,745
5,000
Bbls.
4,000
3,000
2,000
1,000
0
70
72
74
76
78
80
82
Years
47 0702
K·E

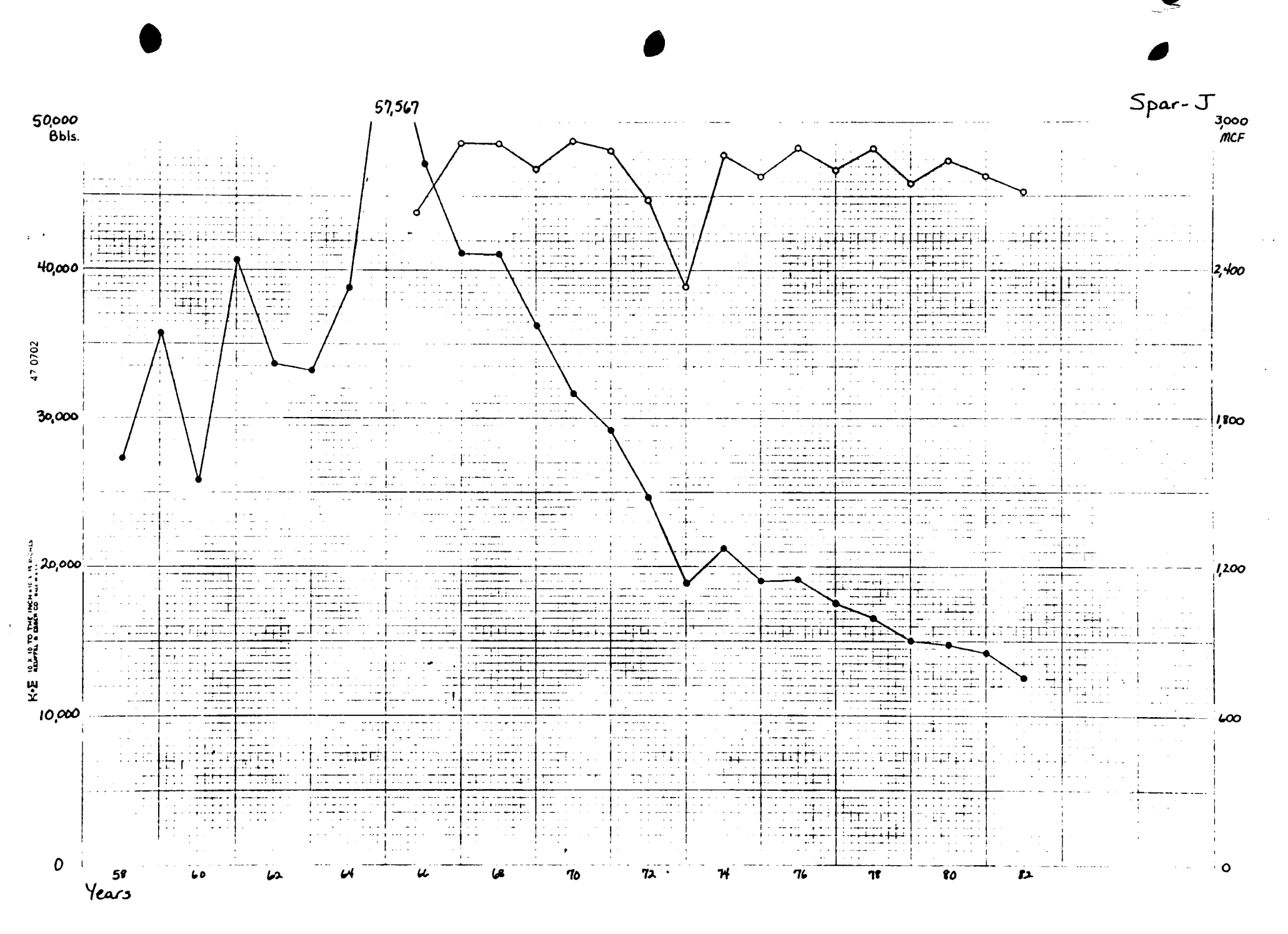

Shears Draw-J
50,000 Bbls.
40,000
30,000
20,000
10,000
0
5,000 MCF
4,000
3,000
2,000
1,000
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

Shoal - J

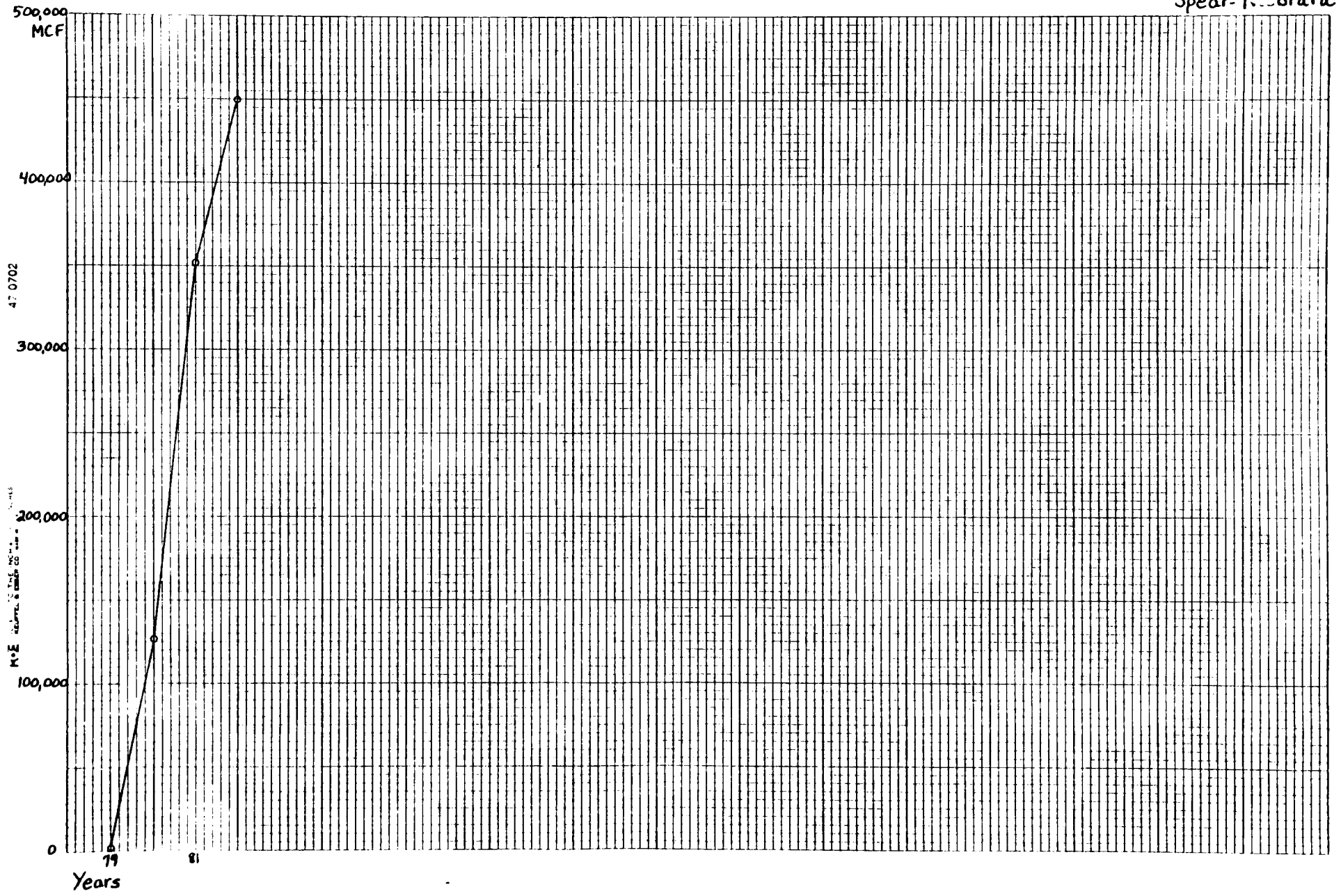


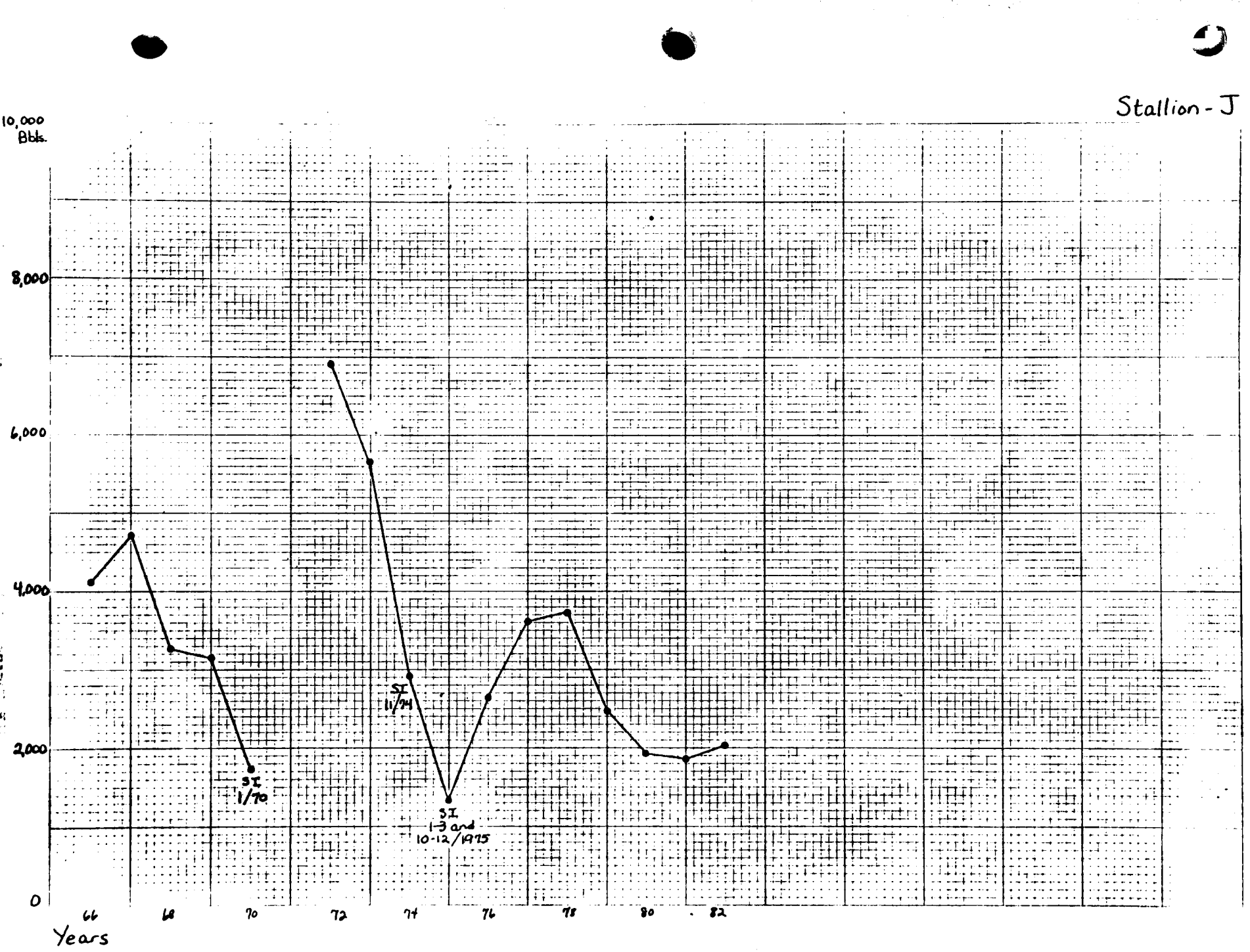

Sioux - D
20,202 MCF
25,000 Bbls.
20,000
15,000
10,000
5,000
0
15,000 MCF
12,000
9,000
6,000
3,000
0
66
68
70
72
74
76
78
80
82
Year
47 0702


Snowflake - J
300,000
MCF
240,000
180,000
120,000
60,000
0
9,000
Bbls.
7,200
5,400
3,600
1,800
0
79
75
77
79
81
Years
47 0702
K&E

