

EMPIRE ABO POOL

Comparison of Current Production and Voidage for the Proposed Citgo Unit Area and ARCO Unit Wells Offsetting the Citgo Unit.  
January 1974 Production

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
NUMBER OF WELLS	DAILY OIL RATE (BOPD)	GAS/OIL RATIO (ft <sup>3</sup> /BO)	DAILY WATER RATE (BWPD)	DAILY OIL RATE (BOPD/WELL)	RESERVOIR NET VOIDAGE RATE (RVB/DAY)	RESERVOIR VOIDAGE RATE PER WELL (RVB/DAY/WELL)	RESERVOIR VOIDAGE EFFICIENCY FACTOR (RSVB/STBO)

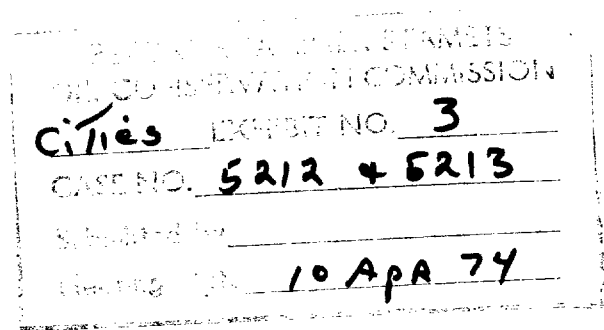
A. Proposed Citgo Unit Area

Lease Name and Well No.							
Magruder A No. 13		53.6	4846	0			
Magruder A No. 14		48.9	4131	0			
Russell C No. 9		68.2	4576	0			
Russell C No. 10		74.7	4557	0			
State CE No. 5		147.5	2599	0			
Wright A State No. 4		117.3	2420	0			
TOTAL	6	510.2	3492	0	85	3,486	581
							6.83

B. ARCO's Empire Abo Unit  
Wells Offsetting Citgo's  
Proposed Unit Area

Lease	Well No.						
H	12	0	(Shut-in)				
I	12	0	(Shut-in)				
I	13	122	1898	0			
J	13	284	751	0			
J	14	284	802	0			
J	15	284	1094	0			
I	16	75	923	0			
I	17	47	3402	0			
H	17	0	(Shut-in)				
TOTAL	9	1096	1107	0	122	2,061	229
							1.88

BEFORE THE DISTRICT COURT OF THE UNITED STATES  
OIL CONSERVATION COMMISSION  
CASE NO. \_\_\_\_\_  
Submitted by ARCO  
Hearing Date 4/17/74



CITGO EMPIRE ABO UNIT

### Example Gas Bank

## Accumulation

Mth	1 Gas Produced	2 Fuel Gas	3 Gas Limit	4 Gas Avail.	5 90% of Avail.	6 Gas Injected	7 Bank Change	8 Bank Acct.	9 Bank Limit
1	139624	4898	52824	81902	73712	86800	-0-	-0-	-0-
2	126112	4424	47712	73976	66578	78400	11822	11822	28933
3	139624	4898	52824	81902	73712	86800	13088	24910	55066
4	135120	4740	51120	79280	71352	84000	12648	37558	84000
5	139624	4898	52824	81902	73712	86800	13088	50646	83067
6	135120	4740	51120	79280	71352	84000	12648	63294	85867
7	139624	4898	52824	81902	73712	86800	13088	76382	84933
8	139624	4898	52824	81902	73712	86800	13088	85866	85866
9	135120	2370	51120	81630	73467	42000	-31467	54399	85866
10	139624	2370	52824	84430	75987	42000	-33987	20412	71866
11	135120	3160	51120	80840	72756	56000	-16756	3656	56933
12	139624	4898	52824	81902	73712	86800	13088	16744	46666
1	139624	3318	52824	83482	75134	58800	-16334	410	61600
2	126112	4424	47712	73976	66578	78400	11822	12232	67200
3	139624	4898	52824	81902	73712	86800	13088	25320	74667

EMPIRE ABO POOL

ARCO and CITGO Units - Production and Voidage Efficiency Under Several Modes of Operation.

