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BASE METAL DISTRIBUTION AT SUGARLOAF PEAK, QUARTZSITE MINING DISTRICT, YUMA COUNTY, ARIZONA

by

R. Ahern

August, 1971

GENERAL

The Sugarloaf Peak center of hydrothermal alteration is in the Quartzsite District, Yuma County, Arizona, six miles west of the town of Quartzsite, Arizona. Access to the property is by dirt roads leading off of the old highway along the southern edge of Interstate 10, between the Quartzsite and Dome Peak exit ramps.

This report is based on examination and sampling of diamond drill core from work by Congdon and Carey. No detailed geologic mapping has been done. The generalized alteration pattern shown on the accompanying map is mostly inferred from the drilling results and from other work by Congdon and Carey.

Congdon and Carey acquired claims in the area in 1962 and began an extensive base metal exploration program. Prior to this time the principle mineral production from the district had been placer gold. The recent work included the drilling of numerous rotary and diamond drill holes in addition to geologic mapping and some geophysics. McIntire Porcupine is reported to have optioned the property and drilled several holes, including DDH-15 west of the area included on the enclosed map. A Proof of Labor was filed last year on 67 contiguous claims, including Coca No. 1 through 44, however several visits to the property last winter and spring did not disclose any new work.

GEOLOGY

Sugarloaf Peak is on the eastern flank of the Dome Rock Mountains. This range of rugged peaks trend along a nearly north-south axis near the western edge of the basin and range province. The mountains are composed of metavolcanic flows and tuffs of intermediate composition. The metavolcanics have been intruded by late Cretaceous rhyolite plugs and dikes. An early Cretaceous granite crops out north of I-10. Another large outcrop of granite occurs at Granite Peak on the extreme eastern edge of the pediment, near the Town of Quartzsite.

Alteration

Sugarloaf Peak occupies the center of a well developed pattern of hydrothermal alteration and metal zoning which has been superimposed upon the general metamorphism of the area. As is shown on the accompanying alteration map, the rocks cropping out in Sections 9 and 10, south of Sugarloaf Peak are unaltered. Prominent quartz veins are scattered throughout this unaltered zone and may be the source of the rich placer gold deposits which occur on the adjoining pediments. Except for the veins, however, mineral assemblages present indicate only metamorphism with no discernable hydrothermal alteration. Between this unaltered area and the center of alteration at Sugarloaf Peak is a zone of weak propylitic alteration.

This zone is characterized by development of hydro-mica bleached biotite, chalky feldspars and abundant specularite. The contact between this weakly altered zone and the unaltered schist is irregular and gradational. The contact between the propylitic and the interior, argillic zone is more distinct though still somewhat gradational. The central argillic zone of alteration is approximately 6,000 feet long by 3,000 feet wide with the long axis in an east-west direction. It is characterized by clay, sericite, pyrite and silica flooding with occasional alunite veinlets. The eastern end of this elliptical zone exhibits strong koalinization with abundant alunite veins and disseminated hematite. North of the argillic zone is the probable extension of the propylitic zone of alteration discussed earlier. The mineral assemblage, however, includes chlorite, epidote, sericite and pyrite, indicative of a zone of more intense alteration.

Mineralization

The widespread pyritic alteration appears to center around an interior zone of geochemically anomalous zinc located within the eastern two-thirds of the zone of argillic alteration. The zinc occurs both as disseminated grains and in quartz-chlorite-pyrite veins. The zinc values in this area run from 1,000 ppm to 4,000 ppm zinc in the "zinc shell" and values below this zone are everywhere well above background, running in excess of .01 percent in almost all samples.

Copper values, of .01 to .03 percent, associated with the zinc are attributable to small amounts of chalcopyrite. Oxidation is shallow and there is little indication of significant secondary enrichment.

Molybdenum is present in significant amounts, averaging between .01 and .02 percent. Small but significant amounts of silver and gold were reported with .1 to .2 ounces of silver and .002 to .006 ounces of gold per ton.

Sampling

The drill core and cuttings from past drilling had been left in an old shack on the property. The building and its contents had been severely vandalized, with much of the core dumped out on the ground or missing. It was decided that a log of the drilling results should be made before vandals had completely destroyed it. One week was spent in sorting out the holes and in logging and sampling the core. Samples were taken to best represent larger intervals, fifty feet if possible, and an estimate was made of the percent of the core salvaged from that interval. The samples were all tested for copper, lead, zinc and molybdenum and a few were checked for silver and gold. The results are listed on the detailed drill hole logs and assay logs which are included with the metal ratio graphs in the appendix of this report. The following is a summary of the outstanding features of these results:

S-1 High zinc values (greater than 1,000 ppm) are associated with strong quartz-alunite-pyrite alteration in the upper 500 feet of the hole. Reduced, but still anomalous zinc values (100 to 500 ppm) are associated

Magnetite

with chlorite, calcite, alunite and quartz below that depth. Copper and molybdenum are present in low, but geochemically significant amounts, with 100 to 200 ppm copper and 50 to 75 ppm molybdenum.

S-2 High zinc values associated with quartz, pyrite, gypsum alteration down to 250 feet form a sharp "zinc shell", similar to that observed in other porphyry copper environments. Below 250 feet the zinc values run from 100 to 200 ppm and are associated with epidote, chlorite, with less quartz and pyrite. Copper values are between 100 ppm and 200 ppm with molybdenum running from 50 to 100 ppm.

S-3 Anomalous zinc values between 150 feet and 400 feet run from 700 to 1,000 ppm. Lead values are slightly higher than were noted in DDH-S2. Copper averages about 100 ppm while molybdenum is generally low and decreases with depth. This pattern is typical of metal distribution near the periphery of the central portion of an alteration pattern.

SL-4 Very high zinc values (1,000 to 4,000 ppm) down to 550 feet fall off to 300 to 500 ppm below that depth, however the metal ratios indicate that the drill hole did not penetrate the bottom of the zinc shell. The wide disparity between the lead to zinc and the lead to molybdenum values is due both to the high zinc content and molybdenum values significantly lower than those noted in holes located closer to the center of the alteration pattern.

SL-5 Zinc values between 200 and 250 ppm indicate that this hole is well outside of the zinc shell. A 50 foot interval of .14 percent copper at 200 feet is the only significant concentration of chalcocite noted in any drilling in this district.

SL-6 Very high zinc values over the full length of the hole are associated with higher than normal lead values and average to low molybdenum values.

SL-7 Generally low, weakly anomalous zinc values with lead values increasing with depth. The lead to zinc ratios indicate a possible zinc shell at the surface.

S-8 Generally low metal values in the few samples available from this drill hole. The location of this hole is unknown.

S-10 Generally only weakly mineralized but still anomalous. Location unknown.

SL-13 Low metal values but with weakly anomalous molybdenite and copper. Location unknown.

SL-15 Generally low in metal values but with weakly anomalous zinc near the surface, and weakly anomalous copper and molybdenum values below. This hole is located somewhere west of DDH-SL-5. With a depth in excess of 3,650 feet it is the deepest hole in the district.

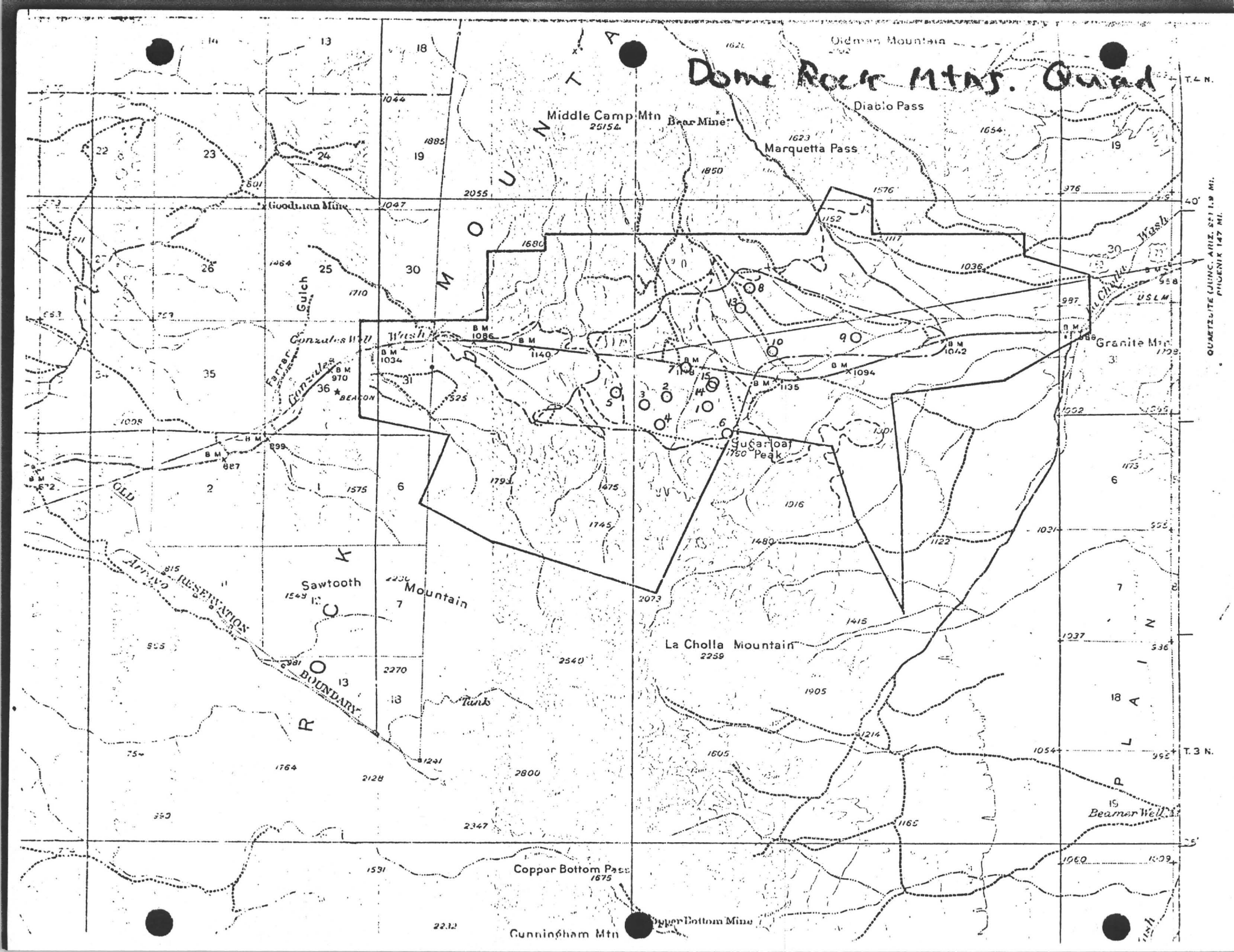
CONCLUSIONS AND RECOMMENDATIONS

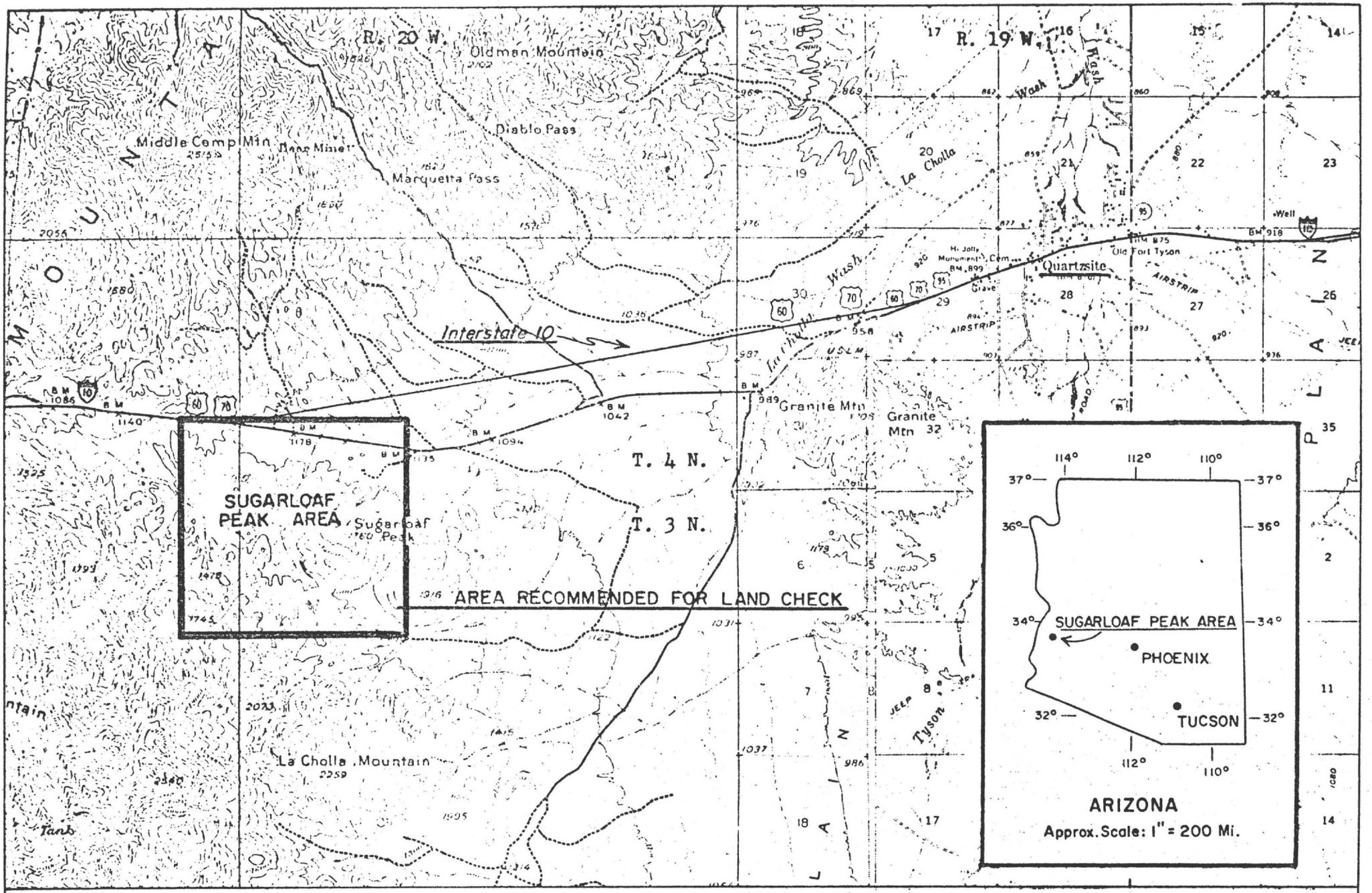
The area of pyritic alteration surrounding Sugarloaf Peak appears to be related to a zoned pattern of hydrothermal alteration and mineralization. If so, the district has favorable exploration potential for a large tonnage "porphyry copper" type deposit. Previous work by Congdon and Carey did not test the central argillic zone deeper than 1,000 feet and no drilling at all was done on the more resistant areas of intense silicification at Sugarloaf Peak.

The work upon which this report is based was very limited in scope, being confined to examination and testing of drill core. The interpretations made, however, are believed to be valid and they indicate that the area warrants further study. It appears probable that Congdon and Carey may drop their claims in the area. If they do it would be advisable to locate a block of claims surrounding Sugarloaf Peak in preparation to doing detailed surface mapping of the geology and alteration pattern. A check of Courthouse records is recommended covering Sections 3, 4, and 5 of Township 4 North, Range 20 West, and Sections 32, 33, and 34 of Township 3 North, Range 20 West, as well as another field check to evaluate present activity in the district.

R. Ahern

R. Ahern


Dome Rock Mtns. Quad
Oldman Mountain
Middle Camp Mtn
25154
Bear Mine
Diablo Pass
Marquetta Pass
Goodman Mine
Farrer Gulch
Gonzales Well
Wash
Granite Mtn
Sugarloaf Peak
Sawtooth Mountain
La Cholla Mountain
2259
Copper Bottom Pass
Copper Bottom Mine
Cunningham Mtn
Beamer Well
T. 4 N.
T. 3 N.
QUARTZSITE (JUNC. ARIZ. 23) 1.9 MI.
PHOENIX 147 MI.



SUGARLOAF PEAK AREA, YUMA COUNTY, ARIZONA

1:62 500

KERR-McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH S-1
Spudded To 1310 in '67
Completed ~~Prior to July,~~ 1965 68
Total Depth ~~Approx.~~ 2,000'
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Coca's Sec 33 T. 4N R. 20W
Elevation
Hole Size NX 0-1616': BX 1616-2000'
Core Size NX 0-550': 700-1616'; BX 550-700'; 1616-2000'
Hole Angle Vertical
Collar ~~Coords.~~ Loc 1030' N32°W ~~N.~~ from SE Cor Sec. 33 ~~E.~~ T4N R20W

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		SAMPLE NUMBER
0-50'	50'			NO SAMPLE					
50-100'	50'	90	1600	210	51				18984
100-150'	50'	92	1100	335	48				18985
150-200'	50'	93	1000	315	50				18986
200-250'	50'	97	1500	145	93				18987
250-300'	50'	116	1200	135	41				18988
300-350'	50'	69	1100	265	70				18989
350-400'	50'	101	1000	190	60				18990
400-450'	50'	163	800	116	160				18991
450-500'	50'	165	1000	135	190				18992
500-550'	50'	202	500	210	100				18993
550-600'				NO SAMPLE					
600-650'	50'	120	340	83	67				18994
650-700'				NO SAMPLE					
700-750'	50'	96	600	545	66				18995
750-800'	50'	120	210	55	52				18996
800-850'	50'			NO SAMPLE					
850-900'	50'	130	230	100	67				18997
900-950'	50'	143	230	100	54				18998

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH S-1

Hole Depth	Inter. Val.	Cu ppm	Zn ppm	Pb ppm	Mo ppm	Oz.Ag	Oz.Au	SAMPLE NUMBER
950-1000'	50'	171	220	115	57		.50	18999
1000-1050'	50'	137	330	100	47		.47	19000
1050-1100'	50'	146	170	100	55		.55	B18951
1100-1150'	50'	100	165	65	59		.91	B18952
1150-1200'	50'	225	320	135	36		.27	B18953
1200-1250'	50'	100	145	85	72		.84	B18954
1250-1300'	50'	100	325	170	110		.65	B18955
1300-1350'	50'	105	200	140	46		.39	B18956
1350-1400'	50'	90	195	90	53		.59	B18957
1400-1450'	50'	120	175	105	70		.67	B18960
1450-1500'	50'	103	175	95	65		.7	B18961
1500-1550'	50'	70	115	45	105		.3	B18962
1550-1600'	50'			NO SAMPLE				
1600-1650'	50'	65	75	55	37		.67	B18963
1650-1700'	50'	55	85	100	41		.41	B18964
1700-1750'	50'	80	105	80	25		.31	B18965
1750-1800'	50'	100	110	50	52		1.0	B18966
1800-1850'	50'	80	100	45	31		.67	B18967
1850-1900'	50'	80	110	60	44		.73	B18968
1900-1950'	50'	80	80	50	58		1.2	B18969

* Gross value calculated from copper per pound; lead per pound; zinc per pound; molybdenum per pound; silver per ounce; and gold per ounce.

KERR-McGEE CORPORATION

Assay Log

istrict Quartzite-Sugarloaf
ole Number DDH S-2
pudded
ompleted Prior to July, 1965
otal Depth Approx. 900'
riller Congdon & Carey
ogged By R. Ahern

County Yuma State Arizona
Claim Sec 33 T. 4N R. 20W
Elevation
Hole Size NX
Core Size NX
Hole Angle Vertical
Collar Coords. N.
E.

Gross Value in Sulfide Minerals*

ole Depth	Inter-val	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample Number
)-100	100	130	1400	70	51		.73		B18971
100-150	50	125	1800	95	55		.58		B18972
150-200	50	220	2700	95	112		1.2		B18973
200-250	50	135	1200	55	100		1.8		B18974
250-300	50	90	185	100	165		1.6		B18975
-350	50	125	120	70	93		1.3		B18976
350-400	50	190	165	55	100		1.8		B18977
400-450	50	105	160	95	100		1.6		B18978
450-500	50	110	185	130	100		.77		B18979
500-550	50	175	140	85	260		3.1		B18980
550-600	50	185	110	50	85		1.7		B18981
600-650	50	90	145	70	115		1.6		B18982
650-700	50	85	165	100	80		.89		B18983
700-750	50	100	335	110	52		.47		B18984
750-800	50	120	260	115	68		.59		B18985
800-850	50	72	136	40	30		.75		14743
850-900	50	95	155	95	53		.56		B18986

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH S-3
Spudded
Completed Prior to July, 1965
Total Depth Approx. 2000'
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec 3 T. 3N R. 20W
Elevation
Hole Size
Core Size NX
Hole Angle Vertical
Collar Coords. N.
E.

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample Number
0-50			NO SAMPLE						
50-100	50	127	260	70	41				B18901
100-150	50	104	260	45	220				B18902
150-200	50	145	970	115	30				B18903
200-250	50	132	700	185	61				B18904
250-300	50	170	1000	170	90				B18905
300-400	100	145	640	205	108				B18906
400-450	50	290	320	120	95				B18908
450-500			NO SAMPLE						
500-550	50	116	350	115	60				B18907
550-650			NO SAMPLE						
650-700	50	100	272	200	70				14714
700-750	50	118	180	72	48				B18909
750-800	50	83	70	80	95				B18910
800-850	50	100	420	130	43				B18916
850-900	50	178	190	170	90				B18911
900-950	50	180	150	150	95				B18912
950-1000	50	170	260	115	64				B18913
1000-1050	50		NO SAMPLE						

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH S-3

Hole Depth	Inter. Val.	Cu	Zn	Pb	Mo	Oz.Ag	Oz.Au	SAMPLE NUMBER
1050-1100	50	112	260	275	70			B18922
1100-1150	50	199	340	190	120			B18914
1150-1200	50	82	124	84	35			B18915, 23, 24
1200-1250	50	108	100	75	37			B18917
1250-1300	50	75	65	42	41			B18918
1300-1350	50	85	75	40	53			B18919
1350-1400			NO SAMPLE					
1400-1450	50	91	80	44	24			B18920, 21
1450-1500	50	95	65	30	33			B18929
1500-1550	50	80	80	50	27			B18925
1550-1600	50	166	73	40	66			B18926, 34
1600-1650	50	105	125	35	45			B18927
1650-1700	50	123	90	33	30			B18928
1700-1750	50	202	70	38	24			B18930
1750-1800	50	195	80	31	33			B18931
1800-1850	50	120	72	32	31			B18932 + 3
1850-1900	50	248	104	80	ND			14715

* Gross value calculated from copper per pound; lead per pound; zinc per pound; molybdenum per pound; silver per ounce; and gold per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH SL-4
Spudded
Completed Prior to July, 1965
Total Depth 790'
Driller Congdon & Carey
Logged By A. Grant

County Yuma State Arizona
Claim Sec 4 T. 3N R. 20W
Elevation
Hole Size
Core Size NX
Hole Angle Vertical
Collar Coords. N.
E.

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		SAMPLE NUMBER
0-50'	50'	48	35	150	35				B18935
50-100'	50'	60	2200	160	68				B18936
100-150'	50'	68	2000	260	68				B18937-8
150-200'	50'	125	1600	255	100				B18939
200-250'	50'	112	1200	280	112				B18940
250-300'	50'	82	1700	270	57				B18944
300-350'	50'	110	2800	620	48				B18941
350-400'	50'	98	1100	250	44				B18942
400-450'	50'	110	1000	280	61				B18943
450-500'	50'	67	800	225	45				B18945
500-550'	50'	75	900	145	65				B18946
550-600'	50'	88	510	135	35				B18947
600-650'	50'	100	510	200	33				B18948
650-700'	50'	90	400	165	46				B18949
700-750'	50'	105	800	125	55				B18950
750-800'	50'	120	395	110	50				B18958-9

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH SL-5
Spudded
Completed Prior to July, 1965
Total Depth 651.3'
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec 33 T. 4N R. 20W
Elevation
Hole Size NX
Core Size NX 0-500 BX 500 to 651
Hole Angle Vertical
Collar Coords. N.
E.

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		SAMPLE NUMBER
0-50'	50'	68	33	115	15				18964
50-100'	50'	60	250	70	14				18965
100-200'	100'		NO SAMPLE						
200-250'	50'	1380	360	35	200				18966
250-300'	50'	137	900	70	180				18967
300-350'	50'	163	250	65	55				18968
350-400'	50'	164	270	60	150				18969
400-450'	50'	170	250	100	82				18970
450-500'	50'	112	95	60	120				18971

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH SL-6
Spudded
Completed Prior to July, 1965
Total Depth 697'
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec 34 T. 4N R. 20W
Elevation
Hole Size NX 0-466'; BX 466-696'
Core Size NX 0-466'; Bx 466-697'
Hole Angle Vertical
Collar Coords. N.
E.

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		SAMPLE NUMBER
0-50'	50'	44	70	90	23				18971
50-100'	50'	144	1400	250	16				18972
100-150'	50'	123	3000	265	28				18973
150-200'	50'	80	1700	650	34				18974
200-250'	50'	125	1500	255	54				18975
250-300'	50'	60	800	240	40				18976
300-350'	50'	71	800	485	80				18977
350-400'	50'		NO SAMPLE						
400-450'	50'	101	700	220	60				18978
450-500'	50'	118	1000	140	57				18979
500-550'	50'	110	1000	270	48				18980
550-600'	50'	84	2300	465	59				18981
600-650'	50'	92	1600	335	90				18982
650-700' 697	50'	91	1800	375	35				18983

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH SL-7
Spudded
Completed
Total Depth 1164.5
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec 33 T. 7 N R. 20 W
Elevation 1120
Hole Size 5 1/8" Rotary
Core Size Not Cored
Hole Angle Vertical
Collar Coords. N.
E.

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample Number
0-50'	50'	52	330	30	27				18901
50-100'	50'	87	450	55	34				18902
						.09	Tr.		
100-150'	50'	54	160	54	30				18903
150-200'	50'	69	170	70	38				18904
		NO SAMPLE							
250-300'	50'	103	100	43	56				18906
						.05	.002		
300-350'	50'	104	190	70	76				18907
350-400'	50'	86	110	45	110				18908
400-450'	50'	95	125	58	68				18909
450-500'	50'	187	320	145	108				18910
						.11	.002		
500-550'	50'	185	390	200	230				18911
550-600'	50'	240	440	245	100				18912
600-650'	50'	NO SAMPLE							
650-700'	50'	117	150	81	105	.09	.001		18914
700-800'	100'	NO SAMPLE							
800-850'	50'	130	160	110	85				18917
						.02	.001		
850-900'	50'	136	160	115	77				18918
900-950'	50'	150	170	115	80				18919
950-1000'	50'	161	130	89	80				18920
* 1145-1164'	19'	220	60	23	115				18913

Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

* NX core

KERR-McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH S-8
Spudded
Completed
Total Depth 1000'
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec . T. R.
Elevation
Hole Size
Core Size NX
Hole Angle Vertical
Collar Coords. N.
E.

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample Number	
380-383	3	125	35	23	29				18944	Quartz Sericite Schist
435-443	8	86	42	20	32	.06	.001		18945	
861-965	34	750	85	17	19				18915	

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number RH S-10
Spudded
Completed
Total Depth 550 547.5
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec T. R.
Elevation
Hole Size
Core Size NX
Hole Angle Vertical
Collar Coords. N.
E.

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample Number	
0-50'	50'	64	40	32	30				18953	
50-100'	50'	68	50	43	36				18954	
100-150'	50'	50	110	71	70	.08	.001	<	18955	
150-200'	50'	55	160	51	38				18956	
200-250'	50'	217	150	55	36				18957	
250-300'	50'	65	125	40	39				18958	
300-350'	50'	56	90	38	44				18959	
350-400'	50'	72	80	58	52				18960	
						.06	.002	<		
400-450'	50'	65	80	68	46				18961	
450-500'	50'	69	100	59	61				18962	
500-550'	50'	100	100	48	56				18963	
	SCATTERED CORE RUNS WITH GOOD RECOVERY.									
347-353'	6'	97	60	31	30				18946	
395-396'	1'	135	15	29	50				18947	Dark Grey Meta-Quartzite
460-462'	2'	97	70	61	35				18948	

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number RH SL-13
Spudded
Completed
Total Depth) 900'
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec T. R.
Elevation
Hole Size 5 1/8 Rotary
Core Size NX Where Cored
Hole Angle Vertical
Collar Coords. N.
E.