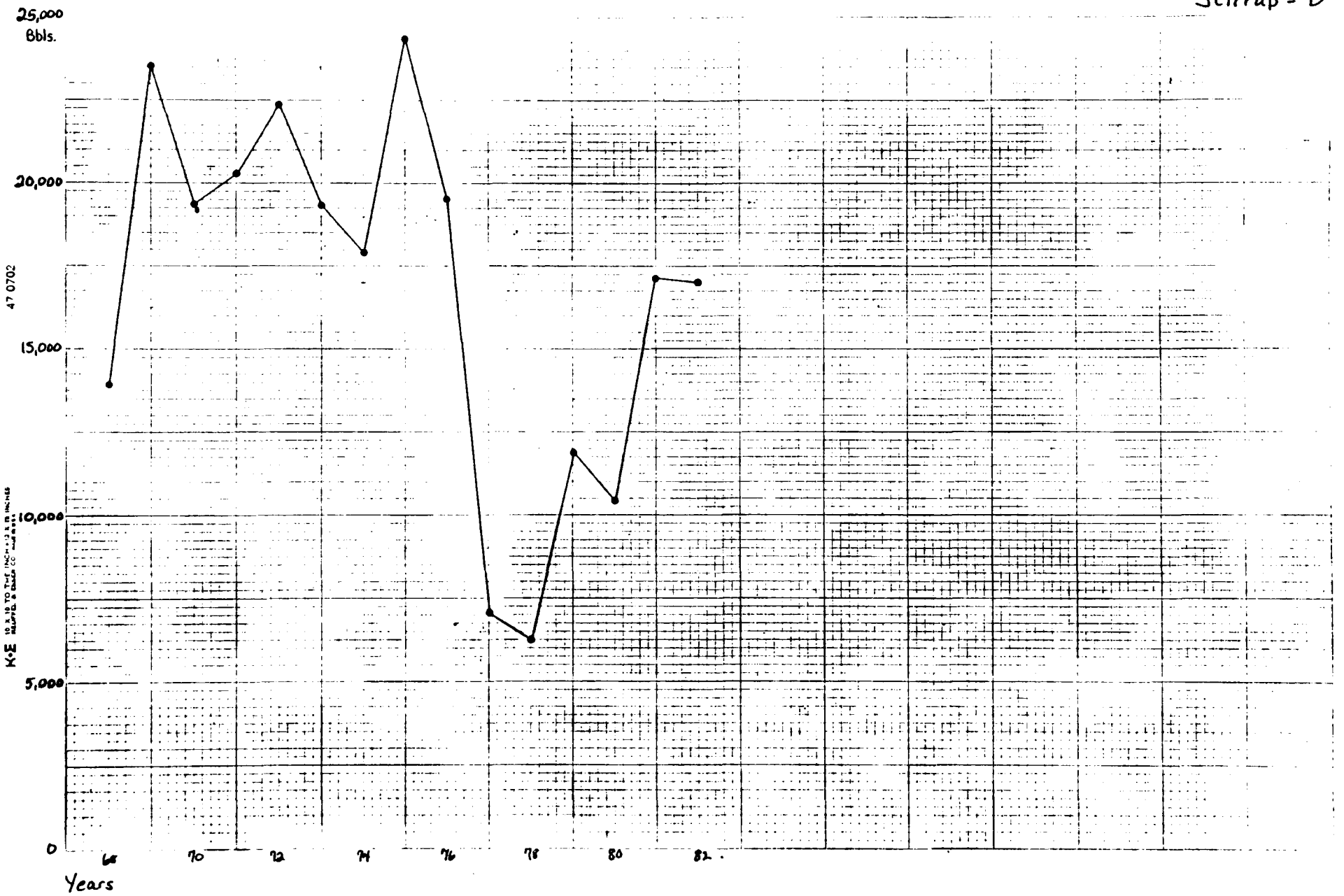

Spar-J
57,567
50,000 Bbls.
40,000
30,000
20,000
10,000
0
3,000 MCF
2,400
1,800
1,200
600
0
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K+E 10 X 10 TO THE INCH 5 X 5 INCHES KEUFFEL & ESSER CO

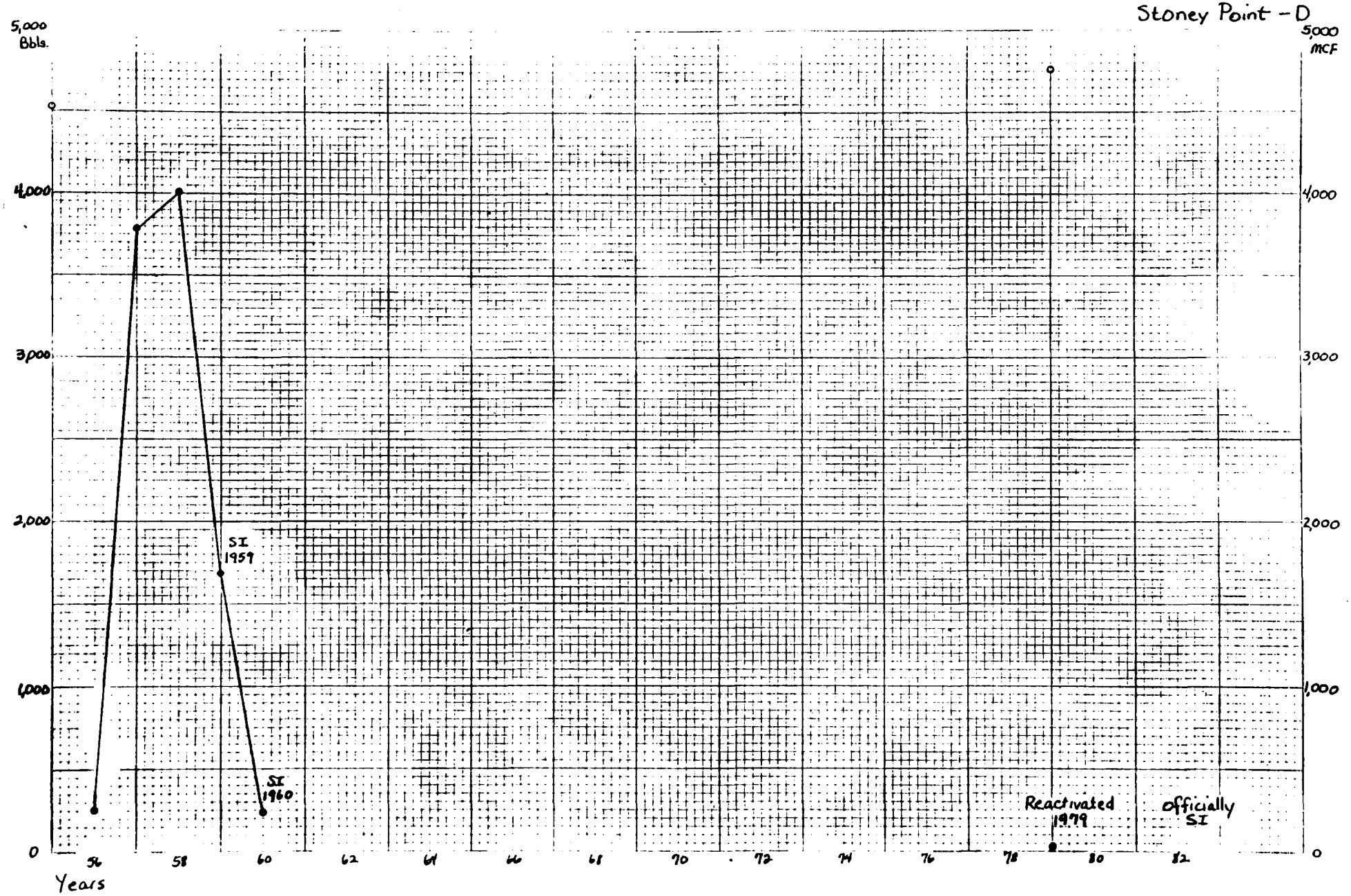
Spear-[illegible]orara



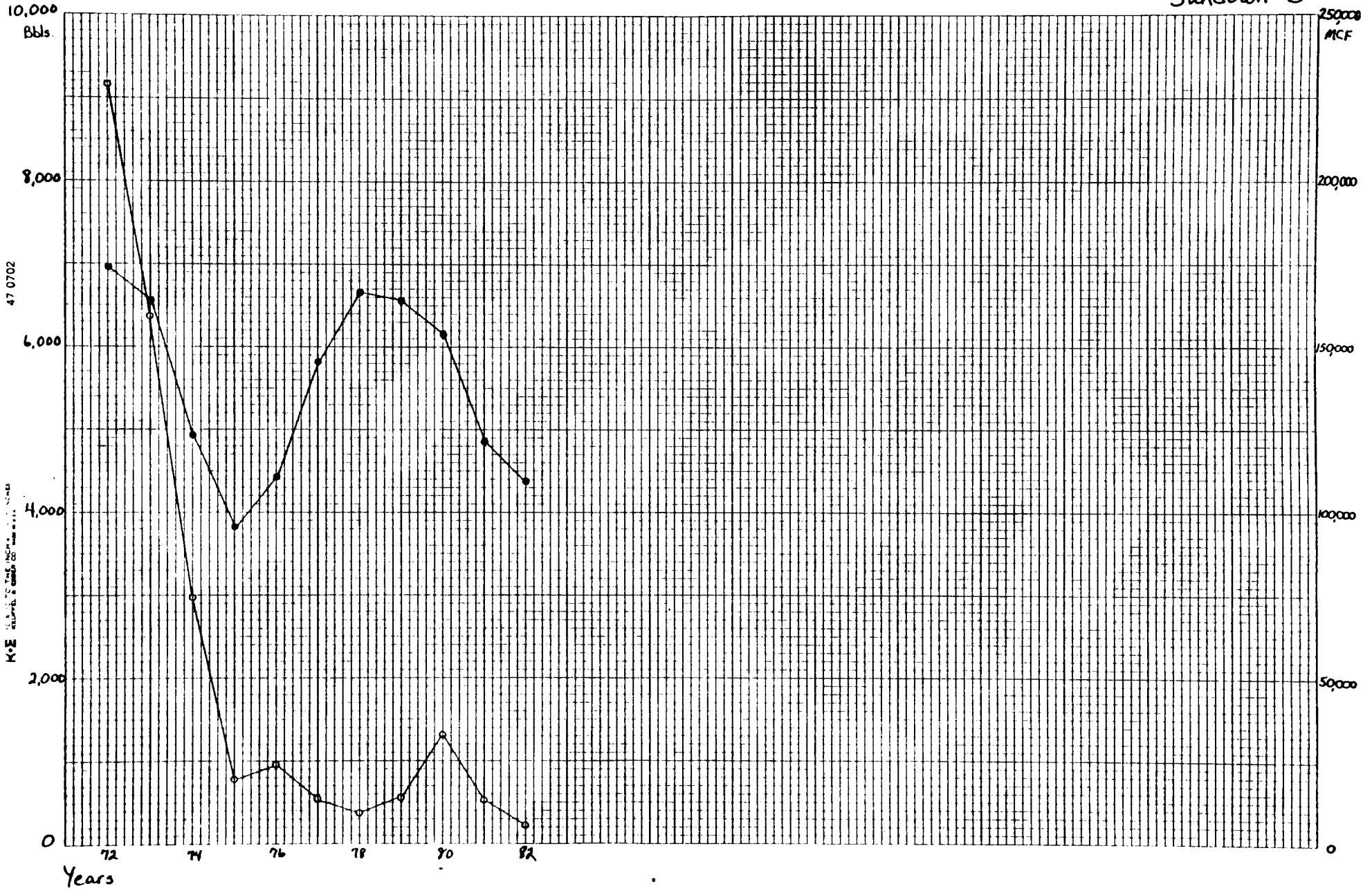

Stallion - J
10,000 Bbls.
8,000
6,000
4,000
2,000
0
SI 1/70
SI 11/74
SI 1-3 and 10-12/1975
66
68
70
72
74
76
78
80
82
Years