	(1) NUMBER OF WELLS	(2) DAILY OIL RATE (BOPD)	(3) GAS/OIL RATIO (ft <sup>3</sup> /BO)	(4) DAILY WATER RATE (BWPD)	(5) RESERVOIR NET VOIDAGE RATE (RVB/DAY)	(6) RESERVOIR VOIDAGE EFFICIENCY FACTOR (RVB/STB) (5)/(2)	(7) RESERVOIR VOIDAGE RATE PER WELL (RVB/DAY/WELL) (5)/(1)	(8) ALLOWABLE VOIDAGE RATE PER WELL (RVB/DAY/WELL)
A. ARCO Unit, January 1974:	221	32,891	977	1,386	56,319	1.71	255	256
B. ARCO Unit, Mid-1974 (Est.): (Inject all Available Residue Gas)	221	40,555	1,100	6,415	28,668	0.71	130	256
C. CITGO Unit Area, January 1974:	6	510	3,492	0	3,486	6.83	581	552**
D. CITGO Unit-Citgo Rules: (a) Mid-1974 (Est) 6 (Sell 1711 MCF/D, inject all additional produced gas) (b) 1977 (Est.) 6	6	651	4,200	0	3,603	5.53	600	No limit
	6	170	30,000	0	5,025	29.51	837	No limit
E. CITGO Unit-ARCO Unit Rules: (Inject all Available Residue Gas) (a) Mid-1974 (Est) 6 (b) 1977 (Est.) 6	6	547	4,200	0	1,559*	2.85	260*	260*
	6	63	30,000	0	1,559*	24.74	260*	260*

(\*This is the average 1972 voidage rate for the combined ARCO and CITGO Unit Areas, apportioned to Citgo Unit on a per-well basis.)

(\*\*This is the daily reservoir voidage rate of a top allowable well (142 BOPD) at maximum GOR (2000/1) Actually, neither present field rules nor the Citgo Rules set any limit on reservoir voidage. Within the ARCO Unit, the reservoir voidage limit is set by the N.M.O.C.C. at 256 RVB/D per well.)

BEFORE THE	COMMISSION
OIL CONSERVATION	
CASE NO.	44-1974-13
Submitted by	
Hearing Date	4/1/74

EMPIRE ABO POOL - ARCO and CITGO Units - Share of Reservoir Voidage Compared to Share of Hydrocarbon Pore Volume and Share of Well-Count.

	(1)	(2)	(3)	(4)	(5)	(6)
UNIT-OPERATING PLAN	DAILY OIL RATE (BOPD)	NET RESERVOIR VOIDAGE RATE (RVB/DAY)	RESERVOIR VOIDAGE EFFICIENCY FACTOR (RVB/STB) (2)/(1)	PERCENT OF TOTAL NET RESERVOIR VOIDAGE RATE FOR ARCO UNIT PLUS CITGO UNIT (%)	PERCENT OF TOTAL RESERVOIR HYDROCARBON PORE VOLUME FOR ARCO UNIT PLUS CITGO UNIT (%)	PERCENT OF TOTAL WELL COUNT FOR ARCO UNIT PLUS CITGO UNIT (%)
I. <u>Production for January 1974.</u>						
a) ARCO Unit:	32,891	56,319	1.71	94.17	98.78	97.36
b) Citgo Unit Area:	510	<u>3,486</u> 59,805	6.83	<u>5.83</u> 100.00	<u>1.22</u> 100.00	<u>2.64</u> 100.00
II. <u>Production for Mid-1974 (est.)</u>						
a) ARCO Unit:	40,555	28,668	0.71	88.84	98.78	97.36
b) Cito Unit - Citgo Rules: (Sell 1711 MCF/D, inject all additional prod. gas)	651	<u>3,603</u> 32,271	5.53	<u>11.16</u> 100.00	<u>1.22</u> 100.00	<u>2.64</u> 100.00
III. <u>Production for Mid-1974 (est.)</u>						
a) ARCO Unit:	40,555	28,668	0.71	94.84	98.78	97.36
b) Citgo Unit - ARCO Rules: (Inject all avail. residue gas, voidage limit 1559 RVB/D, based on 1972 voidage, both units)	547	<u>1,559</u> 30,227	2.85			<u>2.64</u> 100.00
IV. <u>Production for Mid-1974 (est.)</u> (Basis: Reservoir Voidage same as Share of Reservoir Hydrocarbon Pore Volume.)						
a) ARCO Unit:	40,555	28,668	0.71	98.78	98.78	97.36
b) Citgo Unit - ARCO Rules: (Inject all avail. residue gas, voidage limit 354 RVB/D)	137	<u>354*</u> 29,022	2.58	<u>1.22*</u> 100.00	<u>1.22</u> 100.00	<u>2.64</u> 100.00