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample Number
0-50'	50'	98	55	14	24				18930
50-100'	50'	98	45	16	20				18931
100-150'	50'	80	40	16	45	.07	.001	<	18932
150-200'	50'	75	60	17	51				18933
200-250'	50'	68	90	60	47				18934
250-300'	50'		NO SAMPLE						
300-350'	50'	145	65	33	45				18935
350-400'	50'	193	60	29	48	.06	.002	<	18936
400-450'	50'	250	55	24	43				18937
450-500'	50'	202	75	23	57				18938
500-550'	50'	210	65	25	66				18939
550-600'	50'	198	75	26	58				18940
600-650'	50'	210	75	32	73	.05	.001	<	18941
650-700'	50'		NO SAMPLE						
700-750'	50'	255	70	31	86				18942
750-850'	100'		NO SAMPLE						
850-900'	50'	640	74	31	105	.06	.002		18943
Scattered	short NX	Core runs with very poor recovery.							
280-503'	223'	265	80	35	61	.07	.001		18905

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH SL-15
Spudded
Completed
Total Depth > 3650'
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec T. R.
Elevation
Hole Size Rotary 0-533'
Core Size NX 533-2000'; BX 2000-3650'
Hole Angle
Collar Coords. N.
E.

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample Number
0-50'	50'	530	680	255	20	2.55			18921
50-100'	50'	66	810	135	22	1.51			18922
100-150'	50'	122	910	125	24	1.49			18923
150-200'	50'	82	620	175	19	1.74			18924
200-250'	50'		NO SAMPLE						
250-300'	50'	85	580	145	22	1.67			18925
300-350'	50'	73	300	90	24	1.14			18926
350-400'	50'	72	250	80	30	1.10			18927
400-450'	50'	73	260	95	32	1.24			18928
450-500'	50'	66	260	95	33	1.21			18929
500-550'	50'	95	104	30	33	[illegible]			18930 & B18988
550-600'	50'	250	185	100	45	1.75			B18989
600-650'	50'	80	155	85	41	1.24			B18990
650-700'	50'	40	300	50	31	.81			B18991
700-750'	50'	145	170	62	87	1.41			B18992
750-800'	50'	65	135	45	50	.95			B18993
800-850'	50'	110	740	80	55	1.35			B18994
850-900'	50'	70	225	75	52	1.17			B18995
900-950'	50'	100	130	50	75	1.25			B18996

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH SL-15

Hole Depth	Inter. Val.	Cu ppm	Zn ppm	Pb ppm	Mo ppm	Oz.Ag	Oz.Au	SAMPLE NUMBER
950-1000'	50'	70	85	35	45	80		B18997
1000-1050'	50'	90	205	130	155	285		B18998
1050-1100'	50'	70	140	155	155	310		B18999
1100-1150'	50'	100	115	40	44	84		B19000
1150-1200'	50'	160	125	65	75	140		C18901
1200-1250'	50'	110	95	35	40	75		C18902
1250-1300'	50'	75	60	35	53	84		C18903
1300-1350'	50'	115	85	55	87	142		C18904
1350-1400'	50'		NO SAMPLE					
1400-1450'	50'	145	115	60	46	100		C18905
1450-1500'	50'	650	90	55	67	[illegible]		C18906
1500-1550'	50'	620	95	155	56	[illegible]		C18907
1550-1600'	50'		NO SAMPLE					
1600-1650'	50'	165	70	35	96	[illegible]		C18908
1650-1700'	50'		NO SAMPLE					
1700-1750'	50'	215	55	40	55	[illegible]		C18909
1750-1800'	50'	250	90	40	150	[illegible]		C18910
1800-1850'	50'		NO SAMPLE					
1850-1900'	50'	205	60	35	155	[illegible]		C18911
1900-1950'	50'	250	80	45	120	[illegible]		C18912
1950-2000'	50'	175	65	40	68	[illegible]		C18913
2000-2050'	50'	285	70	50	125	[illegible]		C18914
2050-2100'	50'	320	50	50	117	[illegible]		C18915
2100-2150'	50'	110	70	25	34	59		C18916

* Gross value calculated from copper per pound; lead per pound; zinc per pound; molybdenum per pound; silver per ounce; and gold per ounce.

KERR McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH SL-15

Hole Depth	Inter. Val.	Cu ppm	Zn ppm	Pb ppm	Mo ppm	Oz.Ag	Oz.Au	SAMPLE NUMBER
2150-2200'	50'	155	240	350	29	.39		C18917
2200-2250'	50'	205	75	40	45	.15		C18918
2250-2300'	50'	185	175	45	330	.39		C18919
2300-2350'	50'	185	85	15	57	.12		C18920
2350-2400'	50'	200	100	35	31	.16		C18921
2400-2450'	50'	110	165	20	58	.18		C18922
2450-2500'	50'	130	95	10	35	.15		C18923
2500-2550'	50'	115	100	10	66	.16		C18924
2550-2600'	50'	95	80	10	26	.1		C18925
2600-2650'	50'	50	140	10	28	.17		C18926
2650-2700'	50'		NO SAMPLE					
2700-2750'	50'	105	55	35	45	.10		C18927
2750-2800'	50'	105	55	25	27	.1		C18928
2800-2850'	50'	65	55	5	40	.14		C18929
2850-2900'	50'	100	60	15	26	.11		C18930
2900-2950'	50'	110	50	7	49	.19		C18931
2950-3000'	50'	75	50	10	29	.17		C18932
3000-3050'	50'	60	55	15	34	.11		C18933
3050-3100'	50'	175	75	45	35	.17		C18934
3100-3150'	50'	550	90	45	50	.16		C18935
3150-3200'	50'	80	65	5	28	.13		C18936
3200-3250'	50'	80	55	5	27	.12		C18937
3250-3300'	50'	95	70	10	37	.17		C18938
3300-3350'	50'	215	65	15	43	.14		C18939

* Gross value calculated from copper per pound; lead per pound; zinc per pound; molybdenum per pound; silver per ounce; and gold per ounce.

KERR McGEE CORPORATION

Assay Log

District Quartzite-Sugarloaf
Hole Number DDH SL-15

Hole Depth	Inter. Val.	Cu ppm	Zn ppm	Pb ppm	Mo ppm	Oz.Ag	Oz.Au	SAMPLE NUMBER
3350-3400'	50'	190	80	20	33	.53		C18940
3400-3450'	50'	115	75	15	35	.50		C18941
3450-3500'	50'	110	110	20	36	.56		C18942
3500-3550'	50'	160	70	30	64	.94		C18943
3550-3600'	50'	320	70	20	39	.59		C18944
3600-3650	50'	190	95	20	43	.63		C18945

* Gross value calculated from copper per pound; lead per pound; zinc per pound; molybdenum per pound; silver per ounce; and gold per ounce.

KERR-McGEE CORPORATION

District Quartzite-Sugarloaf
Hole Number DDH S-1
Spudded
Completed Prior to July, 1965
Total Depth Approx. 2,000'
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec 33 T. 4N R. 20W
Elevation
Hole Size NX 0-1616'; BX 1616-2000'.
Core Size NX 0-550'; 700-1616'; BX 550-700'; 1616-200
Hole Angle Vertical
Collar Coords. N.
E.

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
0								Schist	White, fine-grained	Discernable superimposed	Pyrite, 10% in schistosity. No oxidation,
74									quartz-sericite, gently	alteration limited to	no chalcocite.
									dipping schistosity.	alunite-pyrite-calcite.	
100	26	100%	18984	90	51	210	+1000		Occasional calcite vein-	Local zones of silica	
									lets. No mafic minerals.	flooding.	
142	42	100%	18985	92	48	335	+1000				
161	19										
181	20	100%	18986	93	50	315	+1000		Grey, phyllic schist		Abundant disseminated pyrite with minor
210	29								cut by veinlets of		local molybdenite.
250	40	40%	18987	97	93	145	+1000		quartz, pyrite, and cal-	Quartz-pyrite veins more	
									cite. 2" quartz-calcite	abundant below 250'. Alunite	
300	50	60%	18988	116	41	135	+1000		vein at 317'.	veins persist, occasional	
										serpentine coating frac-	
350	50	60%	18989	69	70	265	+1000			tures.	
400	50	60%	18990	101	60	190	+1000		Light grey quartz schist,	Quartz flooding with	
									shattered and badly	rare secondary orthoclase.	
450	50	60%	18991	163	160	116	+1000		broken.		" "
456	4	0							Medium grey quartz feld-	Alunite replacing feld-	
500	44	80%	18992	165	190	135	+1000		spar schist, no mafics	spar, quartz veins and	
										silica flooding; alunite	
550	50	80%	18993	202	100	210	500			quartz-pyrite zone at 465'	
	----	BEGIN BX CORE	----								
620	10	100%	14716	112	30	120	264				
627		0									
637	10	100%	18994	120	67	83	340				

District Quartzite - Sugarloaf Hole Number DDH SL-1

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
700		NX CORE						Argillic Schist	Grey, micaceous, fine-grained; locally brecciated.	Difficult to distinguish from metamorphism; chlorite and very rare calcite are possible alteration minerals.	Pyrite in veinlets and stringers along schistosity.
730								Fault Breccia	Rounded schist in clay matrix.		
750	50	100%	18995	96	66	545	600				
765								Schist	Medium greenish grey, fine-grained micaceous	Quartz-sericite chlorite; anhydrite(?) at 768'.	Prominent quartz veins cross-cutting schistosity.
793	43	100%	18996	120	52	55	210				
* 860	10	100%	14734	76	ND	90	216				
884		0						Schist	Quartz-sericite schist breccia.	Calcite veins with minor alunite, occasional quartz-pyrite veinlets.	Pyrite disseminated along schist planes and forming veins. Sulfides are 10%.
900	16	100%	18997	130	67	100	230				
914											3" quartz vein at 915'. Sharply reduced sulfide content, 3 to 5%.
920	20	100%	18998	143	54	100	230				
991								Phyllic Schist	Greenish grey, fine-grained.	Quartz-sericite-alunite; feldspar replaced by alunite.	Pyrite 5-10% in schist planes.
1000	9	100%	18999	171	57	115	220				
1050	50	90%	19000	137	47	100	330				
* 1060	10	100%	14736	80	20	110	236				
1070										Quartz-alunite-sericite with chlorite-pyrite and clay.	Pyrite 10% to 20%: larger quartz-pyrite veins, 1 or 2 per foot.
1100	30	100%	18951	146	55	100	170				
1117		0									Reduced sulfide content.
1150	33	100%	18952	100	59	65	165				
1200	50	100%	18953	225	36	155	320	Quartz Schist	Dark grey, dense, hard.	Clay, chlorite, gypsum.	Pyrite 5-10%.

District Quartzite - Sugarloaf Hole Number DDH SL-1

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
1250	50	40% B	18954	100	72	85	145	Schist	Quartz-chlorite meta-sediments.	Sericite-epidote.	Pyrite 3-5%.
1300	50	90% B	18955	100	110	170	325				Pyrite and quartz-pyrite veins more pronounced but total sulfides still less
1350	50	90% B	18956	105	46	140	200				than 5%.
1400	50	40 B	18957	90	53	90	195	Quartz Schist		Quartz, chlorite, pyrite.	
1419								Schist	Core is badly broken,	Introduced chlorite is	
1428	9	100% B	18960	120	70	105	175		maybe fault zone.	abundant.	
* 1440	10	100%	14735	80	ND	60	160				
1447								Porphyro-blastic Schist	Dark grey fissile, schistosity is nearly horizontal.	Abundant epidote after former feldspar, also veinlets	Quartz-pyrite-sphalerite-calcite veins, intense chalcopyrite tarnish in veins, 10%.
1454									2' quartz vein.		
1466								Quartz Schist	Medium grey, dense, massive.	Epidote replacing feldspar chlorite along fractures, increases with depth.	Pyrite disseminated along planes of schist, 30-50%. Pyrite content increases to 10% below 1476'.
1490								2' Fault Breccia			
1500	53	100% B	18961	103	65	95	175	Chlorite Schist	Porphyroblastic texture locally discernable.		Pyrite 5%.
1523	23	100% B	18962	70	105	45	115				
1606								Quartz-Chlorite Schist Breccia	Medium-greenish grey; locally well healed breccia texture.		Low sulfide content, 2-5%.
1616											
			BEGIN	BX CORE							
1627											
1650	23	100% B	18963	65	37	55	75				
1658								Quartz Schist Breccia	Dense, massive, dark grey schistosity not apparent; breccia texture persists.	Quartz, secondary orthoclase; 2" quartz vein at 1664'.	5% pyrite in quartz-pyrite veins and disseminated.

District Quartzite-Sugarloaf Hole Number DDH SL-1

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
1700	50	100% B	18964	55	41	100	85	Schist Breccia	Dense, massive, medium to dark grey.	Quartz-secondary orthoclase, with minor epidote and chlorite in fractures Occasional calcite veinlets.	3% pyrite disseminated along schist planes, increased to 5-8% below 1740'.
1750	50	100% B	18965	80	25	80	105				
1770									Rock is badly broken up.		
1800	50	100% B	18966	100	52	50	110				
1835								Hornfels	Dense, massive, dark grey; no schistosity visible.		
1850	50	80% B	18967	80	31	45	100	Quartz Schist	Somewhat porphyroblastic, massive with moderate brecciation.	Quartz-chlorite-pyrite.	
1900	50	100% B	18968	80	44	60	110	Breccia	Alternating zones of greenish grey schist and massive dark grey, siliceous rock: possibly intrusive monzonite.	Schist-chlorite-clay-monzonite-quartz flooding with biotite and quartz-calcite-pyrite stringers.	Pyrite 10-15% with minor chalcopyrite tarnish. Molybdenite in quartz vein at 1666'.
* 1920-1925	5	100%	14713	68	5	80	144				
1950	50	100% B	18969	80	58	50	80				
									* Samples taken and described by R. M. Corn.		

KERR-McGEE CORPORATION

District Quartzite - Sugarloaf
Hole Number DDH S-2
Spudded
Completed Prior to July, 1965
Total Depth Approx. 200'
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec 33 T. 4N R. 20W
Elevation
Hole Size NX
Core Size NX
Hole Angle Vertical
Collar Coords. N.
E.

Depth	Int.	%Core Rcvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
0		PLUGGED	(NO CORE)								
25		NX CORE						Schist	Tan to light grey, vug- gy; quartz and biotite- quartz; feldspar porphy- roblasts weathered to clay.	Calcite-chlorite-pyrite. gypsum noted in fractures.	Completely oxidized iron flooding and black hematite filling fractures and schist planes indicating 15% pyrite.
43											Only slight oxidation along fractures. Near vertical quartz-pyrite veinlet cross-cuts horizontal veinlets following schistosity at 50'.
52									Fine-grained, no visible texture.		Very minor disseminated pyrite.
73								Schist	Gently dipping, mottled looking.		Pyrite stringers following schistosity predominate with quartz-pyrite veinlets crosscutting 10% pyrite. No chalcocite or chalcopyrite noted.
77									Shattered zone.		Partially oxidized.
100	75	65%	B18971	130	51	70	+1000				
120									Light to medium grey; platey to massive.	Intense quartz-pyrite with minor chlorite and epidote; no calcite.	Only minor oxidation. sulfides equal 15-20%.
137									Massive, fine-grained.		10% pyrite in stringers along schistosity.
150	50	100%	B18972	125	55	95	+1000				
* 170	10	100%	14741	192	30	35	440				
183										Numerous gypsum veinlets	10-15% pyrite, no chalcocite or chalcopyrite:
200	17	100%	B18973	220	112	95	+1000		Light to medium grey; fine-grained.	accompany quartz-pyrite alteration.	local massive pyrite-gypsum veinlets.

District Quartzite-Sugarloaf Hole Number DDH S-2

Depth	Int.	%Core Recv	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
204								Schist	Porphyroblasts of ortho-	Abundant gypsum-pyrite-	Pyrite 10%.
									clase.	quartz veinlets; porphyro-	
										blasts by epidote.	
230									Core is badly broken.		Partial oxidation.
250	50	80%B	18974	185	100	55	+1000				
269								Schist	Fine-grained, medium	Pyrite-chlorite-epidote.	5-10% disseminated pyrite; 15-20% below
296									grey.		296'.
300	50	60%B	18975	90	165	100	185	Porphyro-	Feldspar replaced by	Quartz-epidote-pyrite with	15% pyrite disseminated and in veinlets.
315-325	10	100%	14717	180	10	90	184	blastic Schist.	epidote in quartz matrix.	minor epidote.	
348									Massive quartz-pyrite-epidote zone.		
350	50	100%B	18976	125	93	70	120	Schist	Fissil, dark-grey, only	Quartz-pyrite-epidote.	5-10% pyrite in veinlets and finely dis-
370									rare porphyroblasts.		seminated with occasional ½" quartz-pyrite
								Porphyro-		Epidote replacing former	veins.
400	50	80%B	18977	190	100	55	165	blastic Schist		feldspar; quartz flooding	
450	50	60%B	18978	105	100	95	160			and veins.	
488								Quartz	Dark grey, dense, mas-	Quartz flooding and in vein-	Massive pyrite in quartz veins.
500	50	80%B	18979	110	100	130	185	Schist	sive, fine-grained.	lets; epidote lining vein-	
532									Micaceous schist, thin	lets with locally massive	
550	50	100%B	18980	175	260	85	140		laminations, greenish-	epidote.	Sparsely disseminated pyrite and quartz-
564									grey.		pyrite veinlets.
								Porphyro-	Dark grey and green.	Epidote replacing former	
								blastic		feldspar, locally massive	
600	50	80%B	18981	185	85	50	110	Schist		epidote associated with	
										quartz-pyrite zones.	

District Quartzite-Sugarloaf Hole Number DDH S-2

Depth	Int.	Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
600								Quartz Schist	Massive, medium-grey.	Quartz-epidote; no calcite	Prominent white quartz vein at 604 contains abundant pyrite and minor molybdenite.
612								Phyllic Schist	Fine-grained, thinly laminated.	Quartz-epidote-pyrite.	
650	50	80%R	18982	90	115	70	145				
700	50	100%R	18983	85	80	100	165	Porphyro-blastic Schist	Dark grey, fine-grained chlorite-quartz ground-mass.	Quartz-epidote-chlorite alteration; epidote in quartz-pyrite veins and replacing former feldspar; minor chlorite along fractures; quartz flooding and occasional white quartz vein.	10% pyrite disseminated and in veins; pyrite content increases with depth.
750	50	100%R	18984	100	52	110	335				
800	50	40%R	18985	120	68	115	260				
830	10	100%	14743	72	30	40	136				
848											
890	42	70%R	18986	95	53	95	155				
					LAST BOX						
									* Samples taken and described by R. M. Corn.		

KERR-McGEE CORPORATION

District Quartzsite-Sugarloaf
Hole Number DDH S-3
Spudded 5-21-62
Completed Prior to July 1965 11-27-64
Total Depth Approx. 2000'
Driller Congdon & Carey
Logged By A. Grant for Kerr-McGee

County Yuma State Arizona
Claim Sec 3 T. 3N R. 20W
Elevation
Hole Size
Core Size NX
Hole Angle Vertical
Collar Coords. N.
E.

Depth	Int.	%Core Rcvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
0											
83	NX	CORE						Schist	Very porous		
104	21	85%	B18901	127	41	70	260		Schistosity at 90° to	Intense quartz-sericite;	Abundant cubic pyrite.
119									core.	oxidized iron on fractures.	
										Abundant talc.	
131	12	20%	B18902	104	220	45	260	Schist	No iron stain, abundant		1/16" molybdenite veinlet at 35° to schist-
187									pyrite; abundant talc.		osity.
196	9	70%	B18903	145	30	115	970	Schist	Argillic schist.	Weak sericite; minor quartz.	Pyrite cubes; fine pyrite veinlets at
* 225	10	100%	14744	128	-5	130	404				35° to schistosity; minor chalcopyrite.
233											
251	18	70%	B18904	132	61	185	700	Schist	Argillic schist.	Chlorite-biotite micas;	Steep pyrite veinlets which cross at 90°
										minor quartz-sericite.	and 45° to schistosity; minor chalcopyrite
279											tarnish.
288	9	70%	B18905	170	90	170	8,000		Argillic schist; numer-	Quartz-sericite; abundant	Near vertical 1½" bull quartz vein; steep
									ous unorientiated por-	pyrite.	pyrite veinlets with sphalerite. Some
									phyroblasts.		pyrite veinlets appear lensoidal.
337										338 - Slightly increased.	Abundant pyrite mostly in schist planes.
										chlorite.	Minor chalcopyrite tarnish; small graphite
										340-350 Intense silicifica-	veinlet.
364	27	60%	B18906	145	108	205	640			tion with occasional bull	
										quartz vein.	
412								415-419		More chlorite than above-	More abundant pyrite.
421	9	100%	B18908	290	95	120	320	Fault Zone		quartz-sericite.	
* 435	10	100%	14745	104	ND	100	244				
499-									Argillic Schist.	Intense quartz-sericite.	Small specs of dark mineral, likely
535	36	80%	B18907	116	60	115	350		Schistosity at 90° to	Abundant pyrite steep chlor-	tourmaline; some minor chalcopyrite
									core.	ite veinlet; tourmaline.	tarnish.
										Strong local silification.	

District Quartzite - Sugarloaf Hole Number DDH S-3

Depth	Int.	%Core Recv	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
655	10	100%	14714	100	70	200	272				
709									Dark grey argillic schist to 727'. Light grey argillic schist to 764'. Dark schist may be result of biotite(?).	Strong silicification, few quartz veinlets. Quartz vein 1/3" at 30° to schistosity. Possibly contains pale yellow-green epidote.	Abundant pyrite; minor chalcopyrite tarnish on pyrite.
764	55	65%	B18909	118	48	72	180				
770	10	100%	14715	48	-5	30	176				
793											
802	9	60%	B18910	83	95	80	70		Light grey.	Anhydrite and massive chlorite veinlets; anhydrite also noted in groundmass.	Minor chalcopyrite stain, however it is more than above. 858 - Calcite cuts across bull quartz which also contains large crystals of red sphalerite.
849											
859	10	40(?)	B18916	100	43	130	420				
887								Medium to light grey Quartz Schist.	Medium to grey quartz schist; porphyroblastic texture. Below 907' color is light grey.	Quartz alteration groundmass seems to be mixture of quartz and biotite. Contains numerous grains of yellow-green epidote; inclusion of anhydrite with faint ring of chlorite.	Abundant disorientiated pyrite veinlets. Occasional quartz-pyrite almost parallel to schistosity.
916	29	100%	B18911	178	90	170	190		Medium grey to greenish-grey schist.	Open quartz veinlets; abundant small anhydrite veinlets which cross schistosity. Minor sericite, possibly secondary biotite.	915 Quartz-pyrite ¼" veinlet at 30° from vertical. Abundant disseminated and veinlet pyrite. Occasional bull quartz veins. Small grains of molybdenite in pyrite veinlet within bull quartz at 933.5'. At 950' note massive fine-grained chlorite veinlet with large grain of chalcopyrite.
955	39	100%	B18912	180	95	150	150	Medium to dark grey schist.	Mildly porphyroblastic texture.	Minor chlorite-quartz-sericite. Several vertical vuggy quartz and calcite veinlets. Pale yellow-green epidote throughout groundmass. Fine-grained blebs of chlorite and/or biotite in groundmass. Open veinlets show very minor oxidation.	Quartz-pyrite veinlets with very minor chalcopyrite. Pyrite veinlets seem to be lined with chlorite. At 970' 3/4" quartz-pyrite veinlet in which the pyrite is well disseminated.
982	27	100%	B18913	170	64	115	260				
1015	10	100%	14717	80	-5	115	188				

District Quartzite-Sugarloaf Hole Number DDH S-3

Depth	Int.	%Core Recv	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
1082								Schist	Quartz schist	Quartz-sericite. Chlorite	Quartz-pyrite veinlets.
1090	8	80%	B18922	112	70	275	260			in groundmass along schist planes.	
1115								Dark grey Schist	Weak to moderate porphyroblastic texture; low sericite content.	- Grains of calcite in groundmass; abundant grains of pale yellow-green epidote. Quartz-alunite. Abundant fine-grained chlorite throughout.	Disseminated and veinlet pyrite. Minor chalcopyrite in quartz-pyrite veinlets.
1140	25	90%	B18921	199	120	190	340		Good porphyroblastic texture.	Phenocrysts are likely feldspars partially altered to alunite.	Pyrite-quartz veinlets; minor disseminated pyrite.
1160	20	80%	B18923	70	33	140	200	Medium green grey schist	Good porphyroblastic texture.	Abundant greenish-yellow epidote in porphyroblastic texture. Quartz alteration. Calcite on veinlets.	Abundant pyrite. Quartz occasionaly occurs in large grains. A ½" quartz-pyrite veinlet is well surrounded by layer of epidote.
1180	20	40%	B18915	70	40	80	120	Dark grey Schist	Below 1194 color is light grey with increased quartz.	Abundant biotite-quartz. - Abundant feldspars.	Good fine pyrite and minor fine chalcopyrite.
1205	25	80%	B18924	102	30	62	90				
1215								Quartz Schist	Quartz schist light-grey.	Occasional quartz-pyrite vein or veinlet. Several fine quartz veinlets; less epidote than above.	Bull quartz with inclusions of epidote-feldspar mixture containing fair disseminated chalcopyrite.
1259	44	80%	B18917	108	37	75	100			Calcite on fractures. 1208-Bull quartz with secondary orthoclase.	
1269									Argillic Schist		
1280	11	70%	B18918	75	41	42	65			Quartz-sericite; calcite on fractures and in groundmass.	Quartz-pyrite veinlet system is mostly parallel to schistosity.
1304								Schist	Argillic schist which is well broken and fractured.	Abundant calcite on veinlets. Minor epidote. Fair chlorite. Iron oxidation evident at 1353 and 1358'. Probable anhydrite.	Possibly increased fine chalcopyrite associated with pyrite veinlets. Anhydrite and chlorite associated with possible epidote.
* 1365	10	100%	14748	36	-5	60	109				
1367	63	75%	B18919	85	53	40	75				
1412									Porphyroblastic texture of quartz-epidote with chlorite, pyrite and minor chalcopyrite.	Abundant quartz with biotite and/or chlorite; probable secondary orthoclase.	1412-1429 Fair chalcopyrite (½-1%) with secondary biotite and epidote.
1429	17	95%	B18920	71	23	50	80			Entire groundmass is recrystallized.	Sample was all of the split core in the interval.

District Quartzite-Sugarloaf Hole Number DDH S-3

Depth	Int.	%Core Recv	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
1431								Medium to	Weak to medium porphy-	Quartz-sericite with bio-	Good disseminated pyrite with weak
								Dark Grey	roblastic texture;	tite. Abundant epidote	chalcopyrite. Occasional chlorite-
								Schist	altered groundmass seems	throughout groundmass.	pyrite veinlet.
									to contain inclusions	Occasional grain of anhy-	
									of original dark schist.	drite. Secondary ortho-	
1460	29	95%	B18921	110	26	40	80		Below 1458 rock is light	clase in small amounts.	
									grey quartz schist.		
1469								Medium to	Quartz schist.	Intense silicification with	Fair chalcopyrite along with fine-grained
								Light grey		minor epidote, calcite on	disseminated pyrite.
								Schist		fractures. Possible secon-	
1480	11	75%	B18922	92	33	30	65			dark K-feldspar.	
1495									Quartz schist.	Probable secondary feldspar.	Fine disseminated pyrite with fair chal-
										Epidote and chlorite in	copyrite.
1515	10	100%	14712	48	ND	40	128			groundmass. Silicification	Below 1516' sulfide content drops.
										is less intense below 1516'	
1541	46	70%	B18923	80	27	50	80	Medium to			
								Dark Grey			
1563								Schist.			
								Medium	Argillic Schist	Calcite in groundmass and	Low total sulfide.
								Grey Schist		on fractures; minor oxida-	
									Quartz sericite.	tion on a few fractures.	
1579	16	80%	B18926	189	40	32	55				
1587	8	80%	B18931	120	120	58	110				
1606											Minor chalcopyrite.
								Quartz		Quartz-sericite; partially	1607 - 1" quartz-pyrite vein with good
								Schist		argillic.	molybdenite stringers. Pyrite is in
1616	10	90%	B18927	105	45	35	125				center of quartz vein.
1646								Quartz-			
								Sericite	1660-1672 - Fault zone	Phyllic to argillic	Low total sulfide.
								Schist			
1685	39	100%	B18928	123	30	33	90				

District Quartzite-Sugarloaf Hole Number DDH S-3

Depth	Int.	%Core Recv	Samp. No.	Assays Cu	Assays Mo			Rock Type	Rock Description	Alteration	Mineralization
1685									Medium to dark grey schist.	Mostly quartz with abundant thin calcite on fractures.	
										Abundant chlorite in schist planes.	1732 Quartz-chalcopyrite veinlet parallel to schistosity. Sulfide level slightly higher than above.
1734	49	50%	818930	202	24	38	70				
								Quartz Schist	As above	As above with less calcite. A few fractures are weakly oxidized.	Generally very low total sulfide. Occasional large quartz vein.
1788	54	60%	818931	195	33	31	80		Dark grey quartz schist. Epidote in fair amount		Increased sulfides with notable chalco-
										chlorite or possible biotite.	pyrite. Quartz veinlets have pyrite
										Calcite on fractures. Calcite or anhydrite(?) with chlorite and pyrite in schist planes.	at center with chlorite lining. Most of the pyrite is in schist planes. 1801.5 - Small specks of molybdenite in massive quartz vein.
1832	44	75%	818932	135	33	27	70		Quartz schist, medium to light grey.	Strong silicification.	Increased total sulfide to 1840'. Below 1840' total sulfide is low.
									Below 1840' schist is light grey with quartz and low sulfide.	Chlorite and/or secondary biotite found with quartz grains and quartz veinlets.	Rock material is well broken with occasional fault zone.
1855	23	60%	818933	96	30	42	75				
* 1860	5	100%	14715	248	ND	80	104				
									DEEPEST CORE FOUND WAS 1857'. TOTAL DEPTH IS UNKNOWN. 2000' PROBABLE TOTAL DEPTH.		
								* Samples	taken and described by T. M. Corn.		

