



MEMORIO

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Memorandum for the Joint Staff

mailed to all interested parties

June 1, 1952

Case No.

2049

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Application, Transcript,  
and Exhibits, Etc.

Case 2047  
Recess Ex. No. 2-A

Calculation of Recoverable Reserves in Marye Sand Only  
El Paso #89 Canyon Largo  
Section 17, T-24N, R-6W  
Rio Arriba County, New Mexico

August 17, 1960

Acres in well site	320
Net sand thickness	19 feet
Porosity of sand	10.0 %
Oil saturation of sand	14.7 %
Water saturation of sand	32.3 %
Calculated bottom hole pressure	2015 psia
Reservoir temperature	118 °F
Compressibility factor	.779
Gas per acre-foot originally in place	367 Mcf
Gas per acre-foot remaining at 250 psia abandonment pressure	37 Mcf
Recoverable gas per acre-foot	330 Mcf
Recoverable gas per acre	6,270 Mcf
Oil content	10 Bbls. / MMcf
Pipeline gas recoverable per acre	6,188 Mcf
Recoverable pipeline gas from 320 acre drillsite	1,980,160 Mcf
Recoverable oil from 320 acre drillsite	19,802 Bbls.

$$43,560 \times .100 \times .530 \times \frac{2015}{14.73} \times \frac{520}{460} \times \frac{1}{118} \times .779 = 367,045 \text{ cu. ft. or } 367 \text{ Mcf/acre-foot originally in place}$$

$$43,560 \times .100 \times .530 \times \frac{250}{14.73} \times \frac{520}{460} \times \frac{1}{118} \times .962 = 36,658 \text{ cu. ft. or } 37 \text{ Mcf/acre-foot remaining at abandonment}$$



Case 2049  
Reese Ex. No. 2-B

Calculation of Recoverable Reserves in Marye Sand Only  
Redfern-Herd #1 Largo Spur  
Section 18, T-24N, R-6W  
Rio Arriba County, New Mexico

August 17, 1960

Acres in well site	320
Net sand thickness	23 feet
Porosity of sand	11.0 %
Oil saturation of sand	21.4 %
Water saturation of sand	28.4 %
Calculated bottom hole pressure	2015 psig
Reservoir temperature	118 °F
Compressibility factor	.779
Gas per acre-foot originally in place	382 Mcf
Gas per acre-foot remaining at 250 psia abandonment pressure	38 Mcf
Recoverable gas per acre-foot	344 Mcf
Recoverable gas per acre	7,912 Mcf
Oil content	10 Bbls. / MMcf
Pipeline gas recoverable per acre	7,809 Mcf
Recoverable pipeline gas from 320 acre drillsite	2,498,880 Mcf
Recoverable oil from 320 acre drillsite	24,989 Bbls.

$$43,560 \times .110 \times .502 \times \frac{2015}{14.73} \times \frac{320}{460 \div 118} \times \frac{1}{.779} = 382,418 \text{ cu. ft. or } 382 \text{ Mcf/acre-foot originally in place}$$

$$43,560 \times .110 \times .502 \times \frac{250}{14.73} \times \frac{520}{460 \div 118} \times \frac{1}{.962} = 38,193 \text{ cu. ft. or } 38 \text{ Mcf/acre-foot remaining at abandonment}$$

Case 2049  
Reese Ex No. 2-C

Calculation of Recoverable Reserves in Marye Sand Only  
Val R. Reese & Assoc., Inc. #1-19 Lybrook  
Section 19, T-24N, R-6W  
Rio Arriba County, New Mexico

August 17, 1960

Acres in well site	320
Net sand thickness	29 feet
Porosity of sand	10.3 %
Oil saturation of sand	22.5 %
Water saturation of sand	35.5 %
Calculated bottom hole pressure	2015 psig
Reservoir temperature	118 °F
Compressibility factor	.779
Gas per acre-foot originally in place	300 Mcf
Gas per acre-foot remaining at 250 psia abandonment pressure	30 Mcf
Recoverable gas per acre-foot	270 Mcf
Recoverable gas per acre	7,830 Mcf
Oil content	10 Bbls. / MMcf
Pipeline gas recoverable per acre	7,728 Mcf
Recoverable pipeline gas from 320 acre drillsite	2,472,960 Mcf
Recoverable oil from 320 acre drillsite	24,730 Bbls.

$$43,560 \times .103 \times .420 \times \frac{2015}{14.73} \times \frac{520}{460} \times \frac{1}{118} \times .779 = 299,592 \text{ cu. ft. or 300 Mcf/acre-foot originally in place}$$

$$43,560 \times .103 \times .420 \times \frac{250}{14.73} \times \frac{520}{460} \times \frac{1}{118} \times .962 = 29,921 \text{ cu. ft. or 30 Mcf/acre-foot remaining at abandonment}$$

Case 2049  
 Anasco Ex. No. 2-D

Calculation of Recoverable Reserves in Marye Sand Only  
 Redfern-Herd #2 Largo Spur  
 Section 13, T-24N, R-7W  
 Rio Arriba County, New Mexico

August 17, 1960

Acres in well site	320
Net sand thickness	20 feet
Porosity of sand	11.0 %
Oil saturation of sand	21.4 %
Water saturation of sand	28.4 %
Calculated bottom hole pressure	2015 psig
Reservoir temperature	116 °F
Compressibility factor	.779
Gas per acre-foot originally in place	382 Mcf
Gas per acre-foot remaining at 250 psia abandonment pressure	38 Mcf
Recoverable gas per acre-foot	344 Mcf
Recoverable gas per acre	6,880 Mcf
Oil content	10 Ebls. / MMcf
Pipeline gas recoverable per acre	6,791 Mcf
Recoverable pipeline gas from 320 acre drillsite	2,173,120 Mcf
Recoverable oil from 320 acre drillsite	21,731 Ebls.

$$43,560 \times .110 \times .502 \times \frac{2015}{14.73} \times \frac{520}{460} \times \frac{1}{118} \times .779 = 382,418 \text{ cu. ft. or } 382 \text{ Mcf/acre-foot originally in place}$$

$$43,560 \times .110 \times .502 \times \frac{250}{14.73} \times \frac{520}{460} \times \frac{1}{118} \times .962 = 38,193 \text{ cu. ft. or } 38 \text{ Mcf/acre-foot remaining at abandonment}$$

Case 2049  
 Reese Ex. No. 2-E

Calculation of Recoverable Reserves in Marye Sand Only  
 Killarney Oil Company #1-24 Killarney  
 Section 24, T-24N, R-7W  
 Rio Arriba County, New Mexico

August 17, 1960

Acres in well site	320
Net sand thickness	37 feet
Porosity of sand	10.6 %
Oil saturation of sand	30.3 %
Water saturation of sand	38.7 %
Calculated bottom hole pressure	2015 psi
Reservoir temperature	118 °F
Compressibility factor	.779
Gas per acre-foot originally in place	228 Mcf
Gas per acre-foot remaining at 250 psia abandonment pressure	23 Mcf
Recoverable gas per acre-foot	205 Mcf
Recoverable gas per acre	7,560 Mcf
Oil content	10 Bbls. / MMcf
Pipeline gas recoverable per acre	7,486 Mcf
Recoverable pipeline gas from 320 acre drillsite	2,395,520 Mcf
Recoverable oil from 320 acre drillsite	23,955 Bbls.

$$43,560 \times .106 \times .310 \times \frac{2015}{14.73} \times \frac{520}{460} \times \frac{1}{.779} = 227,567 \text{ cu. ft. or } 228 \text{ Mcf/acre-foot originally in place}$$

$$43,560 \times .106 \times .310 \times \frac{250}{14.73} \times \frac{520}{460} \times \frac{1}{.962} = 22,728 \text{ cu. ft. or } 23 \text{ Mcf/acre-foot remaining at abandonment}$$



Rease #3.