Stirrup - D

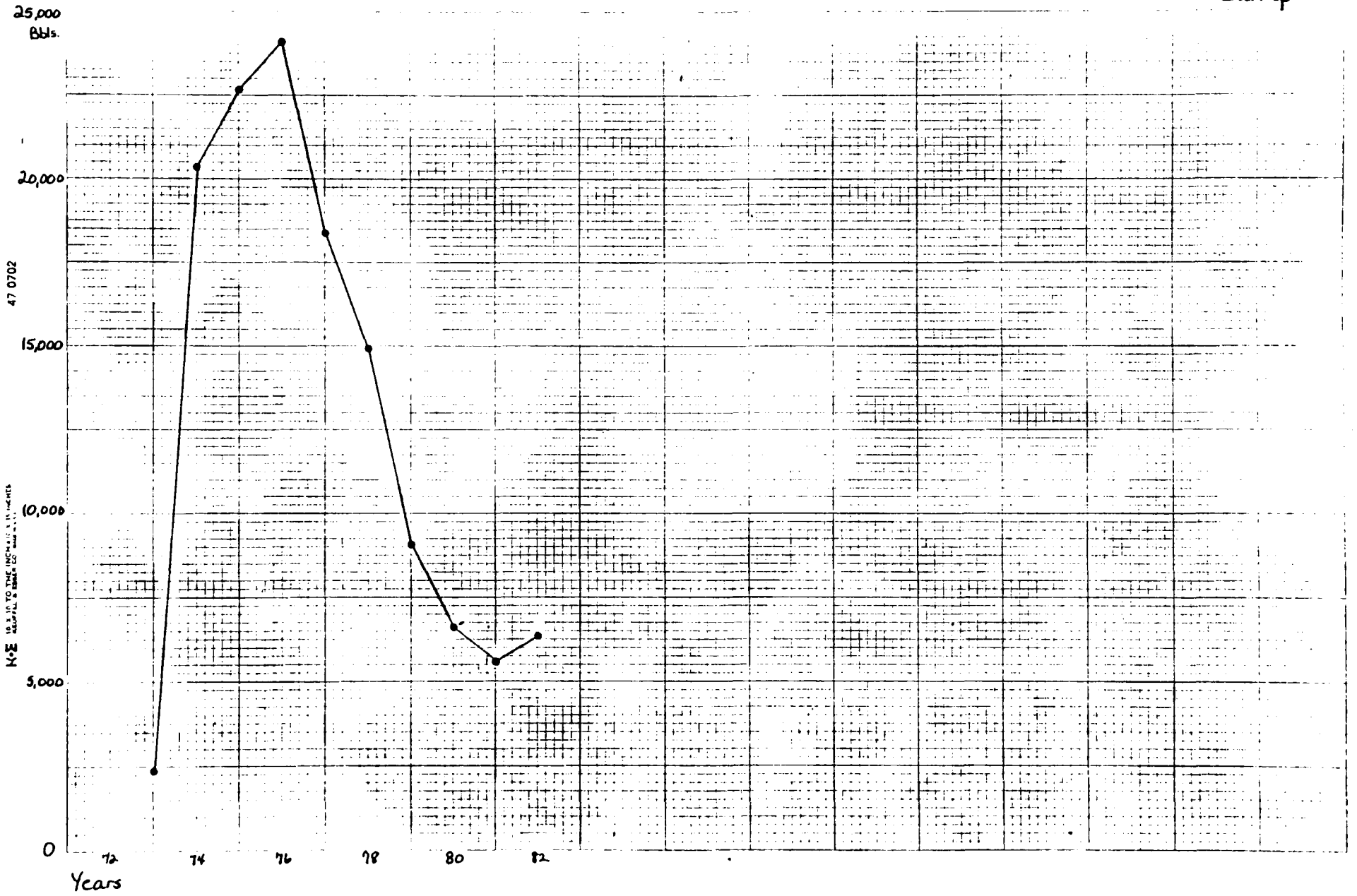

25,000
Bbls.
20,000
15,000
10,000
5,000
0
60
70
72
74
76
78
80
82
Years
47 0702
K+E

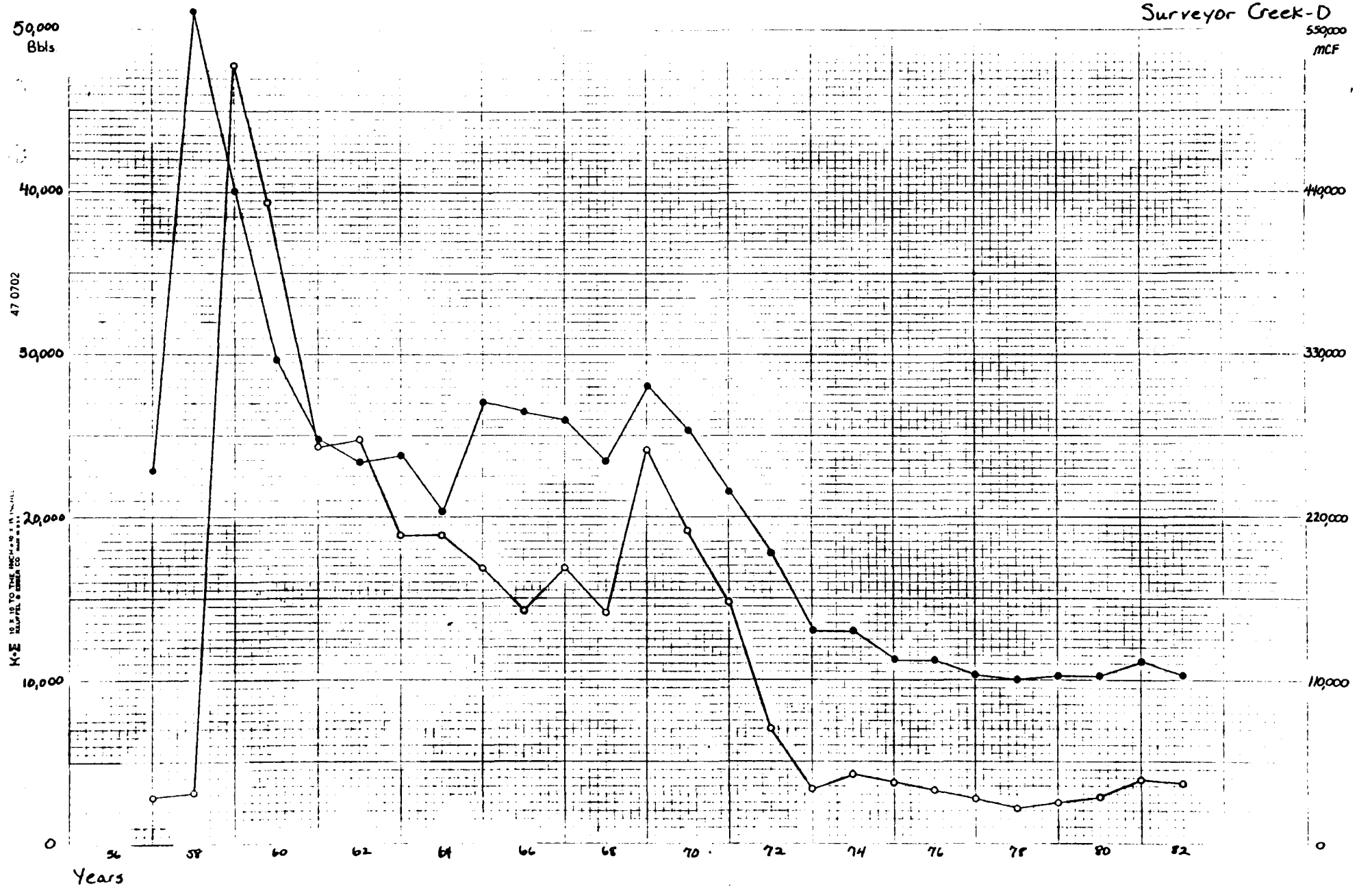

Stoney Point - D
5,000 Bbls.
5,000 MCF
4,000
3,000
2,000
1,000
0
SI 1959
SI 1960
Reactivated 1979
officially SI
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