KERR-McGEE CORPORATION

District Quartzite-Sugarloaf
Hole Number DDH SL-4
Spudded
Completed Prior to July, 1965
Total Depth 790'
Driller Congdon & Carey
Logged By A. Grant

County Yuma State Arizona
Claim Sec 4 T. 3N R. 20W
Elevation
Hole Size
Core Size NX
Hole Angle Vertical
Collar Coords. N.
E.

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
0								Schist	Quartz-sericite: bleached white.	Abundant jarosite on fractures. Quartz veinlets with quartz grains in groundmass.	
30	30								Bleached argillic schist.	Intense quartz-sericite-alunite.	Abundant pyrite.
49	19	40%	B18935	48	35	150	35			Intense quartz-sericite; good alunite in schist planes; minor epidote.	Abundant pyrite with minor chalcopyrite in schist planes.
100	51	80%	B18936	60	68	160	+1000		Quartz-sericite schist	Pyrite is weakly oxidized.	Fair chalcopyrite on pyrite.
118	18	80%	B18937	67	70	270	+1000		110-118' Rock is highly fractured.	Jarosite on most of the pyrite. Wide spread "bleeding" not apparent.	
147											
157	11	100%	B18938	73	53	230	+1000				Minor chalcopyrite on widespread pyrite.
184											
200	36	50%	B18939	125	100	255	+1000		Quartz-schist.	Strong quartz-sericite-alunite. No mafic minerals.	
212											
252	40	40%	B18940	112	112	280	+1000		Quartz-schist.	Groundmass is 100% quartz, sericite. Occasional quartz veinlet.	Abundant pyrite, some with fair chalcopyrite tarnish.
261	9	100%	B18941	82	57	270	+1000				
* 310	10	100%	14730	88	85	450	5600				
319									Quartz-schist.	Intense quartz-sericite-alunite. Coarser quartz than noted above.	Abundant pyrite. Occasional pyrite veinlet with associated epidote.
347	29	75%	B18941	110	48	620	+1000				Occasional chalcopyrite on pyrite.

District Quartzite Hole Number DDH SL-4

	Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
	375									Quartz schist.	Intense quartz-sericite-alunite. More quartz than above. Minor limonite on occasional fracture.	Abundant disseminated pyrite and pyrite veinlets. Minor chalcopyrite tarnish on both kinds of pyrite.
	404	29	60%	B18942	98	44	250	+1000				
	422									Quartz schist.	Intense quartz-sericite-alunite. Quartz is coarse in some places.	Abundant pyrite, some chalcopyrite tarnish.
	460	38	85%	B18943	110	61	280	+1000				
*	485	10	100%	14731	64	5	430	2880		Light medium grey quartz schist.	Note! Introduction of chlorite; may be slightly argillic.	5% pyrite with less chalcopyrite stain. Gently dipping veins following schistosity.
	500	40	70%	B18945	67	45	225	800		2" quartz vein at 509'.	Weak oxidation along some veinlets.	
	550	50	100%	B18946	75	65	145	+1000			More intense silicification below 560'.	Pyrite as abundant thin stringers in schist planes.
	600	50	100%	B18947	88	35	135	510				
*	600	10	100%	14732	60	<5	125	416				Blebs of pyrite disseminated throughout with minor chalcopyrite staining.
	626	26	80%	B18948	100	33	200	510				
	673								Quartz Schist	Porphyroblastic	Porphyroblasts altered to alunite.	Quartz-pyrite-sphalerite veinlets in schist planes.
	692	20	100%	B18949	90	46	165	400				
	703										Chlorite introduced along fractures.	
	723	20	100%	B18950	105	55	125	800				
*	710-715	5	100%	14710	432	20	280	2000				
	747											
	757	10	100%	B18958	100	56	225	505		Light Grey		Quartz-pyrite sphalerite veins cross-cutting schist; disseminated pyrite throughout.
*	760	10	100%	14733	68	<5	160	440				
	784								Quartz Schist	Micaceous banding.	Not discernable.	Quartz-pyrite veinlets.
	790	7	100%	B18959	140	44	190	285				
										-790' - TOTAL DEPTH-		
										* Samples taken and described by R. M. Corn		

KERR-McGEE CORPORATION

District Quartzite-Sugarloaf
Hole Number DDH SL-5
Spudded
Completed Prior to July, 1965
Total Depth 651.3'
Driller Congdon & Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec 33 T. 4N R. 20W
Elevation
Hole Size NX
Core Size NXO-500 BX 500-651 T.D.
Hole Angle Vertical
Collar Coords. N.
E.

Depth	Int.	%Core Rcvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
0											Oxidized; disseminated; pyrite less than
20	20	--Not Cored		----				Schist	Chloritic schist with	Chlorite, clay, weak.	3%.
									blebs of feldspar and		
50	30	100%	18964	68	15	115	33		quartz: occasional zones		
100	50	100%	18965	60	14	70	250		of quartzite, dark		
	---- Not Cored----								greenish-grey.		
229	129								Light grey: original	Alunite-sericite-quartz.	20% oxidized, pyrite stringers coated
									mineralogy destroyed		with minor chalcocite; quartz-pyrite
									by alteration.		vein at 240'; pyrite in veinlets not
											disseminated.
245								Arkosic	Grey to greenish grey.		Pyrite veins and stringers in planes
								Schist			of schistosity.
250	31	100%	18966	1380	200	35	360				
282	32		18967	137	180	70	+1000				
	----Not Salvaged----										
342	60							Argillic	Light to medium grey;	quartz-alunite-gypsum	Pyrite in veinlets and in schist planes;
								Schist	greenish grey.		no chalcocite tarnish noted.
350	8	46%	18968	163	55	65	250				
365											
387	----Not Salvaged----										
400	50	56%	18969	164	150	60	270				Occasional chalcopyrite tarnish noted
											on non-crystalline pyrite.
420									Porphyroblastic texture.		
450	50	70%	18970	170	82	100	250				
474										More quartz veins with	
493	43	100%	18971	112	120	60	95			chlorite along fractures.	
	----Not Salvaged----										
651'	----------TOTAL DEPTH----------										

KERR-McGEE CORPORATION

District Quartzite-Sugarloaf
Hole Number DDH SL-6
Spudded
Completed Prior to July, 1965
Total Depth 696'
Driller Congdon and Carey
Logged By R. Ahern

County Yuma State Arizona
Claim Sec 34 T. 4N R. 20W
Elevation
Hole Size HX 0-466'; BX 466-696'
Core Size HX 0-466'; BX 466-696'
Hole Angle Vertical
Collar Coords. N.
E.

Depth	Int.	%Core Rcvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
0	----NO CORE----							Schist	White, chalky brecciated	Quartz-clay.	Limonite after pyrite in fractures only;
25									with numerous quartz-		completely oxidized.
45	20	100%	18971	44	23	90	70		pyrite veinlets.		
	----	NOT SALVAGED	----								
75									Light grey, brecciated	Quartz-clay-pyrite-sericite.	Pyrite disseminated and in veinlets;
									below 86'.		very minor chalcocite coating pyrite;
100	25	100%	18972	144	16	250	+1000				partially oxidized. 2" quartz-pyrite
											vein at 186' shows abundant pyrite with
150	50	100%	18973	123	28	265	+1000				chalcocite tarnish.
167								Quartz Sericite Schist	Tan to grey: minor oxi- dation: numerous brecci zones: schistosity nearly horizontal.	Quartz-sericite-pyrite; a quartz-gypsum veinlets with pyrite. Intense quartz-alunite- pyrite 198-202'.	Abundant pyrite stringers in schist planes with chalcopyrite tarnish: pyrite 5%.
198											
200	10	100%	14737	80	50	200	2400				
200	50	65%	18974	80	34	650	+1000				
225	25	100%	18975	125	54	255	+1000				
	-----	NOT SALVAGED	-----								
253	28							Phyllic Schist	Light grey, speckled with pyrite: open zones of fault breccia.	Sericite-quartz-pyrite with occasional gypsum veinlets.	Pyrite is 10-20%, disseminated uniformly throughout.
278	25	100%	18976	60	40	240	+1000				
303	25	NOT SALVAGED	-----					Schist	Light grey; no mafic minerals.	Quartz-sericite-pyrite with numerous gypsum veinlets.	Pyrite veinlets exhibit chalcopyrite tarnish; some disseminated pyrite locally.
350	47	100%	18977	71	80	485	+1000				
355	10	100%	14738	28	100	190	224				

District Quartzite-Sugarloaf Hole Number DDH SL-6

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
415								Phyllic Schist	Light grey, schistosity generally horizontal. Prominent massive quartz veinlets of gypsum after anhydrite.	Quartz-sericite-pyrite-alunite with occasional vein 434-478'.	Pyrite stringers along schist planes equal 10%.
450	35	100%	18978	101	60	220	+1000	Fault Breccia 447-451'			
466	-----	REDUCE TO BX CORE	-----								
474								Quartz Vein			Pyrite 10% to 20% disseminated and along schistosity: some sulfide grains exhibit chalcopyrite tarnish; pyrite more abundant at 470': quartz-pyrite-sphalerite-galena vein at 480'.
481											
495			14739	48	48	400	4720	Quartz Schist	Rock is mostly quartz with occasional porphyroblasts of chloritic material.	Quartz-pyrite with minor clay.	Pyrite is 10-20% occurring as stringers in gently dipping planes of schistosity.
500	50	90%	18979	118	57	140	+1000				
550	50	90%	18980	110	48	270	+1000				
553								Phyllic Schist	Light grey, pearly sheen on all surfaces. No veinlets; minor stringers of chlorite.	Quartz-sericite-pyrite with clay; graphite at 600'.	Pyrite approximately 10%: in schist planes.
600	50		18981	84	59	465	+1000				
650			18982	92	90	335	+1000				
* 660	10		14711	68	15	600	2800				
* 690			14740	64	10	840	3680				
696			18983	91	35	375	+1000				
								TOTAL DEPTH - 696'			
									* Samples taken and described by R. M. Corn		

KERR-McGEE CORPORATION

District Quartzite-Sugarloaf
Hole Number DDH SL-15
Spudded
Completed
Total Depth > 3650'
Driller ~~Holmbire~~ - ~~Porcupine~~
Logged By R. Ahern

County Yuma State Arizona
Claim Sec T. R.
Elevation +/-
Hole Size ~~5-1/8~~" Rotary to 533'
Core Size NX 533-2000'; BX 2000-3650'
Hole Angle
Collar Coords. N.
E.

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu	Mo			Rock Type	Rock Description	Alteration	Mineralization
0											
		ROTARY CUTTINGS									
50	50		18921	530	20	255	680				
		NX CORE						Quartz	Medium-grey, medium-	Quartz-sericite-pyrite-	Pyrite disseminated and in veinlets;
62	12		18987	95	290	210	+1000	Sericite	grained metasediments	gypsum veinlets parallel to	partial oxidation.
								Schist	cut by quartz-pyrite	schistosity while quartz-	
100	38		18922	66	22	135	810		and gypsum veinlets	pyrite veinlets cross-cut	
									with minor chlorite	it.	
150	50	NO SAMPLE							along fractures.		
200	50		18923	122	24	125	910				
250	50	NO SAMPLE									
300	50		18924	82	19	175	620				
350	50		18925	85	22	145	580				
400	50		18926	73	24	90	300				
450	50		18927	72	30	80	250				
500	50		18928	73	32	95	260				
533	33		18929	66	34	95	260				
		NX CORE									
550	17	100%	18988	90	50	60	200	Porphyro-	Dark grey, subhedral	Pyrite, very minor epidote	Unoxidized, 5-7% pyrite, mostly in vein-
								blastic	feldspar, chlorite and	and quartz, possible clay.	lets parallel to schistosity; minor chal-
								Schist	clay along schist planes.	2" epidote-quartz-pyrite	copyrite-bornite tarnish; numerous epidote-
									1" quartz vein at 556'	vein at 560'.	quartz-pyrite veinlets cross-cut schistosity.

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
550											
600	50	80%	B18989	250	45	100	185	Porphyro-blastic Schist		Most former feldspar replaced by epidote.	
634									Minor brecciation		
650	50	100%	B18990	80	41	85	155				
663	13		B18991	40	31	50	300				
		NOT SALVAGED									
709								Quartz Sericite Schist	Medium to fine-grained metasediments, cut by calcite veins.		
729								Porphyro-blastic Schist	Dark grey, fine-grained groundmass of quartz and chlorite with sub- to euhedral feldspar.	Quartz-epidote-pyrite veinlets and epidote replacing former feldspar.	Prominent vein at 738'.
750	50	40%	B18992	145	87	62	170				
800	50	60%	B18993	65	50	45	135				
										Massive chlorite associated with pyrite veinlets.	10-20% pyrite disseminated and in veinlets.
850	50	60%	B18994	110	55	80	740				
									Core is badly shattered below 785'.		

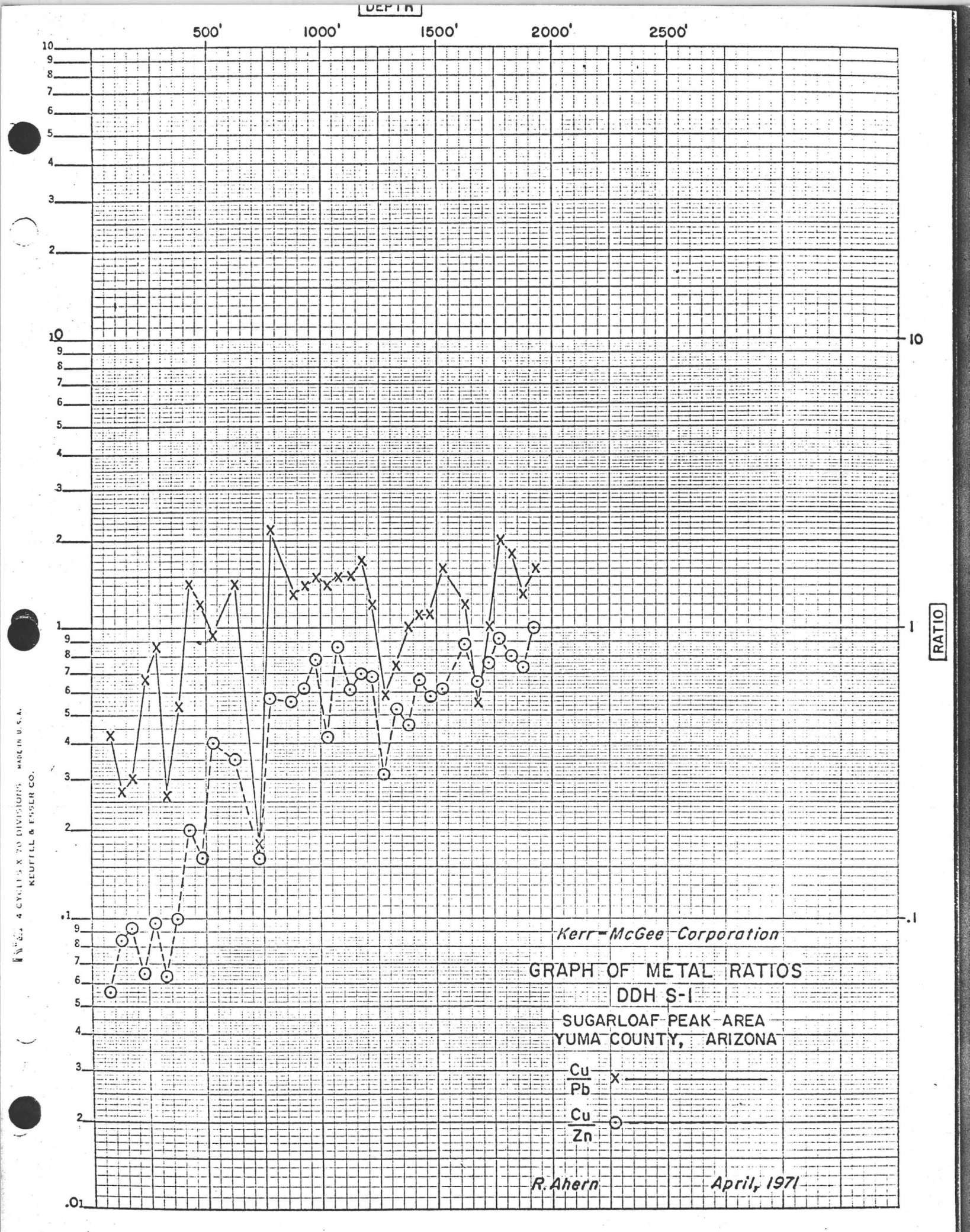
Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
900	50	60%	B18995	10	52	75	225	Porphyblastic Schist	Medium-grey.	Chlorite-quartz-epidote-chlorite is in 1/8 to 1/2" borders along pyrite and quartz-pyrite veins, epidote with quartz-pyrite veins and replacing feldspar, occasional calcite veinlets.	5-10% pyrite, occasional 1-2" pyrite-quartz-epidote veins.
950	50	80%	B18996	100	75	50	130				
1000	50	20%	B18997	70	45	35	85				
1050	50	30%	B18998	90	155	130	205				
* 1050			14749	60	5	110	216				
1065	15	100%	B18999	70	155	155	140				
	-----	NOT SALVAGED	-----								
1116								Quartz-Sericite Schist with Local Brecciation	Thin-bedded, obscurring original texture. Core is dense and massive. Sericite-clay along fractures.	Epidote replacing feldspar, quartz flooding.	Pyrite veinlets in schist planes.
1150	34	90%	B19000	100	44	40	115				
1200	50	20%	C18901	160	75	65	125				
1250	50	40%	C18902	110	40	35	95				
1300	50	40%	C18903	75	53	35	60	Schist Breccia	Fragments of up to several inches in quartz-sericite-chlorite matrix.	Quartz-epidote-gypsum.	Pyrite filling fracture plane bounding and cutting through breccia fragments.
1350	15	100%	C18904	115	87	55	85				
1407											
1450	43	80%	C18905	145	46	60	115			Quartz-chlorite-calcite veins.	Prominent quartz-pyrite veins exhibit good chalcopyrite tarnish.
1500	50	40%	C18906	650	67	55	90				
1550	50		C18907	620	56	155	95				
	-----	NOT SALVAGED	-----								
1600								Quartz Sericite Schist Breccia	Medium to dark grey, mottled looking with veinlets and fractures abundant.	Quartz-chlorite-pyrite.	5-10% pyrite with occasional 1-2" quartz-pyrite veins.
1650			C18908	165	96	35	70				
	-----	NOT SALVAGED	-----								

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
1737								Quartz Sericite Schist	Dark grey fine-grained chlorite and calcite lining fractures; mottled breccia appearing on outside surface.	Quartz-epidote-chlorite; quartz-pyrite veinlets.	Pyrite and quartz-pyrite veinlets cross-cutting schist.
1747	10	100%	C18909	215	55	40	55				
1764											
1784	20	90%	C18910	250	150	40	90				
	-----	NOT SALVAGED	-----								
1867										Occasional calcite veins, chlorite lined fractures abundant.	Low sulfide content, 3-5%.
1900	33	80%	C18911	205	155	35	60				
1950	50	30%	C18912	250	120	45	80				
2000	50	30%	C18913	175	68	40	65		3' quartz vein at 1990' bounded by zones of abundant chlorite.		
	-----	BX CORE	-----								
2050	50	60%	C18914	285	125	50	70			Local zones of intense silication and pyritization.	
2100	50	60%	C18915	320	117	50	50				
2125								Schist Breccia	Scattered zones of porphyroblasts.	Quartz-epidote-chlorite.	
2150	50	80%	C18916	110	34	25	70				
2200	50	10%	C18917	155	29	350	240				
2250	50	80%	C18918	205	45	40	75			More numerous quartz-epidote pyrite vein zones and sinuous fractured filled veins with fine-grained quartz and pyrite.	Quartz-pyrite veins exhibit minor occurrences of molybdenum.
2300	50	100%	C18919	185	330	45	175				
2350	50	70%	C18920	185	57	15	85	Massive Quartz Sericite Schist	No visible brecciation + Porphyroblasts not altered.		Very low sulfide content.
2400	50	80%	C18921	200	31	35	100				
2450	50	80%	C18922	110	58	20	165				
2500	50	80%	C18923	130	35	10	95				
2550	50	20%	C18924	115	66	10	100				

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
2558								Quartz Schist	Dense, massive; few fractures coated with chlorite.	Quartz-pyrite-epidote veins numerous.	Pyrite disseminated weakly; and in quartz-pyrite-epidote veinlets.
2600	50	80%	C18925	95	26	10	80				
2650	50	10%	C18926	50	28	10	140				
2700											
2750	50	30%	C18927	105	45	35	55			Quartz-epidote vein 6" at 2756'.	Pyrite 10-20%.
2800	50	80%	C18928	105	27	25	55				
2850	50	60%	C18929	65	40	5	55				
2900	50	20%	C18930	100	26	15	60			Extreme silica flooding; numerous quartz-chlorite-pyrite veinlets; occasional epidote veins.	Minor sphalerite in a few of the pyrite veinlets.
2950	50	100%	C18931	110	44	7	50				
3000	50	40%	C18932	75	29	10	50				
3050	50	60%	C18933	60	34	15	55		Dark grey, dense quartz-chlorite schist.	Numerous quartz and epidote stringers filling fractures.	
3100	50	60%	C18934	175	35	45	75				
* 3110			14750	44	<5	60	104				
3150	50	80%	C18935	550	50	45	90	Schist Breccia	Somewhat shattered; numerous chlorite lined fractures.	Quartz-epidote-pyrite-epidote-quartz matrix and occasional epidote fragments.	
3200	50	80%	C18936	80	28	5	65				
3250	50	100%	C18937	80	27	5	55			Extreme silica flooding at 3260-3280'.	
3280								Chlorite Schist	Horizontal fractures, 5-10 per inch coated with chlorite.		
3300	50	100%	C18938	95	37	10	70				
3319								Porphyroblastic Schist	Dark grey, dense, massive. Former feldspar replaced by epidote, quartz-pyrite and quartz-epidote fracture fillings.		Occasional 1" quartz-epidote-pyrite veinlets contain sphalerite and rare molybdenite.
3350	50	100%	C18939	215	43	15	65				

