



TELEPHONES

ACCOUNTING 263-6161

EXECUTIVE 261-7670

574 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

EXHIBIT No. 4

November , 1975

()
(Royalty Owner)
()

Dear Sir:

Omega Hydrocarbons Ltd. has completed its studies on the potential of waterflooding the Waskada Oil Field in the Province of Manitoba and has concluded that the flood would benefit the Working Interest Owners and Royalty Interest Owners alike. However, we have not been successful in persuading Copperhead Oil Co. and its partners who own three adjoining wells on the south end of the pool to participate in the proposed flood, so we now plan to proceed with an independent Unit. Omega's proposal is to install a pilot waterflood project and a unitized operation. To accomplish this program we have prepared a Unit Agreement which is intended to maintain equity among Royalty Owners.

The pilot waterflood will involve the conversion of the well located in Lsd. 6-30-1-25 to a water injection well. This location will accommodate the expansion of the plan to a five spot waterflood pattern if and when it is recognized that the flood is in fact accomplishing our objectives which are designed to increase current producing rates and ultimate oil recovery.

To assist you in your deliberations concerning your approval of the scheme we enclose one copy of the proposal entitled "Unit Proposal and Waterflood Plan" dated October, 1975 which forms part of our application to the Manitoba Oil and Gas Conservation Board.

Please sign and return one copy of the Unit Agreement at your earliest possible convenience thus providing approval of Unitization and the waterflood plan.

Yours very truly,

OMEGA HYDROCARBONS LTD.

T. Jack Hall,
President

TJH*vs
Encl.

WASKADA ALIDA BEDS OIL POOL

WATERFLOOD POTENTIAL

Aug 1974

WASKADA ALIDA BEDS OIL POOL
WATERFLOOD POTENTIAL

Prepared for:
OMEGA HYDROCARBONS LTD.

August 1, 1974

D&S PETROLEUM CONSULTANTS LTD.
LONDON, England. CALGARY, Alberta



D&S PETROLEUM CONSULTANTS (1974) LTD.

732 Calgary House-550-6 Avenue S.W. Calgary, Alberta T2P 0S2
Telephone: 403-266-1601 Cable: Denescons Calgary

August 9, 1974

Omega Hydrocarbons Ltd.
574, 330 Fifth Avenue S.W.
Calgary, Alberta.

Attention: Mr. J. Hall

Dear Sir:

Re: Waskada Alida Beds Oil Pool

As requested, we have reviewed the waterflooding potential of the Waskada Alida Beds Oil Pool of Manitoba, effective August 1st., 1974. The pool is geographically located on Figure 1 while Figure 2 is a well map of the pool and immediate area. The pool potential is summarized as follows:

	Net Remaining Reserves bbls.	Cash Flow	
		Undiscounted M\$	Discounted @ 9% M\$
Primary Depletion	202,225	812.1	554.3
Waterflood	675,052	3,627.7	2,310.2

A summary forecast of production, revenue and costs is given in Table 1 for the six Company wells if operation is continued as at present. A summary forecast of pool production, revenue and costs is given in Table 2. The

.....Cont'd.

forecast includes the four Copperhead wells to the south. This forecast is based on the six Company wells to the north which remain unaffected by a partial water drive at the southern end of the pool. Table 2 represents a primary depletion base case for comparison with a pool waterflood, presented in Table 3.

Although no petrophysical data are available (such as reservoir fluid PVT analyses, relative permeability data, bottom-hole pressure measurements and the like) and in fact gas production has not been measured, it is felt that the analysis presented in the attached report is realistic. In lieu of actual data, correlations reported in the literature have been utilized. Good agreement has been achieved between theoretical estimates and actual pool performance using this approach.

Waterflooding of the pool appears to be wholly feasible but will be hindered by the presence of a large free-gas saturation in the reservoir. This saturation is present due to the advanced maturity of the existing primary depletion operation. As a consequence, even at high rates of water injection, response, will not be discernible for at least one and one-half years, or longer.

It has been a pleasure to be of service. Please contact us concerning any matters which may require clarification.

Yours very truly

D&S PETROLEUM CONSULTANTS LTD.

G. G. Meisner, P. Eng.

GGM:rk

WASKADA ALIDA BEDS POOL

INTRODUCTION

This pool, containing ten oil wells, was discovered and developed during 1967. The pool is approximately 50 miles south of the Virden-Roselea Mississippian oil fields.

The wells have been completed with a light acid wash which appears to have been successful in establishing good production from the Alida beds producing zone. Individual well problems have developed over the years some of which are mechanical in nature. It is probable that a well by well review isolating the mechanical problems might reveal wells that could benefit from restimulation.

The pool has been producing by solution gas drive since discovery and has produced a large part of the primary reserve. Recent pressure measurements suggest that the reservoir pressure is in the 150 to 350 psi range. The measurements actually indicate a pressure of about 150 psi on a well which had been shut-in for two weeks. The difference between the shut-in pressure and extrapolated reservoir pressure will be a function of the effective permeability of the reservoir.

Although there is a water leg downdip of the pool which is apparently affecting the four southern wells, there is not an effective water drive.? It must be stated, however, that the best production is taken from the four Copperhead } wells which are unquestionably being influenced by water } influx. Natural water influx is not strong enough to influence more than a limited area.✓ The production history for each well has been plotted on Figures 3 through 12. Although reservoir data is limited, the performance of the pool, at this stage of depletion, is consistent with the oil-in-place used in this report.

The pool production performance has been analyzed by separating the Copperhead wells, which are producing some water and which are believed to be affected to some extent by a water drive.✓ When this is done reasonable agreement is achieved amongst the mapped oil in place, the decline curve extrapolated recovery factor and the theoretical Muskat recovery factor. Based on the foregoing the current reservoir pressure is estimated at about 350 psig.?!)

Gas production has not been measured but it is reported that some gas was blown down early in the pool life and that gas production has diminished since. This may suggest that a small gas cap was present initially but on the other hand the gas production may have declined as the oil production declined. Without a gas measurement history our interpretation of a small insignificant gas cap cannot be proven but from the battery operator's recollection of the performance of the flare this interpretation seems justified. In this analysis then, it has been assumed that there was no effective gas cap but that the oil was saturated with gas at reservoir conditions.

Since there are no PVT measurements it was necessary to use a correlation published in the literature (Lasater). Waterflood data from similar reservoirs was used in the study.

The purpose of this study was to evaluate the feasibility of waterflooding.

CONCLUSIONS

- 1) The original oil-in-place in the pool is estimated at 2,876,000 stock tank barrels.
- 2) The ultimate primary recovery factor is about 25 percent of the original oil-in-place.
- 3) The ultimate waterflood plus primary recovery factor will be about 50 percent of the original oil-in-place.

RECOMMENDATIONS

- 1) The pool should be waterflooded as soon as possible using a Tilston Beds water supply well. A well drilled in 13-30 would serve the multiple purpose of evaluating the location for Alida beds oil production, and possible Tilston beds oil production. Failing in this a Tilston beds water supply well should be developed at the location.

- 2) To initiate a waterflood, whether or not the pool is to be unitized, we would recommend that the following wells be converted to water injection service initially:

4-30-25-1 W1
12-30-25-1 W1

If necessary well 6-30 could later be added as an injector.

RESERVOIR DESCRIPTION

a) Geology

The reservoir is developed in the upper porous member of the Alida beds which dip to the south-west. Updip, the porous member has been subjected to weathering and is tight. The pay zone is overlain by 10 to 15 feet of cap rock and 30 feet of dense Marly beds under the pay zone act as a base seal. The pay zone is impermeable to the west due to a facies change and to the east due to erosion or subcropping of the beds against the unconformity. Below the base seal another 20 feet of porous Alida development is present but wet.

Water is present downdip in the pay zone and a gas cap may have been present in the pool initially. A cross section is provided on Figure 13.

b) Net Pay

The net pay has been picked from the porosity log using a porosity cut-off of seven percent. This cut-off has been observed to correspond approximately to a permeability cut-off of about one to two millidarcies and clearly indicates the good pay. A map of net pay is shown on Figure 14.

c) Porosity, Permeability and Water Saturation

Core data for the Omega wells was processed using a one millidarcy cut-off in the pay zone. The average pool porosity was determined to be 13.7 percent and the average permeability was found to be 9.4 millidarcies. A plot of the relationship between porosity and permeability is given on Figure 15.

The average water saturation for the pool has been estimated to be 35.9 percent from the resistivity logs.

d) Oil-Water Relative Permeability

Relative permeability curves which are considered representative of the reservoir have been estimated from a relationship presented in the literature. The curves are given on Figure 16 for water and oil. A fractional flow curve for the reservoir is also shown on the diagram.

e) PVT Data

No PVT data is available from the pool. The crude falls within the range of the Lasater correlation which is presented in Table 4. It has been assumed that the crude was saturated with gas at initial reservoir conditions.

f) Oil-In-Place

The oil-in-place has been calculated as 2,876,000 stock tank barrels. This calculation is provided in Table 5.

PRIMARY DEPLETION

Recovery Efficiency

A Muskat primary depletion prediction has been prepared from the bubble point pressure. The prediction is presented in Table 6. Also presented in Table 6 are the gas-oil relative permeability ratio data.

It is estimated that the primary recovery from the bubble point will be 25 percent of the original oil-in-place. Although it is believed that the production mechanism will eventually become a partial water drive it appears that insufficient natural force is being exhibited to materially accelerate production or modify the present value of the property.

WATERFLOOD POTENTIAL

Recovery Factor Calculation

Because of the depletion stage of the reservoir a large free gas saturation is indicated by the Muskat depletion drive calculation in Table 6. It is our opinion that the current average reservoir pressure is about 350 psi which means that the gas saturation of hydrocarbon pore space is only slightly less than (30) percent. *Clarification*

The crude oil viscosity is about 4.0 cps at reservoir conditions. It is believed that in a water wet system such as this no problem will be encountered in the formation of an oil bank. The water saturation will increase at the wall of the pore space and first the gas and then the oil will be displaced. The accumulation of oil saturation will form the bank.

It is evident though, that the flood response will be materially influenced by the presence of the large free gas phase. There will be no detectable production response until the free gas saturation has been reduced materially so that injection will proceed for some lengthy period with no visible effect. In this report the method of Prats et al was used to predict future performance.

Vertical conformance was calculated using the Muskat method. Areal sweep efficiency for a 5 spot pattern was used. The displacement efficiency was calculated using the Welge modification of the Buckley Leverett technique. The ultimate recovery factor including primary and secondary recovery will amount to approximately 50 percent of the original oil-in-place.

ECONOMICS

a) Primary

The economics of continued primary operation for the pool (including the Copperhead wells) are presented in Table 2. This forecast is based upon the performance of the Omega wells only, since it is believed that the Copperhead wells are being influenced by water encroachment. The forecast shown is based upon an extrapolation of the production decline trends which is also consistent with the Muskat prediction.

The Manitoba tax legislation has been considered. This legislation requires that the royalty owner pay taxes on oil production.

Initial operating costs are estimated (Table 7) at \$350 per well per month and these costs have been escalated at five percent per year. The initial wellhead crude price after trucking charge is \$6.10 per barrel. This price has been escalated at \$1.05 per barrel until 1976 and thereafter at \$0.45 per barrel until 1982. The crude price and operating

costs have been held constant after 1982 due to uncertainty in estimating this far into the future and the probable interference from other competitive energy sources at these crude price levels. Economic factors are listed in Table 7. A forecast of production revenue and costs is given in Table 2. Individual projections for each Company well are given in Tables 8 through 13.

b) Waterflood

Waterflood economic factors are presented in Table 14. A base cost of \$350 per well per month in 1974 escalating at five percent per year until 1982 has been used for the ten existing wells and one additional well which will be drilled to provide a water supply. The crude price schedule is the same as assumed for the primary depletion forecast. An additional charge of two cents per barrel of produced water has been incorporated to provide for handling return water. The Manitoba tax has been incorporated in the calculation. The tax is provided for in Bill 85 which makes provision for a reduction in tax for newly discovered oil but does not provide a tax reduction for incremental oil recovered by waterflooding.

It has been considered that the most probable cost for development of the property for waterflood in Table 15 is about \$200,000. This cost includes the drilling of a water supply well and water treating and injection facilities. The lease already has adequate battery and treating facilities. It will be necessary to install larger pumping units when response to the water injection is evidenced in about 1976. It has been assumed that high pressure injection lines will be required to each of the five wells which will be converted to injection service.

A forecast of production, revenue and costs is given in Table 3.

DISCUSSION

The Waskada pool can best be exploited if converted to waterflood as rapidly as possible. The natural water drive is inadequate to allow recovery of the pool reserves in a reasonable length of time.

Despite the indicated high reservoir gas saturation, which has resulted from the production to date, the waterflood response should be achieved starting in about 20 months from the initiation of injection at 1,000 barrels per day. The production should then peak out rapidly and thereafter the pool will go on decline.

Because of a lack of reservoir data a conservative position has probably been taken in the assumption that five injection wells will be required to inject 1,000 barrels per day of water using a five spot injection pattern. A more suitable pattern than a five spot can likely be developed and the economics of the operation may thereby be enhanced.