[illegible]

<u>Date of Test</u>	<u>Test Hours</u>	<u>Oil (Bbls)</u>	<u>Gas (Mcf)</u>	<u>FW</u>
<b>Blahely 6-23</b>				
<b>Section 23, T-24N, R-7W</b>				
12-12-62	26	85	130	1.800
1-15-63	24	53	200	3.774
4-15-63	24	48.1	140	3.000
<b>Section 27, T-24N, R-7W</b>				
12-24-62	24	85	375.4	1.400
1-15-63	24	107	375	1.400
2-15-63	24	100	375	1.400
3-15-63	24	100	375	1.400
4-15-63	24	100	375	1.400
5-15-63	24	100	375	1.400
6-15-63	24	100	375	1.400
<b>Section 30, T-24N, R-7W</b>				
12-24-62	24	100	67	1.400
1-15-63	24	67	67	1.400
2-15-63	24	80	430	1.400
3-15-63	24	48.1	375	1.400
4-15-63	24	38	100	1.400
7-21-63	24	21	130	6.200

EL PASO NATURAL GAS COMPANY  
CARTER LEASE 409

Case 2049

Recess Ex. No. 3

Well Name		Location		Depth		Pressure		Temperature		Gas Gravity		Oil Gravity		Water Gravity		Sand		Gravel		Clay		Silt		Total	
Well No.	Section	Township	Range	Section	Depth	Pressure	Temperature	Gas Gravity	Oil Gravity	Water Gravity	Sand	Gravel	Clay	Silt	Total	Sand	Gravel	Clay	Silt	Total	Sand	Gravel	Clay	Silt	Total

1	1	1	1	1	11.3	8.75		5.9	20.1																
2	2	2	2	2	9.1	5.13		10.3	20.5																
3	3	3	3	3	8.7	8.85		10.0	17.1																
4	4	4	4	4	4.4	0.14		17.3	37.9																
5	5	5	5	5	10.2	0.63		26.4	29.1																
6	6	6	6	6	7.5	8.85		10.0	24.8	30.8															
7	7	7	7	7	10.2	0.63		12.7	34.5																
8	8	8	8	8	10.2	0.63		21.8	52.5																

17 FEET OF NET PRODUCTIVE SAND

AVERAGES : PERM 13.5 MD.  
POROSITY 10.0%  
OIL SATURATION 14.7 %  
WATER SATURATION 32.3%

COMPANY **WAL REESE & ASSOCIATES, INC.**DATE ON **8/21/58**FILE NO. **KT-3-821 PG. 4. EC**WELL **FEDERAL NO. 1-24**DATE OFF **8/25/58**ENGRS. **WJC**FIELD **RECITO EXTENSION**FORMATION **GALLUP**ELEV. **6652' GL**COUNTY **RIO ARriba**STATE **NEW MEX.**DRLG. FLD. **OIL REPLETION**CORES **DIAMOND**LOCATION **1980' FRL, 1980' FRL, SEC 24 T24N R7W**REMARKS **SAMPLED BY C.L. REESE AND  
REPRESENTATIVE OF CLIENT****COMPLETION CORRECTION****TABULAR DATA and INTERPRETATION**

SAMPLE NO.	DEPTH FEET	PERM. MD.	POROSITY %	RESIDUAL SATURATION % PORE SPACE		PROD.	PERMEABILITY COEFFICIENT C-O MILLIDARCY					TOTAL WATER C-O PERCENT PORE SPACE				
				OIL	TOTAL		POROSITY X-X-X PERCENT					OIL SATURATION X-X-X PERCENT PORE SPACE				
1	3435-40	0.55	8.4	17.1	46.8		40	30	20	10	0	80	60	40	20	
2	40-51	0.56	13.3	32.8	26.3											
3	41-52	0.38	17.0	26.5	20.6											
4	42-53	0.43	16.7	25.8	19.8											
5	43-54	0.33	11.0	32.7	27.3											
6	44-55	0.28	16.7	33.3	23.1											
7	45-56	0.43	11.0	33.6	28.2											
8	46-57	0.29	7.7	35.7	47.1											
9	47-58	0.27	12.2	30.3	31.1											
10	48-59	0.57	11.4	41.3	34.3											
11	49-60	0.52	13.5	32.6	28.8											
12	50-51	0.18	17.4	33.6	29.1											
13	51-52	0.42	7.1	16.9	55.0											
14	52-53	0.17	9.5	30.5	47.3											
15	53-54	0.15	10.1	29.7	43.6											
16	54-55	0.16	11.6	33.3	38.7											
17	55-56	0.19	10.4	31.7	39.5											
18	56-57	0.17	11.4	35.9	30.7											
19	57-58	0.15	11.0	28.2	35.5											
20	58-59	0.22	10.7	30.9	42.1											
21	59-60	0.10	7.3	12.4	67.2											
22	60-61	0.13	10.2	37.3	43.2											
23	61-62	0.13	11.3	36.3	31.0											
24	62-63	0.11	9.5	30.6	51.5											
25	63-64	0.15	10.3	32.0	34.0											
26	64-65	0.17	11.3	33.6	32.0											
27	65-66	0.13	8.5	16.5	66.7											
28	66-67	0.12	9.0	28.9	47.8											
29	67-68	0.11	8.3	19.3	54.2											
30	68-69	0.11	10.0	33.0	33.0											
31	69-70	0.12	9.5	38.9	32.6											
32	70-71	0.19	10.4	31.8	35.6											
33	71-72	0.14	19.7	29.9	44.3											
34	72-73	0.22	9.2	32.6	47.8											
35	73-74	0.11	9.1	37.4	39.3											
36	74-75	0.08	8.6	32.8	46.3											
37	75-76	0.08	8.3	25.3	50.6											

37 FEET OF NET PRODUCTIVE SAND

AVERAGES: PERM. .23 MD; POROSITY 10.6 %;

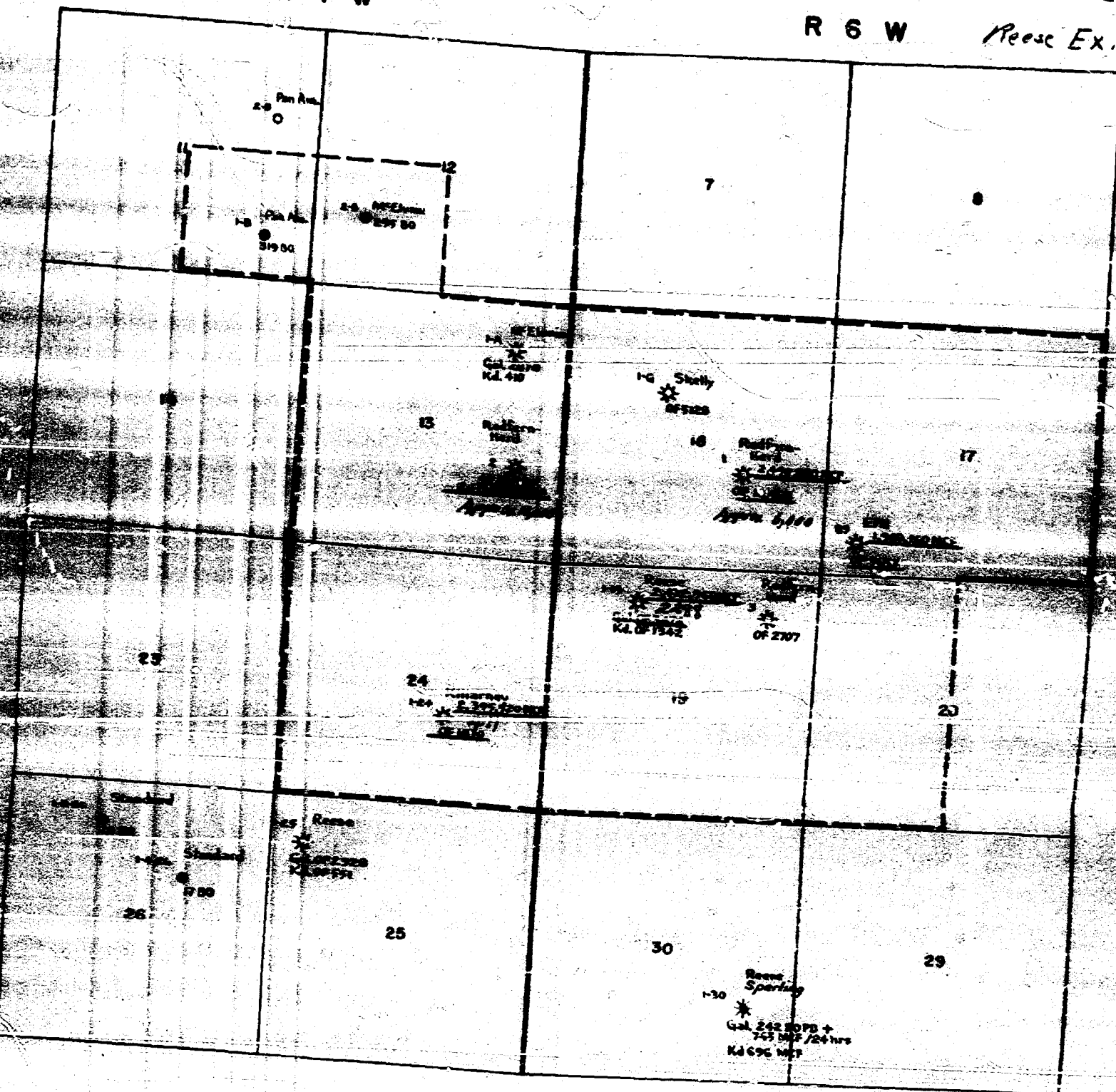
OIL SATURATION 30.3%; WATER SATURATION 38.7%

Case 20449

Reese Ex. No. 4



Case 2049  
Reese Ex. No. 1



DEVILS FORK — GALLUP POOL  
RIO ARRIBA CO., NEW MEXICO

**AUGUST 1960**

VAL R. REESE AND ASSOCIATES INC.