District Quartzite-Sugarloaf Hole Number DDH SL-15 Page Number 6 of 6

Depth	Int.	%Core Recvy	Samp. No.	Assays Cu ppm	Mo ppm	Pb ppm	Zn ppm	Rock Type	Rock Description	Alteration	Mineralization
3377								Quartz Schist	Dark grey, dense, massive, very siliceous.	Quartz-epidote-pyrite.	Very low sulfide content.
3400	50	80%	C18940	190	33	20	80				
* 3425			14751	280	5	30	152				
3430								Quartz Sericite Schist	Dark grey, minor fracturing; breccia texture on outer surface.		
3440	10	100%	C18941	115	35	15	75				
3455											
3500	45	25%	C18942	110	36	20	110		Local highly fractured zones exhibit abundant chlorite.		Occasional quartz-pyrite veins.
3550	50	30%	C18943	160	64	30	70				
3600	50	20%	C18944	320	39	20	70				
3650	50	15%	C18945	190	43	20	95				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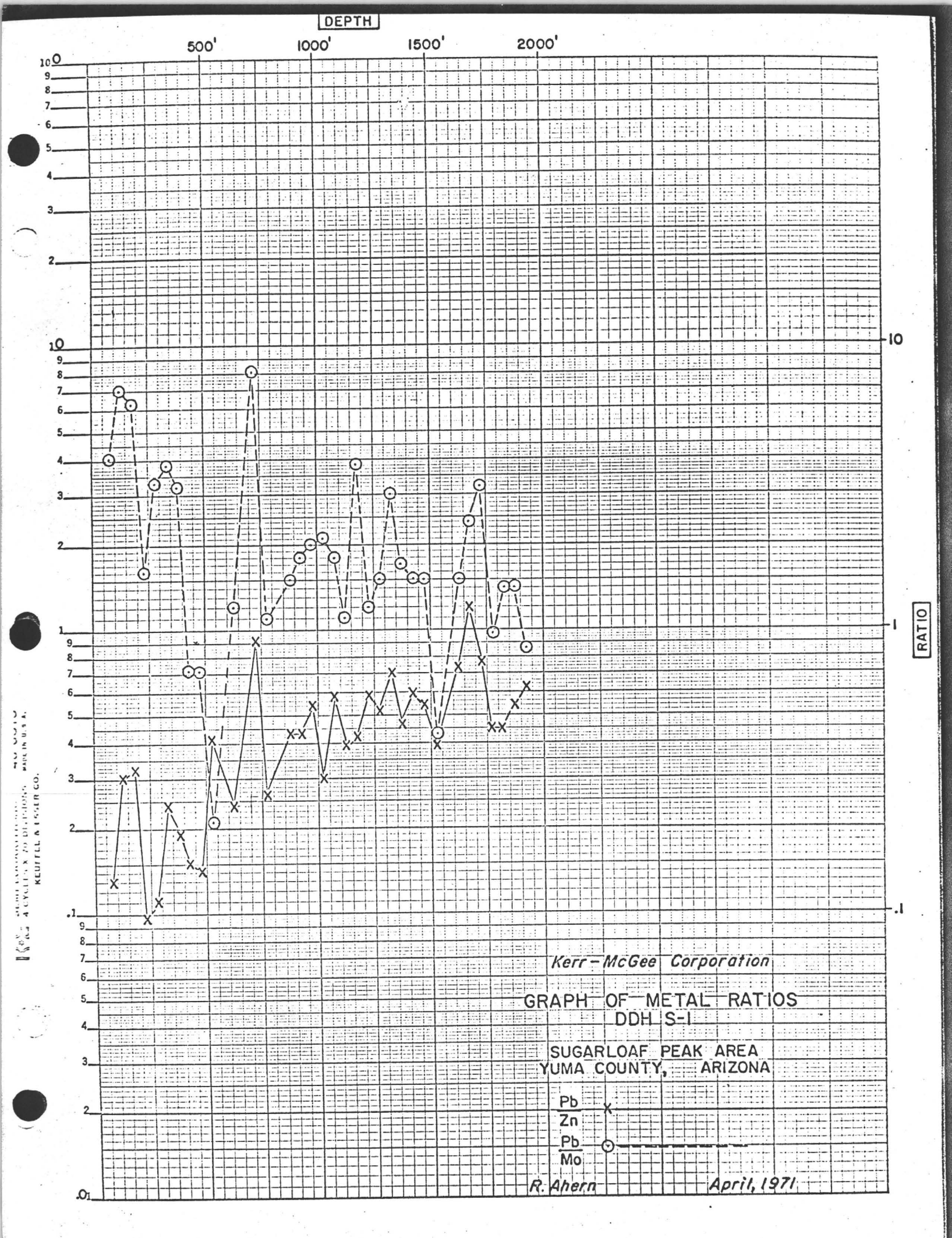
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Cu/Pb
Cu/Zn
R. Ahern
April, 1971
KEUFFEL & ESSER CO. MADE IN U.S.A.
4 CYCLES X 70 DIVISIONS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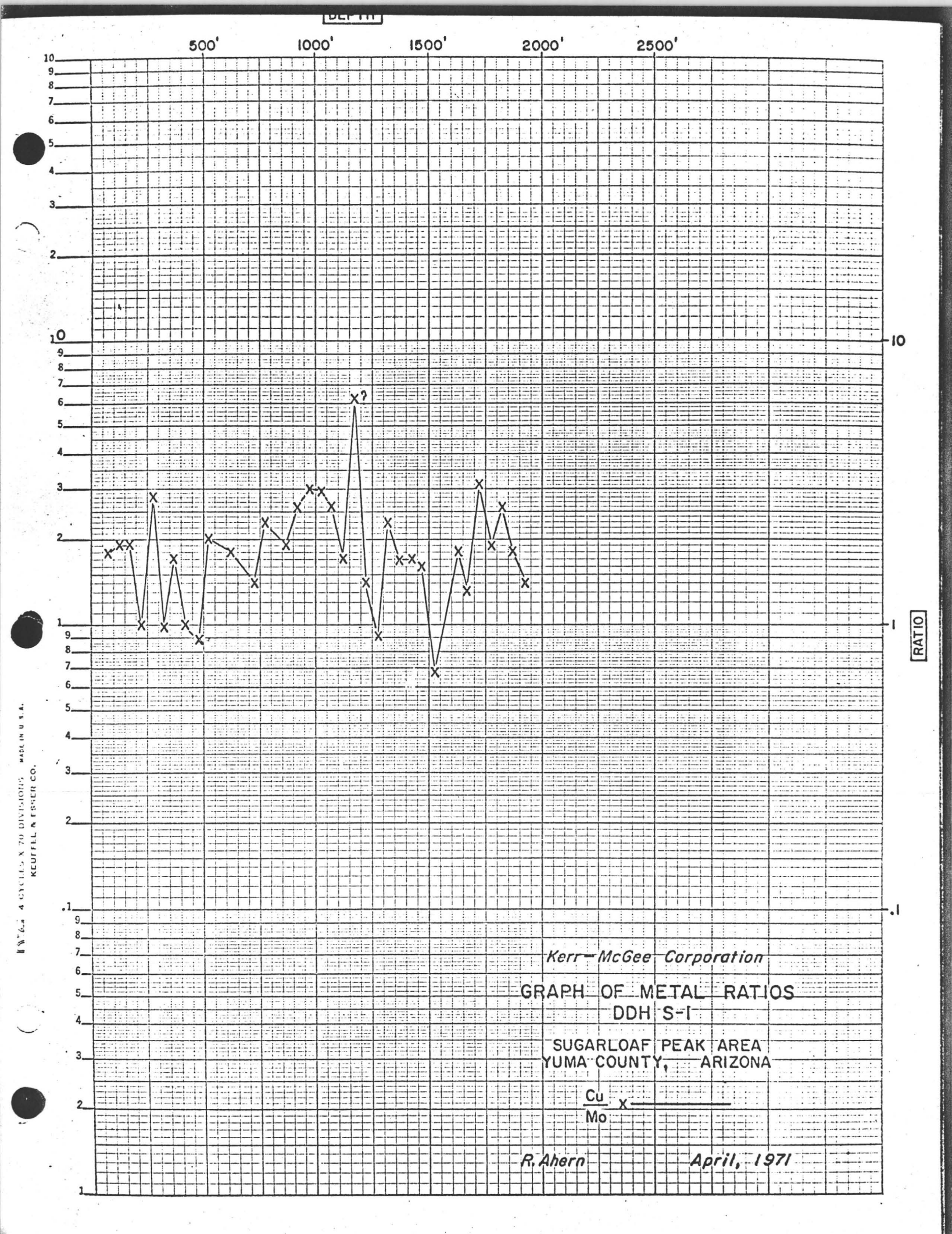
YUMA COUNTY, ARIZONA
Pb/Zn
Pb/Mo
R. Ahern
April, 1971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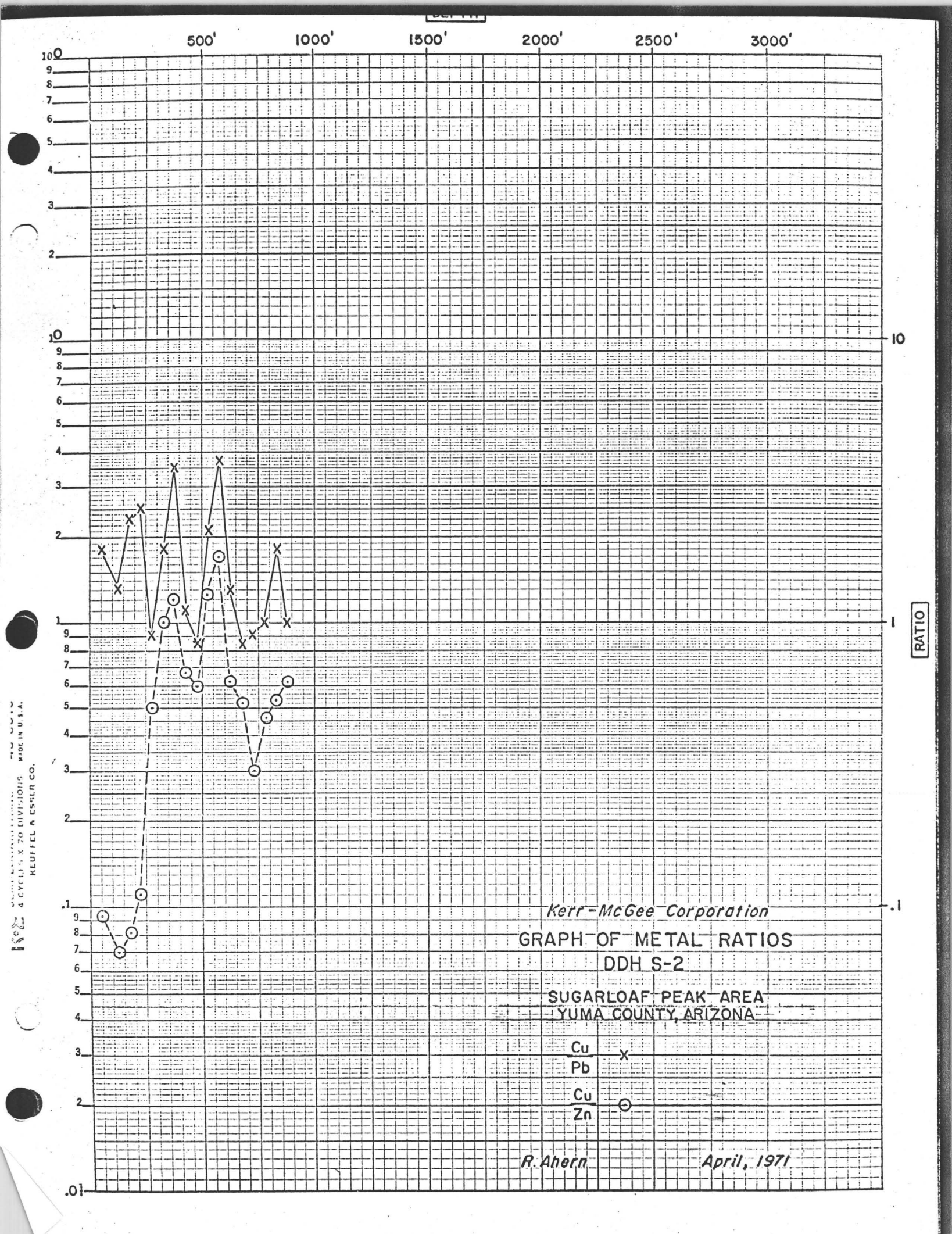
Cu/Mo x
R. Ahern
April, 1971
KEUFFEL & ESSER CO.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Cu/Pb
Cu/Zn
R. Ahern
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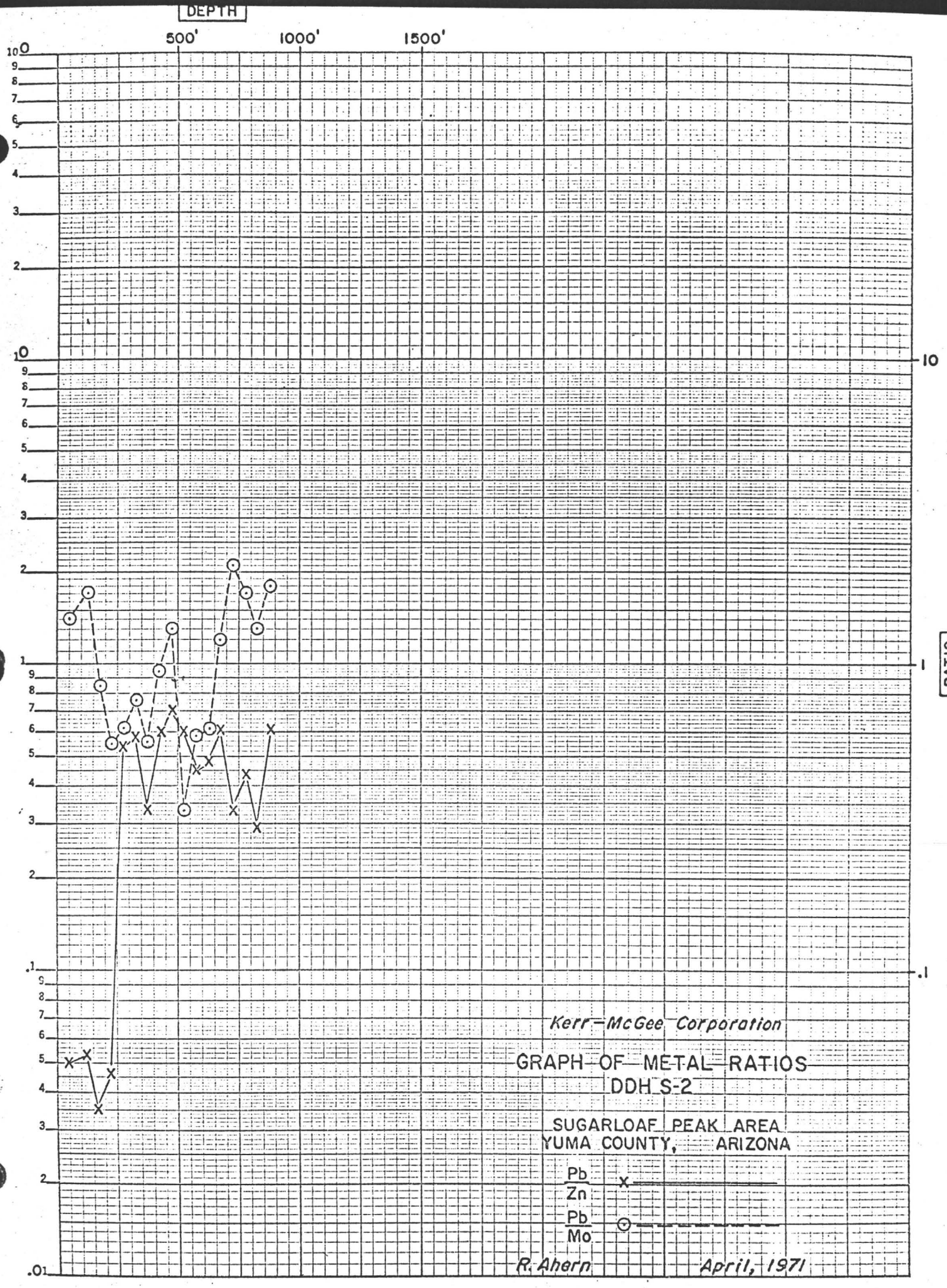
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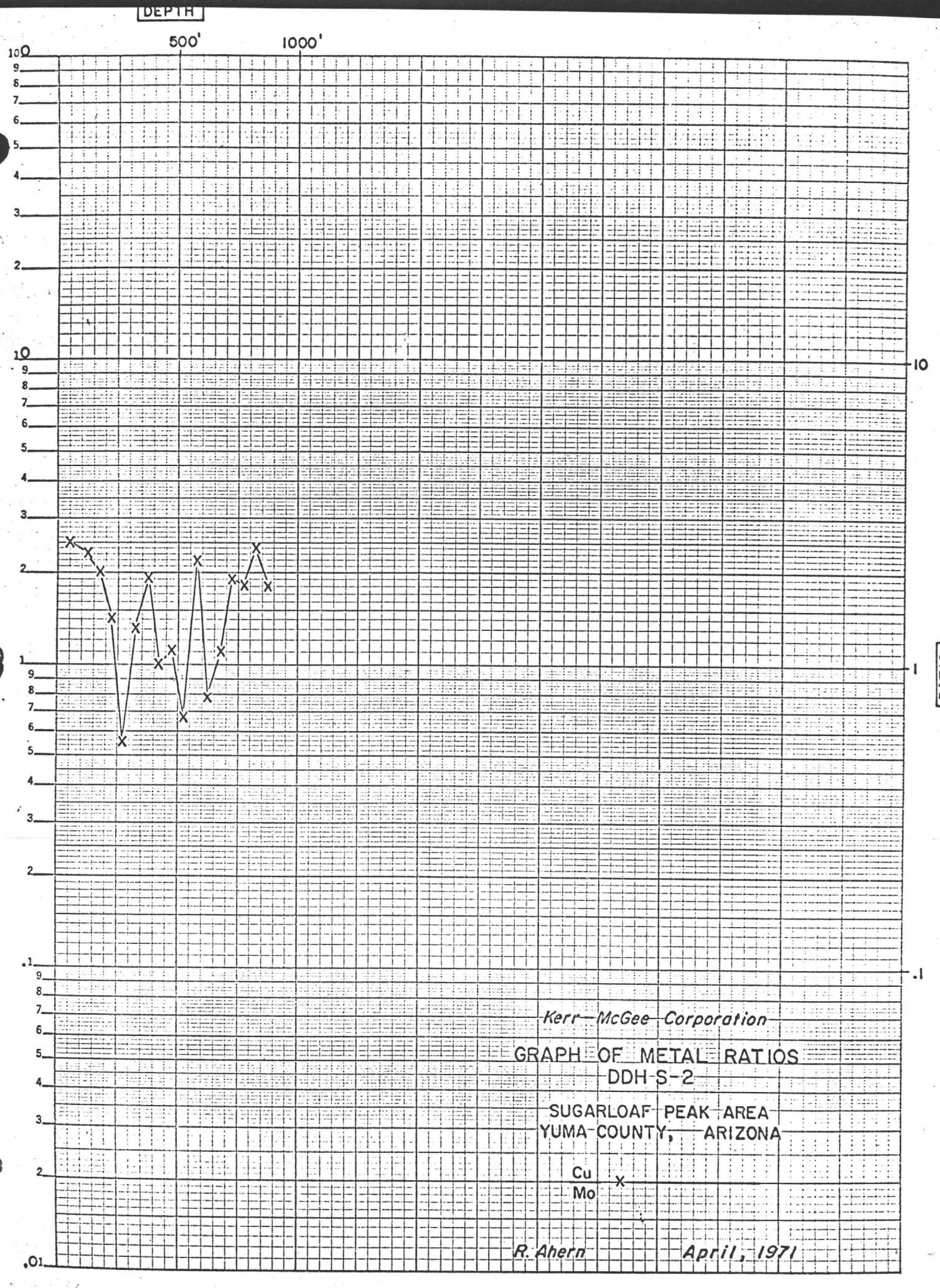
April, 1971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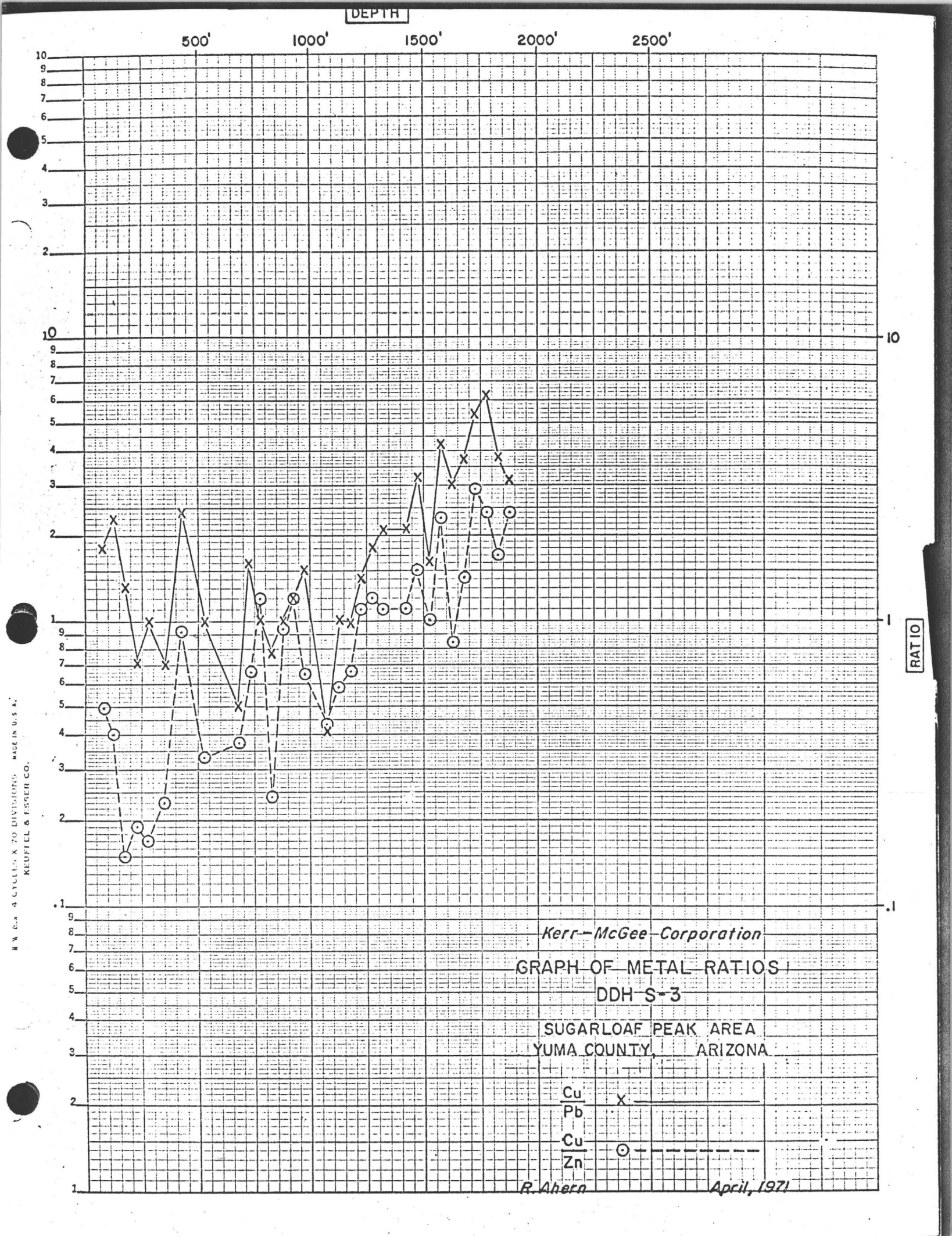
April, 1971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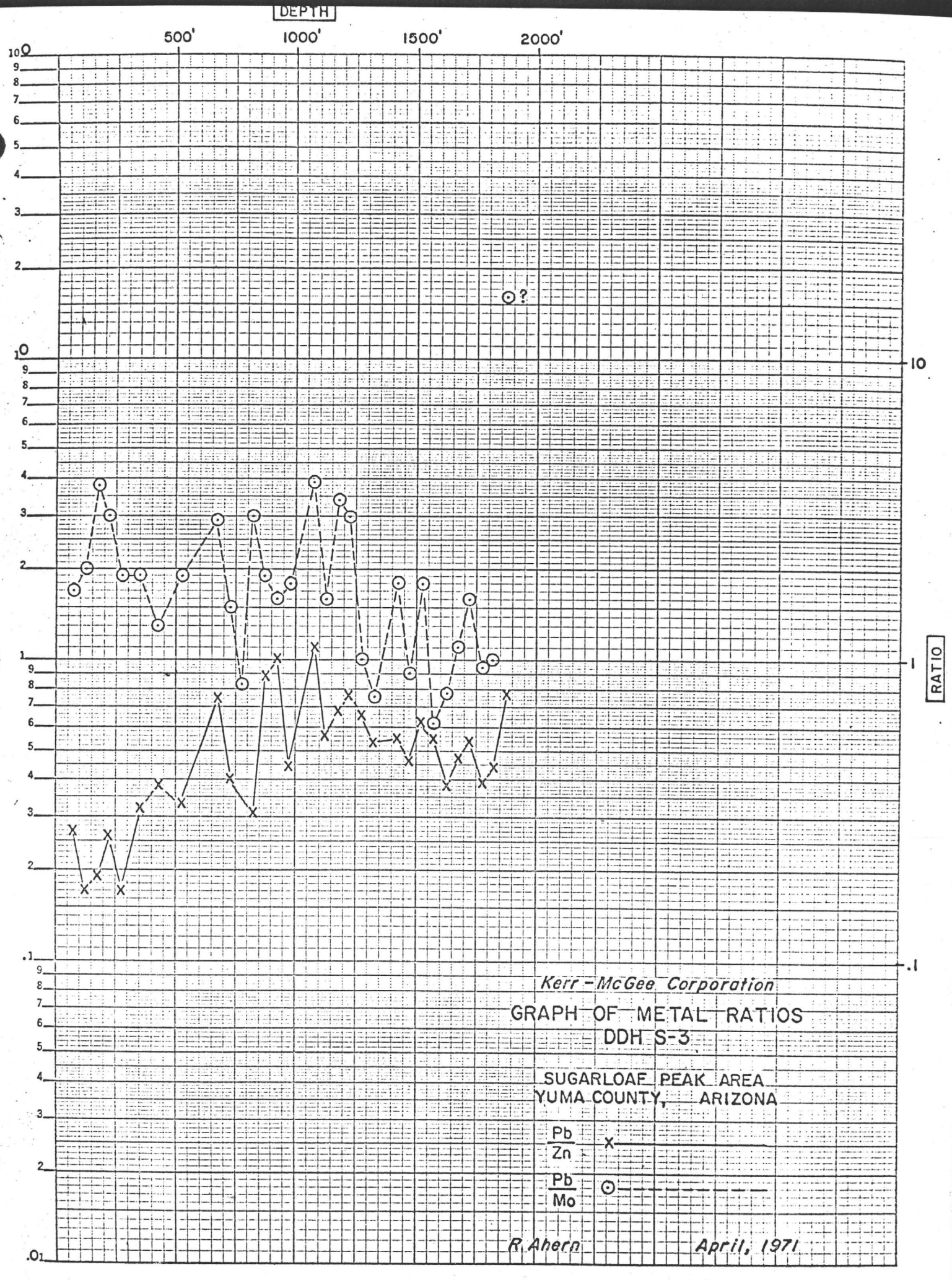