It has been calculated, from the five spot pattern formula with a surface pressure limitation of 1,400 psi that peak production will match the injection rate corrected for crude oil shrinkage. The calculation considers that the effective reservoir permeability is 9.42 mds.

To initiate a waterflood, whether or not the pool is to be unitized, we would recommend that the following wells be converted to water injection service initially:

4-30-25-1 W1
12-30-25-1 W1

If necessary well 6-30 could later be added as an injector.

TABLE 1
OMEGA PRIMARY

CRUDE OIL APPRAISAL SUMMARY

EVALUATION BY :- D+S PETROLEUM CONSULTANTS LTD. PROJECT :- 274-0151
 COMPANY EVALUATED :- WASKADA OIL POOL, MANITOBA EFFECTIVE DATE :- JUL 1, 1974

POOL OR TRACT SHAPE

COMPANY SHAPE

YEAR	PROD STB	CRUDE \$/STB	OPER. COSTS	CAPITAL COSTS	NO. WELLS	PRODUCTION GROSS	NET OPERATING	DISCOUNT RATE	PRESENT WORTH	PRESENT WORTH	DISCOUNTED CAP COSTS	SALVAGE ALLOWANCE	CUM DOLLARS	INDISC. DOLLARS	CUM DOLLARS	CUM DOLLARS	CUM DOLLARS
1974	11175	6.10	1275	0	6	11175	10500	0	10500	0	29999	24999	29999	71521	29999	29355	29355
1975	22502	7.15	31185	0	6	22502	26460	0	26460	0	71521	101521	101521	65249	71521	65249	94947
1976	18276	8.20	27744	0	6	18276	27744	0	27744	0	65249	166765	166765	54927	65249	54927	149544
1977	15404	8.65	34381	0	6	15404	30631	0	30631	0	54927	221596	221596	46835	54927	46835	192245
1978	13320	9.10	34101	0	6	13320	32162	0	32162	0	46835	263758	263758	39764	46835	39764	225412
1979	11737	9.55	37506	0	6	11737	33770	0	33770	0	39764	303522	303522	34216	39764	34216	251247
1980	10492	10.00	39401	0	6	10492	35459	0	35459	0	34216	338981	338981	28777	34216	28777	271642
1981	9487	10.45	41791	0	6	9487	37232	0	37232	0	28777	376213	376213	24274	28777	24274	287378
1982	8459	10.90	43980	0	6	8459	38658	0	38658	0	24274	414871	414871	19465	24274	19465	299556
1983	7738	10.90	42081	0	6	7738	39363	0	39363	0	19465	454234	454234	15214	19465	15214	304515
1984	6288	10.90	36988	0	5	6288	39363	0	39363	0	15214	469448	469448	12077	15214	12077	314939
1985	5730	10.90	29697	0	4	5730	39363	0	39363	0	12077	481525	481525	9885	12077	9885	321124
1986	4883	10.90	29697	0	4	4883	39363	0	39363	0	9885	491398	491398	7669	9885	7669	325625
1987	4262	10.90	27043	0	4	4262	39363	0	39363	0	7669	500067	500067	5829	7669	5829	327364
1988	3645	10.90	22605	0	3	3645	39363	0	39363	0	5829	505896	505896	4509	5829	4509	328605
1989	3049	10.90	20507	0	3	3049	39363	0	39363	0	4509	509405	509405	3608	4509	3608	329514
1990	2242	10.90	14868	0	2	2242	39363	0	39363	0	3608	513013	513013	2849	3608	2849	330172
1991	1808	10.90	12933	0	2	1808	39363	0	39363	0	2849	515862	515862	2359	2849	2359	330672
1992	1154	10.90	7092	0	1	1154	39363	0	39363	0	2359	518221	518221	1974	2359	1974	331056
1993	1102	10.90	7092	0	1	1102	39363	0	39363	0	1974	520195	520195	1622	1974	1622	331345
1994	1055	10.90	7092	0	1	1055	39363	0	39363	0	1622	521817	521817	1303	1622	1303	331558
1995	1011	10.90	7092	0	1	1011	39363	0	39363	0	1303	523120	523120	1003	1303	1003	331708
1996	971	10.90	7092	0	1	971	39363	0	39363	0	1003	524123	524123	728	1003	728	331808
1997	934	10.90	7092	0	1	934	39363	0	39363	0	728	524851	524851	538	728	538	331877
1998	900	10.90	7092	0	1	900	39363	0	39363	0	538	525389	525389	36	538	36	331888
1999	219	10.90	1763	0	1	219	39363	0	39363	0	36	525425	525425	0	36	0	331888
SUBTOT	167491		595768	0		167491	504074	0	504074	0	486267	486267	486267	0	486267	486267	331888
DEMATN	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	167491		595768	0	0	167491	504074	0	504074	0	486267	486267	486267	0	486267	486267	331888

TABLE 2
TOTAL POOL P

[illegible]

TABLE 3
TOTAL POOL WATERFLOOD

CRUDE OIL APPRAISAL SUMMARY

EVALUATION BY :- D+S PETROLEUM CONSULTANTS LTD. PROJECT :- 274-0151
COMPANY EVALUATED :- WASKADA ALIDA 3605 POOL EFFECTIVE DATE :- AUG 1-1974

POOL OR TRACT SHARE										COMPANY SHARE									
*****										*****									
YEAR	GROSS OIL DOWN PRICE STH	OIL 5/STH	OVER COSTS	CAPITAL COSTS	NO. WELLS	---PRODUCTION---		---COSTS---		---NET OPER. REVENUE---		---CASH FLOW---		---CUM 2M		---CUM 9 &		---CUM 2M	
						GROSS BARRELS	NET BARRELS	OPERATING DOLLARS	CAPITAL DOLLARS	ANNUAL DOLLARS	CUM DOLLARS	UNDISC. DOLLARS	PA 9 & DOLLARS	CUM DOLLARS	PA 9 & DOLLARS	CUM DOLLARS			
1974	7500	6.10	22700	200000	11	7500	5423	19250	200000	10443	10443	-189357	-189357	-189357	-189357	-189357	-189357	-189357	-189357
1975	18000	7.15	57293	0	11	18000	13014	48510	0	35583	45226	35583	35583	35583	35583	35583	35583	35583	35583
1976	162351	8.23	60054	45000	11	162351	117380	50936	45000	68364	729640	68364	68364	68364	68364	68364	68364	68364	68364
1977	18349	8.45	53047	0	11	18349	132985	53492	0	82458	155398	82458	82458	82458	82458	82458	82458	82458	82458
1978	112991	9.10	65220	0	11	112991	81042	56156	0	595533	2060481	595533	595533	595533	595533	595533	595533	595533	595533
1979	79331	9.55	69531	0	11	79331	57356	54064	0	354963	2419444	354963	354963	354963	354963	354963	354963	354963	354963
1980	41450	10.00	73008	0	11	41450	44429	61912	0	296615	2716059	296615	296615	296615	296615	296615	296615	296615	296615
1981	50166	10.45	76658	0	11	50166	34270	65004	0	250856	2966215	250856	250856	250856	250856	250856	250856	250856	250856
1982	42100	10.90	40491	0	11	42100	30648	62258	0	213077	3179992	213077	213077	213077	213077	213077	213077	213077	213077
1983	35250	10.40	43314	0	11	35250	28514	70653	0	154444	3348240	154444	154444	154444	154444	154444	154444	154444	154444
1984	24112	10.90	43027	0	11	24112	20431	70409	0	128803	3477243	128803	128803	128803	128803	128803	128803	128803	128803
1985	24343	10.90	43035	0	11	24343	17600	70416	0	99585	3576828	99585	99585	99585	99585	99585	99585	99585	99585
1986	21076	10.90	43046	0	11	21076	15238	70425	0	74222	3655049	74222	74222	74222	74222	74222	74222	74222	74222
1987	14543	10.90	43049	0	11	14543	13436	70429	0	60637	3715686	60637	60637	60637	60637	60637	60637	60637	60637
1988	14614	10.90	43047	0	11	14614	12015	70424	0	47931	3763616	47931	47931	47931	47931	47931	47931	47931	47931
1989	15029	10.90	43043	0	11	15029	10866	70422	0	36618	3800234	36618	36618	36618	36618	36618	36618	36618	36618
1990	13719	10.90	43036	0	11	13719	9918	70417	0	28234	3828468	28234	28234	28234	28234	28234	28234	28234	28234
1991	12417	10.90	43029	0	11	12417	9122	70411	0	20324	3848792	20324	20324	20324	20324	20324	20324	20324	20324
1992	11440	10.90	43020	0	11	11440	8444	70404	0	13591	3862343	13591	13591	13591	13591	13591	13591	13591	13591
1993	10472	10.90	43012	0	11	10472	7861	70396	0	7791	3879173	7791	7791	7791	7791	7791	7791	7791	7791
1994	7914	10.90	43091	0	11	7914	5650	53672	0	2524	3872697	2524	2524	2524	2524	2524	2524	2524	2524
SURTOT	933682		1545491	245000		933682	675052	1310956	245000	3872697	3872697	3872697	3872697	3872697	3872697	3872697	3872697	3872697	3872697
REMAIN	0		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	933682		1545491	245000		933682	675052	1310956	245000	3872697	3872697	3872697	3872697	3872697	3872697	3872697	3872697	3872697	3872697

DISCOUNT RATE	PERCENT	PRESENT MONTH		DISCOUNTED		SALVAGE	
		CASH FLOW	NET REVENUE	CAP COSTS	ALLOWANCE		
0.000	0.000	3627697	3627697	245000	0		
9.000	9.000	2310227	2544788	234560	0		
10.000	10.000	2210611	2440133	233522	0		
12.000	12.000	2029939	2261448	231509	0		
15.000	15.000	1737901	2026541	229630	0		
20.000	20.000	1480340	1715556	224216	0		
25.000	25.000	1253090	1474176	220186	0		

TABLE 4

EMPIRICAL FLUID PROPERTIES ANALYSIS

FIELD NAME		RESERVOIR					
WASKADA		TILSTON - SOUTHS VALLEY					
PRESSURE	PS	SG	AT	VIS. GAS	VIS. OIL	DEN. OIL	DEN. GAS
1369	259	1.118	1.118	.0140	2.370	49.3	4.56
1238	233	1.107	1.160	.0137	2.515	49.6	4.07
1106	206	1.097	1.216	.0133	2.678	49.8	3.58
974	180	1.087	1.292	.0130	2.863	50.1	3.11
842	154	1.076	1.397	.0126	3.071	50.4	2.65
710	129	1.067	1.546	.0123	3.306	50.6	2.20
578	104	1.057	1.772	.0120	3.572	50.9	1.77
446	79	1.048	2.141	.0119	3.873	51.2	1.34
314	55	1.039	2.831	.0117	4.212	51.4	.93
182	31	1.031	4.539	.0115	4.596	51.6	.53
50	8	1.022	15.310	.0114	5.027	51.9	.14

LASATER CORRELATION

TANK OIL GRAVITY = 35.0 API
 SPECIFIC GAS GRAVITY = .500
 RESERVOIR TEMPERATURE = 110 F
 BUBBLE POINT PRESSURE = 1360 PSI
 PRESSURE BASE = 14,690 PSIA
 TEMPERATURE BASE = 60 DEG F

TABLE 5
RESERVOIR FACTORS
WASKADA ALIDA BEDS POOL

Porosity, percent	13.7
Water Saturation, percent	35.9
Formation Volume Factor	1.118
Pool Area, acres	852
Average Net Pay, feet	5.5
Rock Volume, acre-feet	4,719
Original Oil-in-Place, stb	2,876,000
Primary Recovery Factor*, percent	25
Secondary Recovery Factor (Waterflood), percent	25
Ultimate Recovery Factor, percent	50

* Cumulative recovery to date approximately 450,000 barrels for 15.7 percent.