2395 520 MCF GAS UNDERLYING  
320 AC. WELL SITE

41, MCFPD WELL DELIVERABILITY

PRESENT LIMITS OF DEVILS  
FORK - GALLUP POOL

Skelly 1, 1, 1, 1, 1 #1  
Case No. 2049

CORE ANALYSIS REPORT  
FOR  
SKELLY OIL COMPANY  
NEW MEXICO FEDERAL G-1 WELL  
DEVILS FORK FIELD  
RIO ARriba COUNTY, NEW MEXICO  
LOCATION SEC 18 T24N R6W



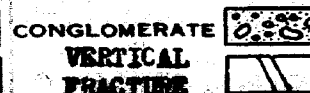
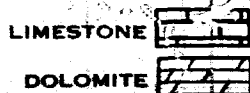
CORE LABORATORIES, INC.



Petroleum Reservoir Engineering

COMPANY SKELLY OIL COMPANY  
 WELL NEW MEXICO FEDERAL G - 1  
 FIELD DEVILS FORK  
 COUNTY RIO ARriba STATE N. MEXICO  
 LOCATION SEC18 T24N R6W

DATE ON 7/12/60 FILE NO RP-3-1228  
 DATE OFF 7/12/60 ENGRS ENGLISH  
 FORMATION GALLUP ELEV 6646' DE  
 DRG. FLD. OIL EMULSION COFES DIAMOND  
 REMARKS SAMPLED BY CLIENT



These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted), but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

## TABULAR DATA and INTERPRETATION

SAMPLE NO.	DEPTH FEET	PERM. MD.	POROSITY %	SATURATION % PORE SPACE		PROD.
				OIL	TOTAL WATER	
1	5570-71	0.01	2.9	51.8	34.5	
2	71-72	8.0	13.1	28.2	19.1	
3	72-73	37	19.4	25.7	20.1	
4	73-74	181	19.5	23.6	17.9	
5	74-75	48	13.9	25.9	18.7	
6	75-76	49	18.7	25.6	20.3	
7	76-77	11	14.6	22.6	19.2	
8	77-78	4.9	16.0	23.1	20.6	
9	78-79	0.08	11.3	34.5	29.2	
10	79-80	0.32	9.4	29.8	21.3	
11	80-81	0.01	6.2	35.5	30.6	
12	81-82	0.02	5.5	12.7	61.8	

PERMEABILITY  $\circ$   $\circ$   
MILLIDARCY

5 4 3 2 1 0

PERCENT

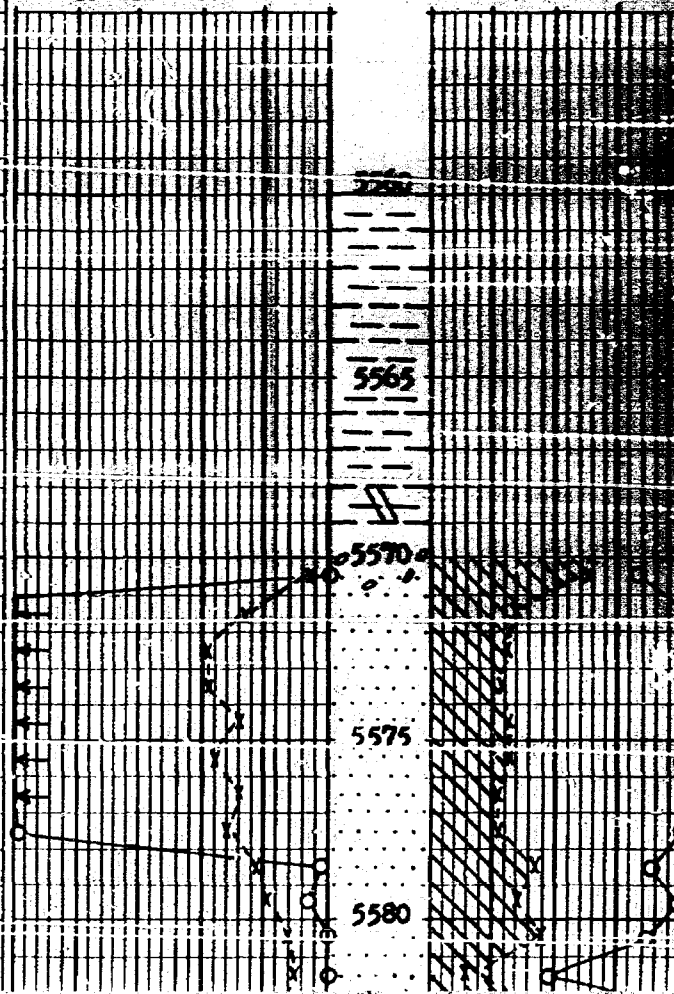
40 30 20 10 0

TOTAL WATER  $\circ$   $\circ$   
PERCENT

80 60 40 20

PERCENT

0 20 40 60 80



13	82-83	0.05	7.4	37.9	11.8
14	83-84	0.13	14.6	35.6	19.2
15	84-85	0.06	10.1	26.7	15.9
16	85-86	1.0	12.2	34.5	22.1
17	86-87	0.06	11.1	32.5	28.8
18	87-88	0.02	6.3	22.2	31.8
19	88-89	0.04	8.5	29.4	42.3
20	89-90	0.02	5.4	22.2	68.5
21	90-91	0.03	4.6	10.9	69.6
22	91-92	0.03	6.1	11.5	65.6
23	92-93	0.01	6.7	13.4	64.2

5583

5585

5587

5589

5603



**CORE LABORATORIES, INC.**

*Petroleum Reservoir Engineering*

**DALLAS, TEXAS**

**July 25, 1960**

REPLY TO  
724 PATTERSON BLVD  
DENVER, COLORADO

**Skelly Oil Company  
Box 4115, Station A  
Albuquerque, New Mexico**

**Attention: Mr. Bill Kendall**

**Subject: Core Analysis  
New Mexico Federal G-1 Well  
Devils Fork Field  
Rio Arriba County, New Mexico  
Location: Sec. 18-T24N-R6W**

**Gentlemen:**

Gallup formation analyzed from 5571 to 5580 feet exhibits residual fluid saturations which indicate the interval to be capable of producing oil. The total observed natural productive capacity of 342 millidarcy-feet is considered adequate for satisfactory rates of flow.

Formation analyzed from 5583 to 5587 feet is interpreted to be oil productive. The low productive capacity indicates a formation treatment will be necessary in order to obtain satisfactory rates of production.

Recoverable oil estimates have been prepared to be used as a guide in the evaluation of the formation. These theoretical maximum estimates have been calculated using the observed core analysis data in conjunction with estimated original reservoir fluid characteristics considered applicable and are subject to the conditions outlined in the body of and in the footnotes to the summary page.

The intervals, 5570 to 5571, 5580 to 5583 and 5587 to 5593 feet, are essentially nonproductive due to low permeability and porosity.

We sincerely appreciate the opportunity to be of service to you.

Very truly yours,

Core Laboratories, Inc.