(\*At this reservoir voidage rate and percent, there will be no fluid drainage across unit boundaries.)

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BEFORE THE MINER STAMETS  
OIL CONSERVATION COMMISSION

EXHIBIT NO. 4

CASE NO. 6711-1974

Submitted by CITGO

Hearing Date 4/2/74

CITGO-EMPIRE ABO UNIT

## Proposed Rules Governing Operation.

(Rules proposed by Atlantic Richfield to conform to rules in effect for the ARCO-Empire Abo Pressure Maintenance Project Area.)

1. Reservoir Voidage to be determined from a formula such as Attachment "A" to Order No. R-4549, with Table of fluid properties such as Attachment "B" to Order No. R-4549.
2. Reservoir voidage calculated by use of the formula mentioned above to be limited to no more than 1559 reservoir barrels per day, or the average 1972 reservoir voidage for the combined ARCO-Citgo Unit, apportioned to the Citgo Unit on the basis of well count.
3. The Citgo Unit be required to inject all available plant residue gas.
4. Allowables and voidages to be nominated and transferred on an individual well basis.
5. Injected residue gas above 90% of "all available residue gas," to be used as a "gas bank" for oil allowable credit during times when mechanical problems diminish or prevent gas injection. Balancing and "zeroing" of the gas bank balance to be on an annual basis.
6. ARCO respectfully requests the Commission to investigate the possible requirement that some portion of any additional allowable be justified on the basis of percent of available residue gas actually injected, as in Rule R-4549, Finding (8) and Rule 4.
7. No well in the Citgo Project Area which directly or diagonally offsets a well not committed to the Citgo Unit producing from the same common source of supply should be allowed to produce more than two top unit allowables for the Empire Abo Pool.
8. New injection and producing wells to be located no closer than 660 feet to the outer boundary of said unit, or 10 feet to any quarter-quarter section or inner boundary, with no gas or water injection well to be located closer than 1650 feet to a tract not committed to the unit and on which is located a well producing from the same common source of supply.
9. Submittal of an annual Plan of Operation, with emphasis on corrosion control, as the injection of sour gas at high pressures can cause severe corrosion problems.