TABLE 6

MUSKAT DISSOLVED-GAS DRIVE CALCULATION

GAS CAP SIZE= 0.0000 GAS REINJECTED FRACTION= 0.0000 FRACTION OF OIL REMAINING IN GAS CAP= 0.0000
 PI = 1349.00 PD = 10.00 PMIN = 50.00 ROI = 1.11200 PSI = 259.000

PRESSURE FUNCTION TABLE

P	BO	1/36	PS	MO	USC	USC
					UG	UG
1370.00	1.11800	555.5560	259.000	2.37000		.01400
1239.00	1.10700	500.0000	233.000	2.51500		.01370
1104.00	1.03700	434.7430	206.000	2.67800		.01330
974.00	1.00700	384.5150	180.000	2.86300		.01300
843.00	1.07600	322.5310	154.000	3.07100		.01240
710.00	1.04700	270.2700	129.000	3.30400		.01230
578.00	1.05700	217.3410	104.000	3.57200		.01200
446.00	1.04800	163.9340	79.000	3.87300		.01190
314.00	1.03900	113.6160	55.000	4.21200		.01170
182.00	1.03100	64.2350	31.000	4.59600		.01150
50.00	1.02200	17.5750	8.000	5.02700		.01140

SN	KG/KG
1.00000	0.00000
.95000	.00009
.90000	.00083
.85000	.00349
.80000	.01037
.75000	.02577
.70000	.05760
.65000	.12049
.60000	.24213
.55000	.47619
.50000	.92593

DISSOLVED GAS NOISE PERFORMANCE BY MUSKAT MATERIAL BALANCE

PRESSURE (PSIA)	OIL SATURATION (FRACTION)	OIL RECOVERY (FRACTION)	GAS RECOVERY (FRACTION)	GAS-OIL RATIO (SCF/STB)
1369.00	1.0000000	.0000745	.0006860	259.80
1359.00	.9960041	.0023780	.0031232	257.40
1349.00	.9935443	.0048781	.0055826	256.01
1339.00	.9902795	.0074270	.0080440	254.62
1329.00	.9869488	.0100258	.0105676	253.24
1319.00	.9835709	.0126759	.0130931	251.86
1309.00	.9801440	.0153784	.0156408	250.49
1299.00	.9766491	.0181346	.0182104	249.12
1289.00	.9731428	.0209461	.0208020	247.76
1279.00	.9695444	.0238140	.0234157	246.40
1269.00	.9659331	.0267399	.0260513	245.05
1259.00	.9622471	.0297252	.0287089	243.70
1249.00	.9585051	.0327714	.0313886	242.36
1239.00	.9547057	.0358802	.0340902	241.02
1229.00	.9508490	.0391108	.0372613	239.62
1219.00	.9469457	.0423996	.0405410	242.32
1209.00	.9430152	.0457204	.0439065	246.16
1199.00	.9390590	.0490718	.0473603	249.09
1189.00	.9350773	.0524536	.0509039	253.81
1179.00	.9310704	.0558557	.0545384	257.61
1169.00	.9270385	.0593078	.0582450	261.40

PRESSURE (PSIA)	OIL SATURATION (FRACTION)	OIL RECOVERY (FRACTION)	GAS RECOVERY (FRACTION)	GAS-OIL RATIO (SCF/STB)
1159.00	.9220817	.0627798	.0520849	265.17
1149.00	.9199004	.0662917	.0659992	268.91
1139.00	.9147946	.0698132	.0700091	272.62
1129.00	.9106644	.0733744	.0741155	276.31
1119.00	.9065101	.0769651	.0783197	279.96
1109.00	.9023317	.0805954	.0826224	283.57
1099.00	.8981399	.0842242	.0864977	287.15
1089.00	.8940194	.0877953	.0903091	312.87
1079.00	.8899748	.0912019	.0942863	331.08
1069.00	.8860055	.0947204	.0984204	348.81
1059.00	.8821001	.0980864	.1027035	366.07
1049.00	.8782554	.1013348	.1071297	382.90
1039.00	.8744671	.1046501	.1116898	399.30
1029.00	.8707311	.1078564	.1163811	415.29
1019.00	.8670439	.1110171	.1211075	430.88
1009.00	.8634021	.1141355	.1261344	446.10
999.00	.8598029	.1172147	.1311876	460.94
989.00	.8562432	.1202574	.1363532	475.43
979.00	.8527208	.1232661	.1416276	489.56
969.00	.8492365	.1262093	.1472921	509.17
959.00	.84579450	.1290309	.1533869	548.12

DEPRESSURE (PSIA)	OIL SATURATION (FRACTION)	OIL RECOVERY (FRACTION)	GAS RECOVERY (FRACTION)	GAS-OIL RATIO (SCF/STR)
949.00	.8425630	.1317440	.1596894	585.23
939.00	.8393765	.1343628	.1661724	620.63
929.00	.8362739	.1368989	.1728221	654.45
919.00	.8332460	.1393619	.1796268	686.81
909.00	.8302846	.1417599	.1865767	717.80
899.00	.8273430	.1440993	.1936633	747.50
889.00	.8245353	.1463874	.2008793	775.97
879.00	.8217764	.1486280	.2082185	803.26
869.00	.8189819	.1508261	.2156751	829.42
859.00	.8162677	.1529857	.2232443	854.49
849.00	.8135903	.1551105	.2309215	878.51
839.00	.8109472	.1572385	.2384703	902.17
829.00	.8083437	.1594114	.2455710	926.42
819.00	.8057800	.1615457	.2527605	949.75
809.00	.8032533	.1636440	.2600356	972.17
799.00	.8007613	.1657090	.2673932	993.70
789.00	.7983148	.1677291	.2748403	1017.79
779.00	.7959454	.1696714	.2823979	1049.70
769.00	.7936464	.1715427	.2900589	1138.90
759.00	.7914098	.1733511	.2978157	1185.59
749.00	.7892291	.1751034	.3056620	1229.92

PRESSURE (PSIA)	OIL SATURATION (FRACTION)	OIL RECOVERY (FRACTION)	GAS RECOVERY (FRACTION)	GAS-OIL RATIO (SCF/STB)
739.00	.7870988	.1768053	.3135924	1272.04
729.00	.7850140	.1784617	.3214020	1312.05
719.00	.7829706	.1800768	.3294869	1350.05
709.00	.7809450	.1816487	.3374446	1386.23
699.00	.7789901	.1831381	.3460798	1421.42
689.00	.7770497	.1846029	.3543785	1455.39
679.00	.7751144	.1860455	.3627783	1487.58
669.00	.7732092	.1874680	.3711573	1518.22
659.00	.7713230	.1888725	.3796337	1547.33
649.00	.7694542	.1902608	.3881658	1574.93
639.00	.7676011	.1916344	.3967522	1601.04
629.00	.7657623	.1929950	.4053914	1625.67
619.00	.7639363	.1943440	.4140823	1648.85
609.00	.7621218	.1956828	.4228238	1670.56
599.00	.7603176	.1970126	.4316146	1690.83
589.00	.7585225	.1983348	.4404540	1709.65
579.00	.7567354	.1996504	.4493410	1727.02
569.00	.7549567	.2010105	.4583376	1742.32
559.00	.7531878	.2023678	.4673888	1756.01
549.00	.7514274	.2037177	.4764869	1768.15
539.00	.7496755	.2050605	.4856314	1785.68

PRESSURE (PSIA)	OIL SATURATION (FRACTION)	OIL RECOVERY (FRACTION)	GAS RECOVERY (FRACTION)	GAS-OIL RATIO (SCF/STB)
529.00	.7470455	.2063317	.4948284	1830.77
519.00	.7462430	.2076756	.5040796	1872.29
509.00	.7445647	.2089452	.5133828	1910.34
499.00	.7429080	.2101936	.5227361	1945.03
489.00	.7412706	.2114231	.5321377	1976.44
479.00	.7396501	.2126362	.5415862	2006.62
469.00	.7380446	.2138349	.5510802	2029.65
459.00	.7364522	.2150212	.5606184	2051.56
449.00	.7348711	.2161969	.5701998	2070.40
439.00	.7333008	.2173624	.5798707	2090.50
429.00	.7317423	.2185174	.5886307	2109.50
419.00	.7301944	.2196623	.5978299	2125.58
409.00	.7286556	.2207990	.6070676	2138.74
399.00	.7271244	.2219290	.6163430	2149.00
389.00	.7255995	.2230537	.6256553	2156.36
379.00	.7240794	.2241747	.6350040	2160.82
369.00	.7225629	.2252933	.6443883	2162.37
359.00	.7210486	.2264111	.6538079	2161.01
349.00	.7195352	.2275294	.6632622	2156.73
339.00	.7180211	.2286498	.6727508	2149.51
329.00	.7165051	.2297738	.6822732	2139.35

MUSKAT CALCULATIONS, Page 8

PRESSURE (PSIA)	OIL SATURATION (FRACTION)	OIL RECOVERY (FRACTION)	GAS RECOVERY (FRACTION)	GAS-OIL RATIO (SCF/STB)
319.00	.714957	.2309029	.6918291	2126.21
309.00	.713413	.2320669	.7013492	2112.38
299.00	.7119302	.2332676	.7108313	2097.87
289.00	.7103907	.2344787	.7203437	2080.38
279.00	.7088411	.2357020	.7298860	2059.86
269.00	.7072797	.2369396	.7394580	2036.27
259.00	.7057044	.2381936	.7490597	2009.57
249.00	.7041131	.2394664	.7586909	1979.73
239.00	.7025034	.2407604	.7683515	1946.67
229.00	.7008729	.2420786	.7780415	1910.37
219.00	.6992202	.2434223	.7877611	1885.99
209.00	.6975587	.2447771	.7975131	1873.25
199.00	.6958866	.2461450	.8072976	1856.26
189.00	.6941996	.2475307	.8171139	1828.99
179.00	.6924928	.2489228	.8269535	1798.38
169.00	.6907609	.2503053	.836717	1763.82
159.00	.6890084	.2517230	.8459211	1722.97
149.00	.6871988	.2531828	.8555016	1675.72
139.00	.6853547	.2546929	.8651133	1621.93
129.00	.6834574	.2562628	.8747563	1561.44
119.00	.6814964	.2579044	.8844308	1498.07

MUSKAT CALCULATIONS, Page 9

PRESSURE (PSIA)	OIL SATURATION (FRACTION)	OIL RECOVERY (FRACTION)	GAS RECOVERY (FRACTION)	GAS-OIL RATIO (SCF/STB)
109.00	.6794583	.2596320	.8941371	1419.60
99.00	.6773267	.2614639	.9038758	1337.78
89.00	.6750799	.2634240	.9136475	1248.31
79.00	.6726882	.2655441	.9234531	1150.33
69.00	.6701132	.2678688	.9332937	1044.98
59.00	.6672940	.2704628	.9431709	929.91

TABLE 7

ECONOMIC FACTORS

PRIMARY DEPLETION

Crude Price (after trucking charge)*, \$/bbl.	6.10
Well Operating Cost, \$/month	350
Operating Cost Escalation to 1982, %/year	5

* Crude price schedule is given in Tables 8 through 13.

TABLE 8

CRUDE OIL APPRAISAL - WASKADA - ALIDA REFS

EVALUATION BY :- O-S PETROLEUM CONSULTANTS LTD.
 COMPANY EVALUATED :- WASKADA OIL POOL - MANITOBA
 WELL AND LOCATION :- 3-30-1-25 W1
 APPRAISAL FOR :- OMEGA HYDROCARBONS LTD.
 CO PARTICIPATION :- WORKING INTEREST 100.000%

ROYALTY BEFORE PAYOUT:- MAN. COST + 12.5%

POOL OR TRACT SHARE

COMPANY SHARE

YEAR	GRSSE OIL STB	PROD. COSTS \$/STB	CAPITAL COSTS DOLLARS	NO. WELLS	PRODUCTION GROSS	NET BARRELS	OPERATING CAPITAL DOLLARS	ANNUAL DOLLARS	REVENUE CUM	UNDISC. DOLLARS	CASH FLOW DOLLARS	CUM DOLLARS
1974	1103	6.10	2000	0	1	1103	227	1750	0	2453	2453	2596
1975	2324	7.15	5040	0	1	2324	1743	4410	0	6577	4577	4032
1976	1078	8.20	5202	0	1	1078	1483	4630	0	6197	6197	5214
1977	1721	8.45	5557	0	1	1721	1291	4862	0	5077	5077	5919
1978	1524	9.10	5234	0	1	1524	1143	5105	0	4242	4242	7004
1979	1367	9.55	6124	0	1	1367	1025	5360	0	3439	3439	2234
1980	1239	10.00	6432	0	1	1239	929	5628	0	2807	2807	22909
1981	1133	10.45	6754	0	1	1133	850	5919	0	2153	2153	1673
1982	1044	10.90	7092	0	1	1044	783	6205	0	1543	1543	1177
1983	668	10.90	7692	0	1	943	726	6205	0	978	35666	774
1984	667	10.90	5191	0	1	647	500	4542	0	453	36110	450
CUMTOT	15068		42410	0		15068	11301	54609	0	36110	36110	27265
DEFACIT	0		0	0	0	0	0	0	0	0	0	0
TOTAL	15068		42410	0		15068	11301	54609	0	36110	36110	27265

DISCOUNT RATE PERCENT	PRESENT WORTH CASH FLOW	PRESENT WORTH NET REVENUE	DISCOUNTED CAP COSTS	SALVAGE ALLOWANCE
0.000	36110	36110	0	-0
9.000	27265	27265	0	0
10.000	26527	26527	0	0
12.000	25159	25159	0	0
15.000	23345	23345	0	0
20.000	20833	20833	0	0
25.000	18911	18911	0	0

CALCULATED COMPANY NET PARTICIPATION 67.160 PERCENT

TABLE 9

CRUDE OIL APPRAISAL - WASKADA - ALIDA REDS

EVALUATION BY :- O+S PETROLEUM CONSULTANTS LTD.
 COMPANY EVALUATED :- WASKADA OIL POOL, MANITOBA
 WELL AND LOCATION :- 4-30-1-25 W1
 APPRAISAL FOR :- OMEGA HYDROCARBONS LTD.
 CO PARTICIPATION :- WORKING INTEREST 100.000%
 ROYALTY BEFORE PAYOUT:- MAN. CROWN + 12.5%
 PROJECT :- 274-0151
 EFFECTIVE DATE :- JUL 1-1974
 TRACT FACTOR :- 100.000 PCT
 POOL RESERVES :- 52592 STB
 PROD TO DATE :- 37545 STB
 GROSS CAP COSTS:- 0 DOLLARS