*J. D. Harris*  
(R)

J. D. Harris,  
District Manager

JDH:LW:sp

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
**DALLAS, TEXAS**

Page 1 of 1 File RP-3-1228  
 Well New Mexico Federal G-1

**CORE SUMMARY AND CALCULATED RECOVERABLE OIL**

**FORMATION NAME AND DEPTH INTERVAL:** Gallup 5571.0-5580.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	9.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	20.7
FEET OF CORE INCLUDED IN AVERAGE	9.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE (c)	19
AVERAGE PERMEABILITY: MILLIDARBY	38	OIL GRAVITY: °API (e)	39
PRODUCTIVE CAPACITY: MILLIDARBY-Feet	342	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL (e)	380
AVERAGE POROSITY: PER CENT	15.1	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL (e)	1.26
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	26.6	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	753

Calculated maximum solution gas drive recovery is 221 barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is 441 barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates.)

**FORMATION NAME AND DEPTH INTERVAL:** Gallup 5583.0-5587.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	4.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	21.5
FEET OF CORE INCLUDED IN AVERAGE	4.0	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE (c)	21
AVERAGE PERMEABILITY: MILLIDARBY	0.31	OIL GRAVITY: °API (e)	39
PRODUCTIVE CAPACITY: MILLIDARBY-Feet	1.2	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL (e)	380
AVERAGE POROSITY: PER CENT	12.0	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL (e)	1.26
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	32.3	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	584

Calculated maximum solution gas drive recovery is 172 barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is 283 barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates.)

(c) Calculated (e) Estimated (m) Measured (\*) Refer to attached letter.

These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc., and its officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

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**BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO**

IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
COMMISSION OF NEW JERSEY FOR  
THE PURPOSE OF CONSIDERING:

CASE No. 2049  
ORDER No. E-1670-2

[illegible]

\_\_\_\_\_

**THE UNIVERSITY OF CHICAGO**

This report given to the Institute at 3 o'clock p.m. on August 10, 1955, at Boston 24, New Boston, Boston, the following verbal Commission of New Boston, Massachusetts followed by the "Commission."

On, on this 28th day of September, 1934, the Commission  
a greater being present, having considered the foregoing petition  
and the petition remained at said hearing, and being duly advised  
in the premises.

**SECRET**

(12) That due public notice having been given as required by law, the Commission has jurisdiction of this event and the right to make a finding thereon.

(2) That by Order No. B-1641-2, the Commission recommended temporary special sales and regulations governing the production, use and protection of wells in the Eagle Peak-oil field, Rio Arriba County, New Mexico, which sales provided, among other things, that 42-acre oil production units and 120-acre gas units

(2) That while the Devils Post-spring was used to determine classified as a gas pool, the evidence adduced at this hearing as well as at previous hearings clearly indicates that it is in fact an "associated" reservoir, producing oil from an oil-saturated sand overlain by a gas-cap being contained in a separate and unconformable gas-saturated sand.

(4) That the parties appearing at the hearing on August 17, 1960, proposed that 80-acre protection units be established for wells in the pool which would be classified as oil wells, and



-2-

CASE No. 2049

Order No. R-1670-B

that operators be permitted to assign up to 120 acres to wells which would be classified as gas wells. Further, the parties proposed that the limiting gas-liquid ratio for the pool be set at 1000 to 1.

(5) That the parties also proposed that any well in the pool producing with a gas-liquid ratio of 30,000 cubic feet of gas per barrel of liquid hydrocarbons, or more, or any well which produces liquid hydrocarbons with a gravity of 50° API or greater be classified as a gas well, and that any well producing with a gas-liquid ratio of less than 30,000 cubic feet of gas per barrel of liquid hydrocarbons and which produces liquid hydrocarbons with a gravity of less than 50° API be classified as an oil well.

(6) That the parties proposed that both the gas area and the oil area be produced, and further that the parties proposed that the gas allocation formula be based on 75 percent average base deliverability plus 25 percent reserve. The parties submitted a straight-average gas production formula.

(7) That the evidence establishes that the gas area in the pool can be efficiently and economically drained and developed on 120-acre gas production units, and it further establishes that the oil area in the pool can be efficiently and economically drained and developed on 80-acre oil production units.

(8) That the volumetric withdrawal formula proposed by the parties is designed to keep the gas-oil contact substantially constant, thereby preventing waste and protecting correlative rights.

(9) That the top unit allowable for the oil wells in the Devils Peak-Gallup Pool should be determined by multiplying Northwest New Mexico Formal Unit Allowable by the appropriate 80-acre proportional (depth) factor (2.33). Further, that the allowable assigned to the gas area of said pool should be determined by an equivalent volumetric withdrawal formula, based on the total production from the oil area, and calculated each six months, the purpose of which would be to limit the withdrawals from the gas area to the volumetric equivalent of withdrawals from the oil area.

(10) That the parties proposing the inclusion of a deliverability factor in the gas production formula failed to prove that there is a general correlation between the deliverability of the gas wells in the Devils Peak-Gallup Pool and the recoverable gas in place under the tracts dedicated to such gas wells.

IT IS THEREFORE ORDERED:

(1) That Commission Order No. R-1641-A be and the same is hereby superseded, effective November 1, 1960.

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(2) That special rules and regulations governing the Devils Fork-Gallup Pool, Rio Arriba County, New Mexico, be and the same are hereby promulgated as hereinafter set forth, effective November 1, 1933.

(3) That the General Rules for georected gas pools in Northwest New Mexico as set forth in Order No. N-1670 be and the same are hereby promulgated as stated, and where it is stated that said General Rules are applicable such stipulation refers only to gas wells.

(4) That a case is hereby designated for the hearing Commission hearing in April, 1934, in order that the Commission can determine at that time whether the special rules and regulations promulgated are such as to be necessary in promoting the conservation of the gas-oil content. After consideration of the said case, the Commission shall decide to promulgate these special rules and regulations prior to April, 1934.

**SPECIAL RULES AND REGULATIONS FOR THE  
DEVILS FORK-GALLUP POOL**

**A. WELL LOCATION AND SPACING REQUIREMENTS**

**SPECIAL RULE 1.** Each well completed or recomplected in the Devils Fork-Gallup Pool or in the Gallup formation within ~~the~~ the limits of the Devils Fork-Gallup Pool, and not nearer to nor within the limits of another designated Gallup pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

**SPECIAL RULE 2.** Each well, oil or gas, completed or recomplected in the Devils Fork-Gallup Pool shall be located no nearer than 750 feet to any quarter section line and each such well shall be located no nearer than 120 feet to a governmental quarter-quarter section line or subdivision lower boundary line. Any well drilled to and producing from the Devils Fork-Gallup Pool prior to the effective date of this order at a location conforming to the well location requirements in effect at the time the well was drilled shall be considered to be located in accordance with this rule.

**SPECIAL RULE 3.** The Secretary-Director shall have authority to grant an exception to Special Rule 2 without notice and hearing when the application has been filed in ~~the~~ the ~~form~~ and the Secretary-Director determines that good cause exists for granting such exception. However, such an exception location, if approved, may necessitate an allowable adjustment.

Applicants shall furnish all offset operators and all operators within the section in which the subject well

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is located a copy of the application to the Commission, and the applicant shall include with his application a list of the names and addresses of all such operators together with a statement that proper notice has been given said operators at the addresses listed. The Secretary-Director may approve the verification listing thirty days after receipt of the application in the absence of objection by the parties mentioned above.

Each gas well completed or contemplated in the  
oil-bearing pool shall be located on a tract which can  
be proved to be productive of gas from said pool and  
shall be of substantially 120 acres, comprising the  
entire section of a single governmental estate.  
Each well shall maintain the surface of the oil-bearing  
pool at or above the surface of the land. A well shall  
be considered as producing the drilling of a gas well on the  
oil-bearing section in the 120-acre unit.

SEC. 4(b). For good cause shown, the Secretary Director  
may grant an exception to the requirements of Rule 4(b) without  
notice and hearing where an application has been filed in due time  
and where the circumstances give or suggest at the time is due to a  
variation in the legal subdivision of the United States, which  
lands survey, in which the following facts exist and the follow-  
ing exceptions has been granted with.

- (1) The non-standard unit consists of contiguous quarter-quarter sections or lots.
- (2) The non-standard unit consists of not more than 334 acres and lies wholly within a single governmental section.
- (3) The entire non-standard unit may reasonably be presumed to be productive of gas from said pool.
- (4) The applicant presents written consent in the form of waivers from all offset operations, and from all operators owning interests in the section in which any part of the non-standard unit is situated and which acreage is not included in the non-standard unit.
- (5) In lieu of Paragraph 4 of this Rule, the applicant may furnish proof of the fact that all of the aforesaid operations were notified by registered mail of his intent to form such non-standard unit. The Secretary-Director may approve the application if, after a period of 30 days, no such operator has entered an objection to the formation of the non-standard unit.