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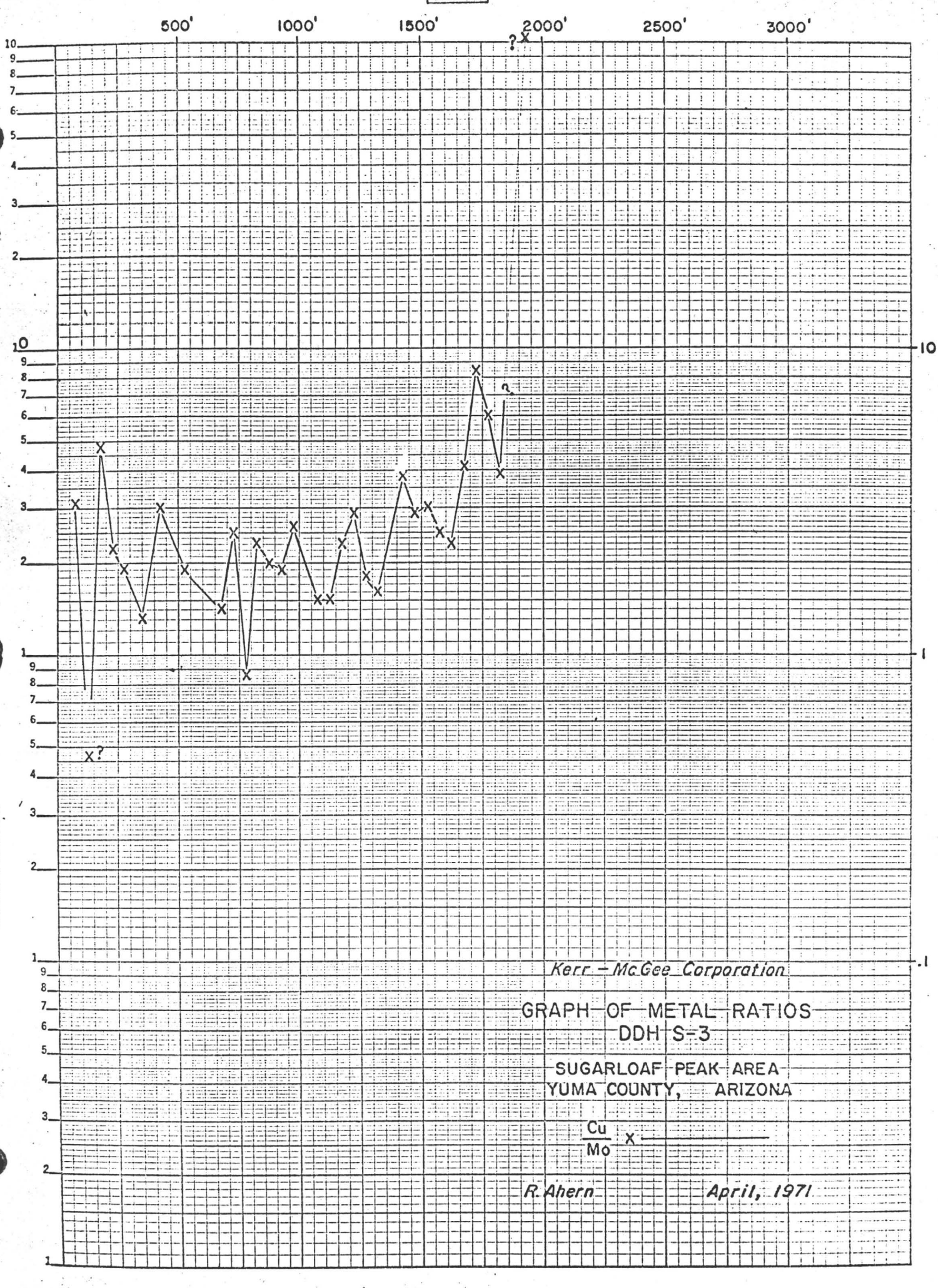
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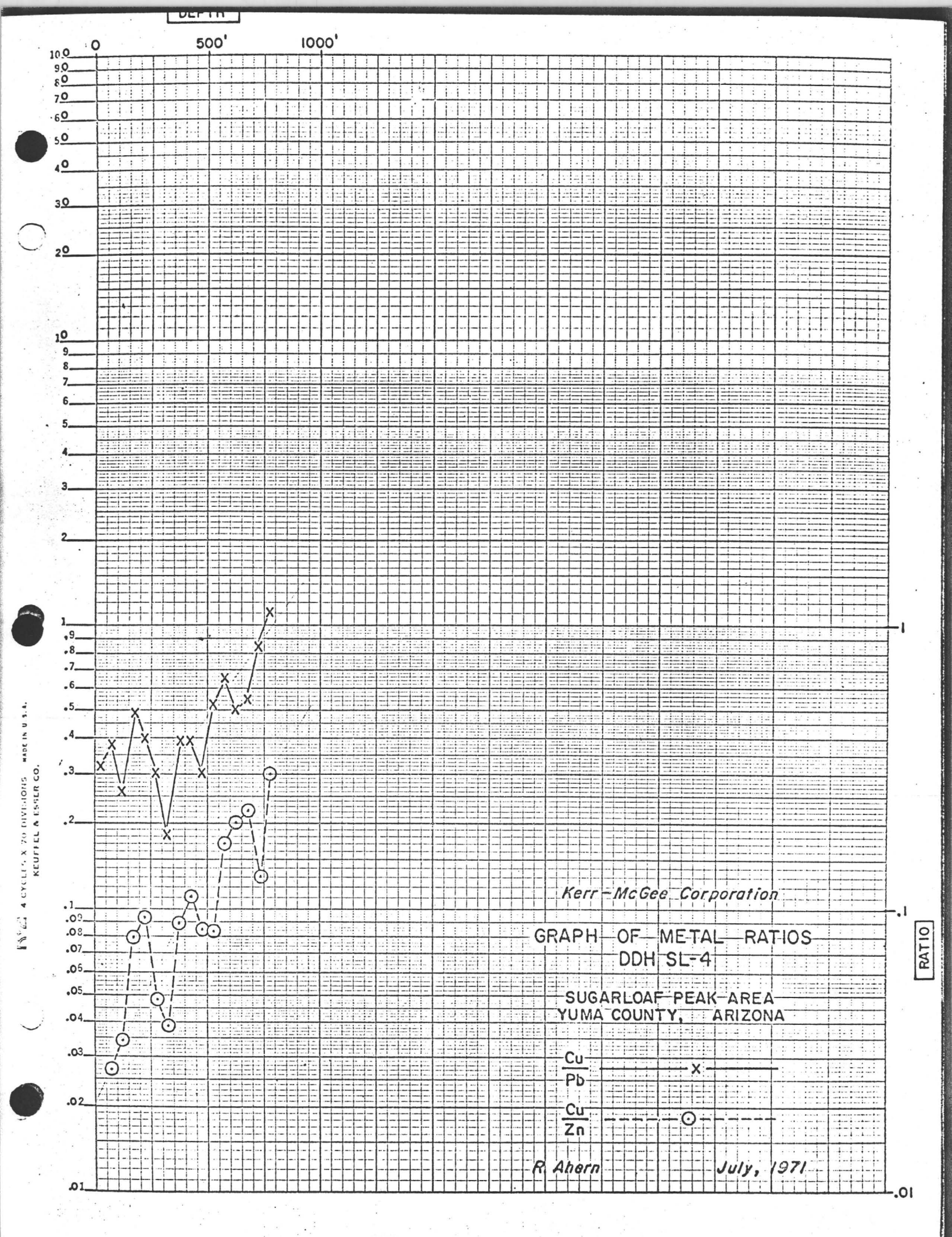
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KEUFFEL & ESSER CO.
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YUMA COUNTY, ARIZONA
Cu/Pb
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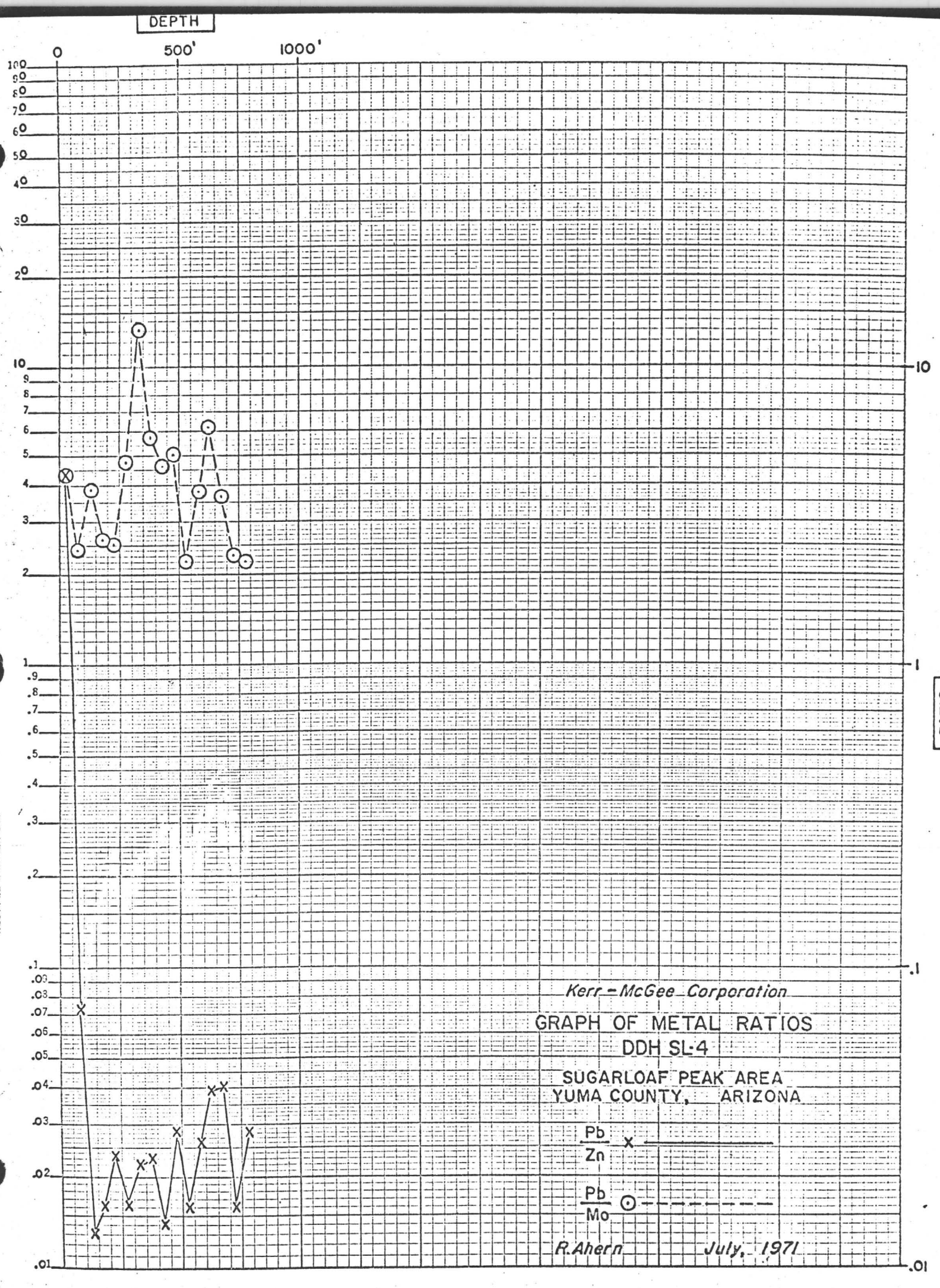
R. Ahern
July, 1971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YUMA COUNTY, ARIZONA
Pb/Zn x
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R.Ahern July, 1971
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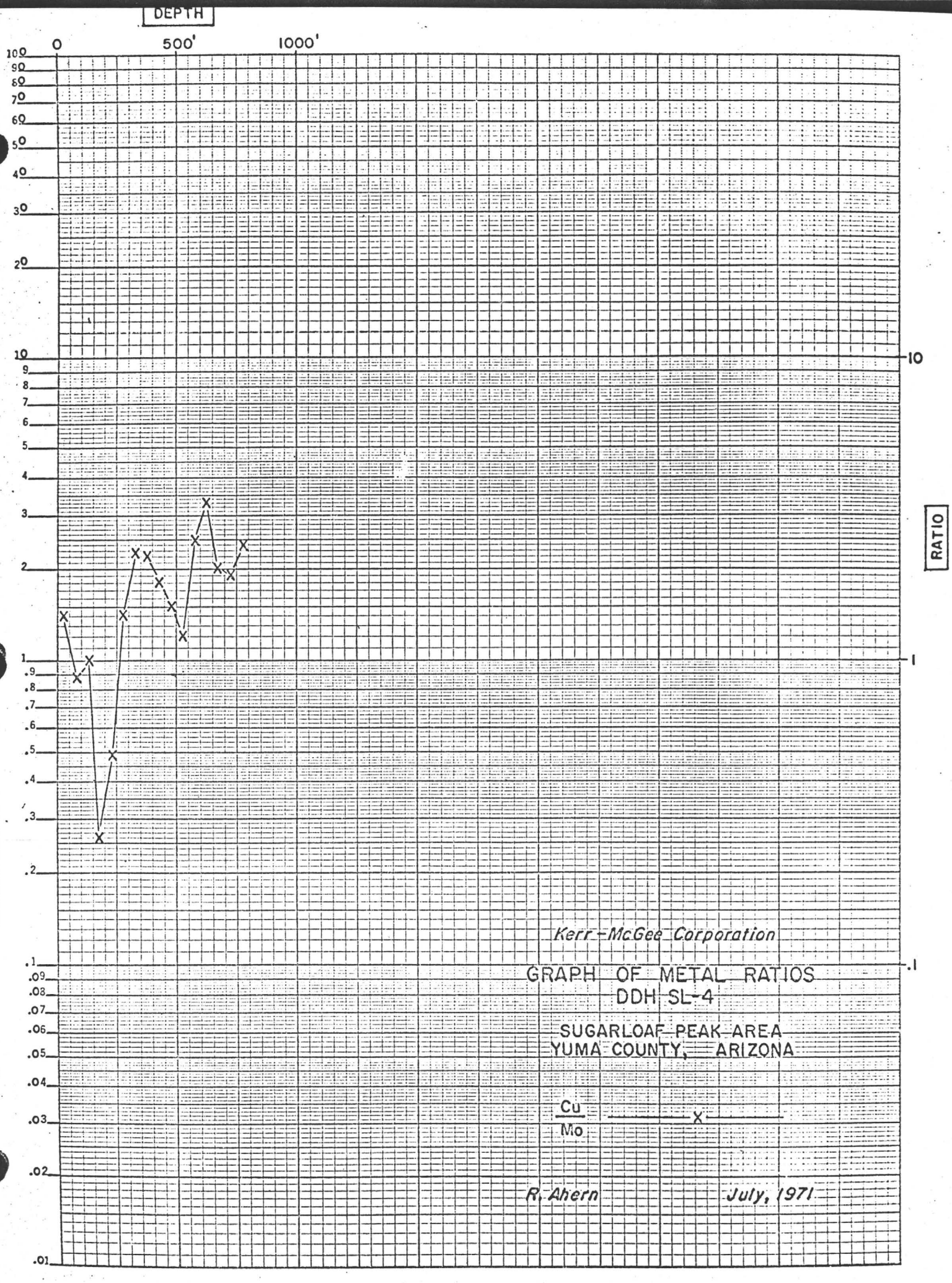
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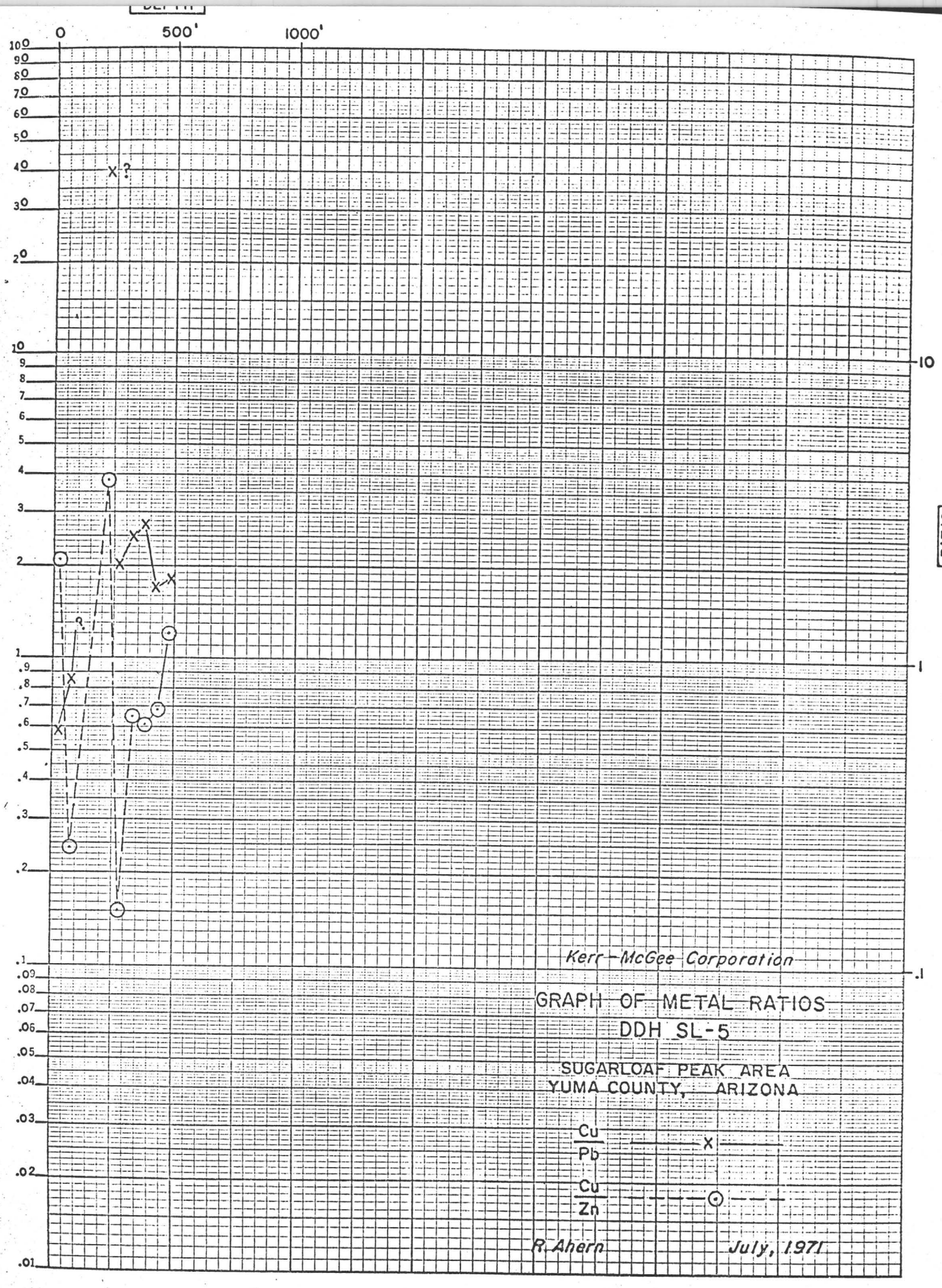
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GRAPH OF METAL RATIOS
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Cu/Pb
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R. Ahern
July, 1971
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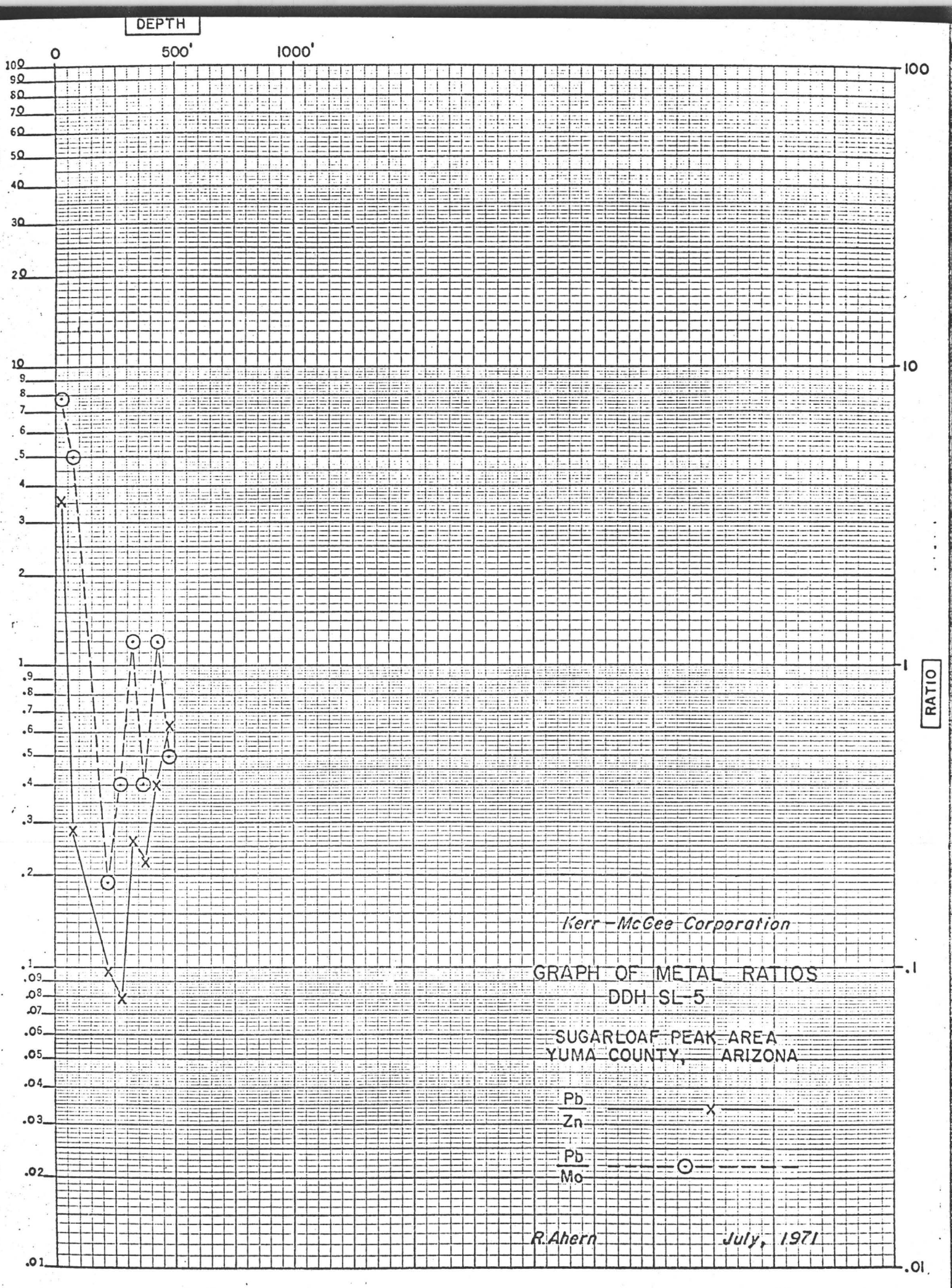
4 CYCLES X 70 DIVISIONS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July, 1971
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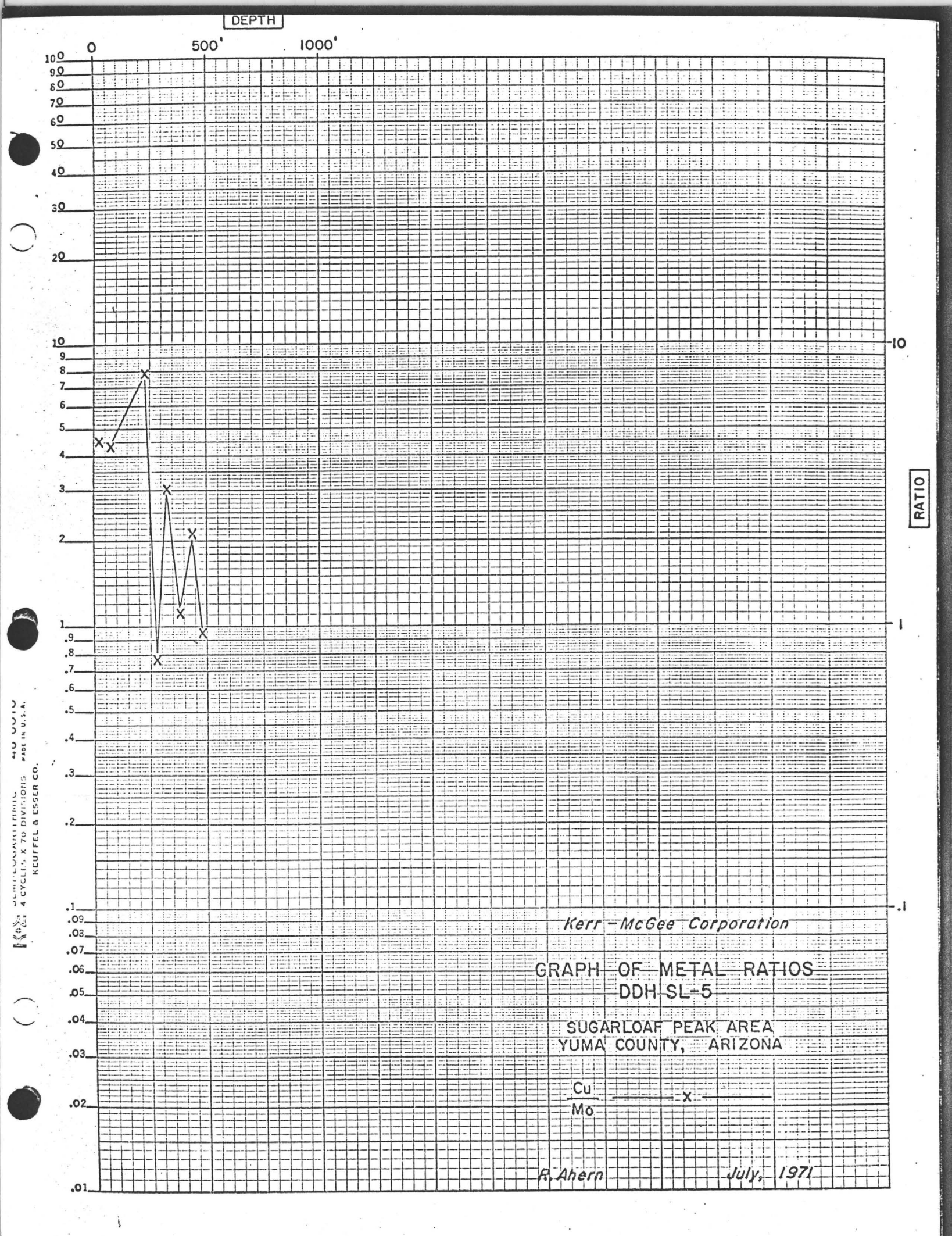
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GRAPH OF METAL RATIOS
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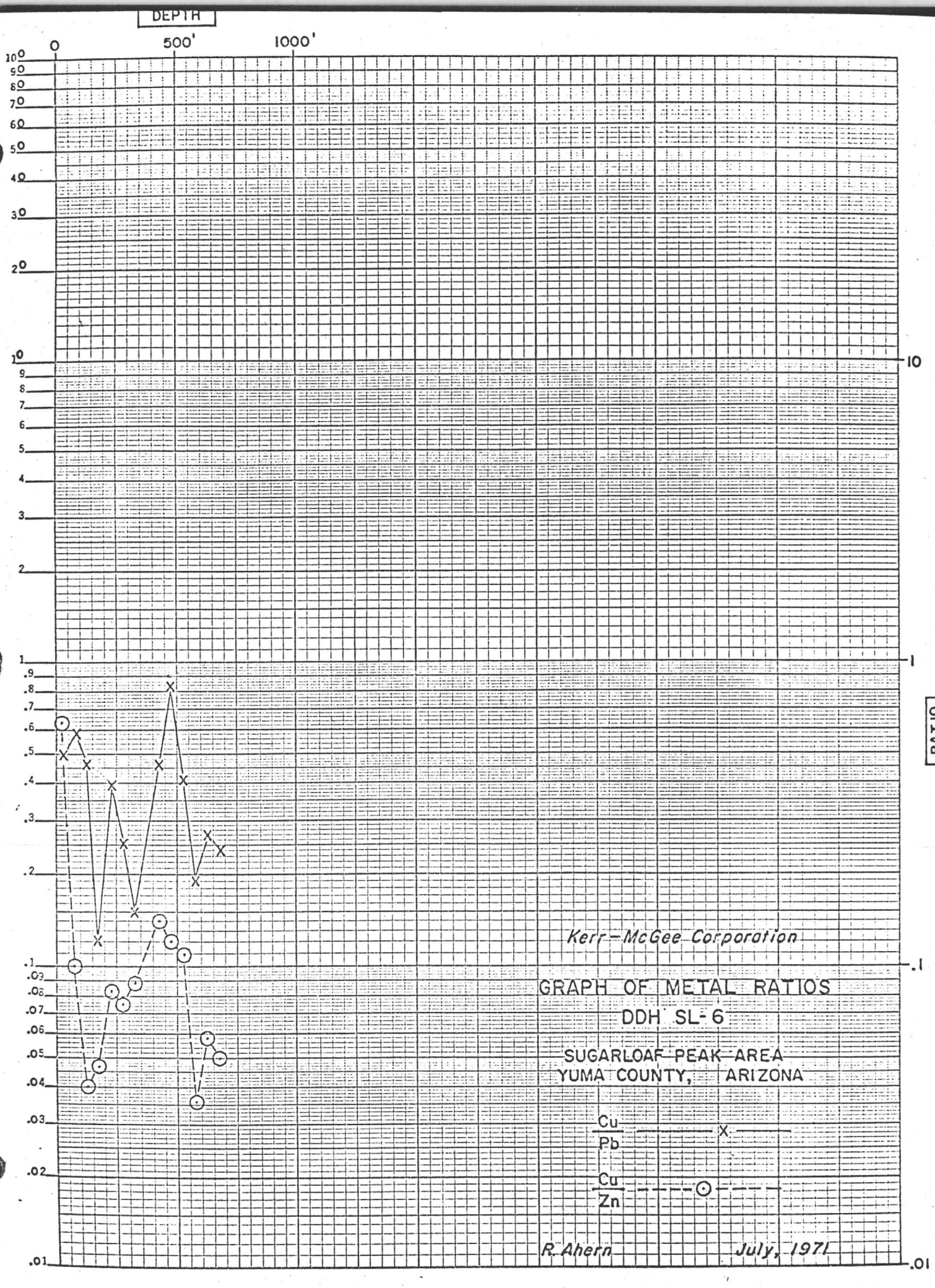
July, 1971
KEUFFEL & ESSER CO.
MADE IN U.S.A.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Cu/Pb
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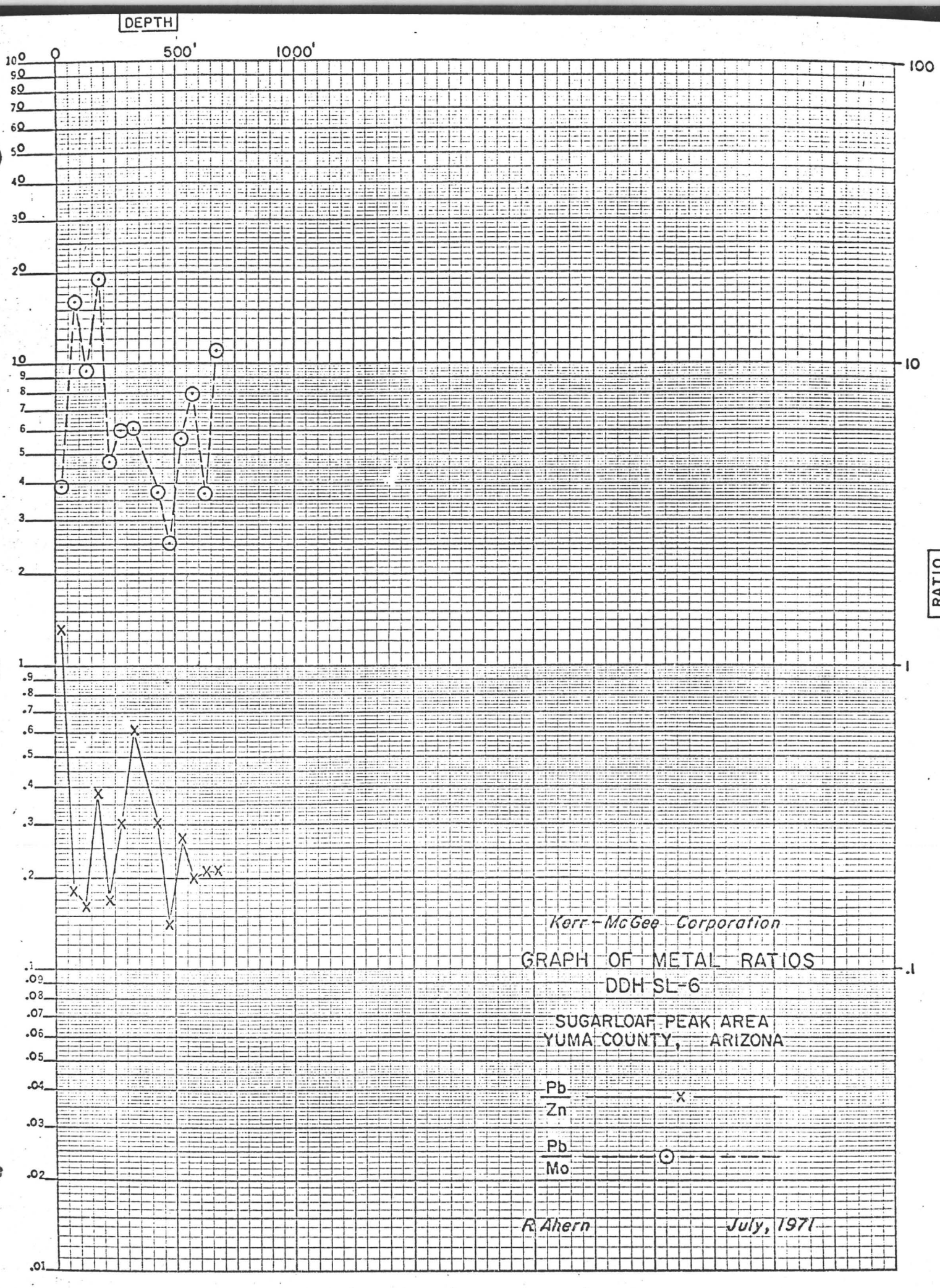
R. Ahern
July, 1971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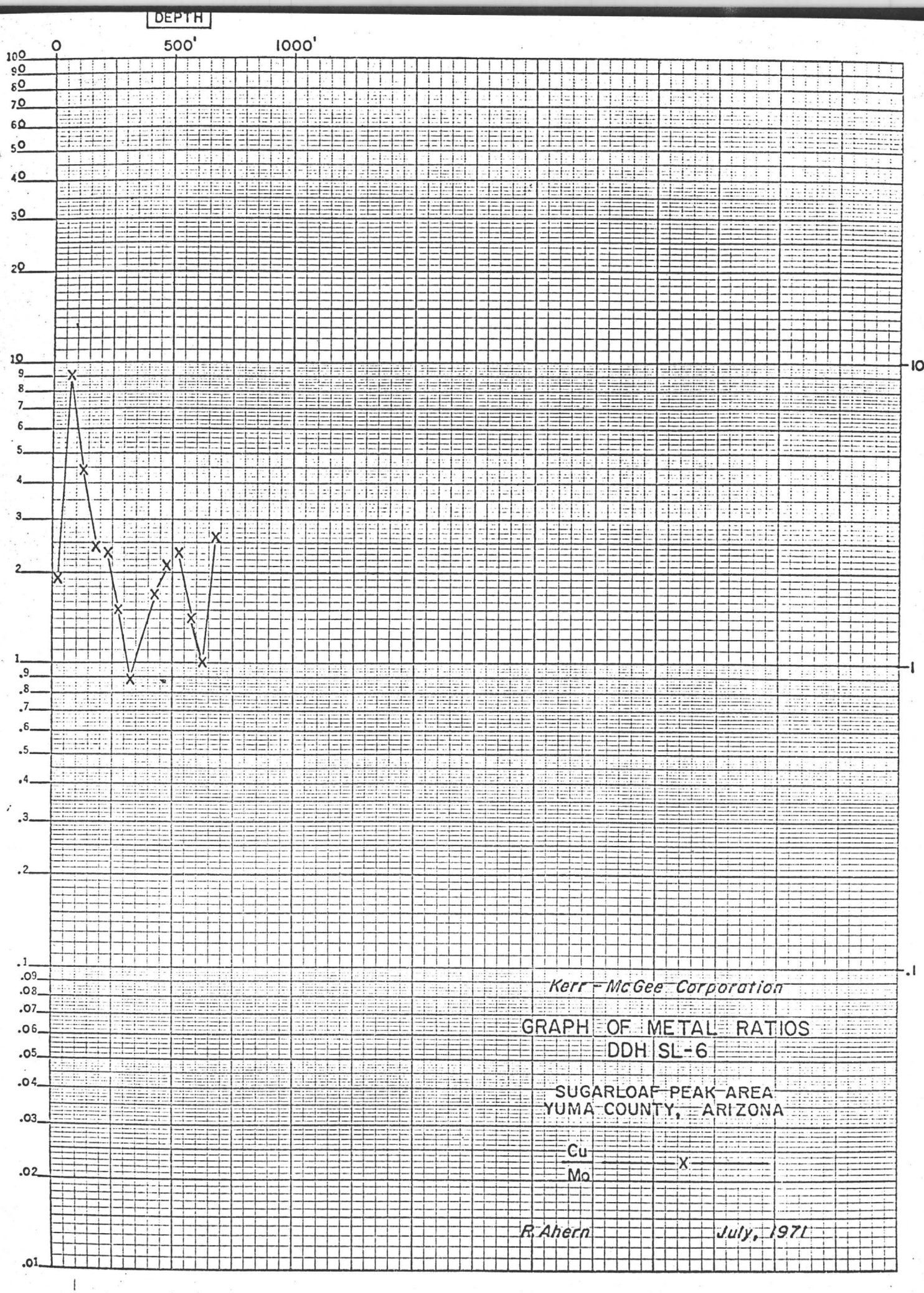
Pb/Zn
Pb/Mo
R Ahern
July, 1971