POOL OR TRACT SHAPE

COMPANY SHAPE

YEAR	GROSS OIL PROD. PRICE CST	WELLS	CAPITAL COSTS	NO.	PRODUCTION WELLS	NET OPER. ANNUAL	REVENUE CUM	DISC. CUM	CASH FLOW CUM				
	DOLLARS		DOLLARS		DOLLARS	DOLLARS	DOLLARS	DOLLARS	DOLLARS				
1974	1363	4.10	2000	0	1	1343	1022	1750	0	3583	3583	3506	3506
1975	2718	7.15	5040	0	1	2718	2038	4410	0	8309	11891	7620	11126
1976	2183	8.20	5202	0	1	2183	1437	4630	0	7200	19092	4059	17184
1977	1824	8.65	5557	0	1	1824	1348	4852	0	5670	24742	4377	21561
1978	1666	9.10	5934	0	1	1666	1176	5105	0	4505	29267	4505	24751
1979	1373	9.55	6126	0	1	1373	1030	5360	0	3479	32745	2260	27011
1980	1222	10.00	6432	0	1	1222	916	5628	0	2689	35435	1603	28614
1981	1101	10.45	6754	0	1	1101	824	5910	0	1921	37354	1051	29665
1982	1002	10.90	7092	0	1	1002	751	6205	0	1227	38943	616	30280
1983	693	10.90	5203	0	1	693	520	4631	0	513	39096	236	30517
SUBTOTAL	15044		56420	0		15044	11283	48493	0	39096		30517	
DEPRATN	0		0	0		0	0	0	0	0		0	
TOTAL	15044		56420	0		15044	11283	48493	0	39096		30517	

DISCOUNT RATE PERCENT	PRESENT WORTH CASH FLOW	PRESENT WORTH NET REVENUE	DISCOUNTED CAP COSTS	SALVAGE ALLOWANCE
0.000	39096	39096	0	-0
9.000	30517	30517	0	0
10.000	29782	29782	0	0
12.000	28414	28414	0	0
15.000	26580	26580	0	0
20.000	24004	24004	0	0
25.000	21896	21896	0	0

CALCULATED COMPANY NET PARTICIPATION 66.671 PERCENT

TABLE 10

CRUDE OIL APPRAISAL - WASKADA - ALIDA REDS

EVALUATION BY :- OAS PETROLEUM CONSULTANTS LTD.
 COMPANY EVALUATED :- WASKADA OIL POOL - MANITOBA
 WELL AND LOCATION :- 5-10-1-25 W1
 APPRAISAL FOR :- OMEGA HYDROCARBONS LTD.
 CO PARTICIPATION :- WORKING INTEREST 100.000%

PROJECT :- 274-0151
 EFFECTIVE DATE :- JUL 1-1974
 TRACT FACTOR :- 100.000 PCT
 POOL RESERVES :- 134960 STR
 PROD TO DATE :- 82723 STR
 GROSS CAP COSTS :- 0 DOLLARS

ROYALTY BEFORE PAYOUT:- MAN. CROWN + 12.58

POOL OF TRACT SHAPE

COMPANY SHAPE

YEAR	GROSS OIL PROD PRICE STR 4/5TH DOLLARS	OPRS. COSTS DOLLARS	CAPITAL COSTS DOLLARS	NO. WELLS	---PRODUCTION---	NET GROSS BARRELS	OPERATING CAPITAL DOLLARS	---COSTS---	ANNUAL DOLLARS	REVENUE CUM DOLLARS	UNITISC. DOLLARS	PA 3 & DOLLARS	CUM PW DOLLARS
1974	2475	5.10	2000	0	1	2475	2156	1750	0	8347	8347	8157	8157
1975	5775	7.15	5040	0	1	5775	4331	4410	0	20174	20174	19504	26671
1976	4472	8.20	5292	0	1	4472	3504	4630	0	14933	47654	15939	42601
1977	3923	8.65	5557	0	1	3923	2842	4362	0	16457	53114	12704	55375
1978	3332	9.10	5834	0	1	3332	2534	5105	0	14631	72545	10352	65646
1979	2972	9.55	6126	0	1	2972	2229	5360	0	13027	91572	13927	74110
1980	2450	10.00	6432	0	1	2450	1938	5628	0	11718	103290	6985	81115
1981	2322	10.45	6754	0	1	2322	1784	5910	0	10449	113740	5714	86829
1982	2179	10.90	7032	0	1	2179	1634	6205	0	9498	123237	4755	91594
1983	2001	10.90	7092	0	1	2001	1501	6205	0	8360	131597	3848	95442
1984	1851	10.90	7092	0	1	1851	1384	6205	0	7261	138852	3065	98508
1985	1721	10.90	7092	0	1	1721	1261	6205	0	6317	145175	2447	100955
1986	1604	10.90	7092	0	1	1604	1204	6205	0	5611	150786	1994	102949
1987	1509	10.90	7092	0	1	1509	1132	6205	0	4884	155670	1593	104541
1988	1422	10.90	7092	0	1	1422	1064	6205	0	4242	159912	1269	105810
1989	1344	10.90	7092	0	1	1344	1008	6205	0	3670	163581	1007	106817
1990	1274	10.90	7092	0	1	1274	955	6205	0	3248	166829	818	107635
1991	1211	10.90	7092	0	1	1211	908	6205	0	2781	169610	642	108278
1992	1154	10.90	7092	0	1	1154	866	6205	0	2359	171969	500	108777
1993	1102	10.90	7092	0	1	1102	827	6205	0	1974	173943	394	109151
1994	1055	10.90	7092	0	1	1055	791	6205	0	1622	175566	289	109451
1995	1011	10.90	7092	0	1	1011	753	6205	0	1300	176866	213	109663
1996	971	10.90	7092	0	1	971	720	6205	0	1003	177969	151	109814
1997	934	10.90	7092	0	1	934	701	6205	0	728	178597	100	109914
1998	900	10.90	7092	0	1	900	675	6205	0	538	179135	58	109982
1999	219	10.90	1763	0	1	219	164	1543	0	96	179231	96	109993
SUMTOT	52107	145359	0	0	52107	39040	144499	0	179231	179231	179231	109993	0
REMAIN	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	52107	145359	0	0	52107	39040	144499	0	179231	179231	179231	109993	0

DISCOUNT PERCENT	PRESENT WORTH CASH FLOW	PRESENT WORTH NET REVENUE	DISCOUNTED CAP COSTS	SALVAGE ALLOWANCE
0.000	179231	179231	0	-0
9.000	109993	109993	0	0
10.000	105400	105400	0	0
12.000	97285	97285	0	0
15.000	87258	87258	0	0
20.000	74605	74605	0	0
25.000	65325	65325	0	0

CALCULATED COMPANY NET PARTICIPATION 64.587 PERCENT

TABLE 11

CONE OIL APPRAISAL - WASKADA ALIQA 8505

EVALUATION BY :- O+S PETROLEUM CONSULTANTS LTD.
 COMPANY EVALUATED :- WASKADA OIL POOL - MANITOBA
 WELL AND LOCATION :- 6-30-1-25 W1
 APPRAISAL FOR :- OMEGA HYDROCARBONS LTD.
 CO PARTICIPATION :- WORKING INTEREST 100.0008
 ROYALTY BEFORE PAYOUT:- MAX. CROWN + 12.5%

POOL OR TRACT SHARE

COMPANY SHARE

YEAR	GROSS OIL PRODN PRICE STR \$/STB DOLLARS	OPER. COSTS DOLLARS	CAPITAL COSTS DOLLARS	NO. WELLS	-----PRODUCTION----- GROSS NET BARRELS BARRELS	-----COSTS----- OPERATING CAPITAL DOLLARS DOLLARS	-----NFT OPER. REVENUE----- ANNUAL CUM DOLLARS DOLLARS	-----CASH FLOW----- DISC. P4 9 % DOLLARS DOLLARS	CUM PW DOLLARS				
1974	2085	6.10	2000	0	1	2025	1564	1750	0	5000	5900	5900	5861
1975	4007	7.15	5040	0	1	4037	3005	4410	0	13588	19578	13588	18323
1976	3104	8.20	5292	0	1	3104	2328	4630	0	11697	31275	11697	28165
1977	2535	8.65	5557	0	1	2535	1901	4252	0	9439	40764	9439	35489
1978	2142	9.10	5934	0	1	2142	1607	5105	0	7781	48345	7781	40939
1979	1855	9.55	6126	0	1	1855	1391	5360	0	6467	55012	6467	45201
1980	1636	10.00	6432	0	1	1636	1227	5628	0	5400	60411	5400	48420
1981	1463	10.45	6754	0	1	1463	1097	5910	0	4397	64809	4397	50824
1982	1323	10.90	7092	0	1	1323	902	6205	0	3514	68327	3514	52599
1983	1208	10.90	7092	0	1	1208	904	6205	0	2757	71094	2757	53858
1984	1111	10.90	7092	0	1	1111	834	6205	0	2038	73122	2038	54719
1985	1028	10.90	7092	0	1	1028	771	6205	0	1425	74548	1425	55271
1986	957	10.90	7092	0	1	957	713	6205	0	900	75647	900	55591
1987	567	10.90	4438	0	1	567	425	3993	0	367	75814	367	55710
CURTAT	25022		42022	0		25022	18767	72566	0	75814		75814	55710
REMAIN	0		0	0		0	0	0	0	0		0	0
TOTAL	25022		42022	0		25022	18767	72566	0	75814		75814	55710

DISCOUNT RATE PERCENT	PRESENT WORTH CASH FLOW	PRESENT WORTH NET REVENUE	DISCOUNTED CAP COSTS	SALVAGE ALLOWANCE
0.000	75914	75914	0	-0
9.000	55710	55710	0	0
10.000	54101	54101	0	0
12.000	51146	51146	0	0
15.000	47281	47281	0	0
20.000	42027	42027	0	0
25.000	37875	37875	0	0

DISCOUNT RATE PERCENT	PRESENT WORTH CASH FLOW	PRESENT WORTH NET REVENUE	DISCOUNTED CAP COSTS	SALVAGE ALLOWANCE
0.000	75814	75814	0	-0
9.000	55710	55710	0	0
10.000	54101	54101	0	0
12.000	51146	51146	0	0
15.000	47281	47281	0	0
20.000	42027	42027	0	0
25.000	37875	37875	0	0

CALCULATED COMPANY NET PARTICIPATION 65.511 PERCENT

CRUDE OIL APPRAISAL - WASKADA - ALIDA REFS

[illegible]

TABLE 14
ECONOMIC FACTORS
WATERFLOOD

Crude Price (after trucking charge)*, \$/bbl.	6.10
Pool Operating Cost, \$/month	3,850
Water Handling Cost, cents/bbl.	2
Operating Cost Escalation to 1982, %/year	5

* Crude price schedule is given in Table 3.

TABLE 15
CAPITAL REQUIREMENTS
WASKADA ALIDA BEDS POOL
WATERFLOOD

Water Supply Well & High Volume Pump	\$65,000
Water Treating and Injection Plant	\$75,000
Injection Well Conversion	\$40,000
High Pressure Injection Lines	<u>\$20,000</u>
Sub-total	\$200,000
Larger Pumping Units Following Response	<u>\$45,000</u>
TOTAL	\$245,000