BEFORE EXAMINER STAMETS  
OIL CONSERVATION COMMISSION

EXHIBIT NO. 5

CASE NO. 100-22372

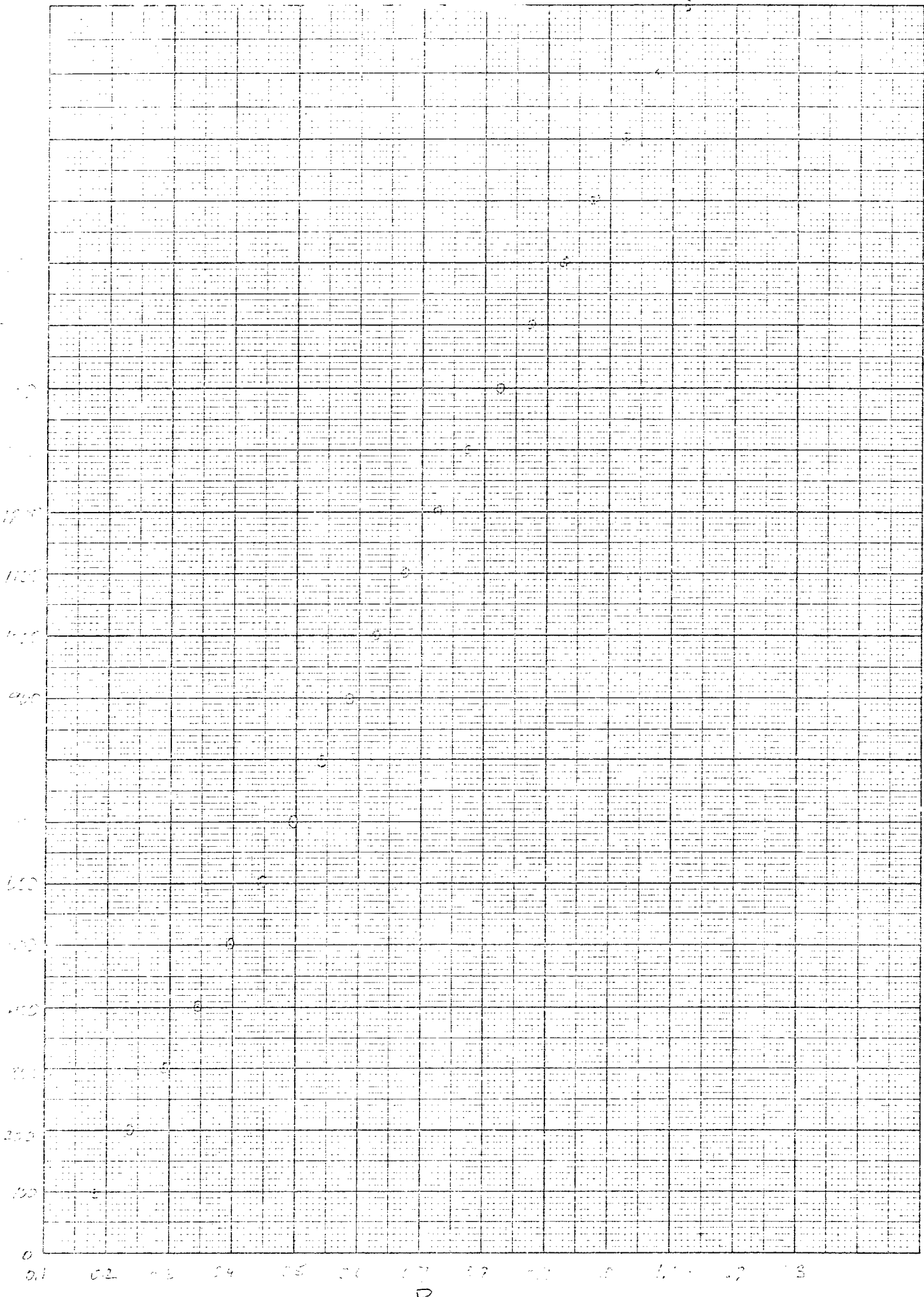