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**SPECIAL RULE 4(a).** The District Supervisor shall have authority to approve non-standard gas production units without notice and hearing and without administrative approval by the Secretary-Director if such unit consists of less than 110 surface contiguous acres and the non-standard unit is necessitated by a variation in the United States Public Lands Survey.

**SPECIAL RULE 4(b).** The acreage assigned to any non-standard gas production unit shall bear the same ratio to a standard allocation in said pool as the acreage in the unit bears to 110 acres.

**SPECIAL RULE 5(a).** Each oil well completed or anticipated in the 110-acre pool shall be located on a well community approximately 80 acres which may be produced to be productive of oil from said pool and which consists of the 1/2, 1/4, 1/8 or 3/8 of a section. For purposes of these rules, a well community of 80 acres 75 and 80 surface contiguous acres shall be considered a standard unit. No other surface acreage shall be considered as productive. The drilling of an oil well on each of the quarter-quarter sections in the 80-acre unit.

**SPECIAL RULE 5(b).** For pool cases shown, the Secretary-Director may grant an exception to the requirements of Rule 5(a) above without notice and hearing where an application has been filed in due form, and where the modification size or shape of the tract is due to a variation in the legal description of the United States Public Lands Survey, or where the following provisions are complied with:

- (1) The non-standard unit is to consist of a single quarter-quarter section or lot.
- (2) The non-standard unit contains less than 81 acres.
- (3) The entire non-standard unit may reasonably be produced to be productive of oil from said pool.
- (4) The applicant presents written consent in the form of waivers from all offset operators.

(5) In lieu of paragraph 4 of these rules, the applicant may furnish proof of the fact that all of the offset operators were notified by registered mail of his intent to form such non-standard unit. The Secretary-Director may approve the application if, after a period of 30 days, no operator has entered an objection to the formation of such non-standard unit.

**SPECIAL RULE 5(c).** The District Supervisor shall have authority to approve non-standard oil production units without notice and hearing and without administrative approval by the Secretary-Director if such unit consists of two quarter-quarter sections or lots and is less than 70 surface contiguous acres and the

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non-standard unit is necessitated by a variation in the United States Public Lands Survey.

**SPECIAL RULE 5(d).** The allowable assigned to any non-standard oil production unit shall bear the same ratio to a standard allowable in said pool as the acreage in the unit bears to 80 acres.

**B. MINUTE-TIME AND FORTY-FIVE PERCENT**

**RULE 6(a).** (General Rules applicable) Also see Rule 8.

**RULE 6(b).** (General Rules applicable)

**RULE 7(a).** (General Rules applicable)

**RULE 7(b).** (General Rules applicable)

**C. ACREAGE AND DEDICATION OF ACREAGE**

**SPECIAL RULE 8.** The total tentative gas allowable to be allocated to the pool shall be equal to the sum of the preliminary or original tentative gas production together with necessary adjustments. The gas allowable pending such adjustments shall be the total allowable assigned to original wells shall be allocated among the original wells entitled to an allowable in the proportion that each well's acreage bears to the total of the acreage entitled to all non-original wells in the pool.

The total tentative gas allowable to be allocated to the pool during the initial three-month gas production period defined in Special Rule 13 shall be the sum of the preliminary or original tentative gas production shall be filed at least five days prior to the Regular Commission Allowable Hearings in October, November, and December, 1940. These provisions shall each indicate the market demand for gas during the covering month and shall be subject to any necessary adjustments.

The provisions of Special Rule 13(a) relating to the determination of final gas allowable for a six-month production period on the volumetric equivalent of production from the oil area shall also apply to the initial three-month gas production period and the final gas allowable for said period shall be the volumetric equivalent of production from the oil area during November and December, 1940, and January, 1941.

Preliminary nomination for the first full six-months gas production period shall be filed with the Commission at least five days prior to the December hearing.

**SPECIAL RULE 8(a).** No well shall be assigned an allowable until Form C-104, Form C-110, and Form C-116 have been filed, together with a plat (Form C-120) showing the acreage dedicated to the well



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and the location of all wells on the unit. Form C-116 shall show, in addition to the information required thereon, the quantity of the liquid hydrocarbons produced in the test.

The District Supervisor of the Commission's Lubbock District Office is hereby authorized to assign a temporary gas allowable to wells connected to a gas transportation facility during the recovery of land oil, which allowable shall not exceed the amount of cubic feet of gas obtained by multiplying the daily top well allowable for the pool by 2000.

**SPECIAL RULE 8(a).** Oil well allowables shall be determined in accordance with the provisions of Section 11a, Rule 8(a).

**SPECIAL RULE 8(b).** A gas well's "average number" shall be determined by the number of a well's production in cubic feet divided by the well's "average number" of a well's production in cubic feet. An oil well's "average number" shall be determined by the average production of a well's production in cubic feet divided by the well's "average number" of a well's production in cubic feet.

**SPECIAL RULE 8(c).** The allowable to be assigned to each well shall be equal to the average production of such well during any month of the preceding gas production period.

**SPECIAL RULE 8(d).** Each oil well on an oil-gas oil production unit shall be permitted to produce an amount of gas determined by multiplying the top well oil allowable for the pool by the number of gas-oil units for the pool (2000). In the event there is more than one oil well on an oil-gas oil production unit, the operator may produce the allowable assigned to the unit from said wells in any proportion.

**SPECIAL RULE 8(e).** Allowables to wells whose classification has changed from oil to gas or from gas to oil as the result of a gas-liquid ratio test shall commence on the first day of the month following the month in which such test was reported, provided that a plot (Form C-116) showing the average dedicated to the well and the location of all wells on the dedicated acreage has been filed.

**RULE 10(a).** (General Rules applicable)

**RULE 11.** (General Rules applicable)

**SPECIAL RULE 12.** The full production of gas from each well, including drilling gas, shall be charged against the well's allowable regardless of the disposition of the gas; provided, however, that gas used in maintaining the producing ability of the well shall not be charged against the allowable.

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**D. DETERMINATION OF PRODUCTION**

**ARTICLE 12.** The initial gas production period shall be from 7 o'clock a.m. on November 1, 1950, to 7 o'clock a.m. on February 1, 1951. Subsequently, the dates 7 o'clock a.m. February 1st and 7 o'clock a.m. August 1st shall be known as "check" dates, and the periods of time bounded by these dates shall be known as the gas production periods for the month production period.

**ARTICLE 12.1.**

(1) The gas allowance for oil wells in the month production period shall be determined as follows:  $V = Q \times \left( \frac{A + \Delta A}{A + \Delta A} \right) \left[ (x_1 - x_2) + \left( \frac{x_2 - x_3}{x_1 - x_2} \right) \times \frac{1}{2} \times (x_2 - x_3) \right]$  where:

$$V = \left[ Q \times \left( \frac{A + \Delta A}{A + \Delta A} \right) \right] \left[ (x_1 - x_2) + \left( \frac{x_2 - x_3}{x_1 - x_2} \right) \times \frac{1}{2} \times (x_2 - x_3) \right]$$

where:

- $V$  = the gas allowance for the gas well for the preceding six months period, in cubic feet.
- $Q$  = total oil production from the oil well during the preceding six months period, barrels.
- $(A + \Delta A)$  = total acreage dedicated to the well during preceding six months period.
- $(a + \Delta a)$  = total acreage dedicated to oil wells during preceding six months period.

(Note: "A" and "a" represent acreage dedicated to gas wells and to oil wells respectively for the entire six months period.  $\Delta A$  and  $\Delta a$  represent acreage so dedicated for only a portion of the six months period. In the

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every wall is completed or unclassified during a gas survey, unless the survey is shall be completed on schedule.

$$k = \frac{1}{2} \left( \frac{g}{h} \right) \quad a = \frac{1}{2} \left( \frac{g}{h} \right)$$

where:

$\Delta A$  or  $\Delta a$  = average to be added to gas or oil flow, respectively.