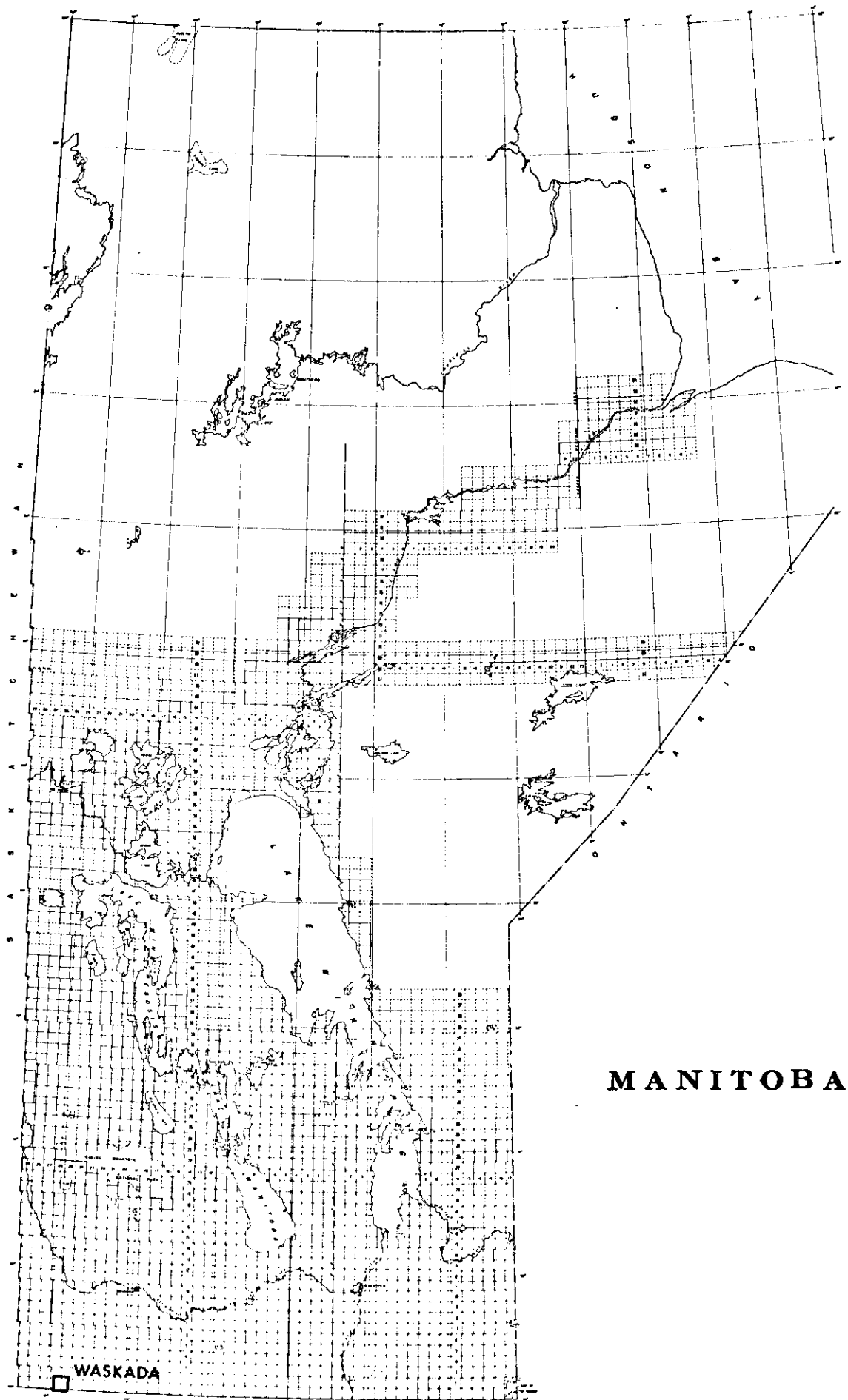


FIGURE 1

WASKADA

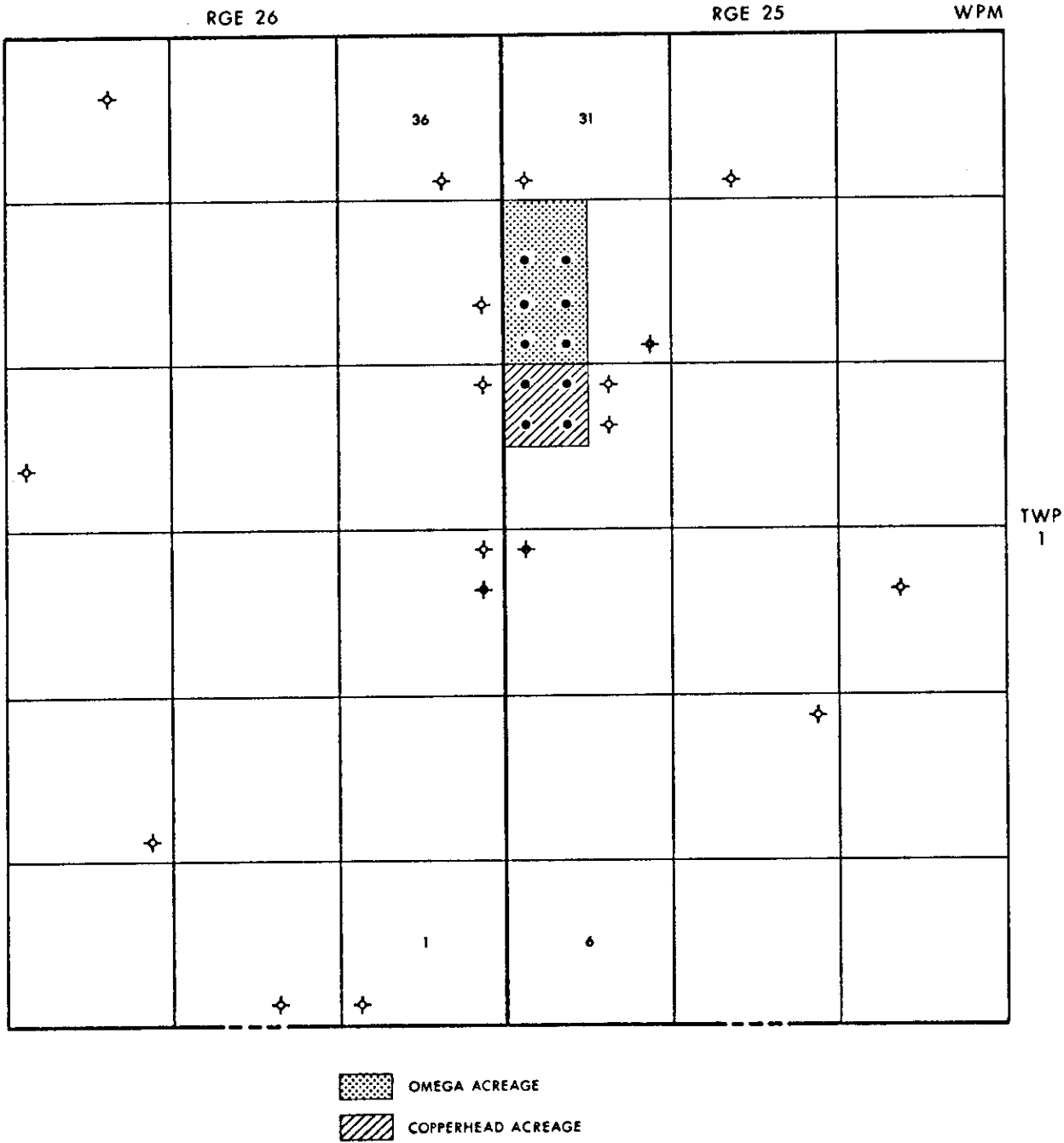


FIGURE 2

11-19-1-25 WPM
PRODUCTION HISTORY
WASKADA

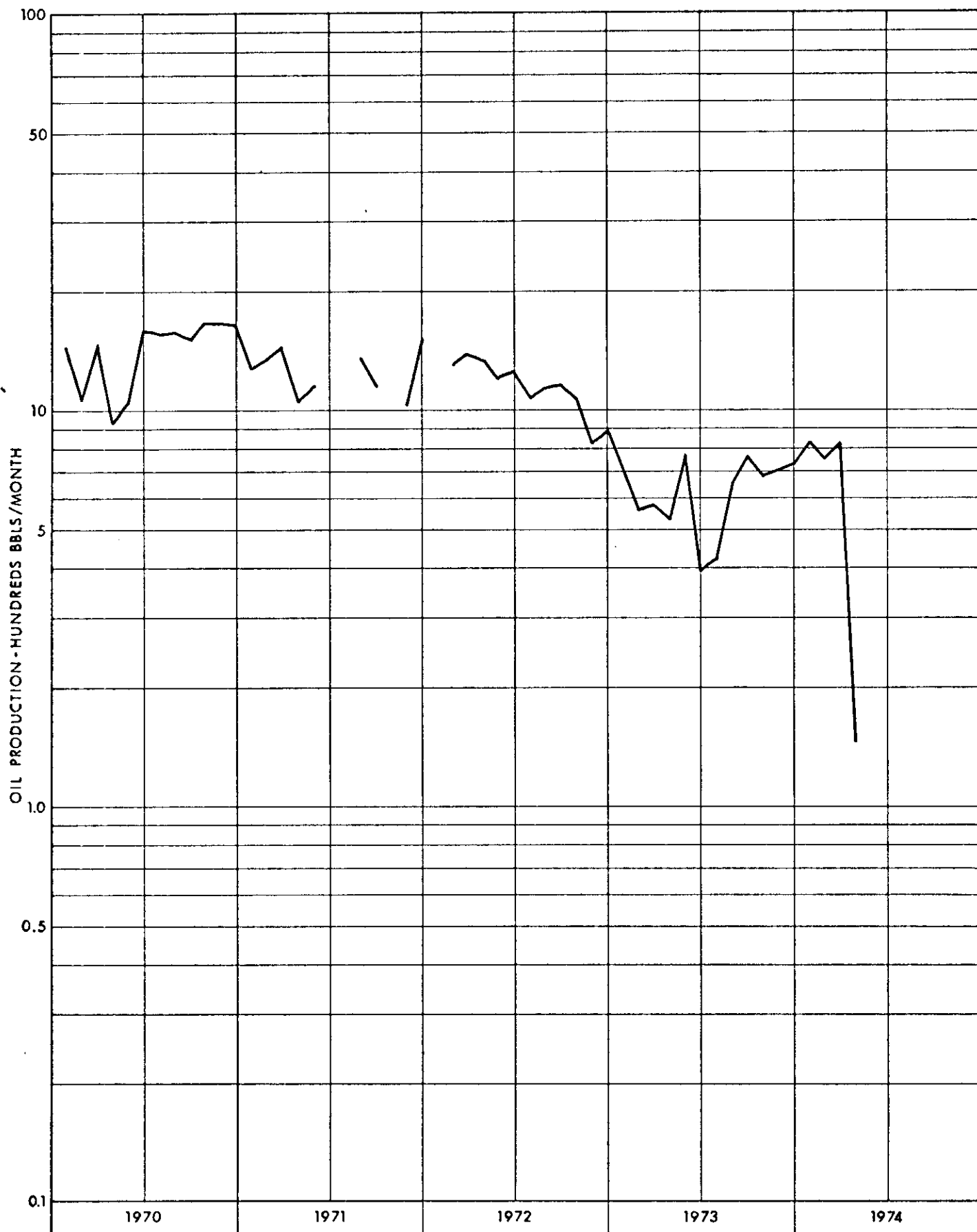


FIGURE 3

12-19-1-25 WPM
PRODUCTION HISTORY
WASKADA

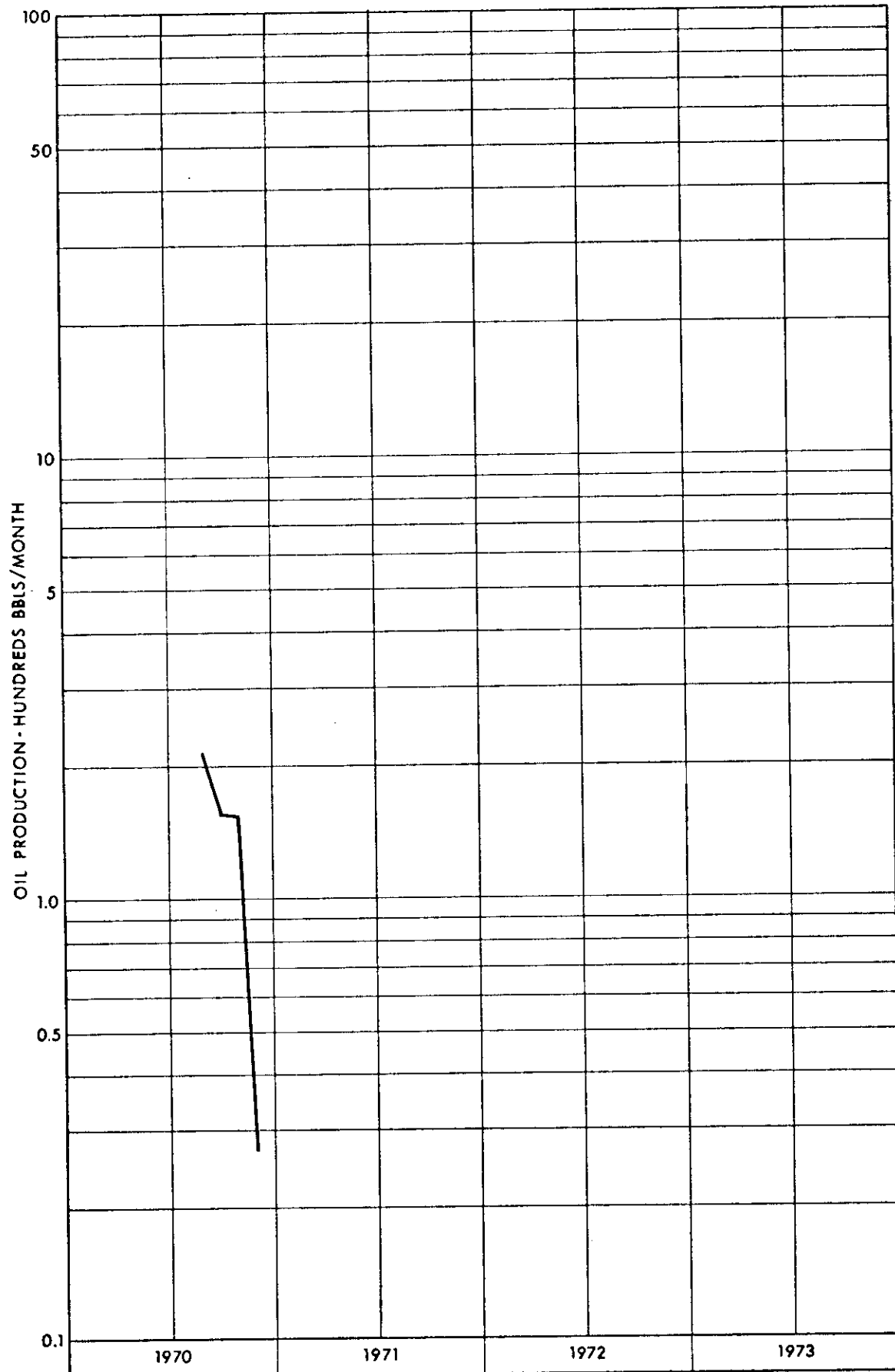


FIGURE 4

13-19-1-25 WPM
PRODUCTION HISTORY