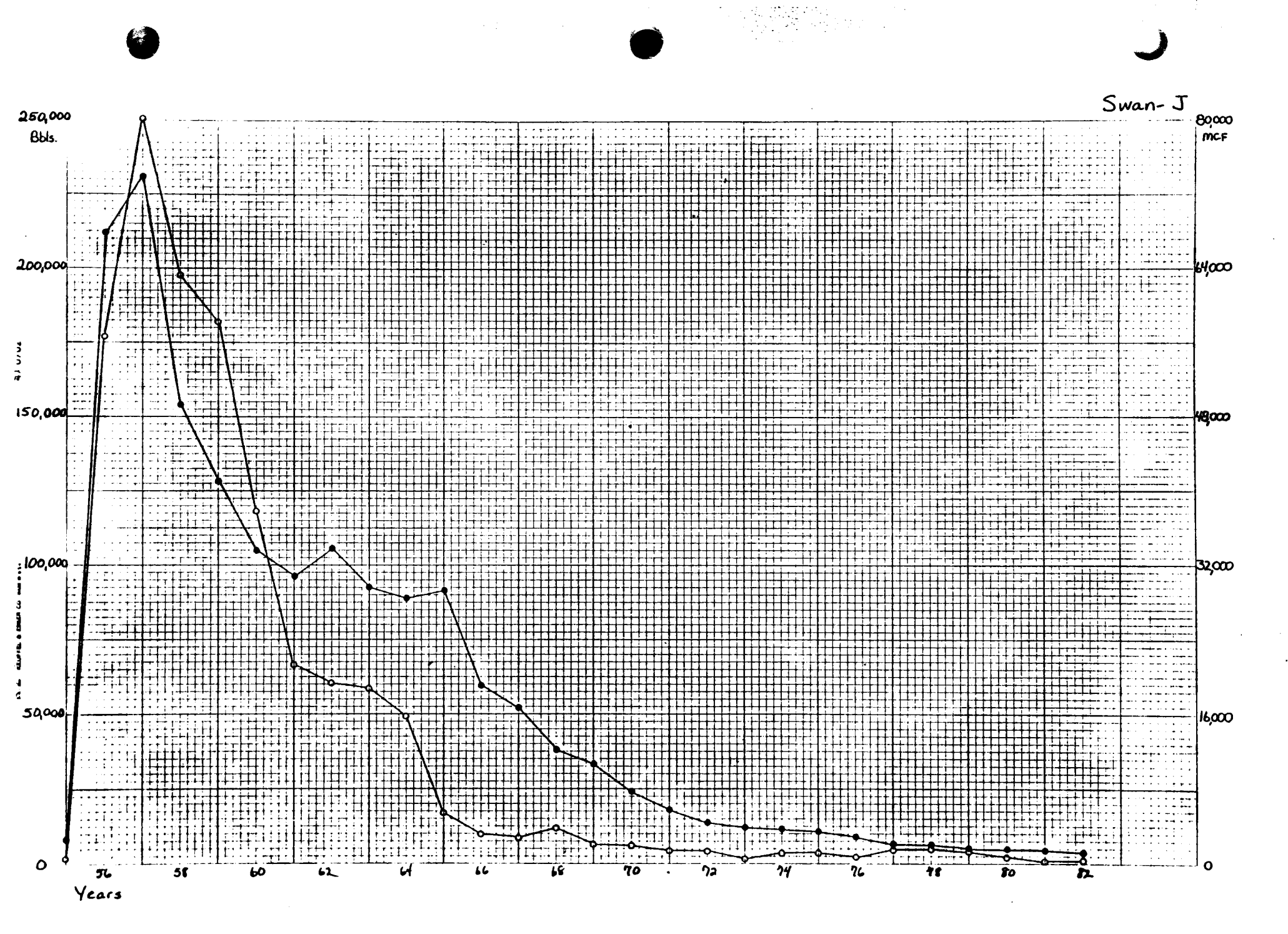
Sundown - D

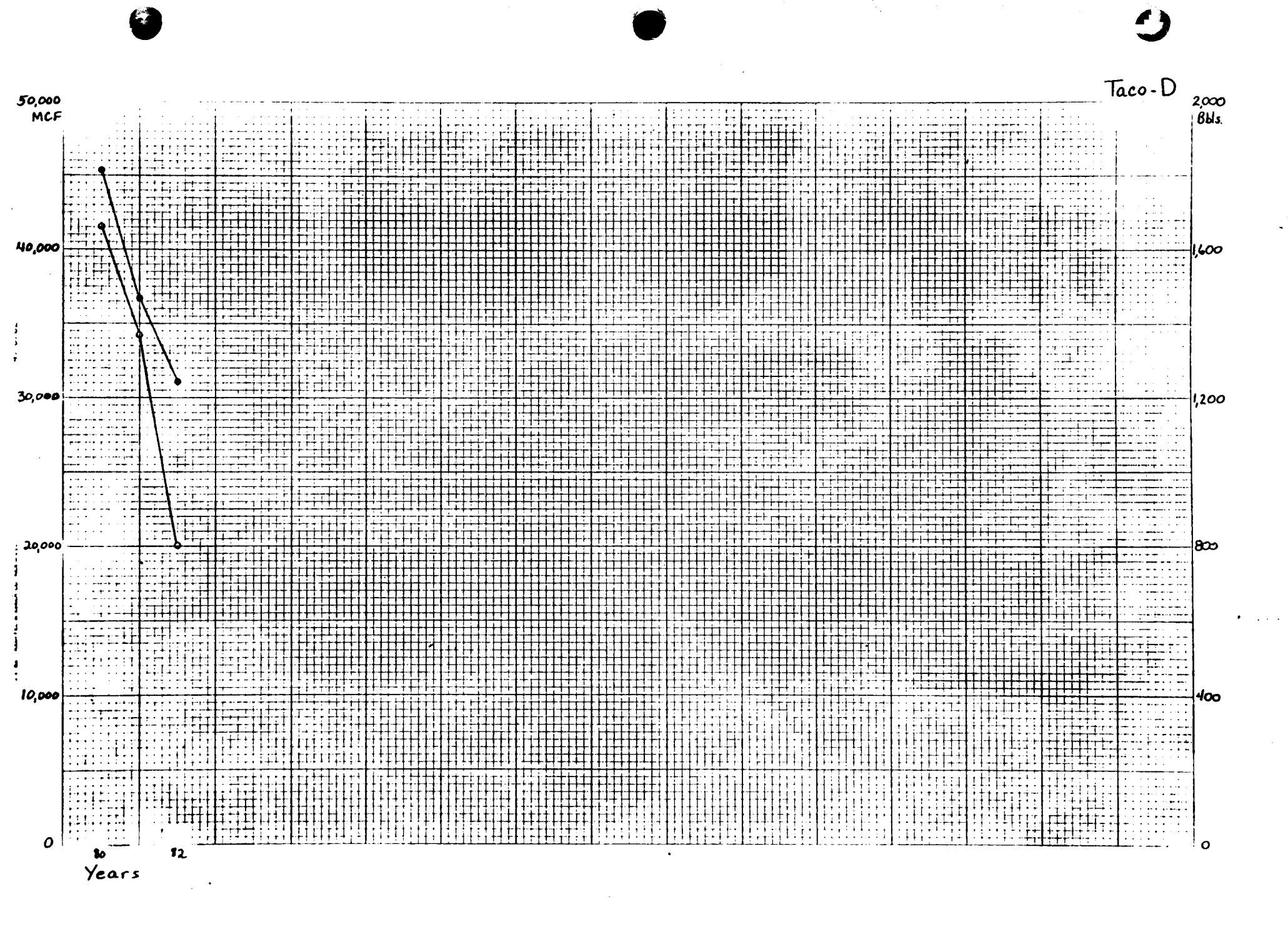

10,000
Bbls.
8,000
6,000
4,000
2,000
0
250,000
MCF
200,000
150,000
100,000
50,000
0
72
74
76
78
80
82
Years
47 0702
K+E

Sumup - J

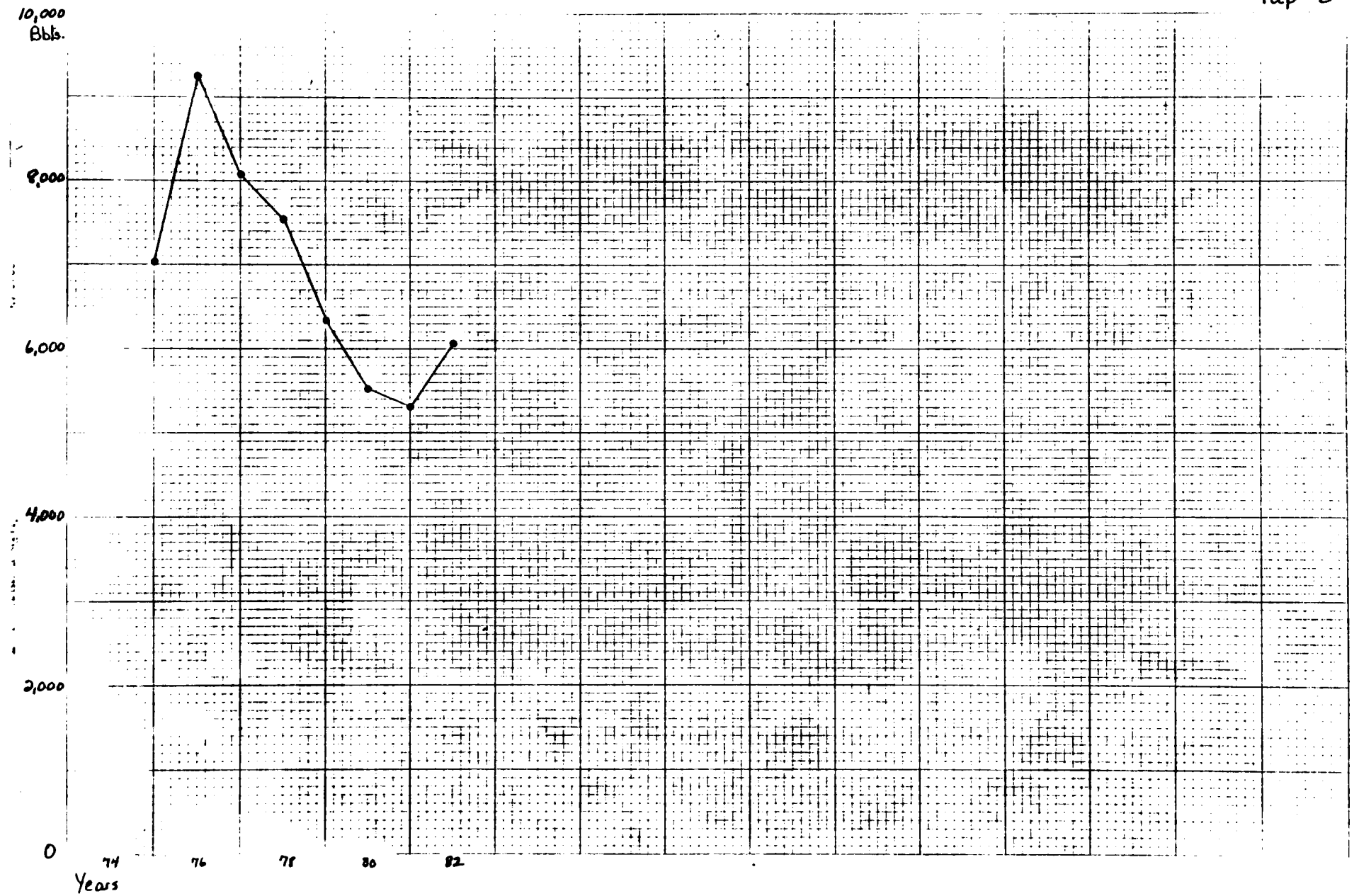

25,000
Bbls.
20,000
15,000
10,000
5,000
0
72
74
76
78
80
82
Years
47 0702

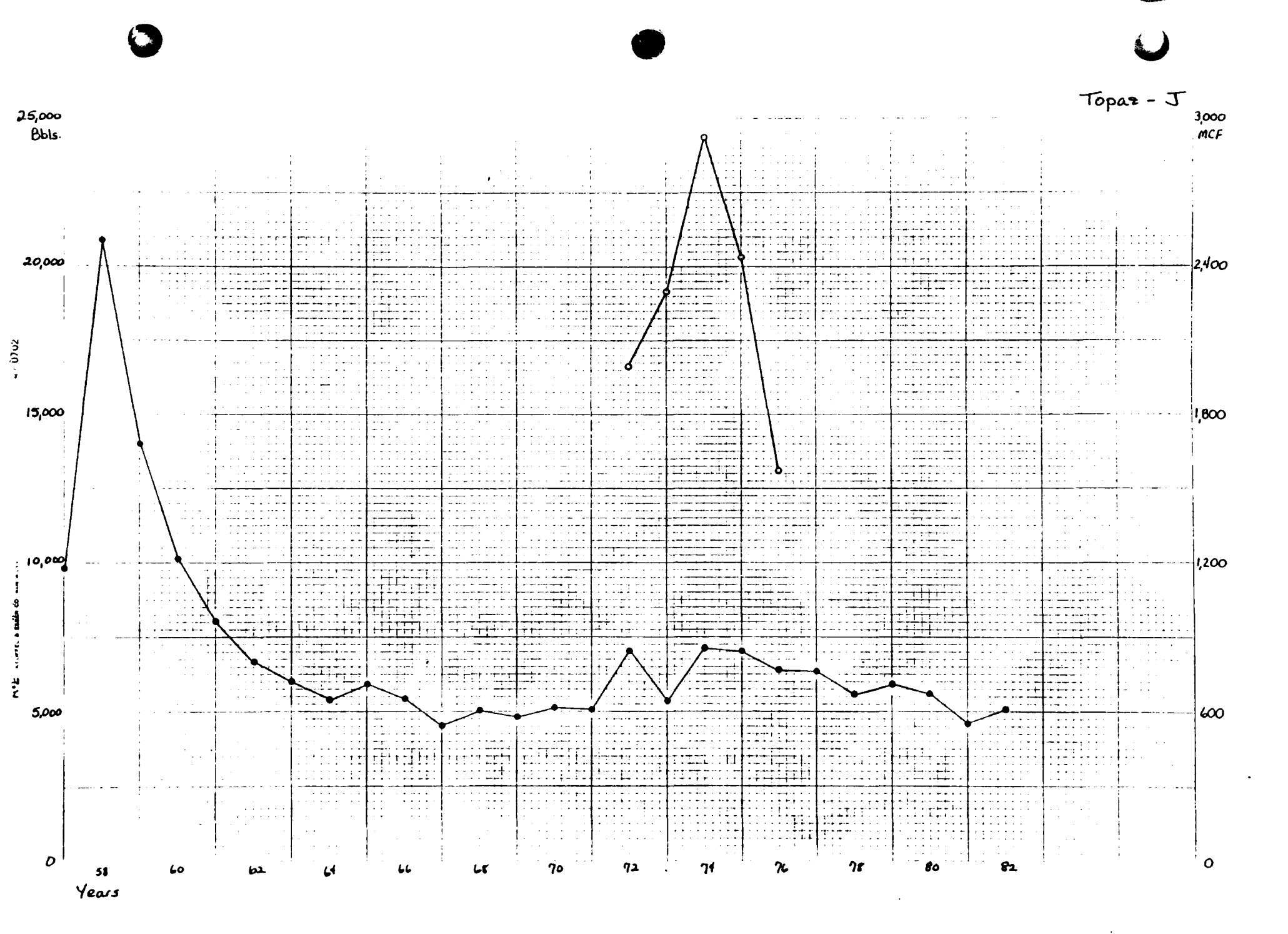

Surveyor Creek-D
50,000 Bbls
40,000
30,000
20,000
10,000
0
550,000 MCF
440,000
330,000
220,000
110,000
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years
47 0702
K·E