$k$  or  $a$  = average correction to the wall

$h$  = height of gas or oil column

$g$  = total weight of gas or oil in column

$T_1$  - average temperature for oil and gas survey

$T_2$  - correction for the oil and gas survey

$T_{avg}$  - temperature of standard conditions - 60° F or 15.6° C

$T_{std}$  - initial bottom-hole temperature, assumed to be standard at 15.6° F or 5.9° C

$P_{std}$  - average reservoir pressure based on well survey

$P_{std}$  - pressure at standard conditions - 14.7 psia

$Z$  - deviation factor for gas at  $P_{std}$  and at 14.7° F. (Z factor determined from gas deviation factor tabulation in Special Rule 13(a).)

$V_o$  - oil reservoir volume factor at  $P_{std}$ . (V determined from Oil Reservoir Volume Factor Tabulation in Special Rule 13(b).)

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Substituting known constant values in Formula (a) above,

$$V = \left[ \frac{Q(A + \Delta A)}{A + \Delta A} \right] \left[ (x_1 - x_2) + \left( \frac{830 \times P_{\text{gas}}}{607} \times \frac{1}{15.015} \times \frac{1}{H} \right) \right]$$

$$V = \left[ \frac{Q(A + \Delta A)}{A + \Delta A} \right] \left[ (x_1 - x_2) + \left( \frac{0.32 \times P_{\text{gas}}}{H} \right) \right]$$

(2) The volumetric equivalent of gas for the gas case determined in (1) above shall be compared with the actual production from the gas well.

(a) If the actual production from the gas well is greater than the volumetric equivalent of gas determined in (1) above, the gas well is considered to be producing gas.

(b) If the actual production from the gas well is less than the volumetric equivalent of gas determined in (1) above, the gas well is considered to be producing gas.

Formula (a) above, the following values of  $x_1$ , Solution gas-oil ratio,  $R$ , and Solution Factor,  $S$ , Oil Recovery Factor,  $F$ , and the volumetric equivalent of gas,  $V$ , shall be used in comparing the volumetric equivalent of gas with the actual production from the gas well.

$P_{\text{gas}}$	$x_1$	$R$	$S$	Oil Recovery Factor
Average Reservoir Pressure	Solution gas, $\text{cu. ft./bbl.}$	Gas Deviation Factor		
2000	925	.785		1.424
1800	890	.789		1.424
1600	850	.795		1.414
1400	805	.801		1.404
1200	765	.806		1.395
1000	725	.814		1.385
800	685	.823		1.374
600	647	.832		1.360
400	610	.842		1.347
200	570	.853		1.335
100	535	.864		1.322

(Tabulation Continued Next Page)



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300	450	575	1,300
350	460	580	1,300
400	470	585	1,300
450	480	590	1,300
500	490	595	1,300
550	500	600	1,300
600	510	605	1,300
650	520	610	1,300
700	530	615	1,300
750	540	620	1,300
800	550	625	1,300
850	560	630	1,300
900	570	635	1,300
950	580	640	1,300
1000	590	645	1,300

RULE 12(1). (General Rules applicable)

RULE 12(2). (General Rules applicable)

RULE 12(3). (General Rules applicable)

RULE 12(4). If, at the end of a production period, a company's well has produced more than the total allowable acreage it was assigned and if corresponding also for that period, the company's well shall be considered as a non-producing well and the allowable and net states shall be adjusted accordingly.

RULE 12(5). (General Rules applicable)

RULE 12(6). (General Rules applicable)

RULE 12(7). (General Rules applicable)

R. REPRODUCTION OF RULES

RULE 12(1). (General Rules applicable)

RULE 12(2). (General Rules applicable)

RULE 12. (General Rules applicable)

RULE 12. If, at the end of a production period, a company's well has produced more than the total allowable acreage it was assigned and if corresponding also for that period, the company's well shall be considered as a non-producing well and the allowable and net states shall be adjusted accordingly.

RULE 12. (General Rules applicable)

RULE 20. (General Rules applicable)

F. REPORTS OF PRODUCTION

RULE 21(A). (General Rules applicable)

RULE 21(B). (General Rules applicable)

RULE 21(C). (General Rules applicable)

RULE 21(D). (General Rules applicable)

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d. GENERAL

**SPECIAL RULE 22.** No gas, either dry gas or casinghead gas, produced from the Devils Fork-Gallup Pool shall be flared or vented except as otherwise provided in these Special Rules and Regulations.

**RULE 23.** (General Rules applicable)

**SPECIAL RULE 24.** All transportation or users of gas shall file gas well connection notices with the Commission as soon as possible after the date of connection or reconnection.

e. MINIMUMIMUM GENERAL RULE RULES

**SPECIAL RULE 25.** A gas well in the Devils Fork-Gallup Pool shall be a well producing with a gas-liquid ratio of 10,000 cubic feet of gas per barrel of liquid hydrocarbons, or more, or any well which produces liquid hydrocarbons with a gravity of 60° API or greater. An oil well in the Devils Fork-Gallup Pool shall be a well producing with a gas-liquid ratio of less than 10,000 cubic feet of gas per barrel of liquid hydrocarbons and which produces liquid hydrocarbons with a gravity of less than 60° API.

**SPECIAL RULE 26.** The operator of each newly completed well in the Devils Fork-Gallup Pool shall cause a gas-liquid ratio test to be taken on said well soon after the well has been completed. However, that in no event shall the test be completed later than 10 days from the date of first production unless the well is connected to a gas-gathering facility and is producing under a temporary gas agreement assigned in accordance with Rule 8(a) above. Provided, however, that any well which is shut-in shall be exempted from the aforesaid gas-liquid ratio test requirement so long as it remains shut-in. The initial gas-liquid ratio test shall be taken in the manner prescribed by Special Rule 27 below. If the gas-liquid ratio is 10,000 cubic feet of gas per barrel of liquid hydrocarbons, or more, or the gravity of the liquid hydrocarbons is 60° API or greater, the operator shall not produce the well until beneficial use can be made of the gas.

No gas shall be flared or vented from any well classified as an oil well more than 60 days after the well begins to produce. Exceptions may be granted administratively by the Secretary-Director if the request sets forth facts and circumstances justifying such exception.

**SPECIAL RULE 27.** Gas-liquid ratio tests shall be taken on all wells in the Devils Fork-Gallup Pool and on all wells producing from the Gallup formation within one mile of the boundaries of the Devils Fork-Gallup Pool which are not within another designated Gallup pool during the months of January, April, July, and October of each year. The initial gas-liquid ratio test shall suffice as the first quarterly test. Tests shall be 24-hour tests.

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being the final 24 hours of a 72-hour period during which the well shall be produced at a constant normal rate of production. Results of such tests shall be filed on Commission Form G-124 on or before the 10th day of the following month. At least 72 hours prior to commencement of any such gas-liquid ratio test, each operator shall file with the local district office of the Commission a test schedule for its wells specifying the time each of its wells is to be tested. Copies of the test schedule shall also be furnished to all other operators.

Special tests shall also be taken at the request of the Secretary of the Commission and may also be taken at the request of the operator. Such special tests shall be taken in accordance with the procedures outlined hereinafter, including notification to the Commission and other operators.

**SPECIAL RULE 14.** The average reservoir pressure shall be determined by means of a pressure gauge, and the pressure shall be reported on Form G-124 in accordance with the provisions of Special Rules 14(a) and 14(b). The pressure shall be reported to the Commission, which shall be the approximate depth of the gas-oil contact (1025 feet above sea level). The pressure on individual wells shall be determined in the following manner:

- (1) Reservoir pressure tests shall be taken on all producing wells, gas and oil (including wells not producing oil) in accordance with the procedures outlined in Special Rule 14(a) except with respect to shut-in time and bottom hole pressure as provided above.
- (2) Information obtained on these tests shall be reported on Form G-124 in accordance with the provisions of Special Rules 14(a) and 14(b), and the Commission shall use the arithmetic average of the pressures so reported for the purposes,  $P_{avg}$ , in the calculations as provided in Special Rule 13(a).

**SPECIAL RULE 15.** The gas-oil ratio limitation for the Devils Fork-Gallup Pool shall be 1000 cubic feet of gas per barrel of liquid hydrocarbons produced.

**SPECIAL RULE 16.** No acreage shall be simultaneously dedicated to an oil well and to a gas well in the Devils Fork-Gallup Pool.

**SPECIAL RULE 17.** The vertical limits of the Devils Fork-Gallup Pool shall be the Gallup formation.

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WILLIAM H. HARRIS, JR., New Mexico, on the day and year written  
above is deceased.