WASKADA

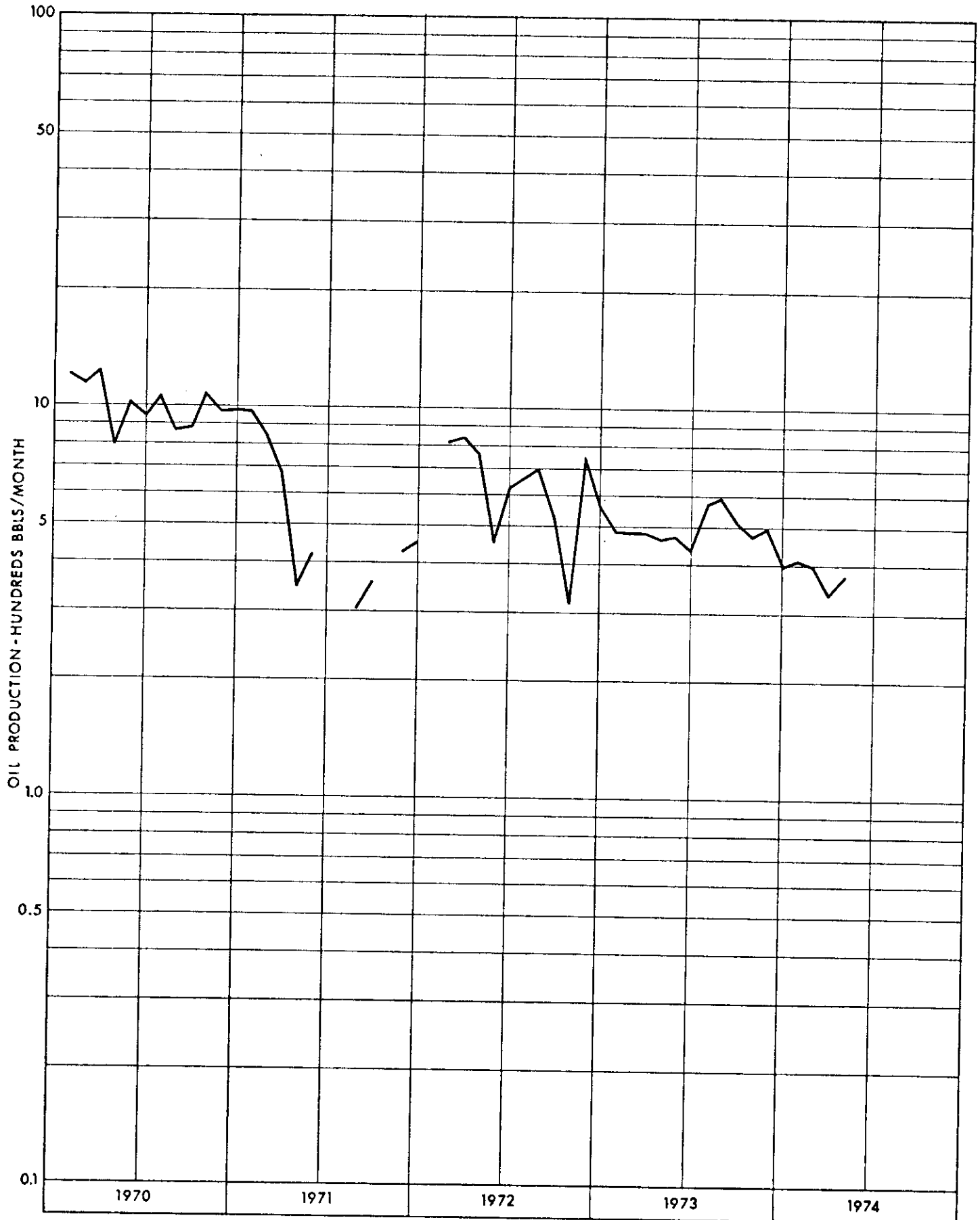


FIGURE 5

14-19-1-25 WPM
PRODUCTION HISTORY
WASKADA

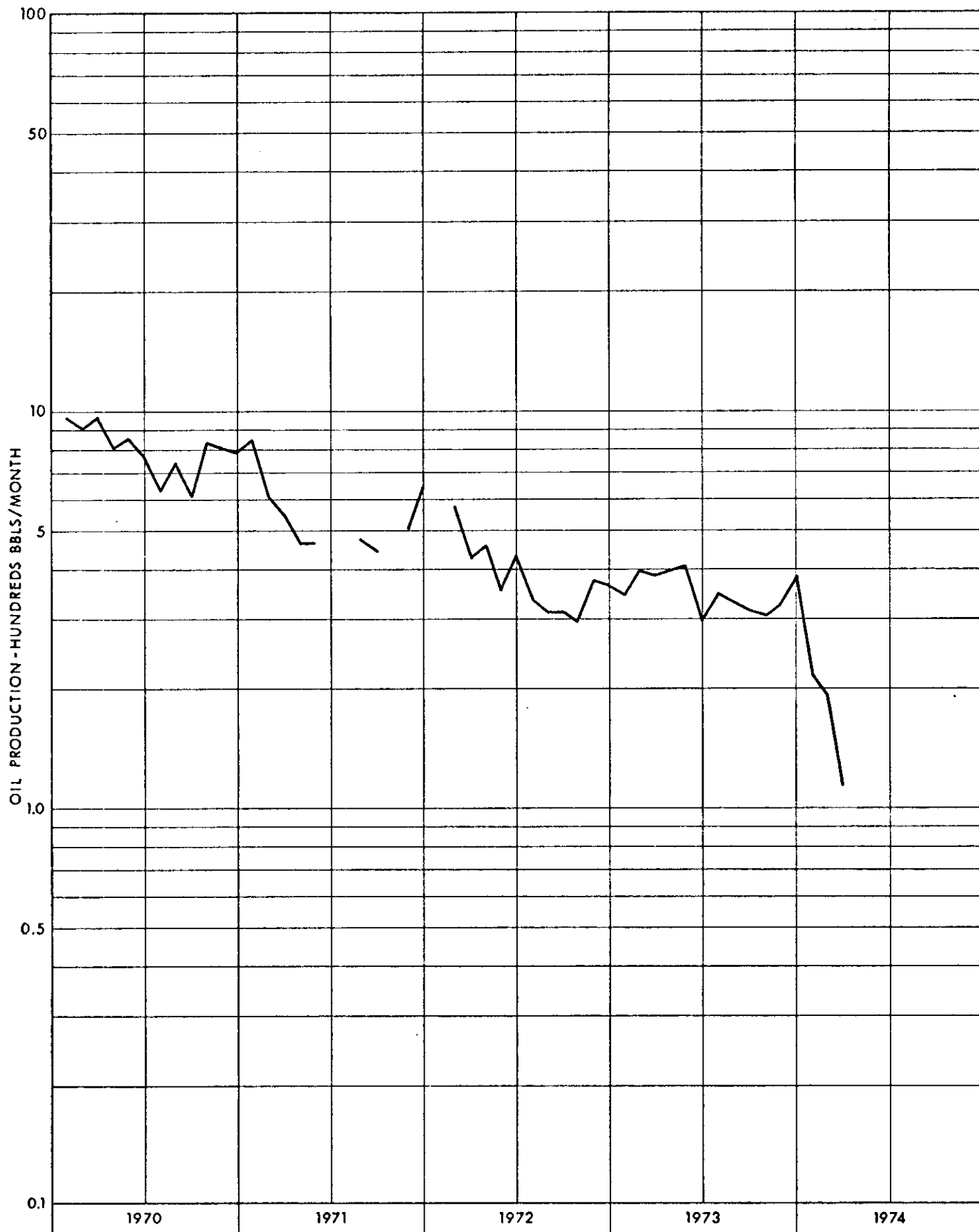


FIGURE 6

3-30-1-25 WPM
PRODUCTION HISTORY
WASKADA

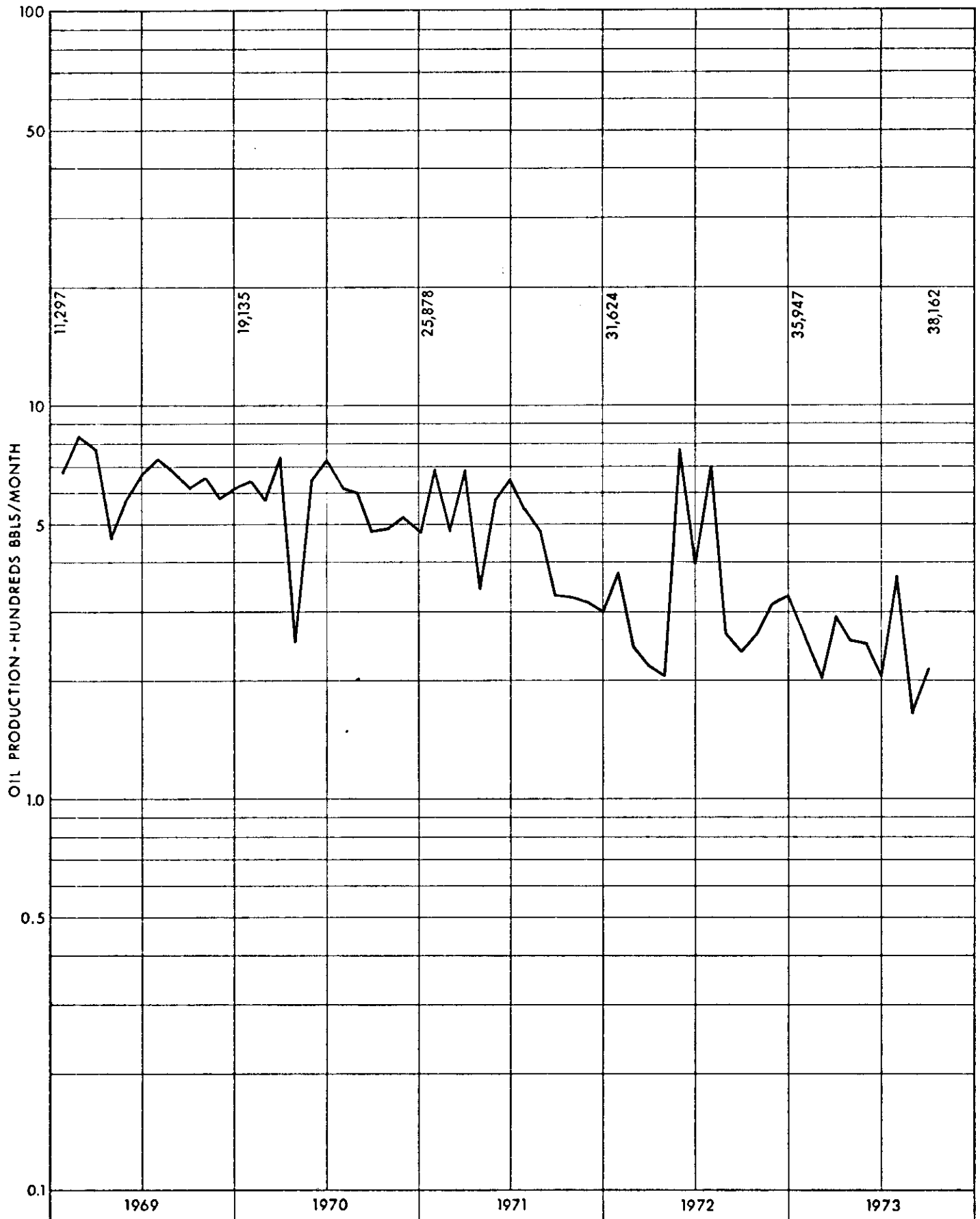


FIGURE 7

4-30-1-25 WPM
PRODUCTION HISTORY
WASKADA

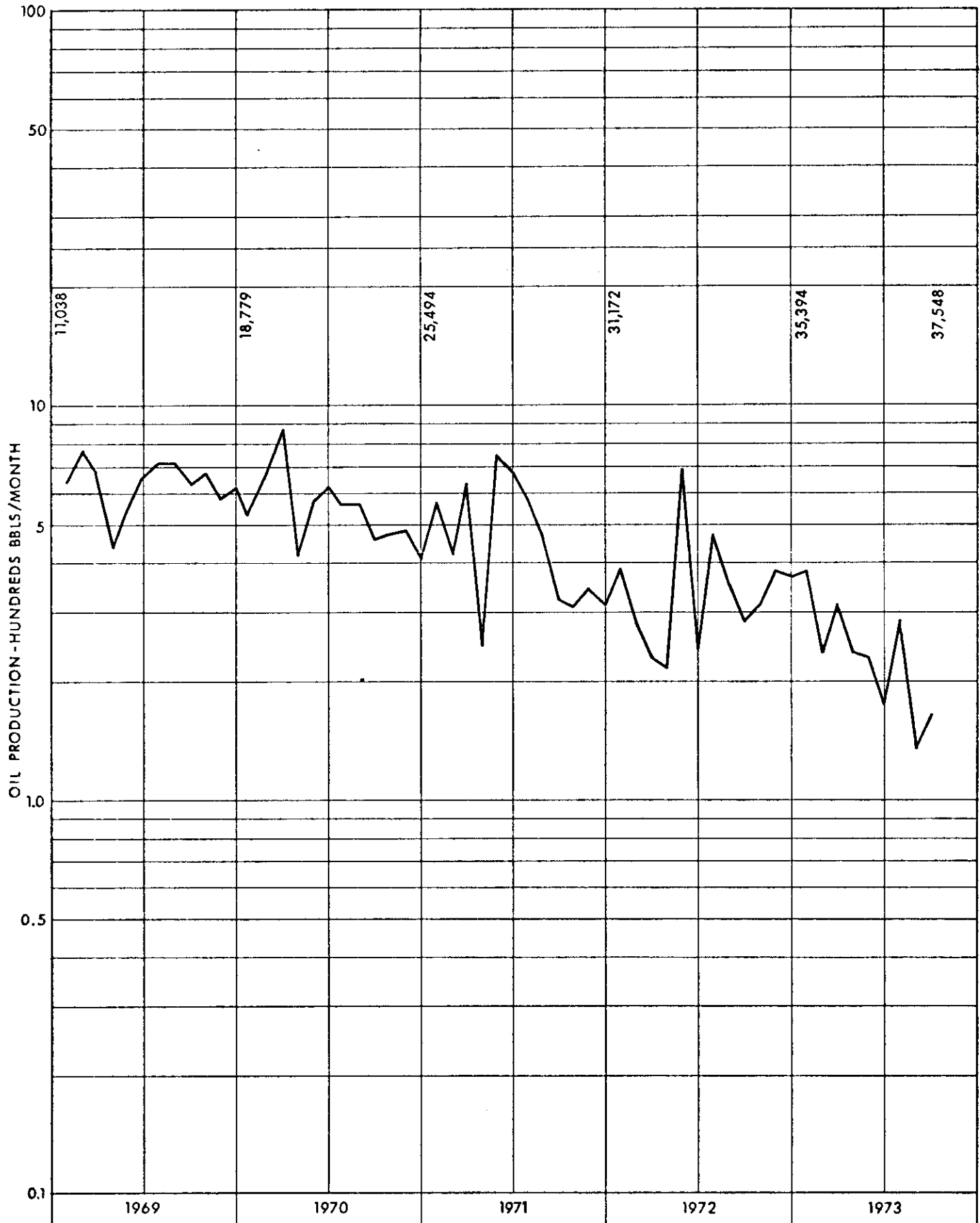