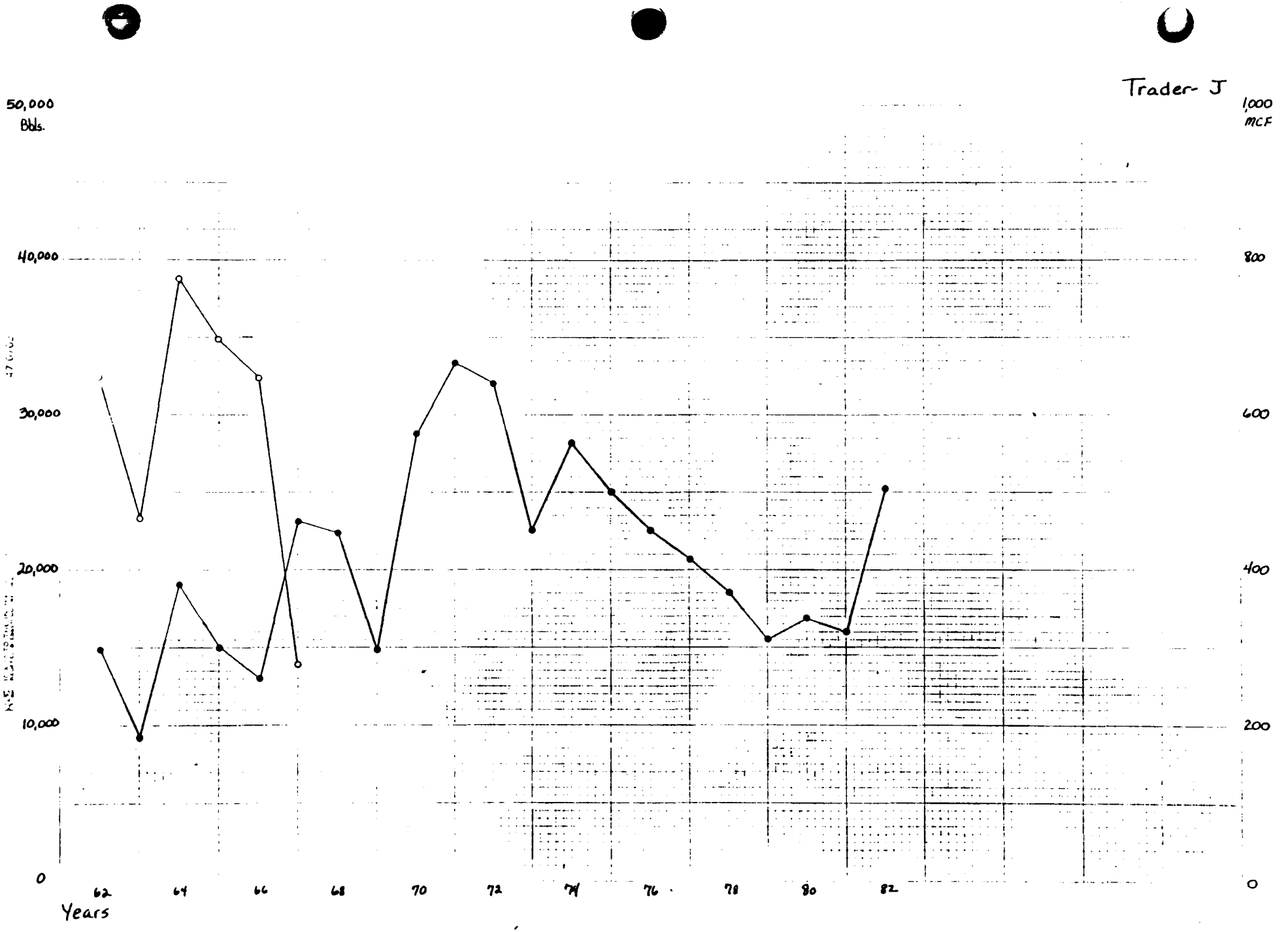

Swan- J
250,000
Bbls.
200,000
150,000
100,000
50,000
0
80,000
mcf
64,000
48,000
32,000
16,000
0
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

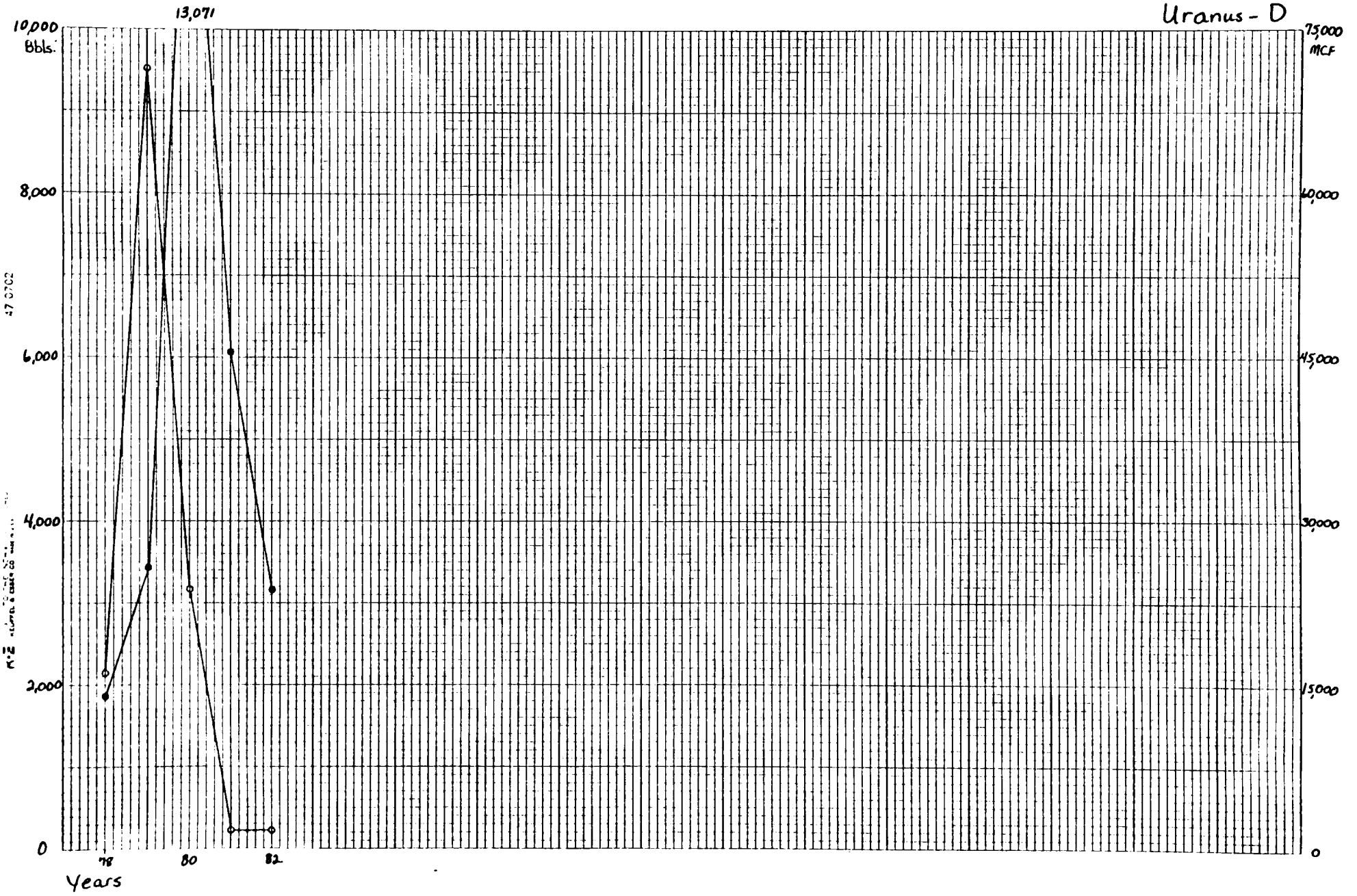

Taco-D
50,000
MCF
40,000
30,000
20,000
10,000
0
2,000
Bbls.
1,600
1,200
800
400
0
80
82
Years

Tap-D

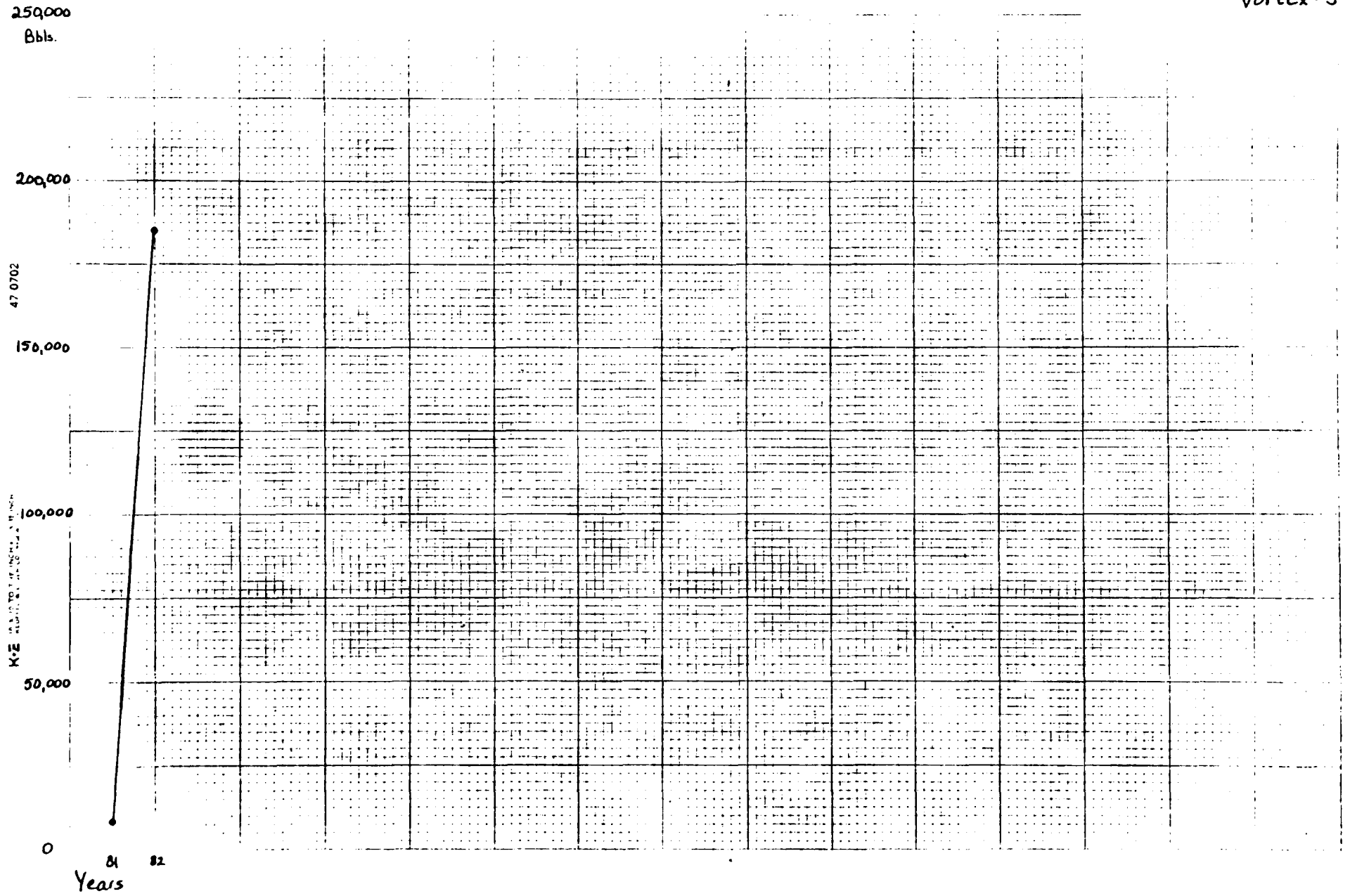



Topaz - J
25,000
Bbls.
20,000
15,000
10,000
5,000
0
3,000
MCF
2,400
1,800
1,200
600
0
58
60
62
64
66
68
70
72
74
76
78
80
82
Years