STATE OF NEW MEXICO  
COUNTY OF SANTIAGO

*John T. Cunningham*  
Jury Foreperson

*William H. Harris, Jr.*  
Deceased

*D. F. Harris*  
Attorney

A. L. Harris, Jr., Clerk of Court

cc/



BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING  
CRANED BY THE OIL CONSERVATION  
COMMISSION OF NEW MEXICO FOR  
THE PURPOSE OF CONSERVING:

CASE No. 1049  
Order No. N-1670-B-1

ASSIGNMENT OF THE OIL CONSERVATION  
COMMISSION OF NEW MEXICO TO IN-  
VESTIGATE THE DEVILS FORK AND GAL-  
LUP POOL FOR THE DEVILS FORK-GALLUP  
POOL, NEW MEXICO COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

IN THE MATTER OF:

This case came on for hearing at 9 o'clock a.m. on April  
17, 1933, and on April 18, 1933, at which time the  
Commission, before the Oil Conservation Commission of New Mexico,  
hereinafter referred to as the "Commission."

Now, on this 18th day of October, 1933, the Commission,  
a quorum being present, having considered the testimony presented  
and the exhibits received at said hearing, and being fully advised  
in the premises,

FINDS:

(1) That due public notice having been given as required by  
law, the Commission has jurisdiction of this case and the subject  
matter therein.

(2) That the evidence adduced at said hearings indicates  
that development of the Devils Fork-Gallup Pool under the special  
rules and regulations promulgated by Order No. N-1670-B has been  
orderly and has progressed without undue waste and without viola-  
tion of correlative rights; as inasmuch as each owner has been afforded  
the opportunity to produce his just and equitable share of the oil  
and gas in place.

(3) That said Devils Fork-Gallup Pool has been prorated and  
produced under the aforesaid special rules and regulations in such  
a manner as to prevent the significant movement of the gas-oil con-  
tact, thereby preventing waste and protecting correlative rights.

(4) That said rules, with minor modification, should be  
continued in effect until further order of the Commission.

(5) That provision should be made in said rules to require  
that all wells be tested semiannually to determine the bottom hole

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pressure and further that all gas produced, regardless of the type of well from which produced or the disposition thereof, be measured.

**IT IS HEREBY ORDERED:**

(1) That the Special Rules and Regulations for the Devils Fork-Gallup Pool as promulgated by Order No. H-1670-B-1a and the same are hereby ordered to remain in effect until further order of the Commission.

(2) That Special Rule 22 of said Special Rules and Regulations be and the same is hereby amended to read in its entirety as follows:

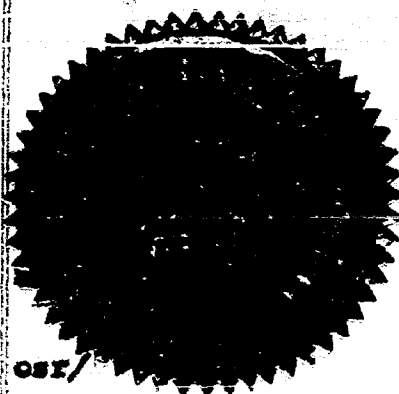
**SPECIAL RULE 22.** No gas, either dry gas or casinghead gas, produced from the Devils Fork-Gallup Pool shall be flared or vented except as otherwise provided in these Special Rules and Regulations. All gas produced, whether dry gas or casinghead gas and regardless of final disposition thereof, shall be constantly and accurately measured.

(3) That sub-paragraph (1) of Special Rule 22 of said Special Rules and Regulations be and the same is hereby amended to read in its entirety as follows:

(1) Subsurface pressure tests shall be taken on all wells, gas and oil, in accordance with the procedure outlined in Statewide Rule 302, except with respect to shut-in time and datum as provided above. Pressures of pumping oil wells may be calculated from static fluid level determinations.

(4) That jurisdiction of this cause is hereby retained for the entry of such further order or orders as may be necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.



STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

*E. L. Mechem*  
EDWIN L. MECHEM, Chairman

*E. S. Walker*  
E. S. WALKER, Member

*A. L. Porter, Jr.*  
A. L. PORTER, JR., Member & Secretary

EXEMPT MARG. WELLS RECLASS. TO NON MARG. NEEDING 1242 DELIV. TESTS  
TAB RUN DATED SEPT 12 1962

BLANCO MESA VERDE POOL

SOUTHERN UNION GAS PIPELINE SYSTEM  
CONSOLIDATED OIL AND GAS INCORPORATED  
STARR FEDERAL  
IN133113 CLASSIFY FROM EXEMPT MARG TO NON MARG

SOUTHERN UNION GATHERING SYSTEM  
SEYMOUR  
2M2431 9 CLASSIFY FROM EXEMPT MARG TO NON MARG

AZTEC PICTURED CLIFF POOL

EL PASO NATURAL GAS PIPELINE SYSTEM  
AZTEC OIL AND GAS COMPANY  
F U T I T T  
1E 23 11 CLASSIFY FROM EXEMPT MARG TO NON MARG

W. P. CARR  
HARVEY POOL UNIT  
1L 93 11 CLASSIFY FROM EXEMPT MARG TO NON MARG

EL PASO NATURAL GAS COMPANY  
FLOOD FEO  
1C343111 CLASSIFY FROM EXEMPT MARG TO NON MARG  
MARTIN POOL UNIT  
1K343 11 CLASSIFY FROM EXEMPT MARG TO NON MARG

PUBLIC SERVICE COMPANY

EL PASO NATURAL GAS PIPELINE SYSTEM

GULF OIL CORPORATION .....

APACHE FEDERAL

2M 824 5 CLASSIFY FROM EXEMPT MARG TO NON MARG

SOUTHERN UNION GAS PIPELINE SYSTEM

SOUTHERN UNION PRODUCTION COMPANY .....