FIGURE 8

5-30-1-25 WPM
PRODUCTION HISTORY
WASKADA

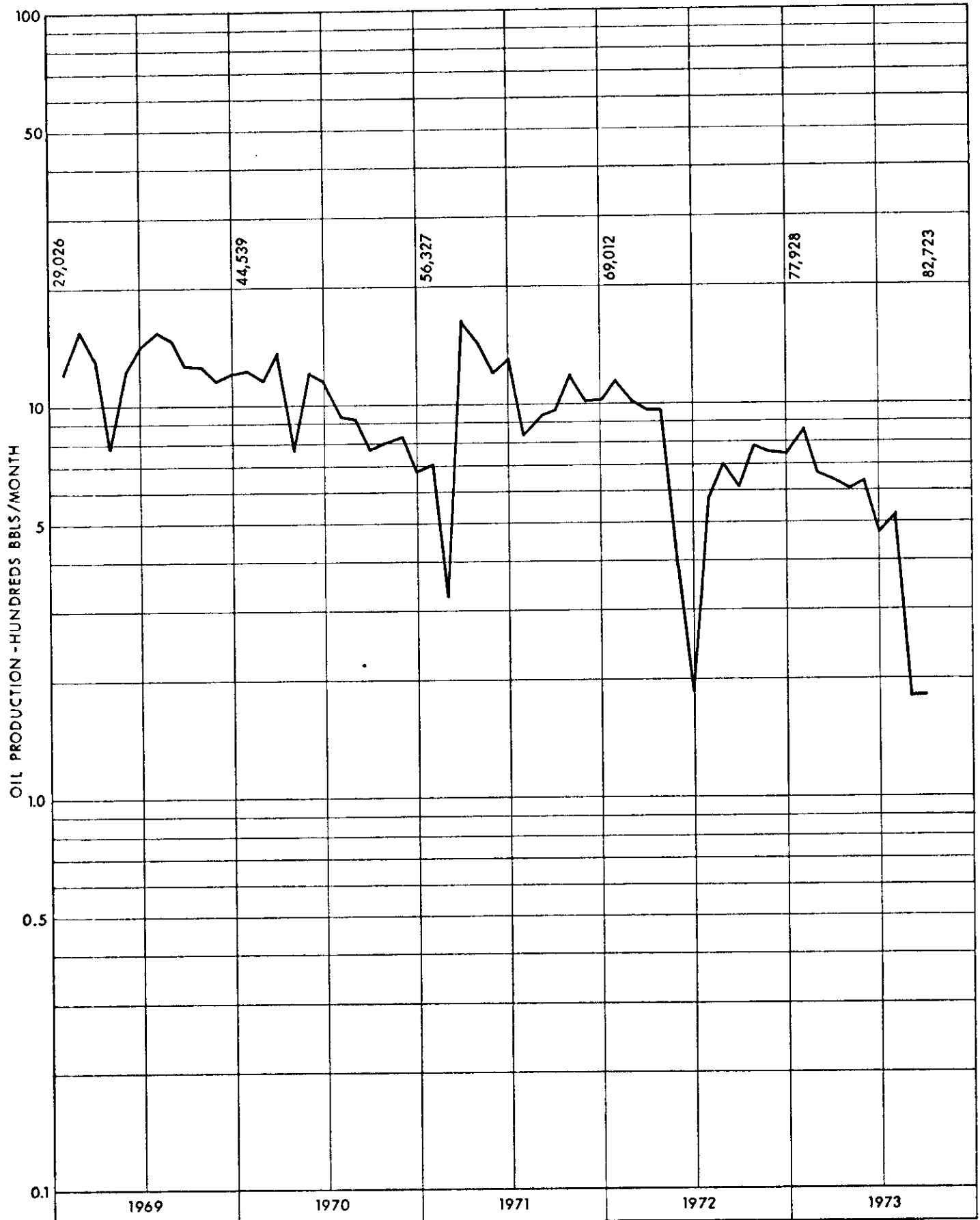


FIGURE 9

6-30-1-25 WPM
 PRODUCTION HISTORY
 WASKADA

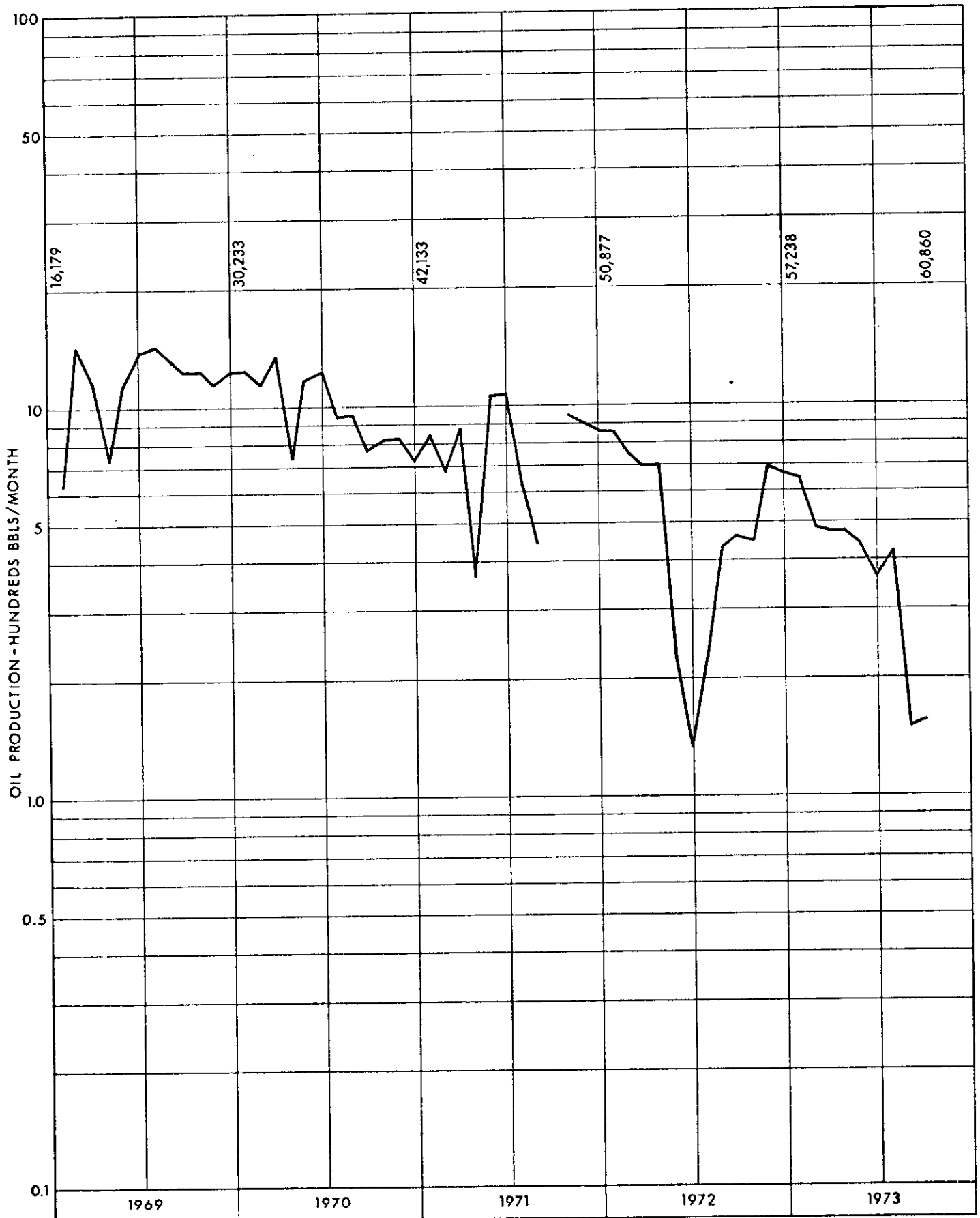


FIGURE 10

11-30-1-25 WPM
 PRODUCTION HISTORY
 WASKADA

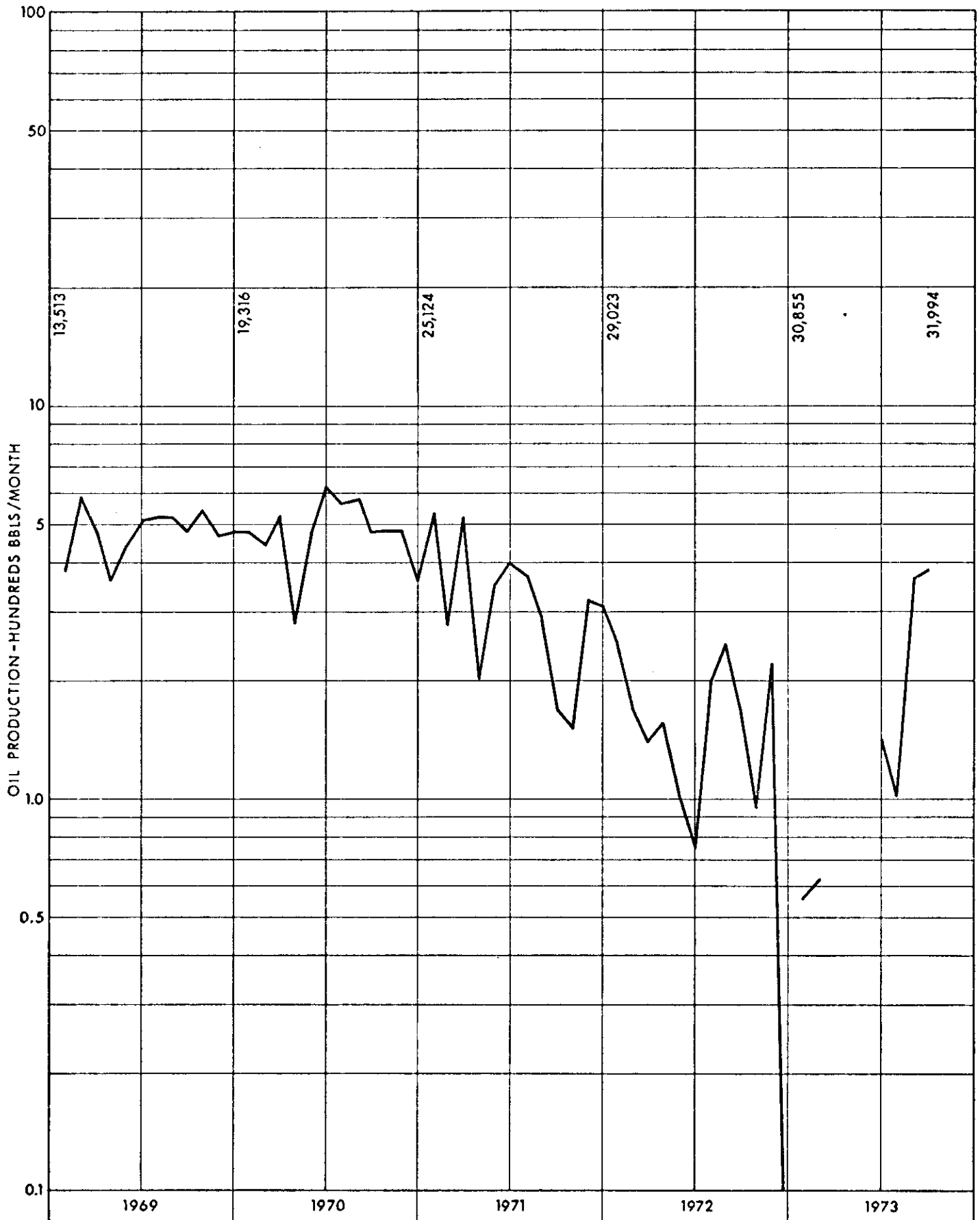


FIGURE 11

12-30-1-25 WPM
PRODUCTION HISTORY
WASKADA