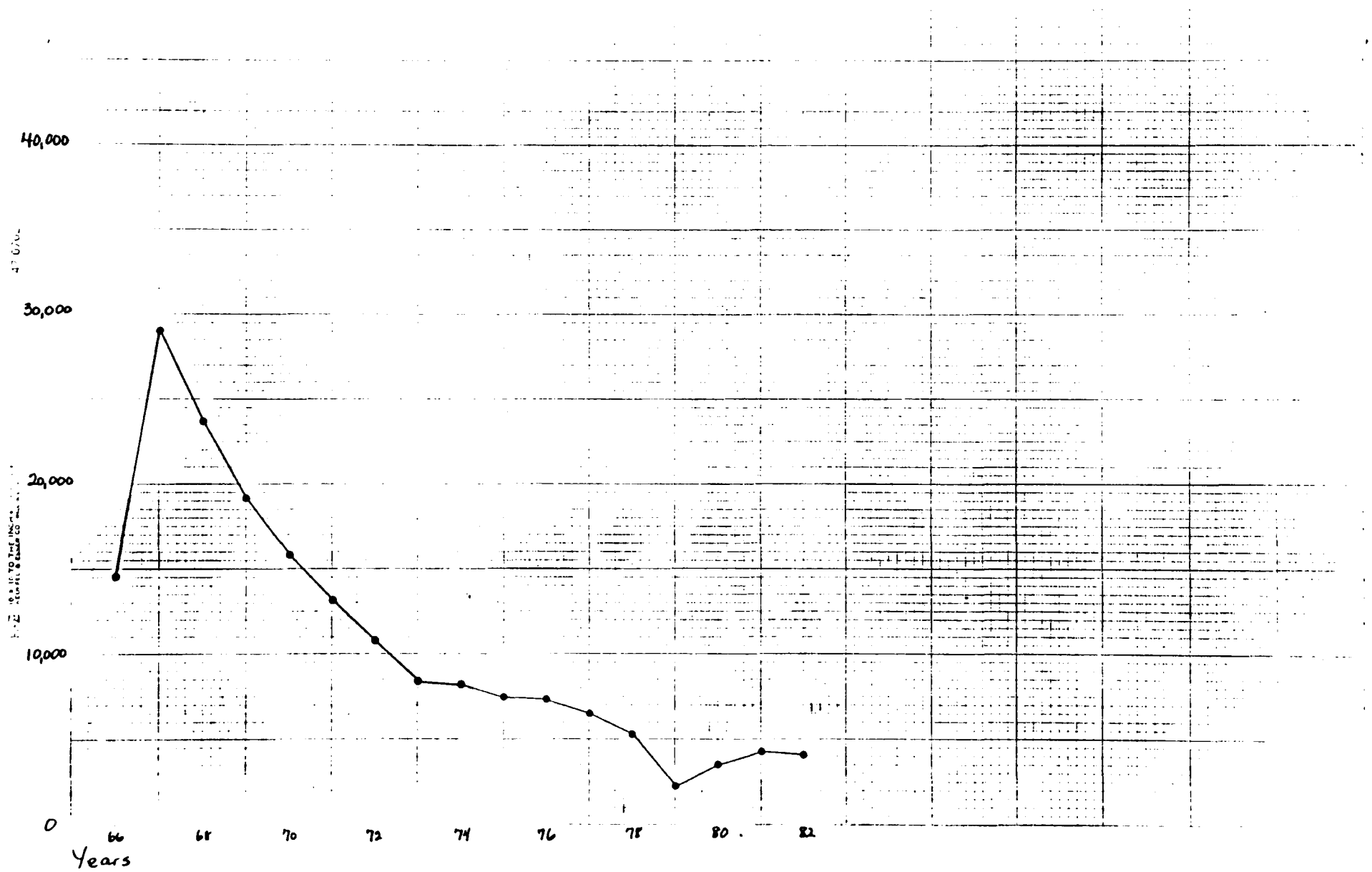

Trader- J
50,000
Bbls.
1,000
MCF
40,000
800
30,000
600
20,000
400
10,000
200
0
0
62
64
66
68
70
72
74
76
78
80
82
Years

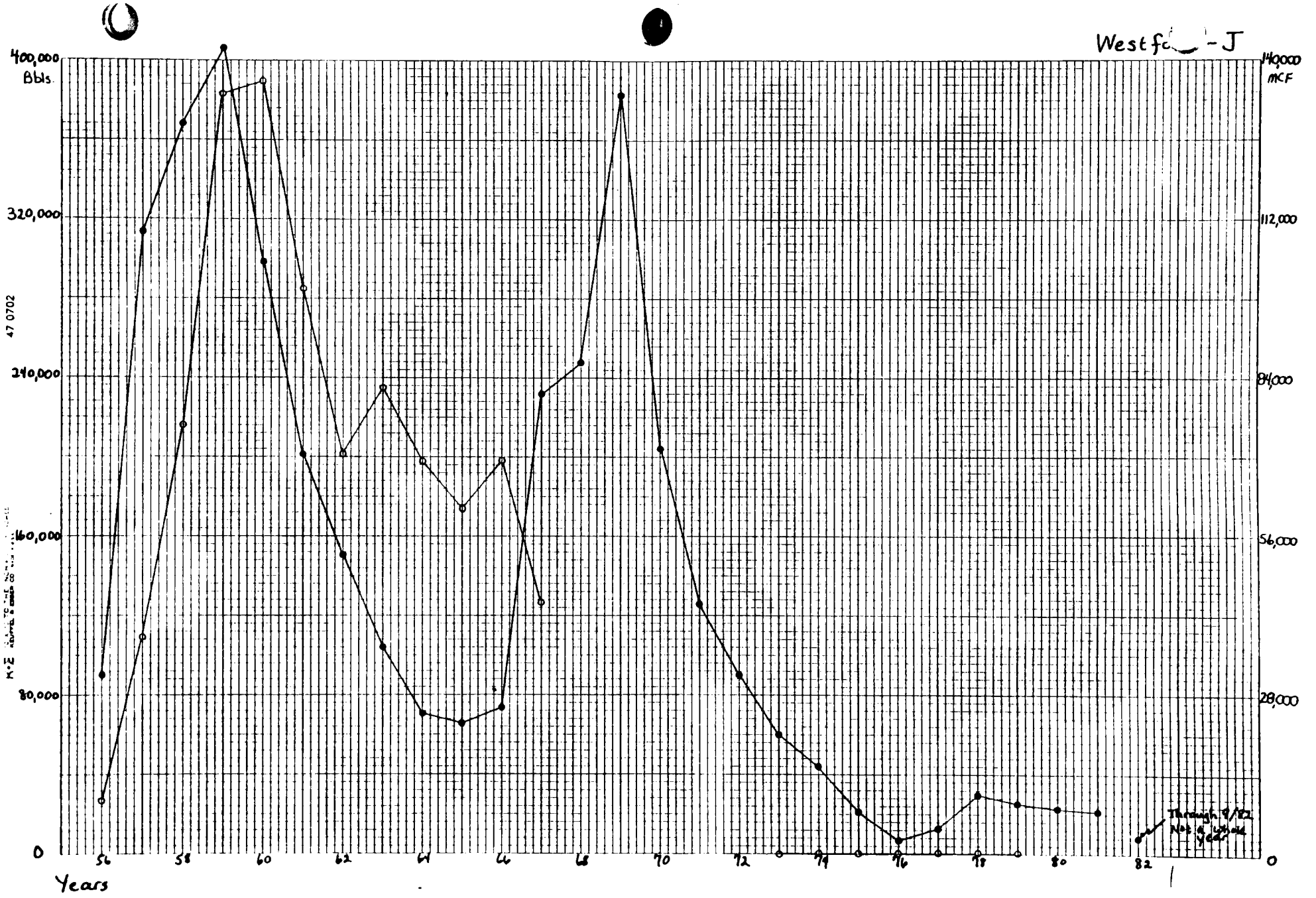

Uranus - D
13,071
10,000
Bbls.
8,000
6,000
4,000
2,000
0
75,000
MCF
60,000
45,000
30000
15,000
0
78
80
82
Years