Submitted by AT&T

Hearing Date 6/27/72

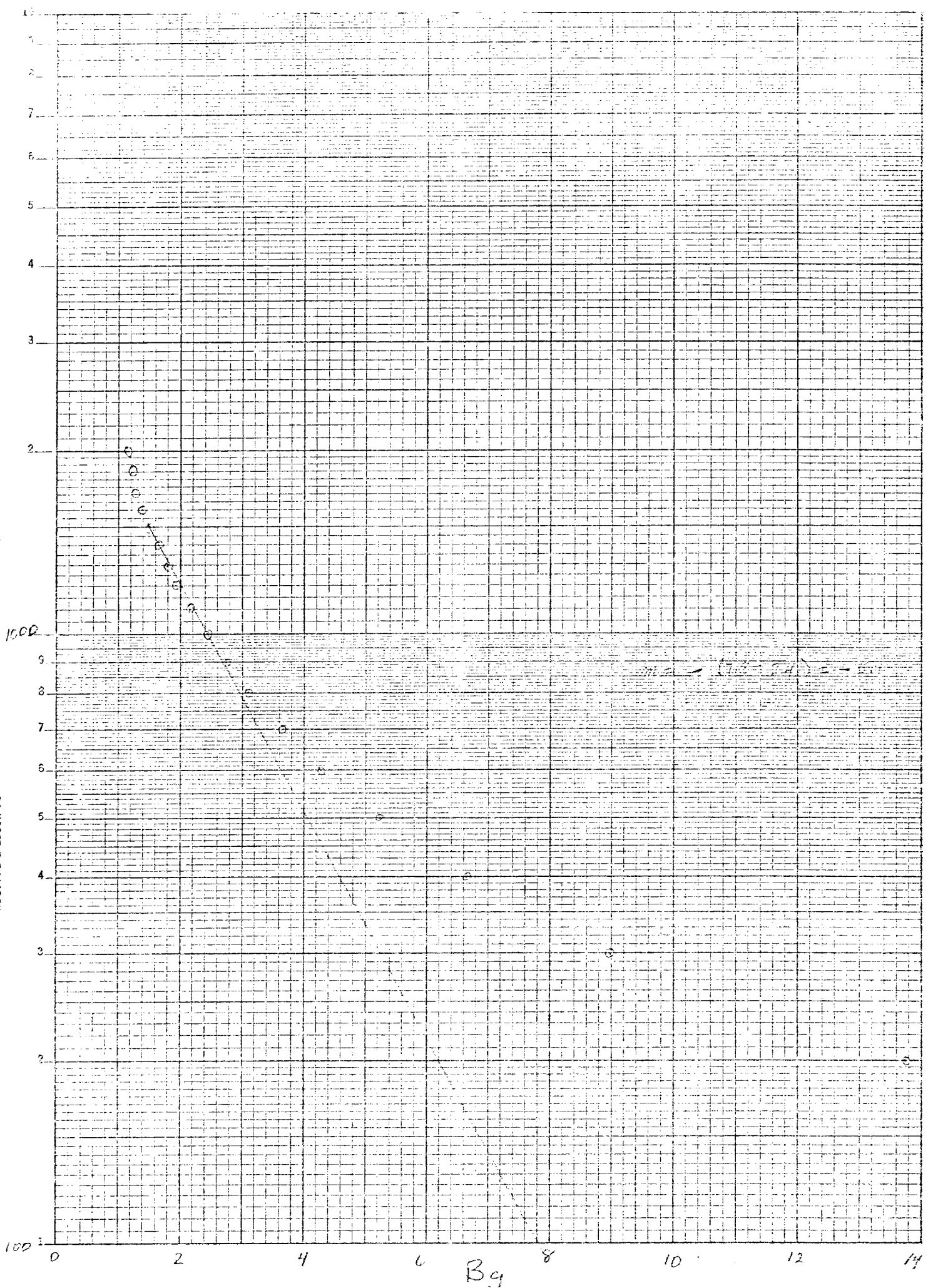
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BHP