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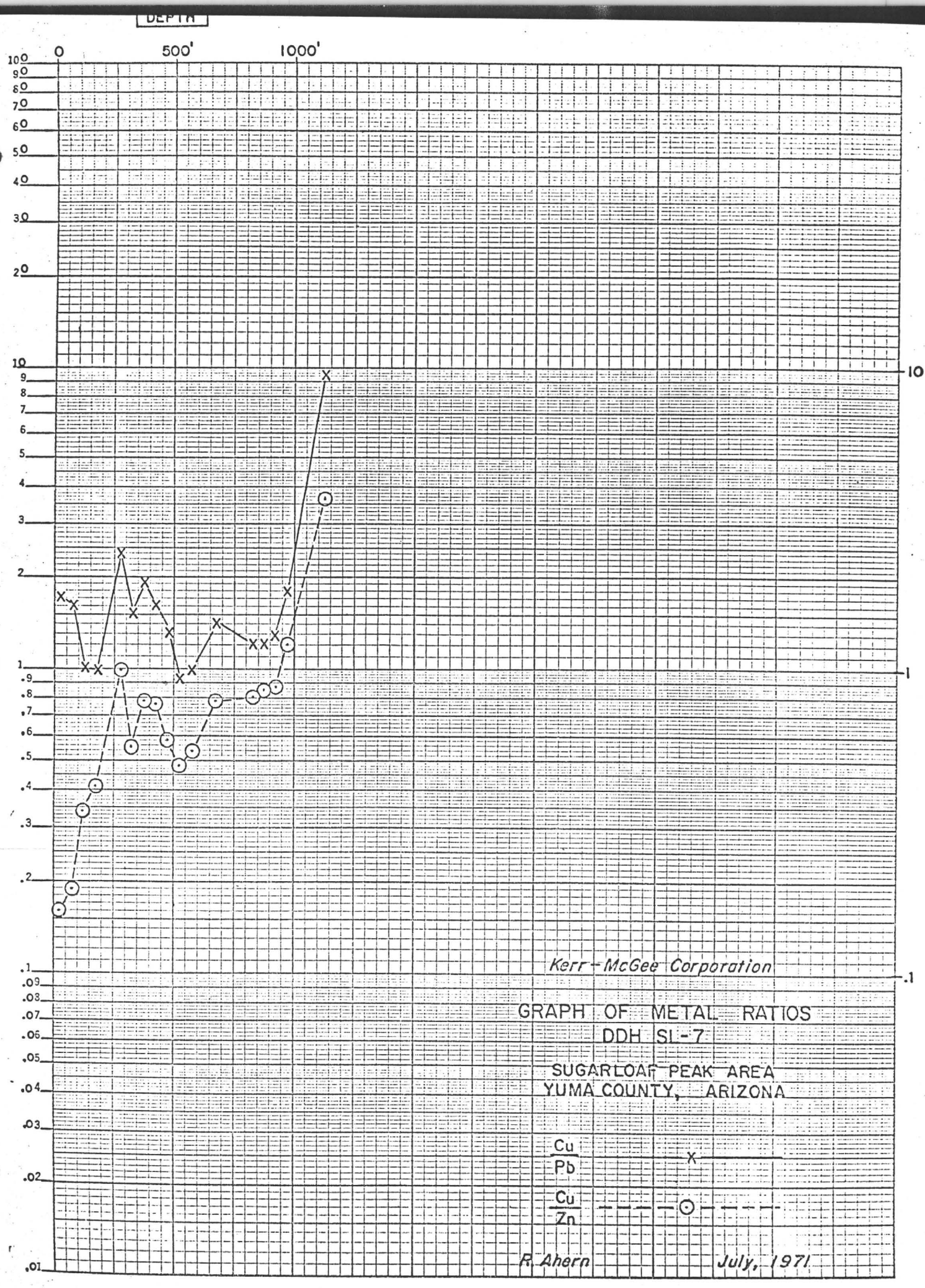
KEUFFEL & ESSER CO.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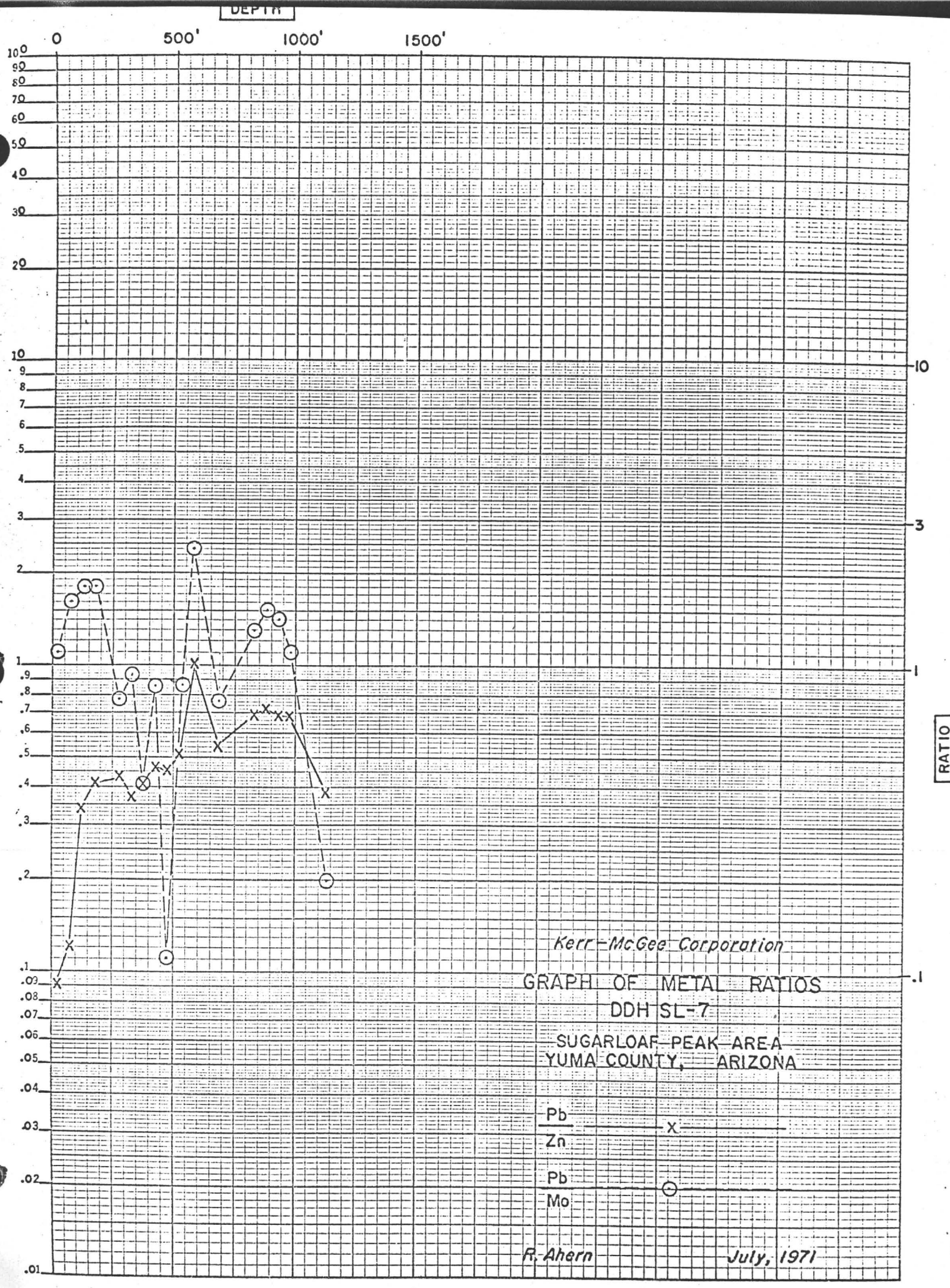
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
DDH SL-7
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Cu/Pb
Cu/Zn
R. Ahern
July, 1971
KEUFFEL & ESSER CO.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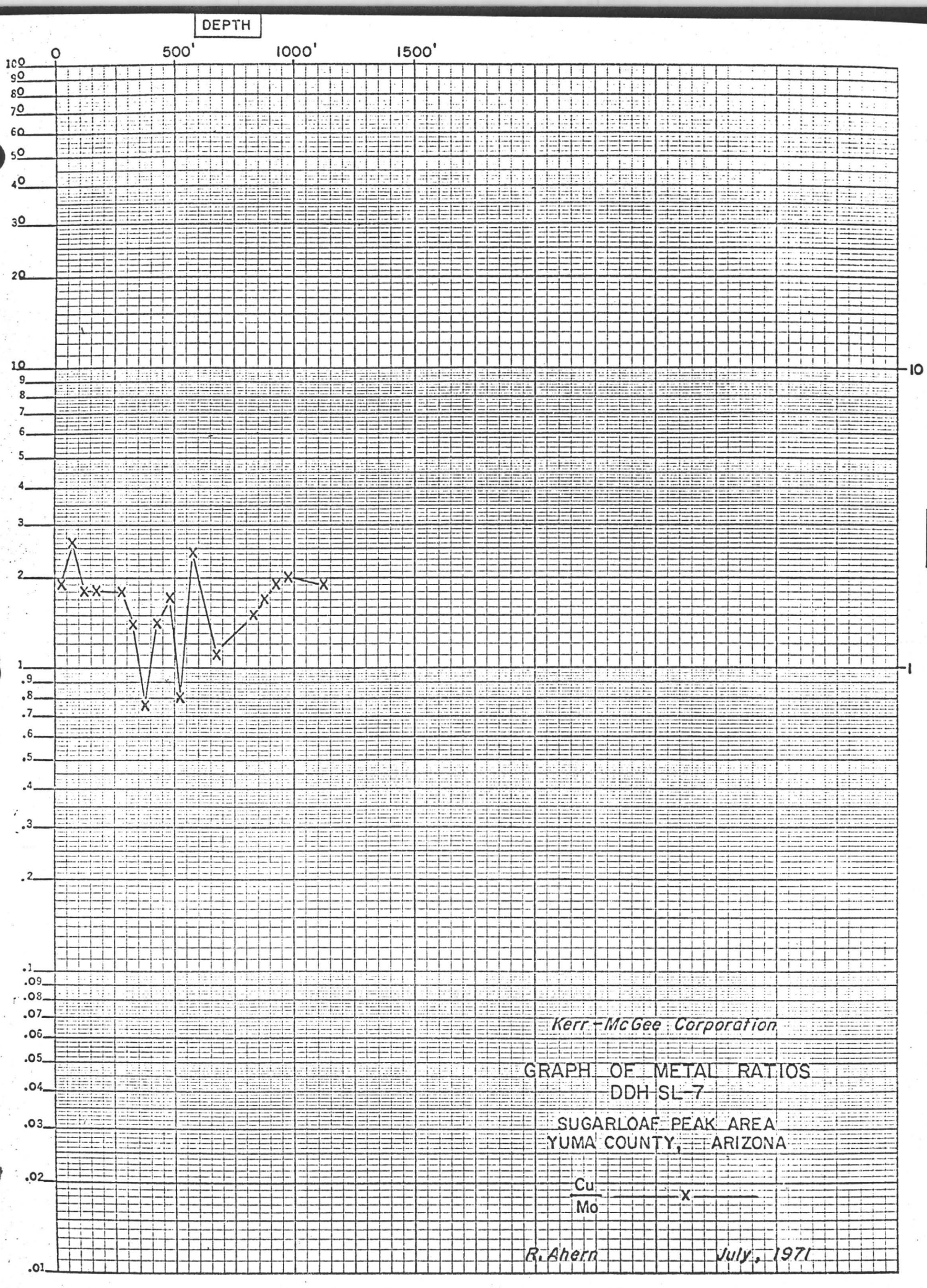
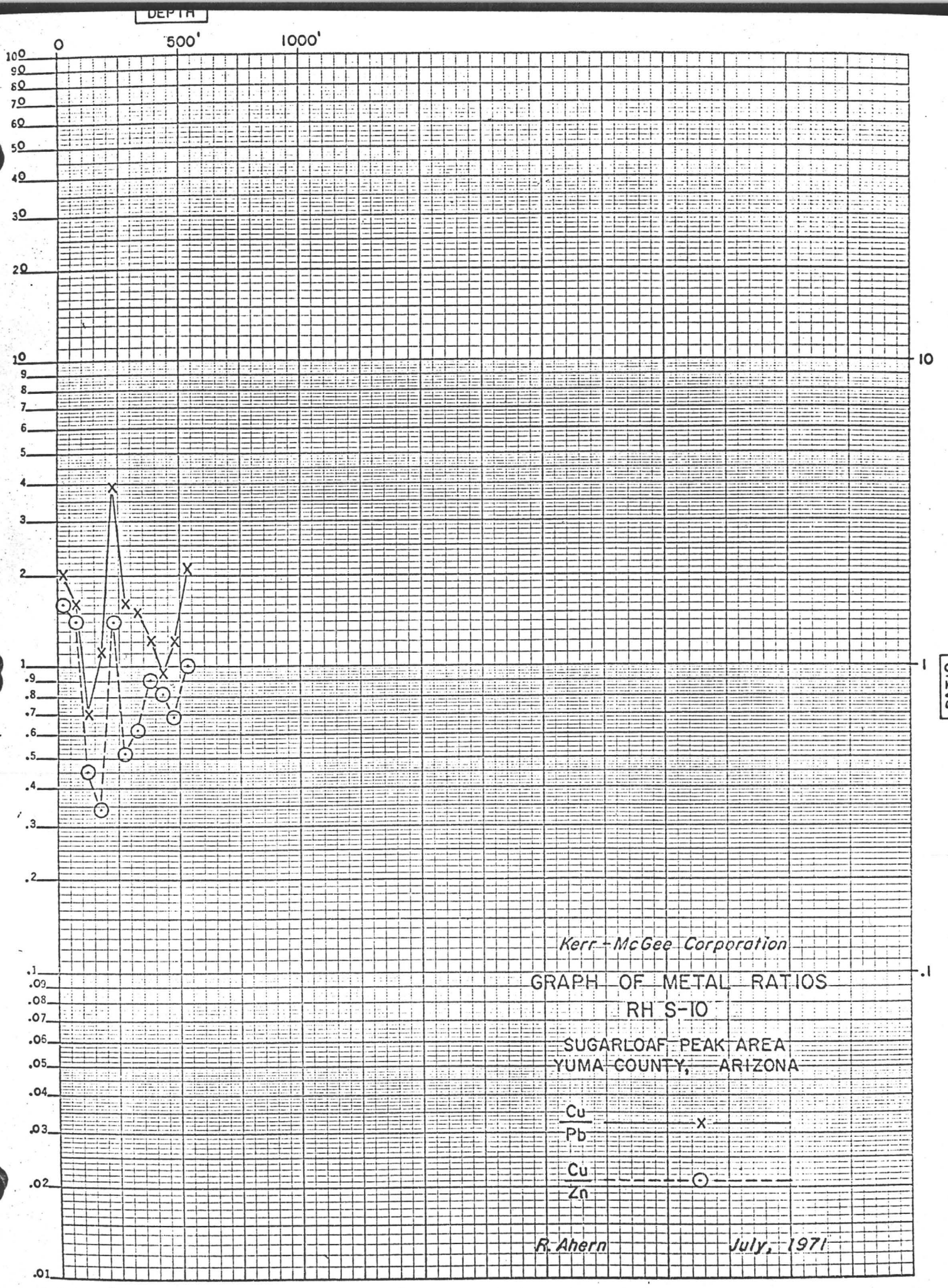
RATIO
KLUFFEL & ESSLER CO.
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
DDH SL-7
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Pb/Zn
Pb/Mo
R. Ahern
July, 1971