Vortex - J

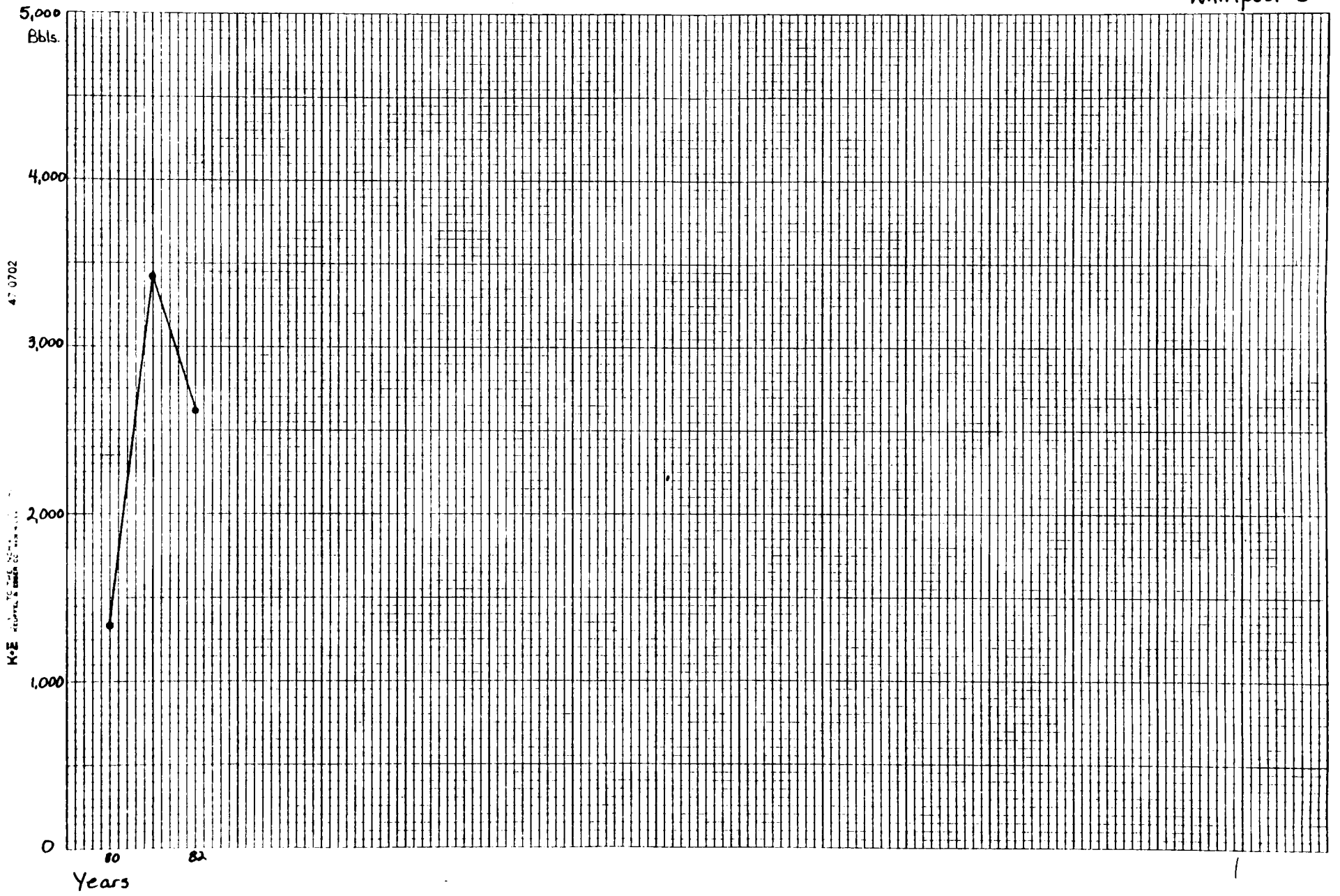

250,000
Bbls.
200,000
150,000
100,000
50,000
0
81
82
Years
47 0702
K-E

Wampum- J

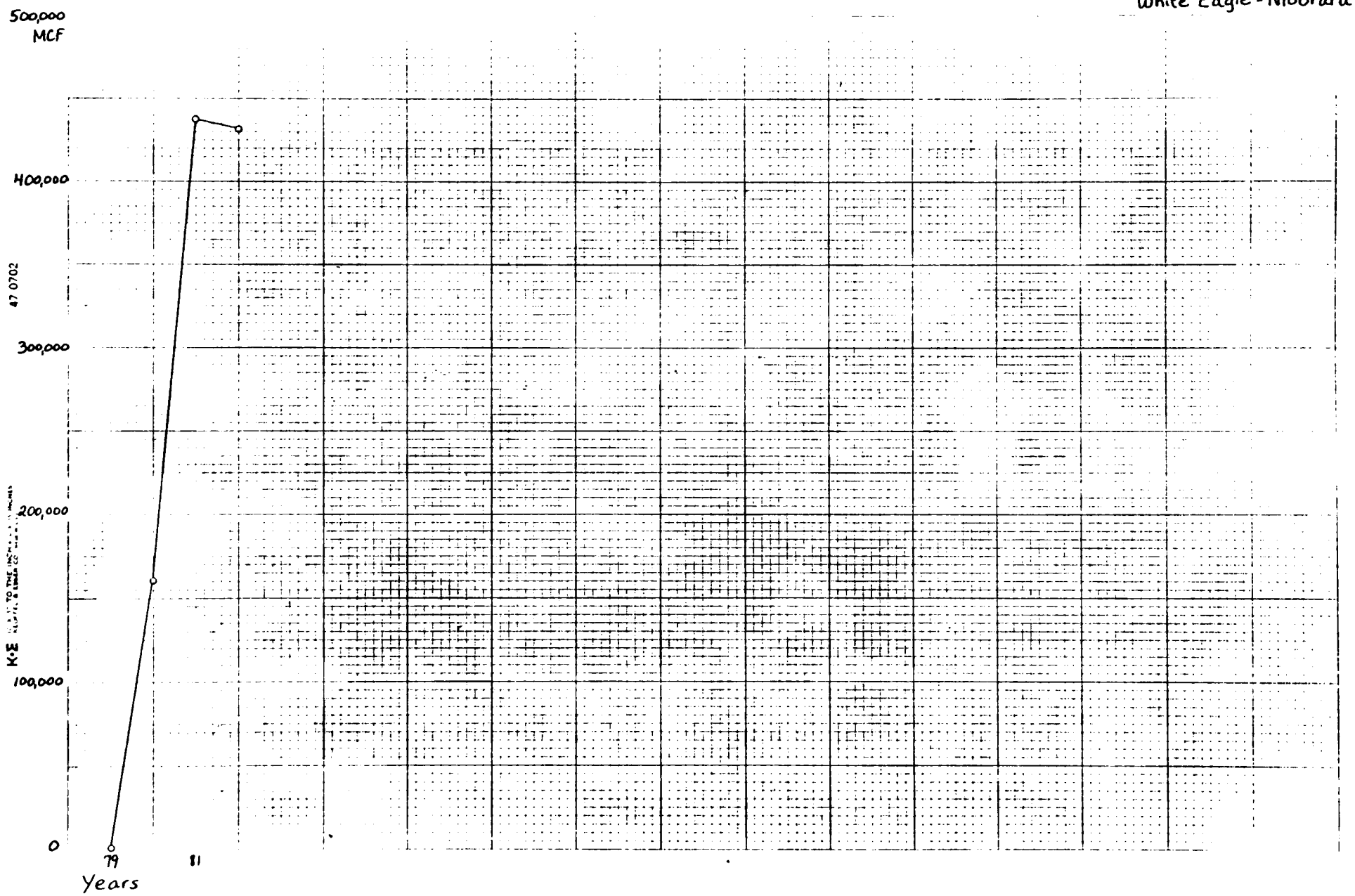

50,000
Bbls.
40,000
30,000
20,000
10,000
0
66
68
70
72
74
76
78
80
82
Years

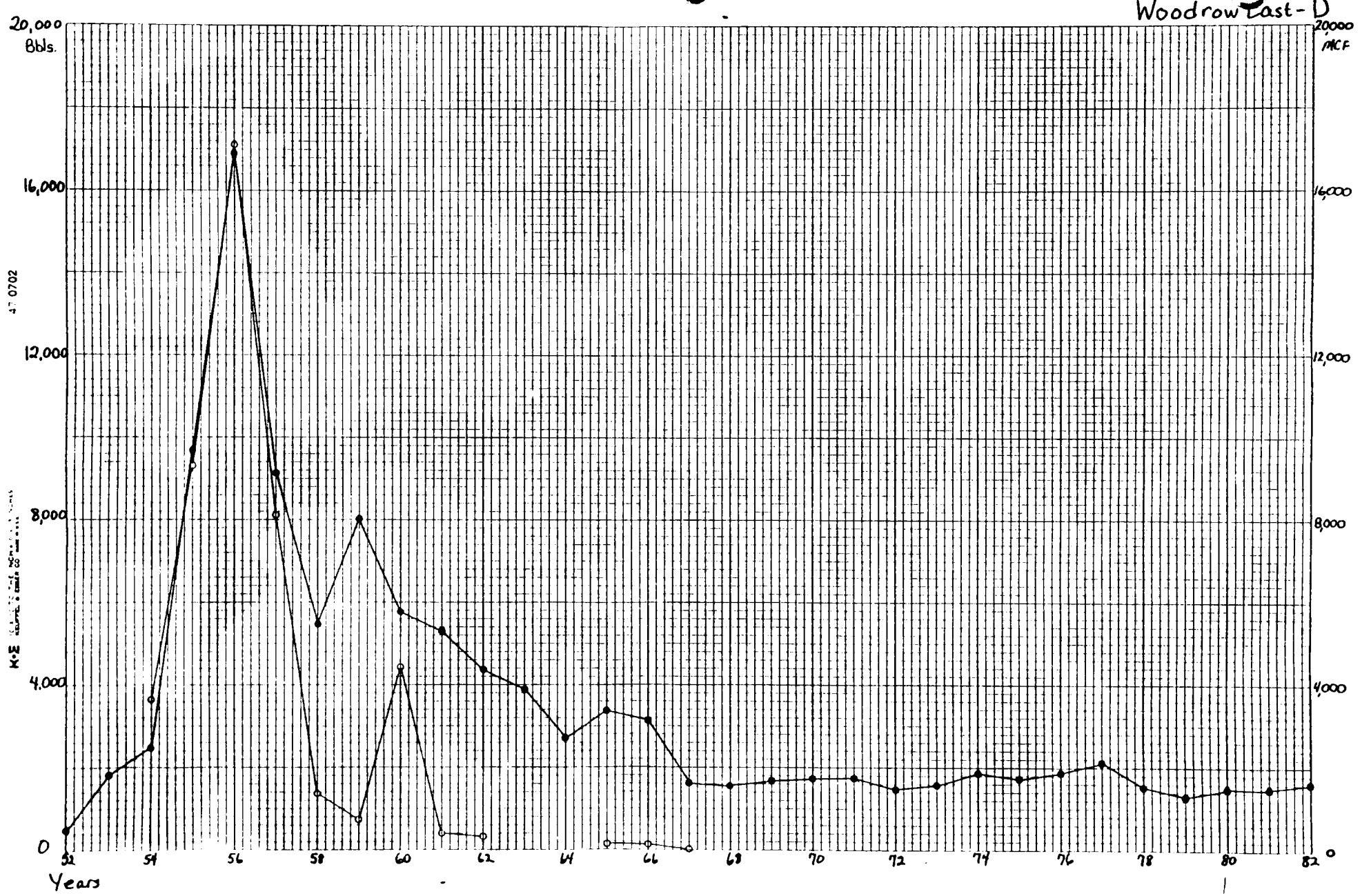

Westfa -J
400,000 Bbls.
320,000
240,000
160,000
80,000
0
140,000 MCF
112,000
84,000
56,000
28,000
0
47 0702
56
58
60
62
64
66
70
72
74
76
78
80
82
Through 9/82 Not a typical year
Years