20 X 20 TO THE INCH • T. N. B. R. C. H. S. •  
KLEIN & LUSSEN CO. MADE IN U.S.A.



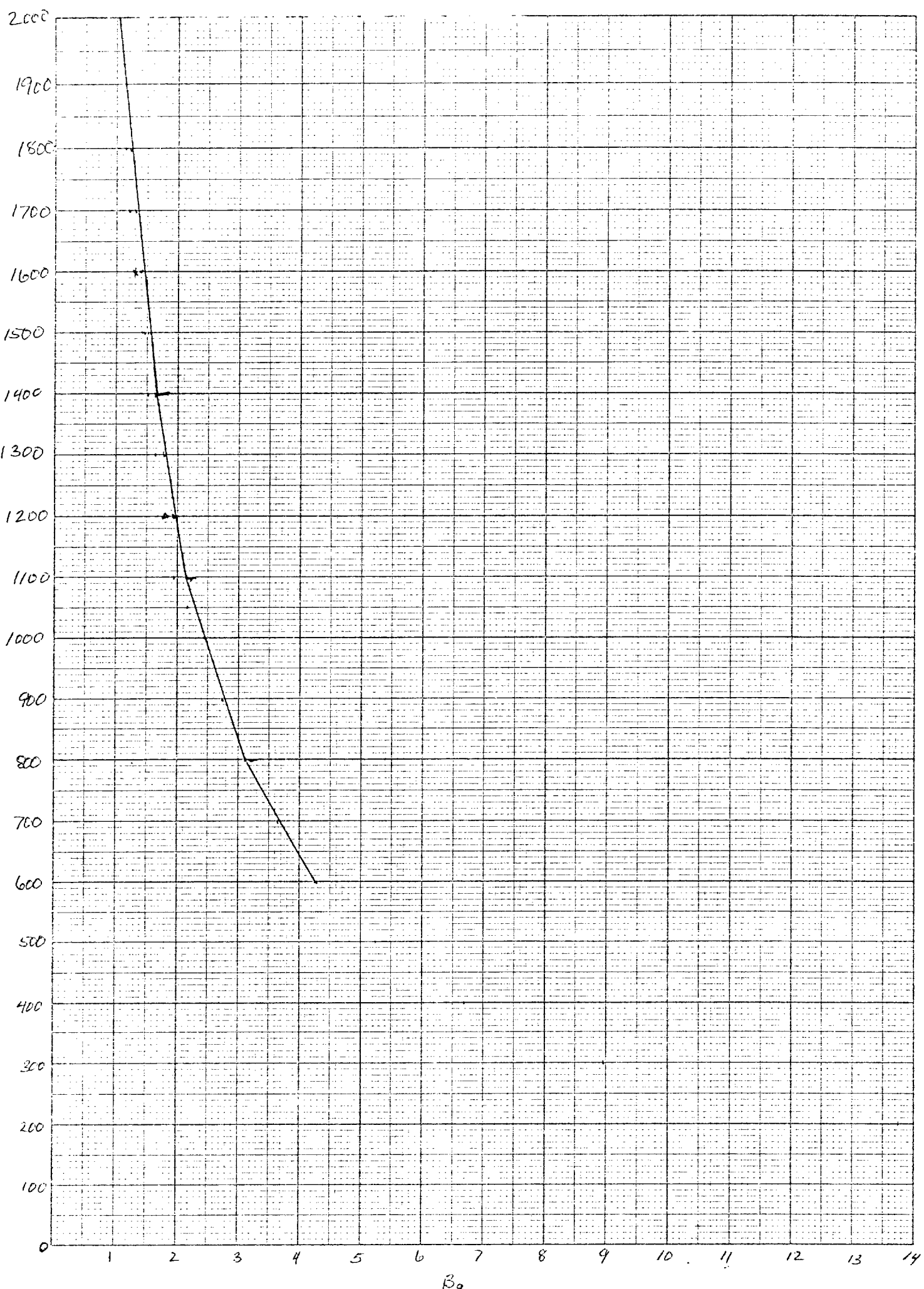
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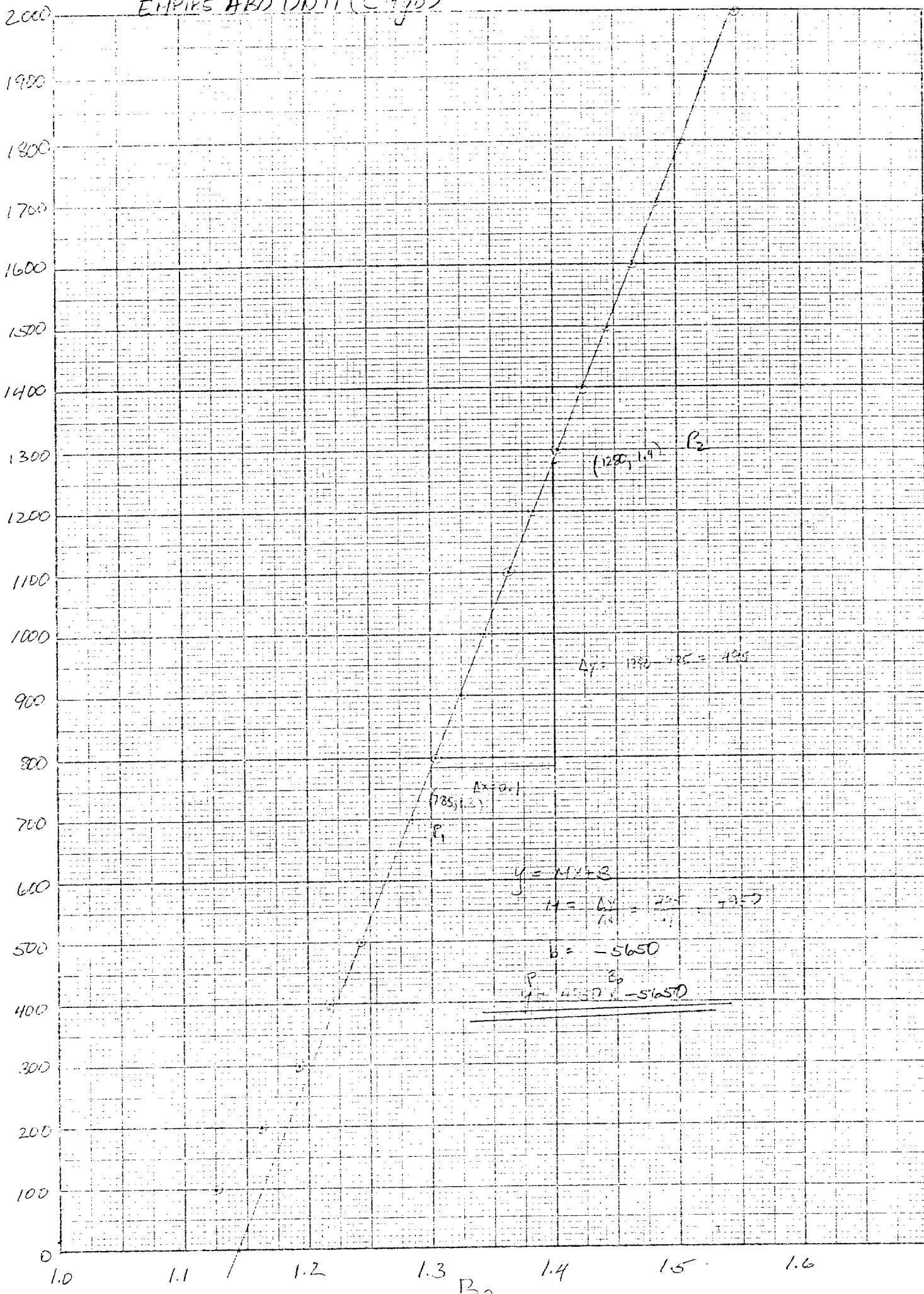


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EMPIRE ARD UNIT (C-770)



BHP

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K. H. H. & S. H. H.  
K. H. H. & S. H. H.