4 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.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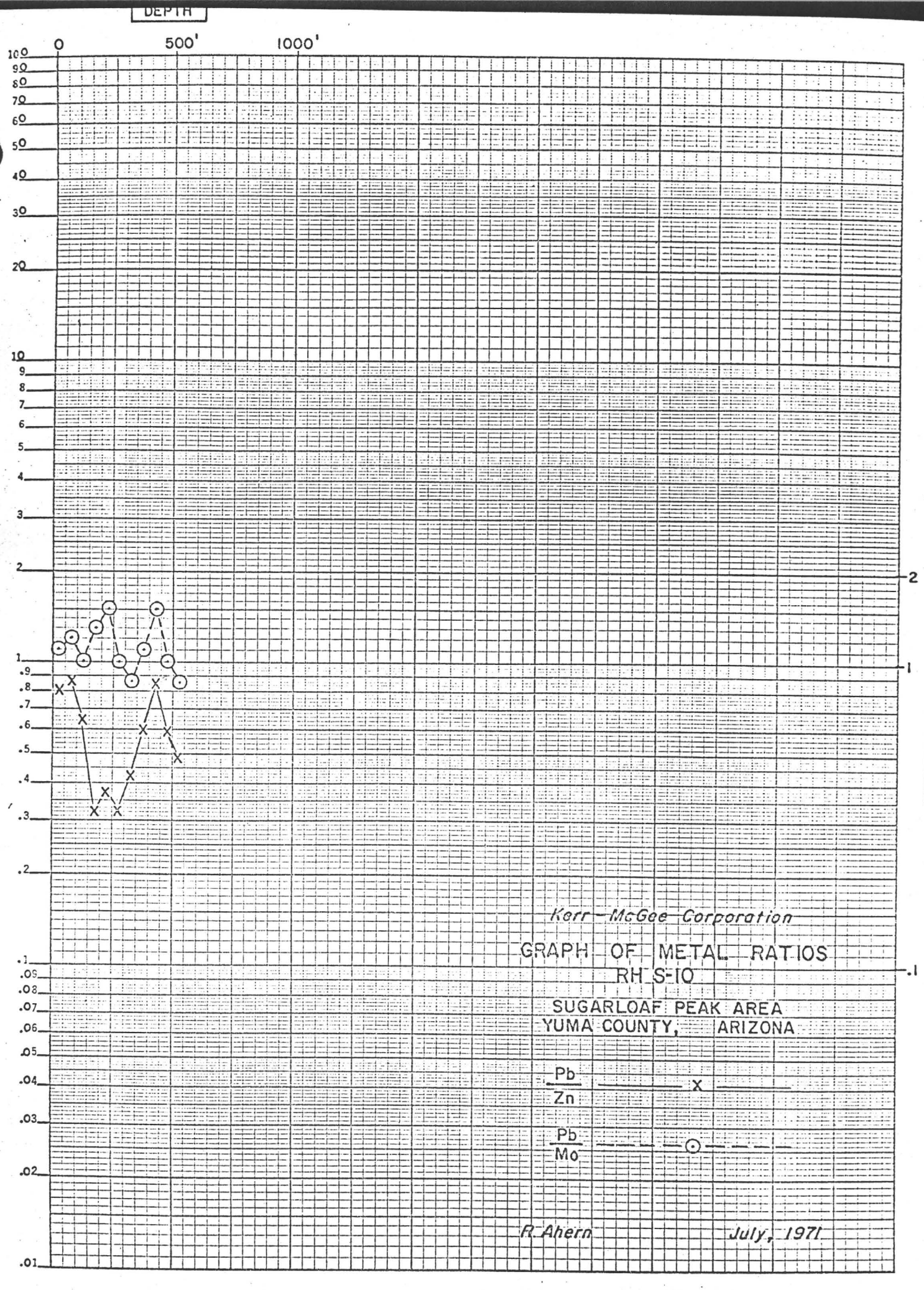
RATIO
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
RH S-10
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Cu/Pb
Cu/Zn
R. Ahern
July, 1971
4 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.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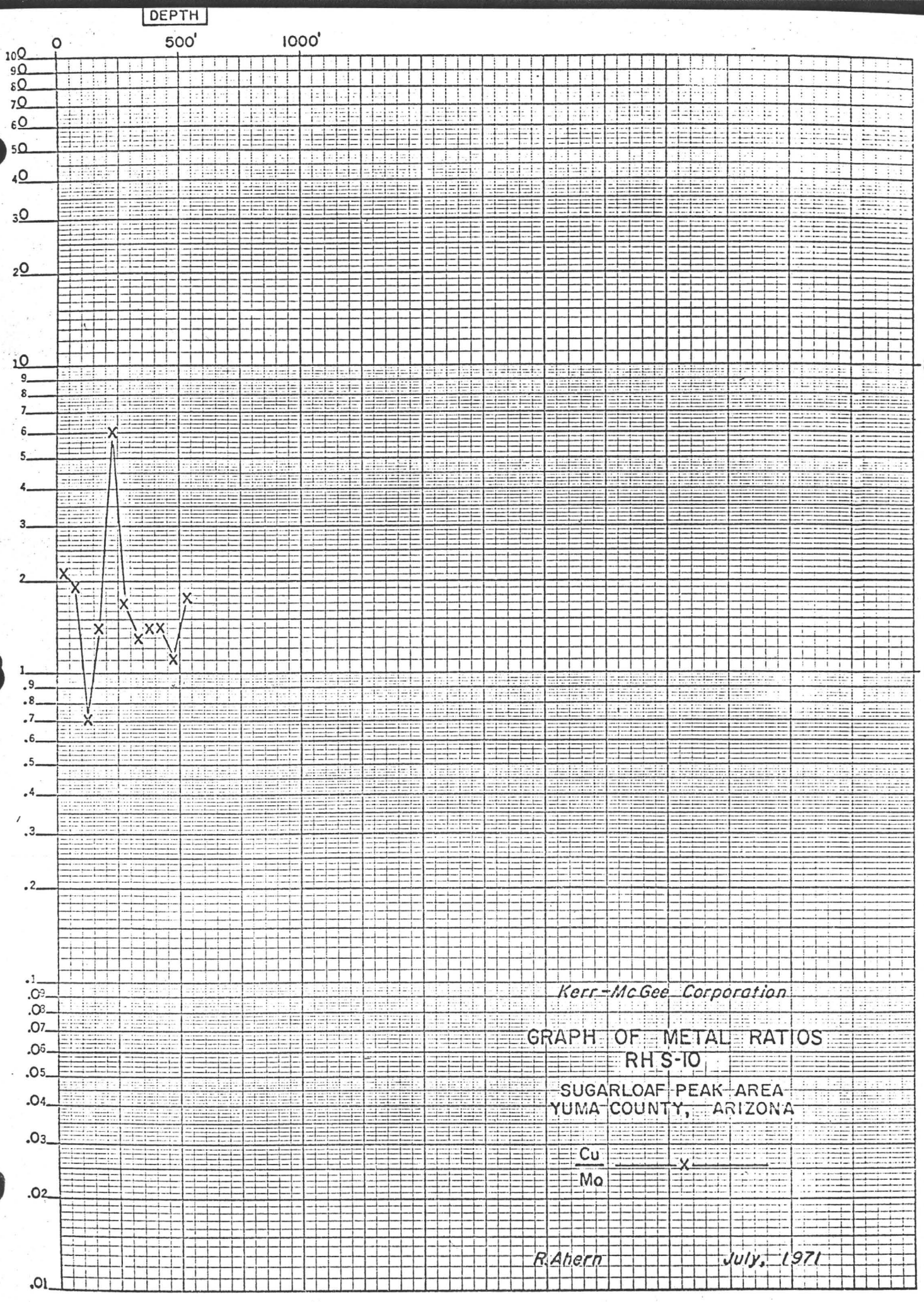
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
RH S-10
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Pb/Zn
Pb/Mo
R. Ahern
July, 1971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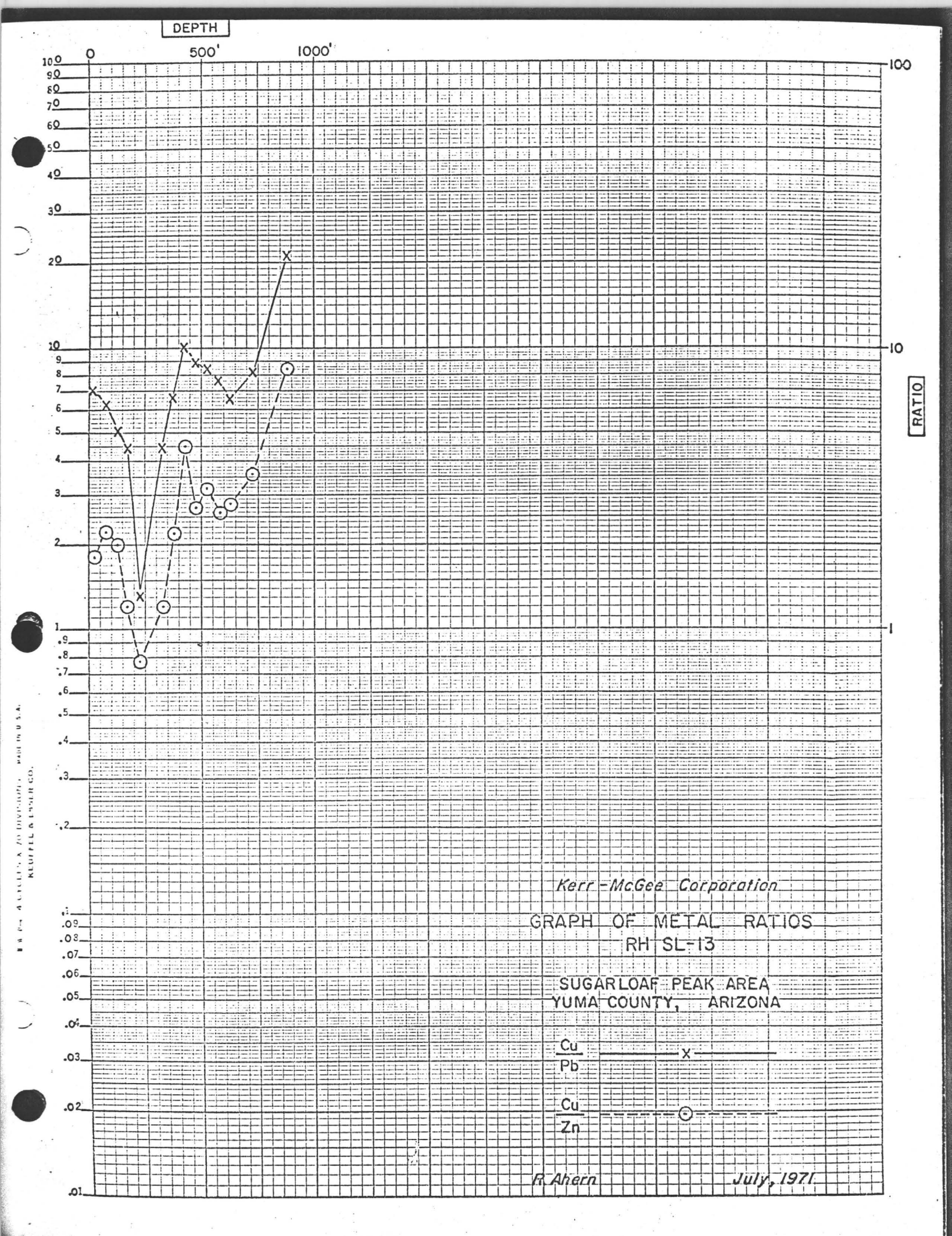
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
RH S-10
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Cu / Mo
R. Ahern
July, 1971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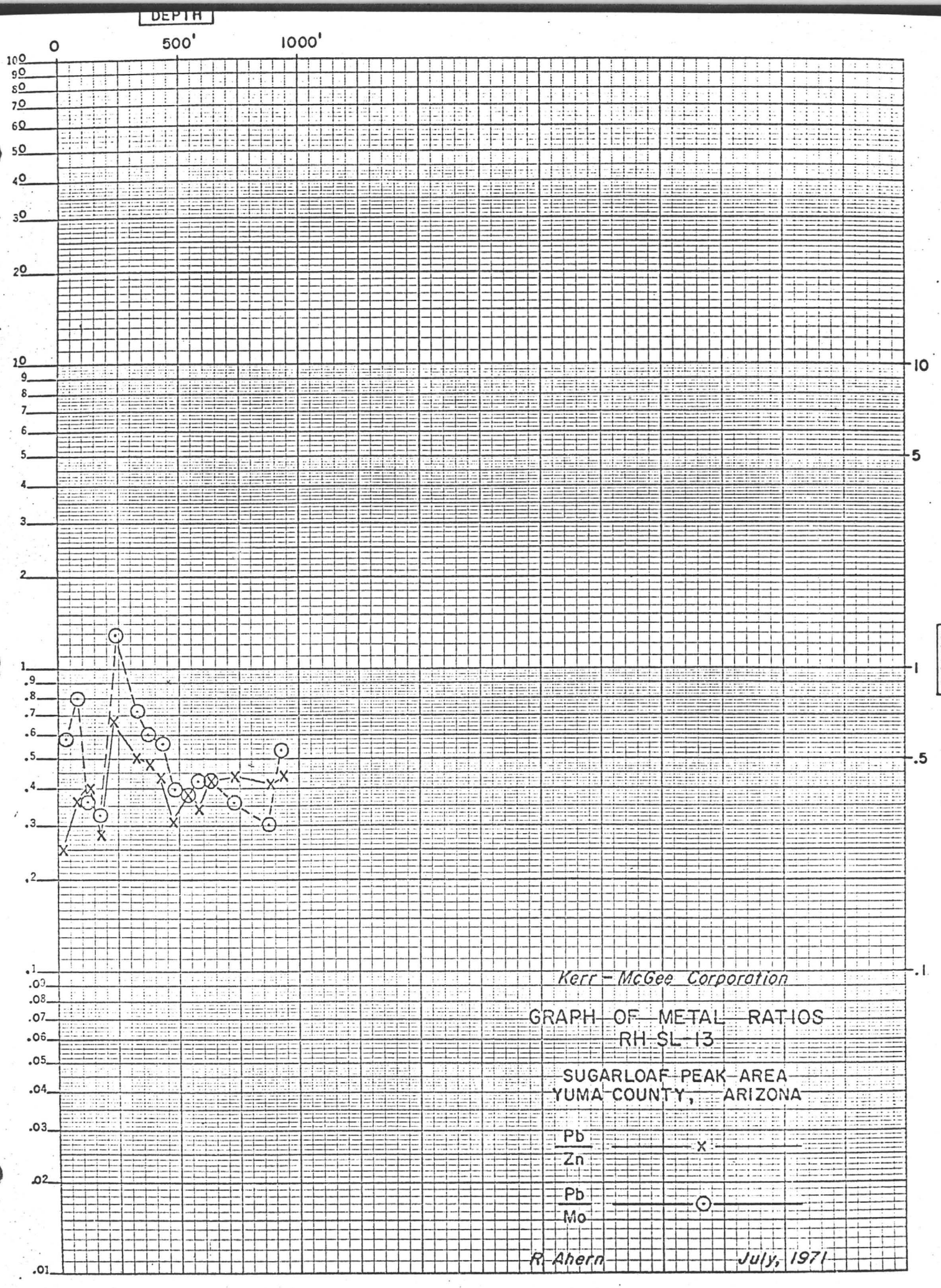
RATIO
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
RH SL-13
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Cu/Pb
Cu/Zn
R. Ahern
July, 1971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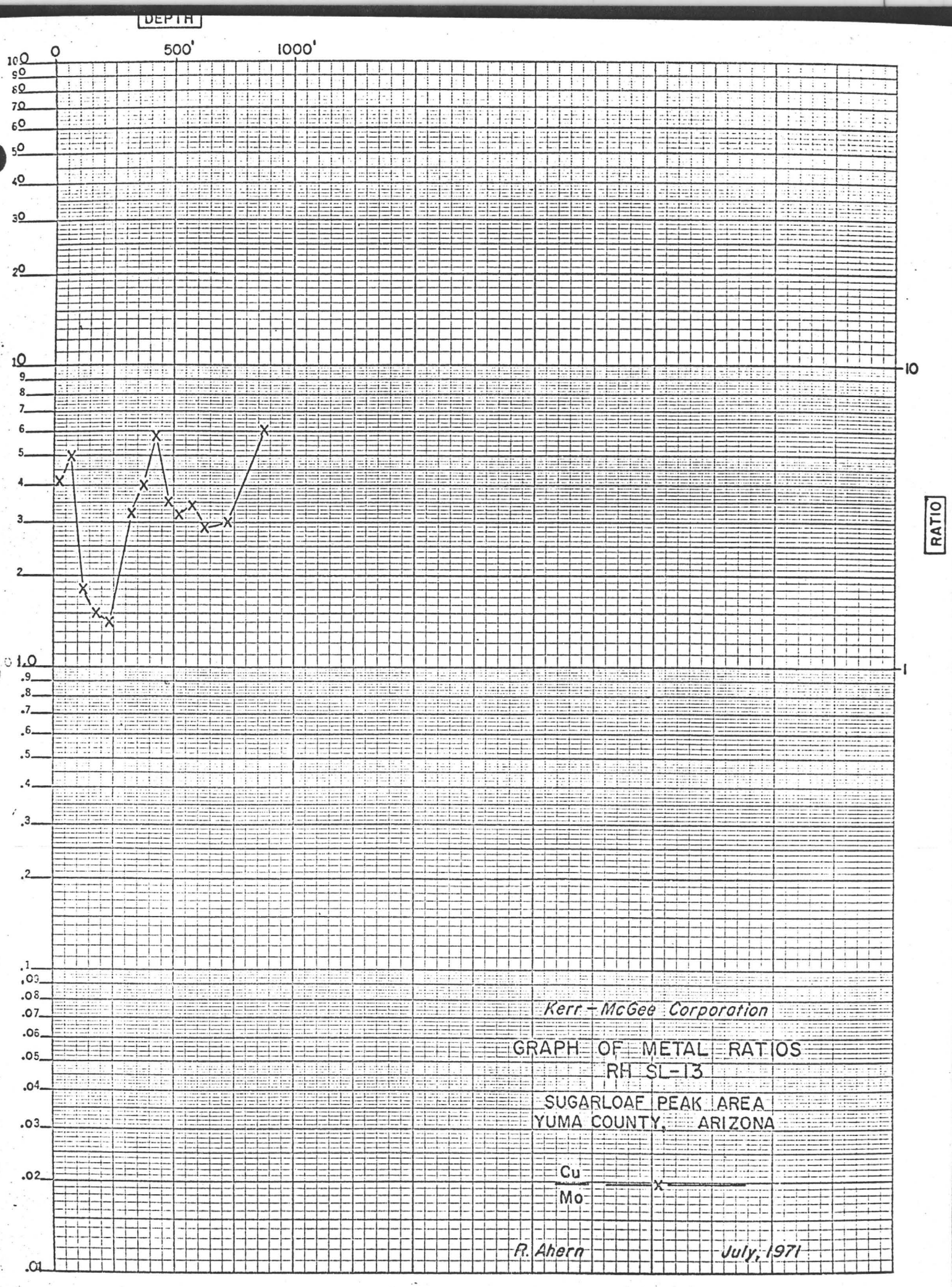
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
RH SL-13
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Pb/Zn
Pb/Mo
R. Ahern
July, 1971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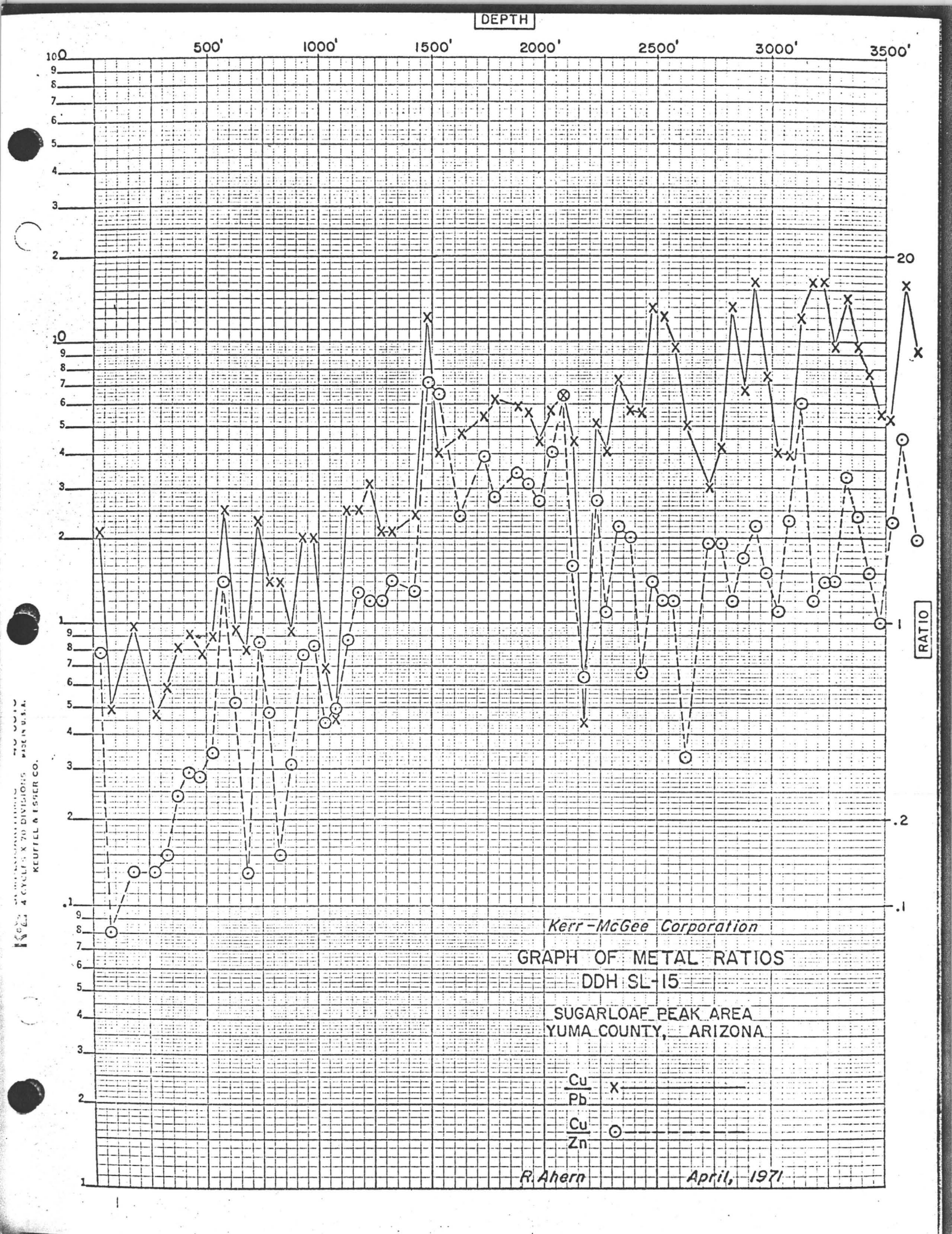
RATIO
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
RH SL-13
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Cu / Mo
R. Ahern
July, 1971
KEUFFEL & ESSER CO.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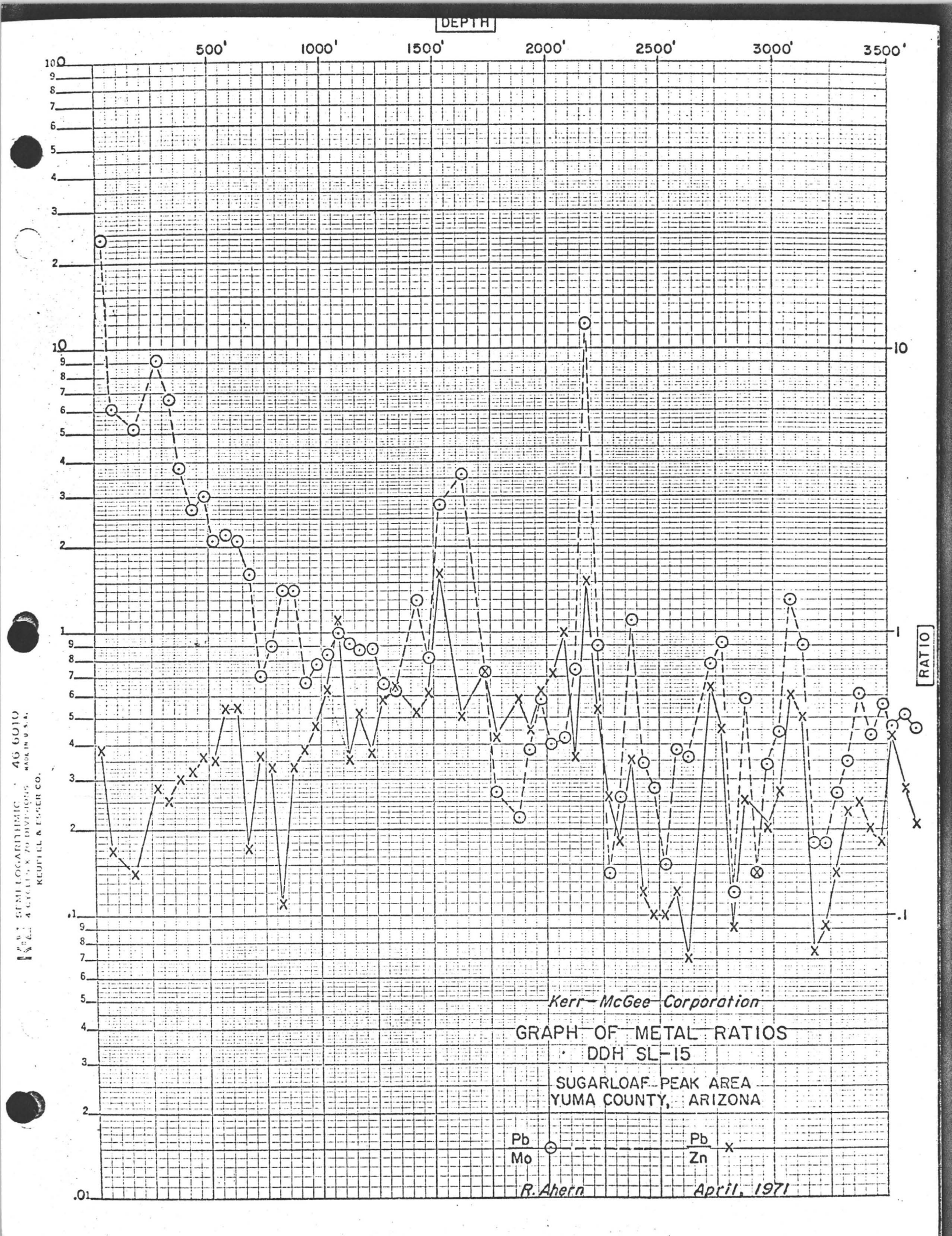
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
DDH SL-15
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Cu/Pb
Cu/Zn
R. Ahern
April, 1971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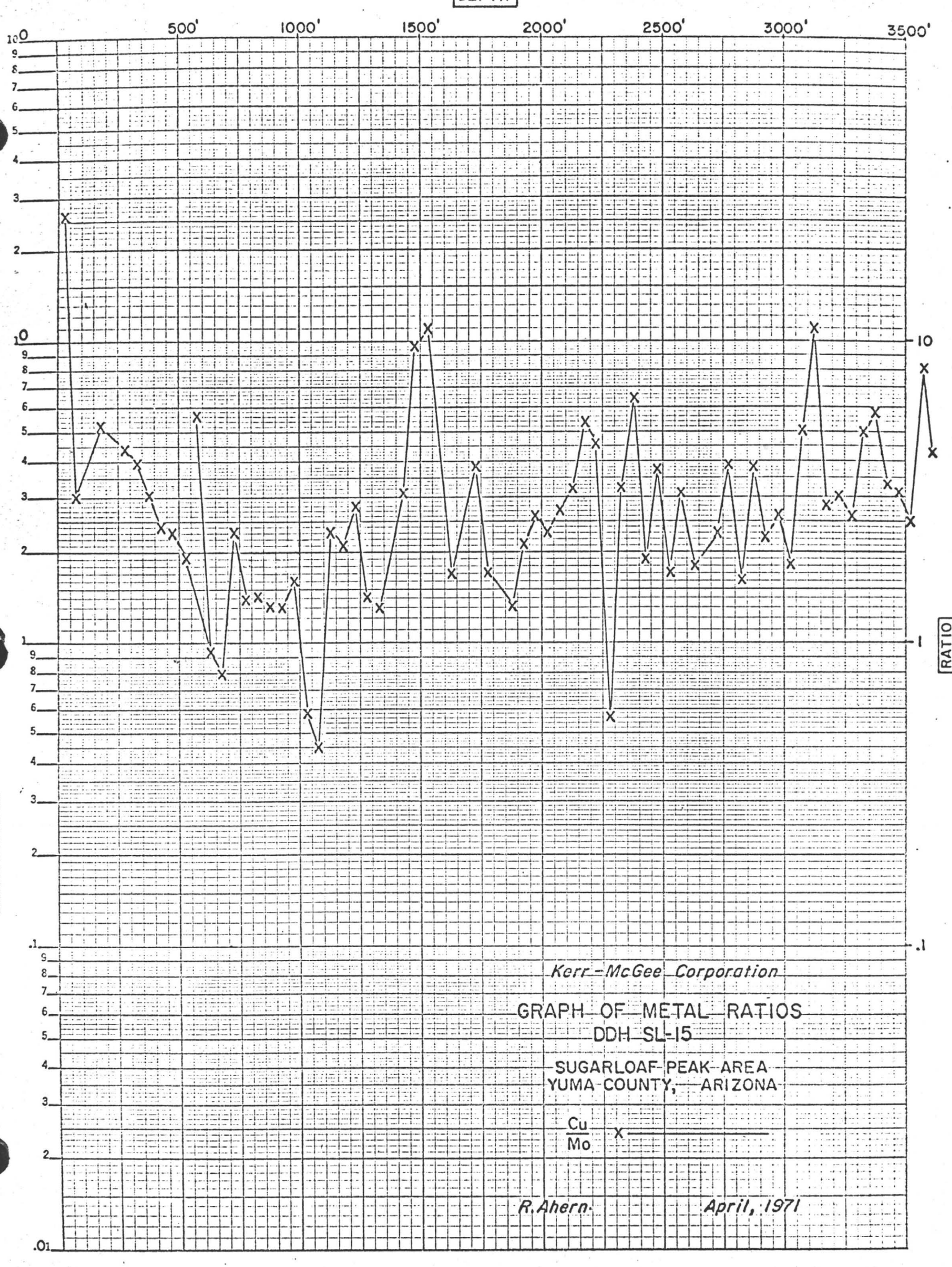
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
DDH SL-15
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Pb/Mo
Pb/Zn
R. Ahern
April, 1971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RATIO
Kerr-McGee Corporation
GRAPH OF METAL RATIOS
DDH SL-15
SUGARLOAF PEAK AREA
YUMA COUNTY, ARIZONA
Cu/Mo X
R. Ahern
April, 1971

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-1
Spudded 2/8/72
Completed 2/8/72
Total Depth 100'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 2 Sec 23 T. 4 N. R. 20 W.
Elevation 1175'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 255' N55°W of SE Cor. SUG #2

VALIDATION DRILL HOLE FOR CLAIMS SUG #1-10

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-25'	25'									Schist with disseminated pyrite and sericite.
25-30'	5'	91		40	45				20795	
30-40'	10'									
40-45'	5'			52	46				20796	
45-55'	10'									
55-60'	5'			30	90				20797	
60-70'	10'									
70-75'	5'	136		41	73				20798	
75-85'	10'									
85-90'	5'	58		30	51				20799	
90-95'	5'									
95-100'	5'	119	155	57	69				20800	

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-2
Spudded 2/9/72
Completed 2/9/72
Total Depth 80'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 13 Sec 4 T. 3 N. R. 20 W.
Elevation ~ 1250'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 200' N 60° W of E End Center SUG 13

VALIDATION DRILL HOLE FOR CLAIMS SUG #11-18

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-30'	30'									Schist with abundant pyrite
30-35'	5'	90	17	14	6				19285	
35-45'	10'									
45-50'	5'	38	10	15	5				19286	
50-60'	10'									Chalcocite coating pyrite
60-65'	5'	995		67	6				19288	
65-75'	10									
75-80'	5	19	320	52	2				19287	

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-3
Spudded 2/7/72
Completed 2/7/72
Total Depth 80'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 24 Sec 33 T. 4 N. R. 20 W.
Elevation 1175'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 655' N85°E of W End Center SUG #24

VALIDATION DRILL HOLE FOR CLAIMS SUG #19-26

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.
0-30'	30'								
30-35'	5'		417	34	8				20402
35-45'	10'								
45-50'	5'	100	165	49	6				20403
50-60'	10'								
60-65'	5'	72	160	31	7				20404
65-75'	10'								
75-80'	5'	248	188	40	5				20405

Schist with pyrite-specularite-sericite-chlorite alteration.

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-4
Spudded 2/9/72
Completed 2/9/72
Total Depth 80'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 32 Sec 33 T. 4 N. R. 20 W.
Elevation 1250'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 600' N80°W of E End Center SUG #32

VALIDATION DRILL HOLE FOR CLAIMS SUG #27-34

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0- 5'	5'									
5-10'	10'			86'	13				20406	Schist
10-20'	10'			218	22				20407	Intense Phyllic Alteration, Quartz veinlets Sericite-pyrite
20-30'	10			245	10				20408	
30-40'	10'	99		236	18				20409	
40-50'	10'	69	3300	144	9				20410	
50-60'	10'			140	13				20411	
60-70'	10			121	17				20412	
70-80'	10	65	1000	136	19				20413	
Average	-	78	2150	166	15					

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-5
Spudded 2/9/72
Completed 2/9/72
Total Depth 100'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 27 Sec 4 T. 3 N. R. 20 W.
Elevation 1275'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 450' S87°W of NE Cor. SUG 37

VALIDATION DRILL HOLE FOR CLAIMS SUG #35-44

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-15'	15'									
15-20'	5'			41	7				19289	Schist
20-30'	10									Phyllic Alteration
30-35'	5'			151	14				19290	
35-45'	10'									Intense Sericitization with Quartz - Sulfide Veinlets
45-50'	5'	22	75	186	10				19291	
50-60'	10'									
60-65'	5'	23	300	247	6				19292	
65-75'	10'									
75-80'	5'			326	5				19293	
80-90'	10'									
75-100'	5'	20	1500	157	8				19294	
Average -		22	625							

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-6
Spudded 2/8/72
Completed 2/8/72
Total Depth 100'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 49 Sec 34 T. 4 N. R. 20 W.
Elevation 1150'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 410' N75°E of SW Cor. SUG #79

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-15'	15'									Schist
15-20'	5'			93	14				20789	Pyritic Alteration
20-30'	10'									
30-35'	5'			81	7				20790	
35-45'	10'									
45-50'	5'			49	6				20791	
50-60'	10'									
60-65'	5'			41	6				20792	
65-75'	10'									
75-80'	5'	42		59	5				20793	
80-95'	15'									
95-100'	5'	38	375	60	4				20794	

NOTE: Some water collected in bottom of hole.

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-7
Spudded 2/10/72
Completed 2/11/72
Total Depth 70' + 30'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 58 Sec 34 T. 4 N. R. 20 W.
Elevation 1225'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 180' N60°E of SW Cor. SUG #58

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-15'	15'									
15-20'	5'			136	8				19297	Schist Pyrite-Sericite-Alunite Alteration.
20-25'	5'									
25-30'	5'			67	13				19298	
30-45'	15'									
45-50'	5'			72	14				19299	
50-60'	10'									
60-70'	10'			85	7				19300	

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-8
Spudded 2/9/72
Completed 2/9/72
Total Depth 50' + 50'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 69 Sec 3 T. 3 N. R. 20 W.
Elevation 1300'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 375' N80°W of E End Center SUG 69

VALIDATION DRILL HOLE FOR CLAIMS SUG #65-74

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.
0-15'	15'								
15-20'	5'			92	2				19295
20-45'	15'								
45-50'	5'			68	1				19296
Average	-			80	2				

Sericite Schist, with Chlorite, Specularite Alteration, No Pyrite.