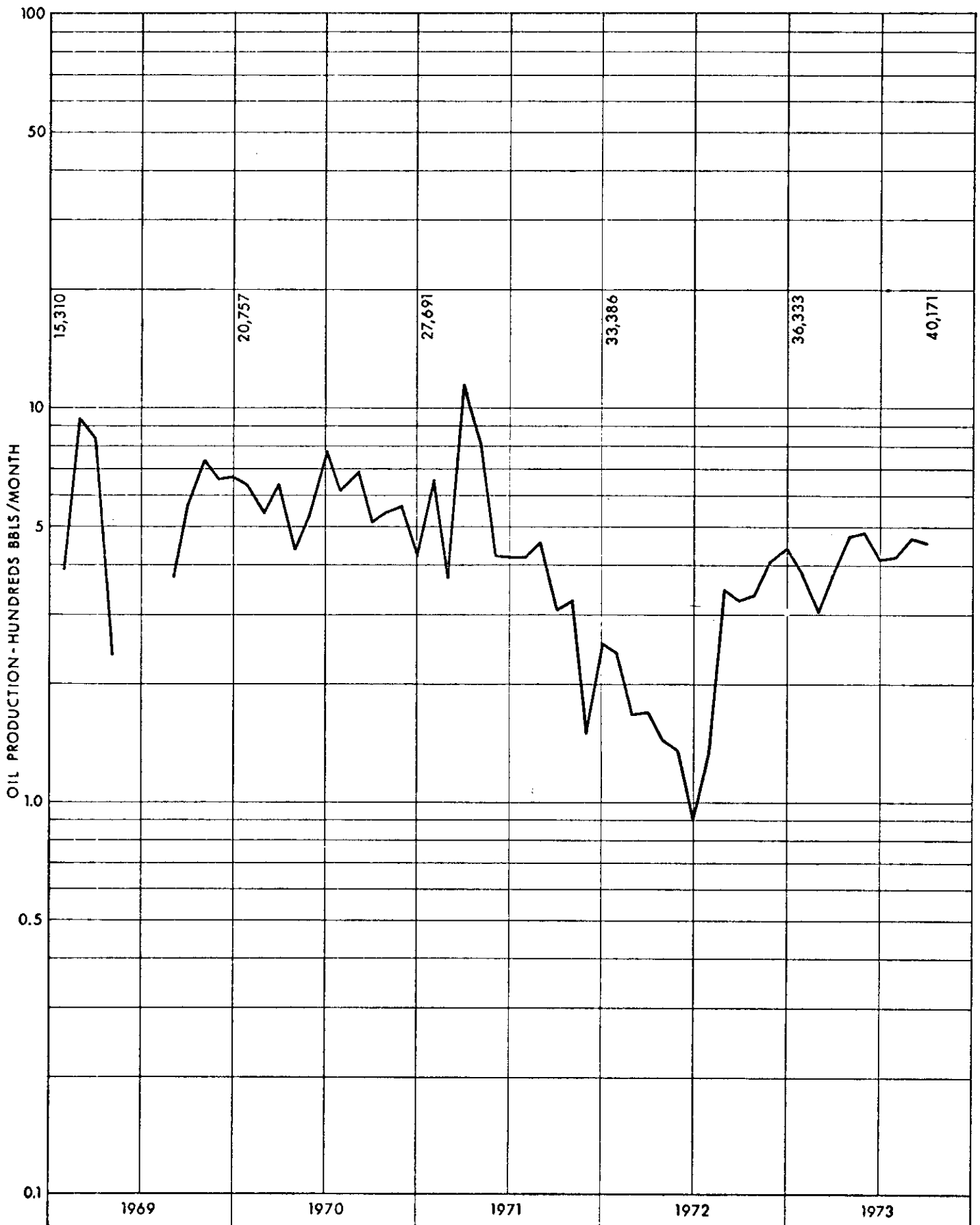


FIGURE 12

RGE 26

RGE 25

WPM

36

31

11

16

17

13

10

5

0

5

3

5

5

5

0

1

6

TWP 1

74-2151

PERMEABILITY VS POROSITY
WASKADA

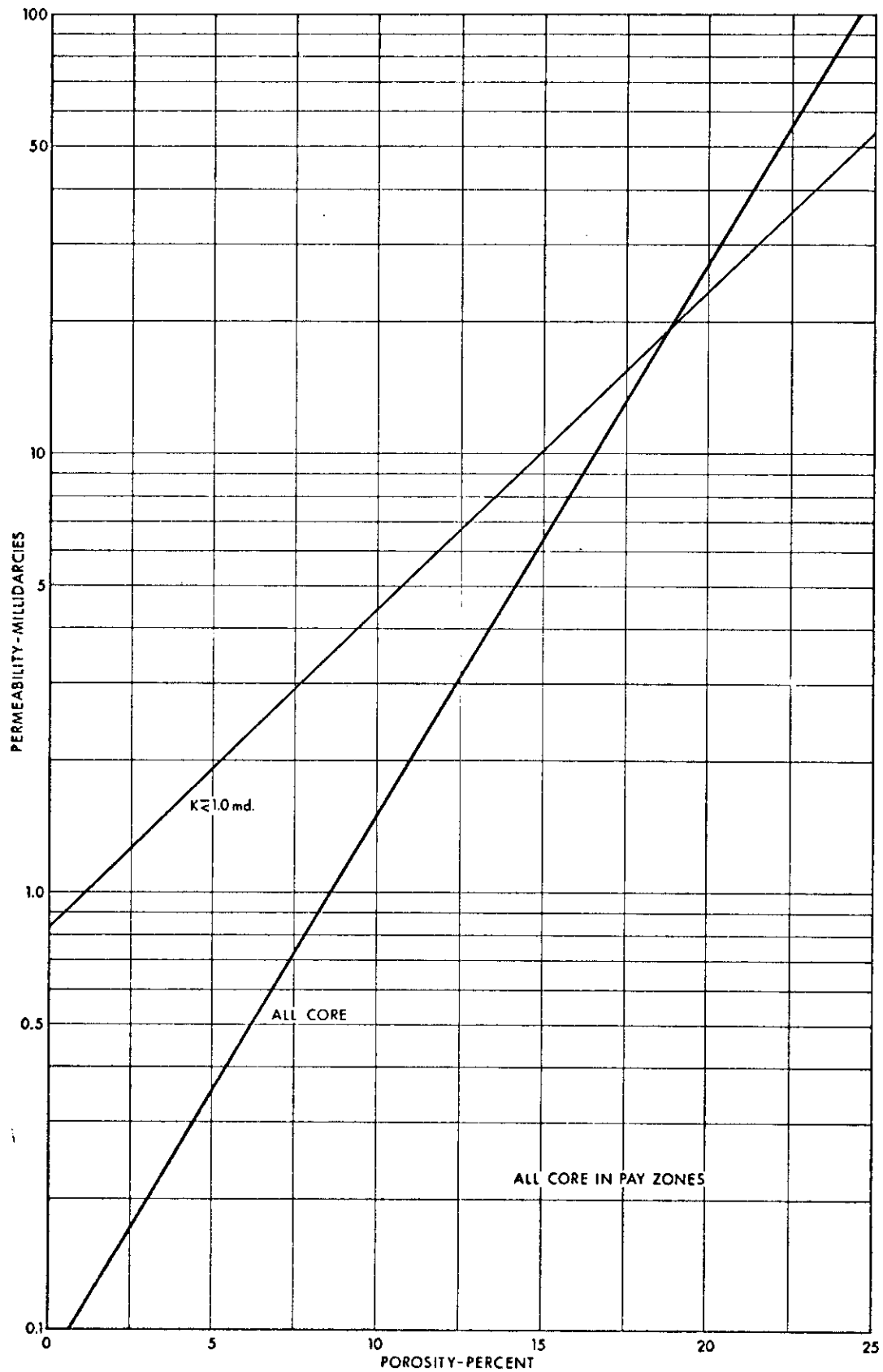


FIGURE 15

RELATIVE PERMEABILITY VS WATER SATURATION
WASKADA

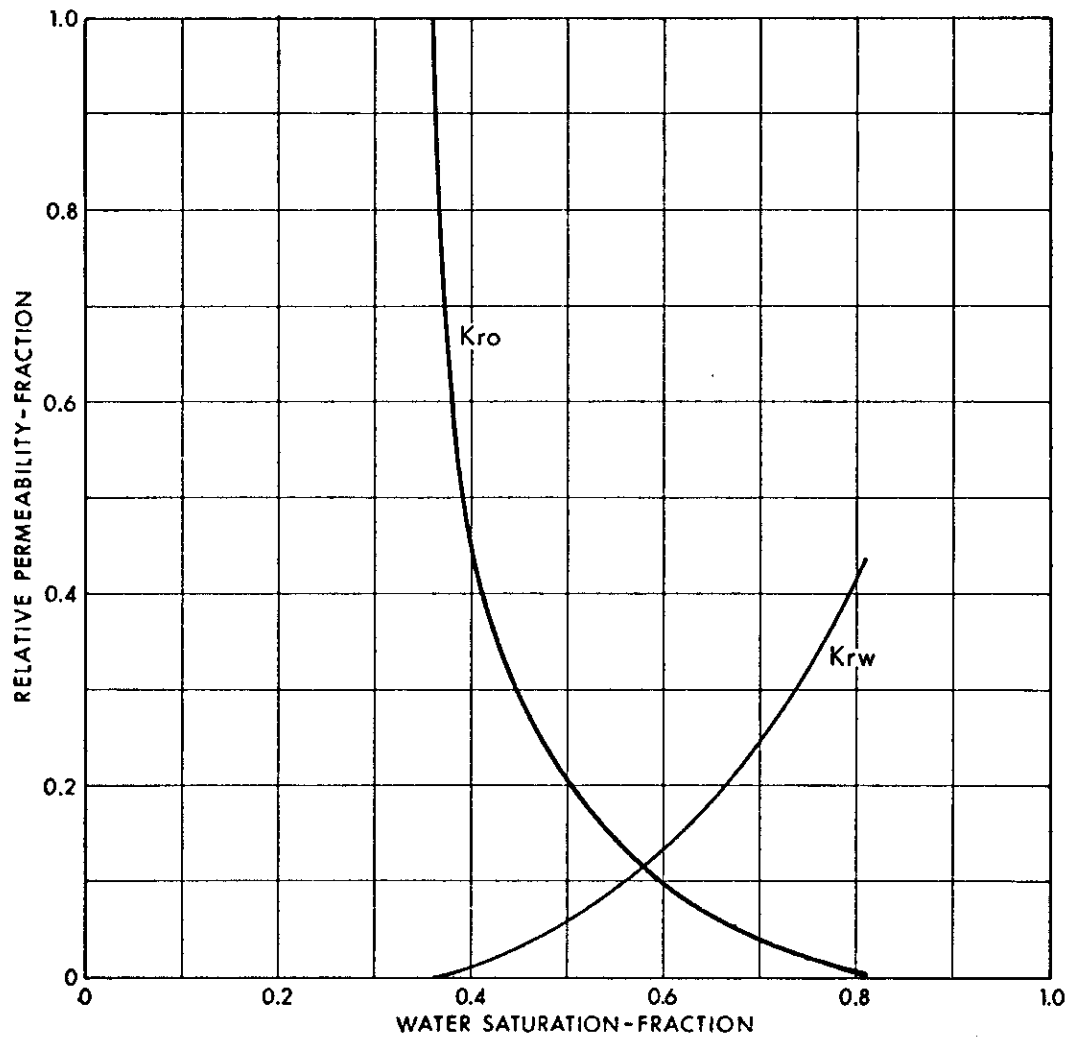


FIGURE 16