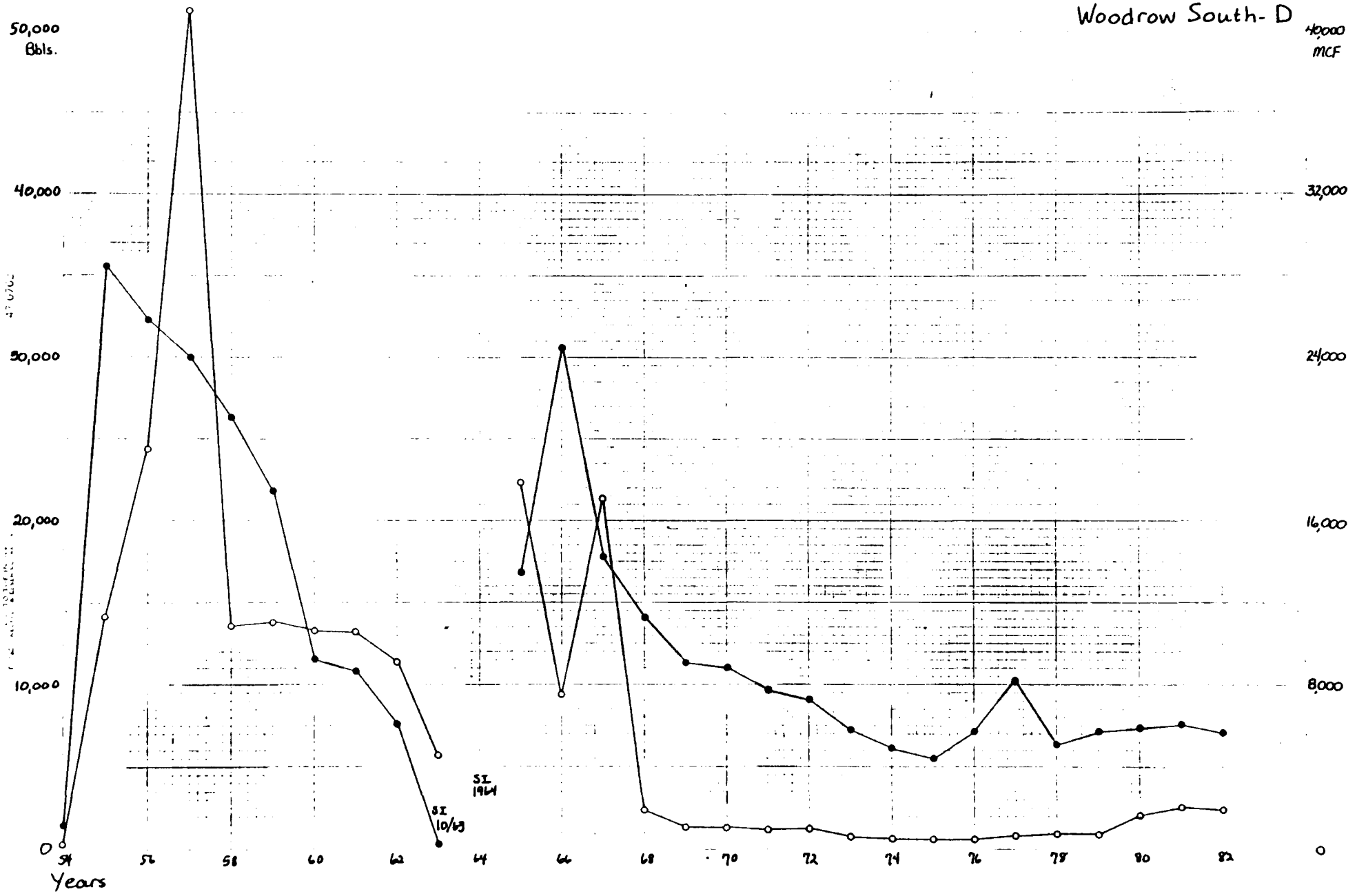
Whirlpool J

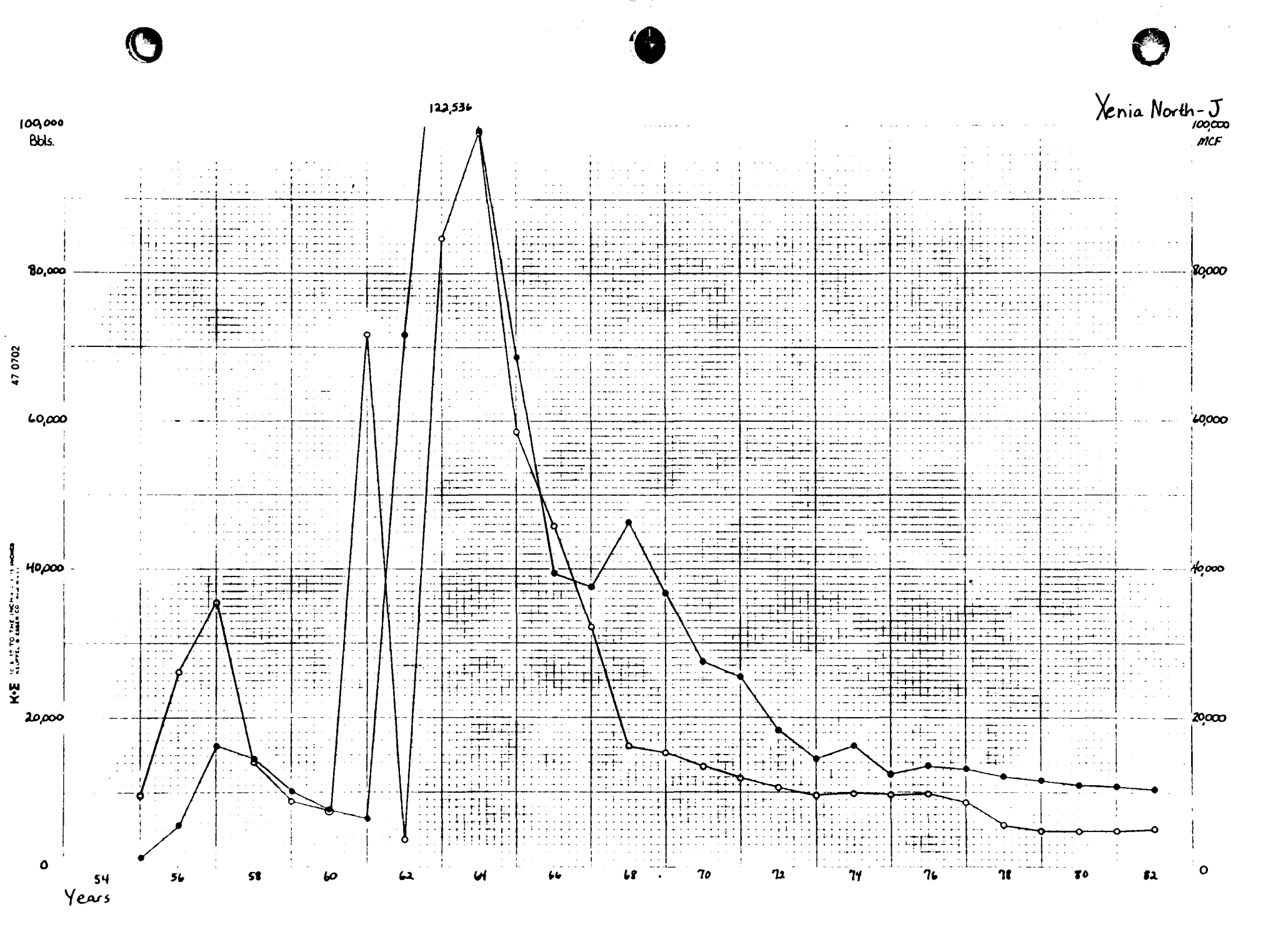


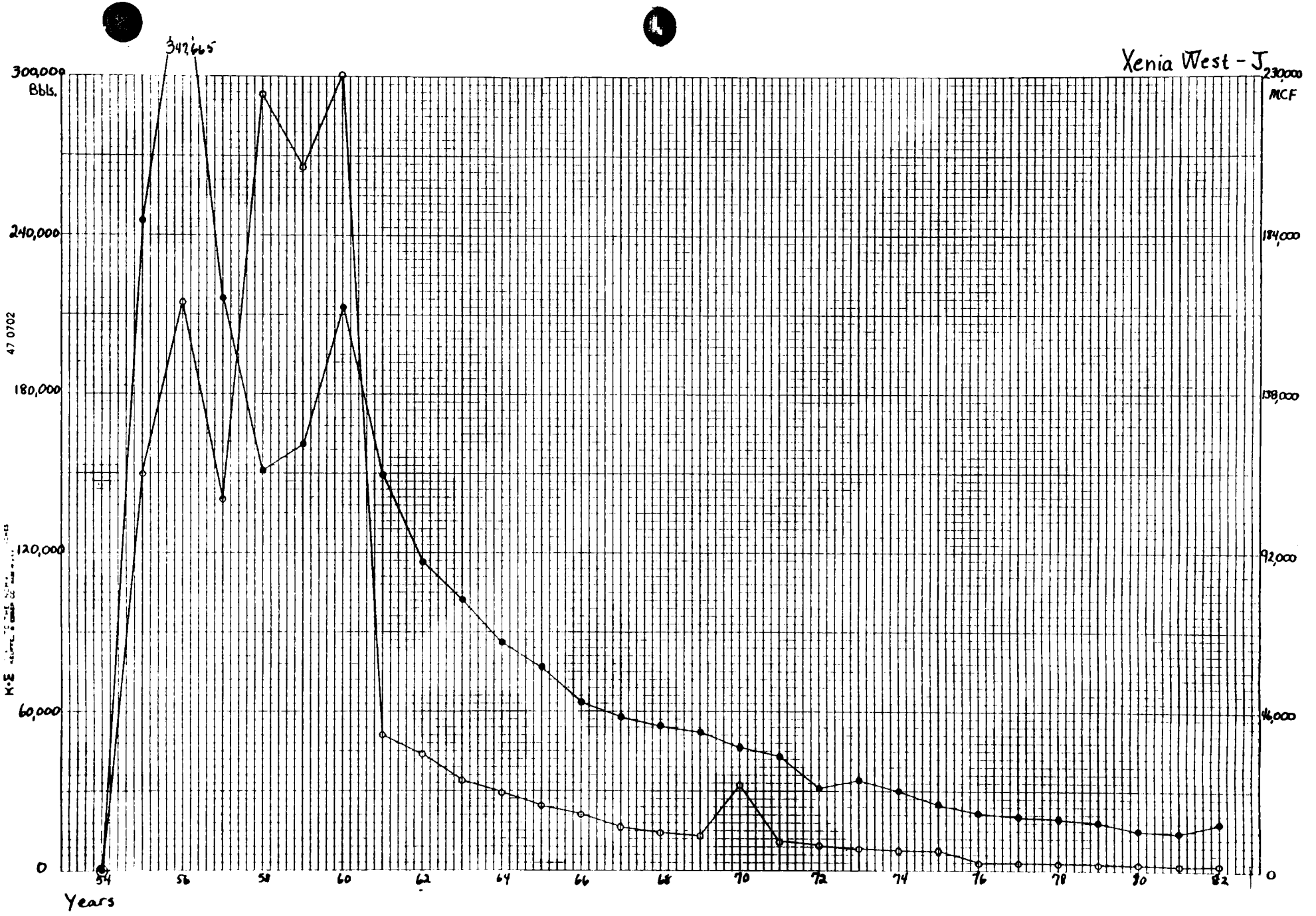
White Eagle - Niobrara

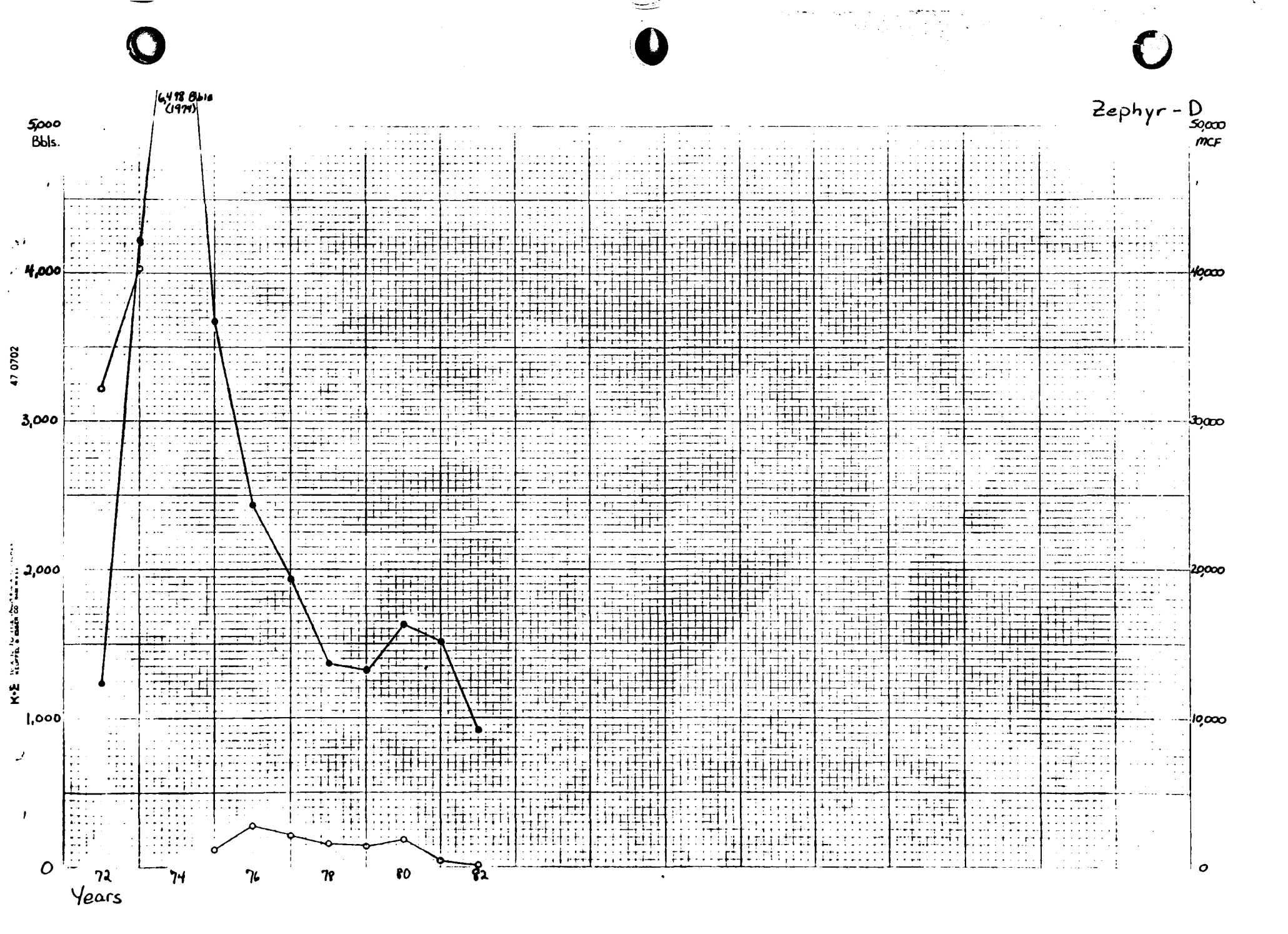



Woodrow East - D
20,000
Bbls.
16,000
12,000
8,000
4,000
0
20000
MCF
16,000
12,000
8,000
4,000
0
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years


Woodrow South- D
50,000
Bbls.
40,000
30,000
20,000
10,000
0
40,000
MCF
32,000
24,000
16,000
8,000
0
SI
10/63
SI
1964
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years


Xenia North-J
122,536
100,000 Bbls.
100,000 MCF
80,000
60,000
40,000
20,000
0
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years


Xenia West - J
342,665
300,000 Bbls.
240,000
180,000
120,000
60,000
0
230,000 MCF
184,000
138,000
92,000
46,000
0
47 0702
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
Years


Zephyr - D
5,000 Bbls.
50,000 MCF
6,498 Bbls (1971)
4,000
40,000
3,000
30,000
2,000
20,000
1,000
10,000
0
0
72
74
76
78
80
82
Years
47 0702

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 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;
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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