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-9
Spudded 2/7/72
Completed 2/7/72
Total Depth 100'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 76 Sec 34 T. 4 N. R. 20 W.
Elevation 1125'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 675' N80°E of W End Center SUG #76

VALIDATION DRILL HOLE FOR CLAIMS SUG #75-81

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-95'	95'									Alluvium
95-100'	5'			64	7				20401	

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-10
Spudded 2/11/72
Completed 2/11/72
Total Depth 70' + 30'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 86 Sec 3 T. 3 N. R. 20 W.
Elevation 1175'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 600' N60°E of SW Cor. SUG #86

VALIDATION DRILL HOLE FOR CLAIMS SUG #82-89

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-15'	15'									Schist
15-20'	5'			700	14				20784	Intense Propylitic Alteration with Chlorite, Sericite, Specularite, Pyrophyllite.
20-25'	5'									
25-30'	5'			900	7				20786	
30-45'	15'									
45-50'	5'			430	5				20787	
50-60'	10'									
60-65'	5'			700	5				20788	

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-11
Spudded 2/11/72
Completed 2/11/72
Total Depth 80'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim SUG 90 Sec 3 T. 3 N. R. 20 W.
Elevation 1200'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 165' S50°W of NE Cor. SUG 90

VALIDATION DRILL HOLE FOR CLAIMS SUG #90-97

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-15'	15'									
15-20'	5'			830	6				20779	Schist
20-30'	10'									Intense Specularite Alteration with Chlorite
30-35'	5'			1400	7				20780	
35-45'	10									
45-50'	5'			1100	3				20781	
50-60'	10'									
60-65'	5'			500	5				20782	
65-75'	10'									
75-80'	5'			99	3				20783	

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-12
Spudded 7/27/72
Completed 7/27/72
Total Depth 95'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim ZALES Sec 31 T. 4 N. R. 20 W.
Elevation 1100'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 285' S61°E of NW Cor. ZALES #14

VALIDATION DRILL HOLE FOR CLAIMS ZALES #12, 14, 16, 18, 20, 23

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-35'	35'									Alluvium
35-45'	10'			44	2				A26994	Schist, Weak Phyllic Alteration Quartz, Sericite, Pyrite
45-55'	10'			50	6				A26993	
55-65'	10'			18	9				A26992	
65-75'	10'			10	16				A26991	
75-85'	10'			8	8				A26990	
85-95'	10'	24		5	2				A26989	
NOTE:	5 to 10	gal/min. water from bottom				20 feet.				

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-13
Spudded 7/28/72
Completed 7/28/72
Total Depth 140'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim ZALES 15 Sec. 32 T. 4 N. R. 20 W.
Elevation 1125'
Hole Size 4 3/4"
Core Size
Hole Angle Vertical
Collar Coords. 160' N40°E of W End Center ZALES #15

VALIDATION DRILL HOLE FOR CLAIMS ZALES #15,17,19,21,22

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.
0-140'									
NOTE:	15 gpm water at 80'.								

Badly Weathered Bedrock. No Fresh Sulfides.

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-14
Spudded 7/28/72
Completed 7/28/72
Total Depth 20'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim Sec T. R.
Elevation
Hole Size
Core Size
Hole Angle
Collar Coords. 105' S54°E of W End Center ZALES #13.

VALIDATION DRILL HOLE FOR CLAIMS ZALES #11 and 13

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-20'	20'									Alluvium
PE: Old bit left in bottom of drill hole.										

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

KERR-McGEE CORPORATION

Assay Log

District Quartzsite
Hole Number RH V-15
Spudded 7/29/72
Completed 8/1/72
Total Depth 263'
Driller Atkinson Drilling Co.
Logged By R. Ahern

County Yuma State Arizona
Claim ZALES 4 Sec 32 T. 4 N. R. 20 W.
Elevation 1175'
Hole Size 4 3/4" 0-260'
Core Size NX 260-263'
Hole Angle Vertical
Collar Coords. 300' N70°W of E End Center ZALES #4

VALIDATION DRILL HOLE FOR CLAIMS ZALES #1 thru 10

Gross Value in Sulfide Minerals*

Hole Depth	Interval	Cu ppm	Zn ppm	Pb ppm	Mo ppm	oz.Ag	oz.Au		Sample No.	
0-142'	142'									Alluvium
142-260'	118'									Oxidized Schist
260-263'	3'	60	81	15	10	.7	Nil.		21546	NX Core Weak Pyritic Alteration with Fresh Sulfides

NOTE: 15 gpm at 95'.

* Gross value calculated from copper ¢ per pound; lead ¢ per pound; zinc ¢ per pound; molybdenum $ per pound; silver $ per ounce; and gold $35.00 per ounce.

R. A.

KERR-McGEE CORPORATION
INTERNAL CORRESPONDENCE

TO E. E. Jones

DATE May 25, 1973

FROM R. M. Corn

SUBJECT Sugarloaf Peak Area,
Quartzsite Mining District,
Yuma County, Arizona

The geologic relationships, alteration, mineralization, and exploration potential of the Quartzsite prospect are thoroughly covered in Dick Ahern's report, and in my opinion, he has done an excellent job in deciphering the complex structural relationships of the prospect. I would like to add a few comments emphasizing certain general features of the porphyry copper alteration system at Quartzsite and its indicated favorable exploration potential.

COPY

The alteration system at Quartzsite contains an impressive amount of disseminated base-metal mineralization. The area of quartz-sericite-alunite-pyrite alteration near Sugarloaf Peak in the eastern part, and originally higher part, of the alteration system contains large volumes of mineralized rock, exhibiting lead and zinc values in excess of .15 to .20 percent each, combined with molybdenum values that vary 100 to 1000 parts per million. These relatively high lead-zinc and molybdenum values are similar to, and higher than, metal values encountered in a similar alteration environment at Red Mountain, Arizona, where they appear to be a direct reflection of the ore-grade primary copper mineralization occurring at greater depth in the alteration system.

Both alunite and tourmaline are abundant minerals in the Quartzsite alteration system. The occurrence of both of these minerals is believed to indicate that major amounts of the volatile elements, sulfur,

fluorine, and boron were introduced into the alteration system during the period of hydrothermal alteration and metallization. The widespread and abundant alunite, associated with relatively high lead-zinc and molybdenum values, is believed to reflect a center of potassic alteration that should contain abundant anhydrite associated with copper and molybdenum mineralization at greater depth in the alteration system. Surface exposures of quartz-sericite-alunite-pyrite alteration are known to reflect deeper potassic alteration with associated anhydrite and ore-grade primary copper mineralization at El Salvador, Chile, Cananea, Mexico, and Red Mountain, Arizona. Although drilling has not been carried to sufficient depth at Red Mountain, Colorado to define ore-grade copper mineralization, the quartz-sericite-alunite-pyrite alteration exposed at the surface has been shown to be a direct reflection of abundant anhydrite and increasing copper values at depth. Intense quartz-sericite-alunite-pyrite alteration, similar to that at Quartzsite, is considered to be a direct indication of centers of potassic alteration and ore-grade copper mineralization that occur at depth at Cananea, Mexico. Interestingly, tourmaline is also a widespread constituent of the alteration system at Cananea.

The occurrence of disseminated copper mineralization on the Hancock claims in the western part of the altered area is of considerable interest, not just because this represents several million tons of potential ore-grade copper mineralization, but primarily because it represents the copper mineralization expected to be associated with potassic alteration in a position originally at greater depth in the alteration system. Although the copper mineralization is obscurred by faulting, oxidation, and alluvial cover, detailed examination of exposures near the Hancock workings

indicates that both the intrusive and metamorphic rocks formerly contained disseminated primary chalcopyrite mineralization of ore-grade or near ore-grade values. The indicated disseminated primary chalcopyrite mineralization on the Hancock property is believed to be part of, and a reflection of, primary chalcopyrite mineralization that is associated with potassic alteration toward the center of the alteration system in the western part of the Quartzsite prospect.

In summary, the combination of the features described above, widespread intense quartz-sericite-alunite-pyrite alteration associated with substantial disseminated lead, zinc, and molybdenum values, within what appears to have originally been the upper part of the alteration system, together with the indicated primary copper mineralization, associated with potassic alteration at a position originally at greater depth in the alteration system, is believed indicative of a very favorable exploration potential for ore-grade primary copper mineralization within the Quartzsite porphyry copper alteration system.

RMC/ps

COPY

R. A.

EXPLORATION POTENTIAL OF THE SUGARLOAF PEAK AREA, QUARTZSITE MINING DISTRICT, YUMA COUNTY, ARIZONA

by

Richard Ahern

May 25, 1973

Kerr-McGee Corporation

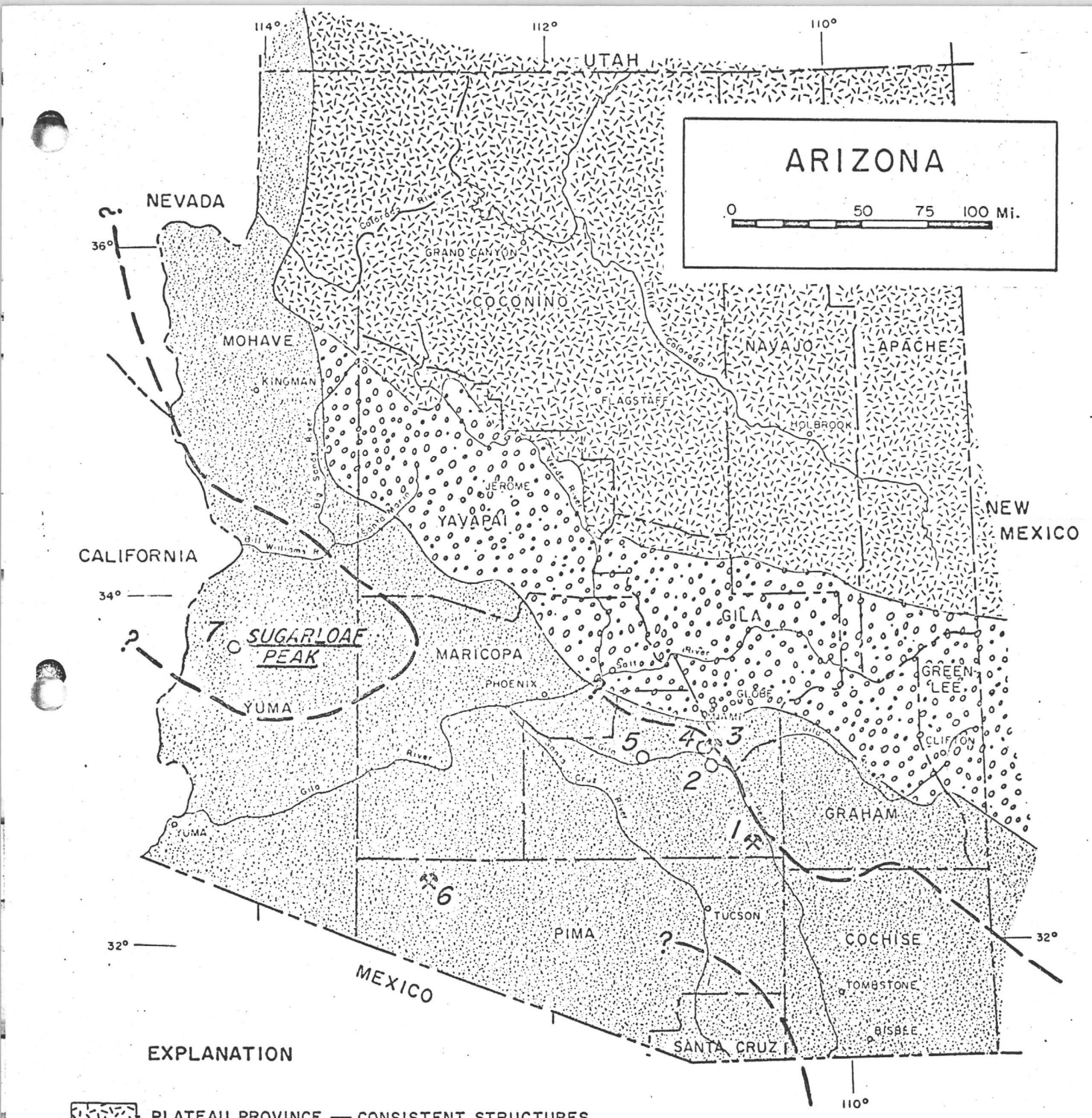
SUMMARY

The Sugarloaf Peak prospect is an area of porphyry copper type alteration and mineralization located in west-central Yuma County, Arizona. The area has a history of placer gold production, but only minor base metal values. Consequently the district has not received much attention from major mining companies.

Detailed mapping of the alteration system together with extensive geochemical sampling indicates that Sugarloaf Peak was originally a vertical alteration-mineralization system similar to that associated with other porphyry copper deposits. The system has been structurally rotated 90° to the east and offset by major faults, with strike and/or dip movement.

The most favorable target for ore-grade copper mineralization is at, or near, the surface in the zone of exposed potassic alteration near the west end of the Kerr-McGee claims. Results of surface sampling and reported values from shallow drill holes indicate the presence of a triangular shaped area of ore-grade copper mineralization at or near the surface which could contain 10,000,000 tons of ore-grade copper mineralization for each hundred feet of depth. Projection of this zone beneath the adjacent zone of potassic alteration would yield substantially greater tonnage with a prospect target of 48,000,000 tons per hundred feet of thickness.

To test this prospect, a 1000 to 1500 foot diamond drill hole is recommended, to be collared near the center of exposed copper mineralization in Hancock Wash. This would yield the most useful geologic information, as well as give a third dimension to our estimate of the potential copper mineralization.



EXPLANATION

PLATEAU PROVINCE — CONSISTENT STRUCTURES

MOUNTAIN ZONE — CONSISTENT TO INCONSISTENT STRUCTURES

BASIN AND RANGE PROVINCE — INCONSISTENT STRUCTURES

POSTULATED LOCATION OF FLAT OR THRUST FAULT LOBE

PROSPECTS ○ AND MINES ⚒ WITH POST MINERAL STRUCTURAL ROTATION

1. San Manuel — Kalamazoo (Newmont)
2. Kelvin (Kerr-McGee)
3. Ray (Kennecott)
4. Granite Mountain (Kerr-McGee)
5. Florence (Continental Oil)
6. Ajo (Phelps Dodge)
7. Sugarloaf Peak (Kerr-McGee)

FIGURE 1

GENERAL

The Sugarloaf Peak prospect is an area of porphyry copper type alteration and mineralization located in the Quartzsite Mining District of west central Yuma County, Arizona. The area of interest lies south of U.S. Highway 60 & 70, now I-10, and east of Quartzsite Pass, where I-10 cuts through the Dome Rock Mountains.

The district is credited with over 10,000 ounces of placer gold production, however there has been no significant base metal production from this part of Arizona. Burton Hancock is reported to have shipped two carloads of material from the Surprise Claims, running 49 tons of 1.1 percent copper and 54 tons of 2.1 percent copper. Lehre Eardman reports shipping a truckload of lead-silver ore from the Leadville Mine. Exposed mineralization and sampling by us indicates that these figures are at least reasonable.

This report is based on extensive field work in the district, including geologic mapping and geochemical sampling of the area covered by Kerr-McGee's claims, some ground magnetic work and evaluation of results from shallow validation drill holes, as well as on data obtained from other sources, such as Congdon and Carrey. They controlled the area by location and options from 1962 thru 1971 and did more than 14,500 feet of rotary and diamond drilling, as well as conducting extensive Induced Polarization and aeromagnetic surveys.

GEOLOGY

The Sugarloaf Peak area is underlain by Precambrian schist and granite, which has been intruded by a complex stock of probable Laramide age and overlain by a Tertiary quartz porphyry flow. These units are partially covered by Late Tertiary and Quaternary gravels.

The main mass of the Dome Rock Mountains south of U.S. Highway I-10 is schist, with a few outcrops of schist north of the highway. The schist is representative of the greenschist facies of regionally metamorphosed intermediate volcanics and interbedded sedimentary units. Previous workers in the district from the Arizona Bureau of Mines have considered the schist to be of Cretaceous age, however there is little or no evidence for this. The rock is very similar to nearby outcrops in California and northern Yuma County that are of Precambrian age, and correlated with the Yavapai schist of central Arizona. There are no other schists of Cretaceous age in the region, however the metamorphosed volcanics were equated with unmetamorphosed Cretaceous-Tertiary andesites exposed in central and southern Yuma County. The lithologic similarity to Precambrian schists, the large extent of outcrop, and the lack of any real evidence correlating the metamorphosed volcanics with the unmetamorphosed Tertiary volcanics all suggest that the schist is better correlated with the Precambrian Yavapai schist.

The Precambrian granite is exposed in the mountains north of the highway except for a few exposures to the south where I-10 cuts through the mountains at Quartzsite Pass near the western edge of the map. The granite is generally coarse with less than five percent mafic minerals, mostly biotite and chlorite.

The Cretaceous intrusive stock varies in composition from aplite to biotite-diorite porphyry, but most exposures are monzonite porphyry. The biotite-diorite phase appears to be confined to the contact with the Precambrian granite. Aplite occurs as occasional dikes and possibly as a breccia zone in the NW 1/4, SE 1/4 Section 31, Township 4 North, Range 20 West.

A quartz porphyry or rhyolite porphyry caps Sugarloaf Peak. Large outcrops of porphyry occur along the flanks of Brown Mountain to the east, and capping a small hill just north of Brown Mountain. Scattered outcrops found north of the Dome Rock exit ramp appear to be remnants of a major flow. A very small block of rhyolite is exposed south of Brown Mountain, however this occurrence appears to be intrusive whereas those on Brown Mountain are flows. The outcrop at Sugarloaf Peak could be a cap or it could represent a neck or plug. It is at an elevation considerably above the other occurrences, and the contact is covered with talus. Adits along the flanks of Sugarloaf Peak do not penetrate to the core. A caliche cemented conglomerate surrounds the small hill of quartz porphyry near the southeast corner of Section 34, Township 4 North, Range 20 West. Late Tertiary gravels and Quaternary alluvium fill deep valleys along both the east and west flanks of the mountain range and lap up onto the pediments at Sugarloaf Peak, partially obscuring outcrops.

STRUCTURE

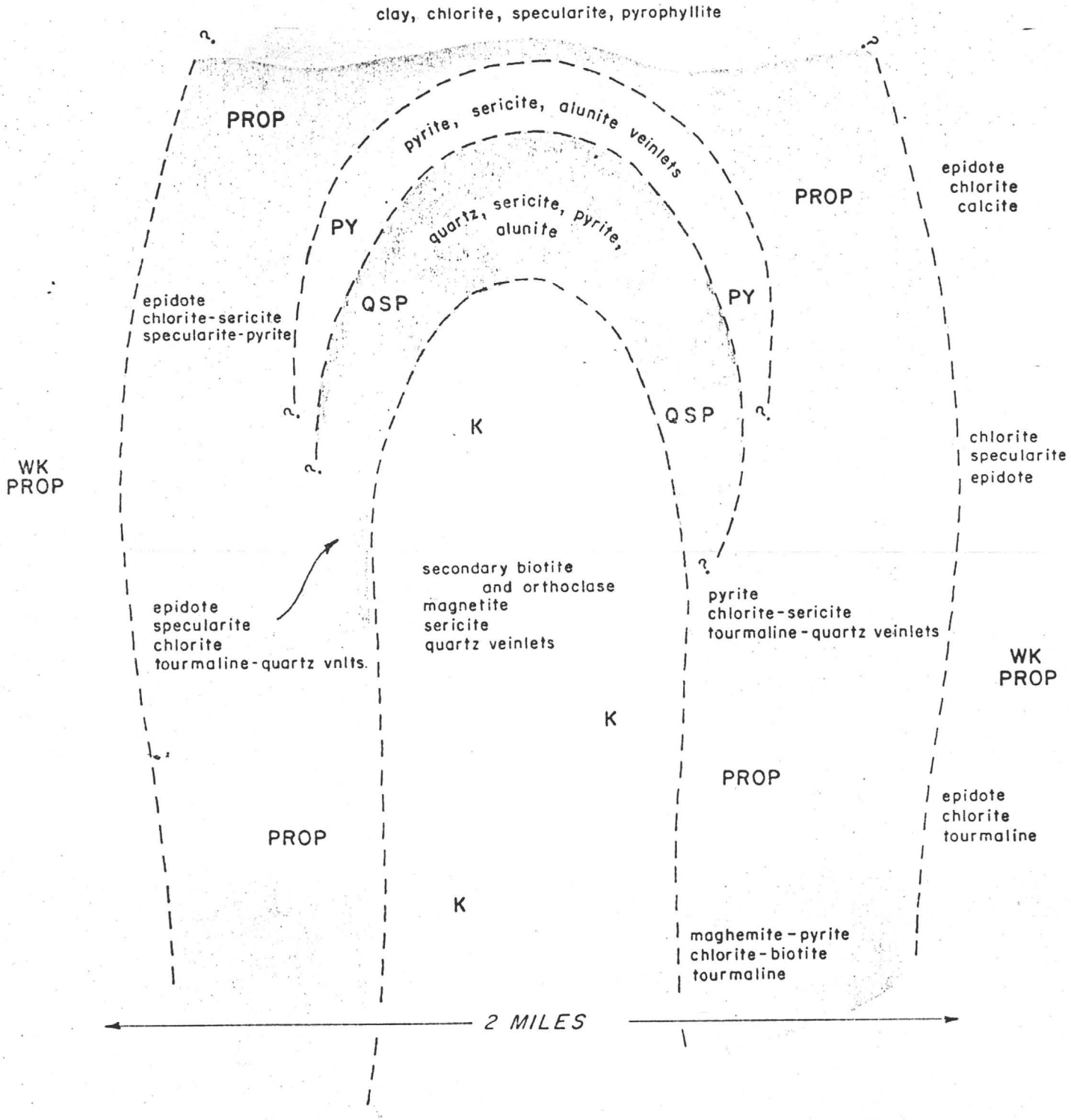
The Sugarloaf Peak prospect lies within a province of structural rotation and low-angle faulting. These structural elements are related to crustal distension and are similar to those observed along the west side of the San Pedro River, such as have been described at the San Manuel-Kalamazoo Mine and at Kerr-McGee's Kelvin and Granite Mountain prospects.

There are no marker horizons in the schist, however structural rotation to the east has been interpreted from detailed mapping of the alteration pattern and from the metal zoning relationships. Fault offsets are evidenced by abrupt discontinuities in the alteration pattern and are generally coroborated by corresponding changes in the geochemical pattern.

The horizontal position of the alteration pattern has been determined from review of drill hole information evidencing a decrease in alteration grade with depth in the area of drilling just west of Sugarloaf Peak. Northeast striking faults, dipping steeply westward to nearly flat lying, are related to gravity sliding during structural rotation and/or post rotation block faulting. Their displacements are generally of only a few hundred feet. In addition to these faults, major northwest trending, right lateral strike slip faults have been mapped. This structural trend can be projected into the Sugarloaf Peak area from the Plomosa Mountains to the east and appears to extend across the Dome Rock Mountains into the area of alluvial cover to the west. Displacement, as indicated by offset segments of the alteration system, may be 500 to 1000 feet along any one slip plane, however there are numerous slip planes within the area mapped and the total offset may be on the order of 5000 feet within that area.

ALTERATION

The observed alteration and metal dispersion patterns are shown on the accompanying maps of the Sugarloaf Peak area. Figure 2 is a diagrammatic presentation of the original alteration pattern. The alteration types and their associated metals are described in order of their probable occurrence, extending downward from the ore time surface above the central core of a typical porphyry copper alteration system. At Quartzsite this is equivalent to starting about one-half mile east of Sugarloaf Peak and moving westward over the surface along a horizontal axis.



ALTERATION

K	POTASSIC
QSP	PHYLLIC
PY	PYRITIC
PROP	PROPYLITIC
WK PROP	WEAK PROPYLITIC

HYPOTHETICAL SYSTEM OF PORPHYRY COPPER ALTERATION

WITH RESTRICTED ENVELOPE OF QUARTZ-SERICITE-PYRITE
MODELED AFTER RED MOUNTAIN, SANTA CRUZ CO., ARIZONA

SUGARLOAF PEAK

QUARTZSITE DISTRICT YUMA COUNTY ARIZONA

R. AHERN
MAY, 1973

FIGURE 2

Propylitic alteration is both the exterior and the uppermost facies of alteration and is generally characterized by epidote, chlorite, carbonate, and an absence of sulfides or quartz veinlets. This type of alteration is gradational into unaltered rock at a distance from the center of the alteration system. The change is particularly difficult to recognize in greenschist, however, because the metamorphic mineral assemblage is nearly the same as that of propylitic alteration.

Exposures of hydrothermal propylitic alteration immediately west of Sugarloaf Peak are typical of the upper high level of alteration occurring near the core of the alteration system. Chlorite and epidote are accompanied by specularite with lenses and zones of sericite and pyrophyllite. Occasional major quartz specularite vein zones and some calcite veinlets are also present. Exposures north of highway I-10 exhibit chlorite, epidote and specularite with quartz tourmaline veinlets. This is characteristic of deeper propylitic alteration than that discussed above, and probably reflects a position near the propylitic-phyllic interface, with the quartz veinlets extending out beyond the zone of pyritic alteration. The area of propylitic alteration along the southern edge of Kerr-McGee's claims is generally weaker than the two areas just described. Chlorite, epidote, and specularite are associated with calcite veins to the southeast, and with minor calcite and moderate tourmaline to the west.

Pyritic alteration at Sugarloaf Peak is characterized by disseminated pyrite controlled by planes of schistosity, generally without quartz veinlets. Abundant alunite veinlets occur along the north slope of Sugarloaf Peak, with intense sericite and clay on the south edge. The pyrite zone occurs at Sugarloaf Peak as a cap which separated the

propylitic and phyllic zones when in their original upright position. This zone does not generally extend to any great depth along the flanks of the system.

Phyllic alteration consisting of quartz, sericite, and pyrite is exposed over an area one mile long and from 3000 to 5000 feet wide just west of Sugarloaf Peak. This facies is generally characterized by intense sericitization with abundant disseminated pyrite and closely spaced quartz pyrite veinlets. Within the Sugarloaf Peak alteration system the phyllic alteration zone appears to grade downward or westward into altered rock characterized by variably spaced quartz pyrite veinlets and sericite envelopes within a phase of alteration reflecting the transition from weak potassic to propylitic alteration. This type of alteration is exposed adjacent to the potassic hill in the center of Section 31. The gradation from near potassic to propylitic appears to take place over a width of from 300 to 500 feet.

A block of potassic alteration measuring 2000 by 3000 feet is exposed in the center of Section 31, Township 4 North, Range 20 West. The block is bounded on the north, south and west sides by major faults. The east side is the gradational change from potassic to phyllic, to the deep propylitic type of alteration discussed above. The potassic alteration is characterized by secondary orthoclase, minor magnetite and quartz-chalcopyrite veinlets with disseminated sulfides. Capping indicates a fairly high chalcopyrite to pyrite ratio in the Hancock Wash area with slightly decreasing chalcopyrite to the east.

It should be emphasized that changes in alteration are gradational, sometimes taking place over considerable distances, even though they are shown as distinct contacts on a map. It should also be pointed out that a single alteration facies may be represented by different sets of mineral assemblages at different levels within the system. For example, the propylitic alteration near the top of the system may be characterized by epidote, calcite and pyrophyllite, while the propylitic zone at great depth would be identified by an association of chlorite, sericite, and magnetite. In addition to this, a single mineral species may be associated with more than one facies of alteration. For example, chlorite is pervasive in the propylitic zone, a minor constituent of the pyritic or argillic zone, and absent in the phyllic zone. It reappears replacing biotite in the near or weak potassic zone and gives way to biotite in the zone of potassic alteration, however it is present in the deep barren core of some deposits.

METAL ZONING

The dispersion pattern of both lead and molybdenum reflect the exposed alteration pattern and corroborate the structural rotation inferred from the overall alteration pattern. Lead values ranging from 100ppm to greater than 1000ppm are reported from the pyritic altered area adjacent to Sugarloaf Peak. The area of intense phyllic alteration west of Sugarloaf Peak is characterized by only moderate lead values accompanied by highly anomalous molybdenum with values ranging from 5ppm to greater than 100ppm in an angular pattern concentric with the observed alteration pattern. Drill hole information from both the high lead and the high molybdenum areas define a zone averaging over 1000ppm zinc from the surface to a depth of 500 feet. Testing of selected surface samples shows that the