NEWSOM FED

8G2926 8 CLASSIFY FROM EXEMPT MARG TO NON MARG

NICKSON FED

2H2326 8 CLASSIFY FROM EXEMPT MARG TO NON MARG

FULCHER KUTZ PICTURED CLIFF POOL

SOUTHERN UNION GAS PIPELINE SYSTEM

B. M. N S COMPANY

WYPER EXEMPT LOW ACREAGE STATUS

20293 12 CLASSIFY FROM EXEMPT MARG TO NON MARG

LOW ACREAGE

PAN AMERICAN PETROLEUM CORPORATION

J F DAY C

2P2 281 CLASSIFY FROM EXEMPT MARG TO NON MARG

FRED FEASEL C

1J33281 CLASSIFY FROM EXEMPT MARG TO NON MARG

KUTZ DEER TEST A

1027281 CLASSIFY FROM EXEMPT MARG TO NON MARG

SOUTH BLANCO PICTURED CLIFF POOL

EL PASO NATURAL GAS PIPELINE SYSTEM

ARTIC 311 AND

1000000



CANDARO PRODUCTION COMPANY  
CANDARO

1 A2526 7 CLASSIFY FROM EXEMPT MARG TO NON MARG

EL PASO NATURAL GAS COMPANY .....  
KLEIN A

1B3126 6 CLASSIFY FROM EXEMPT MARG TO NON MARG  
RINCON UNIT

36N1427 7 CLASSIFY FROM EXEMPT MARG TO NON MARG  
46B 126 7 CLASSIFY FROM EXEMPT MARG TO NON MARG  
28 6 SAN JUAN

69M2427 6 CLASSIFY FROM EXEMPT MARG TO NON MARG

FOSTER AND RIDDLE .....  
FOSTER

1D17 6 7 CLASSIFY FROM EXEMPT MARG TO NON MARG

SOUTHERN UNION GAS PIPELINE SYSTEM

AZTEC OIL AND GAS COMPANY .....  
JICARILLA FED

1F3525 4 CLASSIFY FROM EXEMPT MARG TO NON MARG

WEST KUTZ PICTURED CLIFF POOL

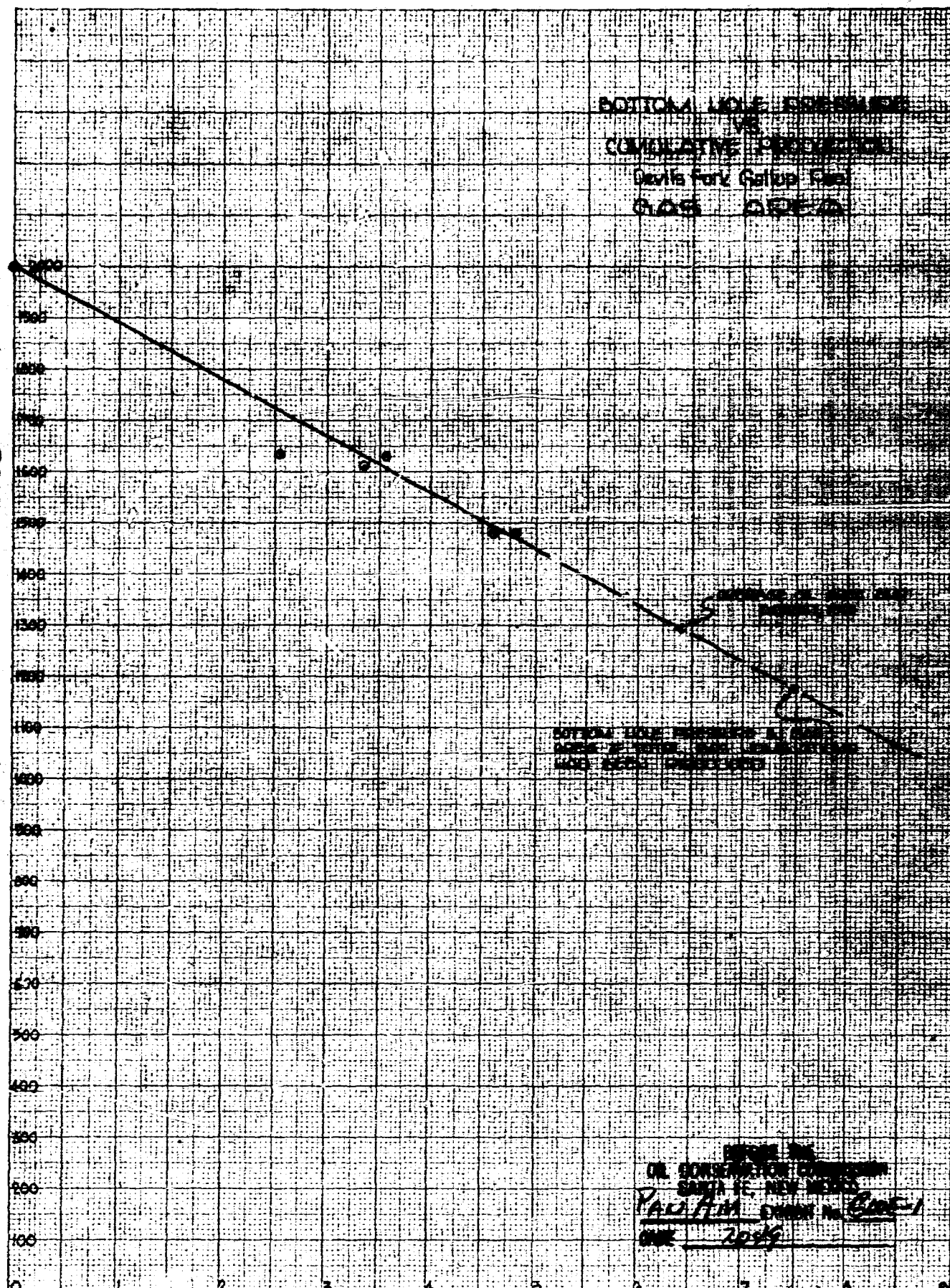
EL PASO NATURAL GAS PIPELINE SYSTEM

PAN AMERICAN PETROLEUM CORPORATION .....  
GALLEGOS CANYON UNIT

22G182812 CLASSIFY FROM EXEMPT MARG TO NON MARG  
61A 42712 CLASSIFY FROM EXEMPT MARG TO NON MARG

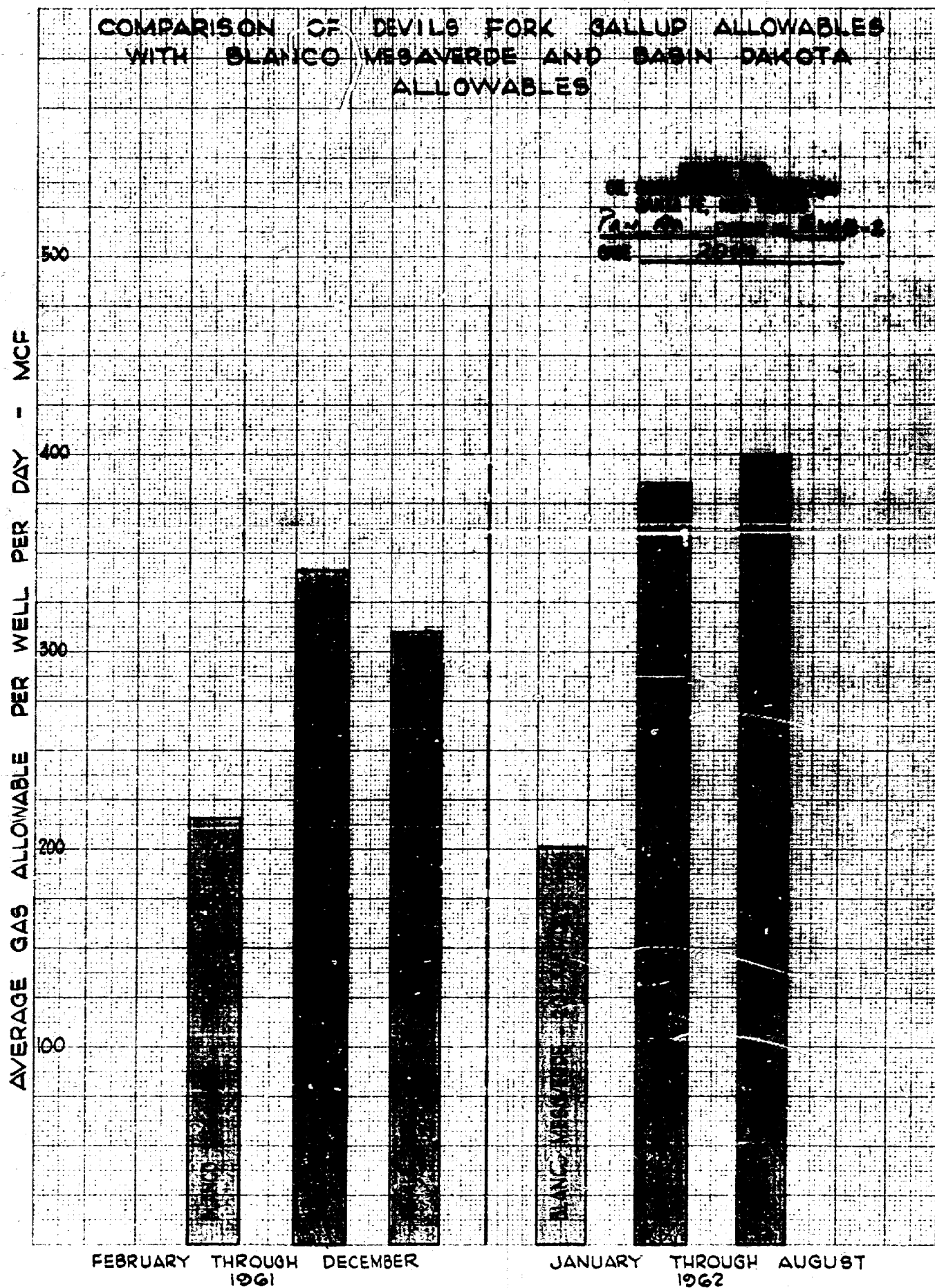
K-2 10 X 10 TO THE CM. 359-14  
Kruppel & Esner Co. Made in U.S.A.

BOTTOM HOLE PRESSURE - PSI



CUMULATIVE PRODUCTION - BILLION CUBIC FEET

K&E 10 X 10 TO THE CM. 359-114  
KEUFFEL & ESSER CO. MADE IN U.S.A.



DEVILS FORK FIELD

RIO ARriba COUNTY, N.M.

Bottom Hole Pressure  
Buildup  
Calculations

Merion  
cf # 2A.



DEVILS FORK FIELD  
Bottom Hole Pressure Survey  
7-30-62 to 8-6-62

<u>Well</u>	<u>Highest Measured Pressure</u>	<u>Extrapolated Pressure</u>	<u>Pressure by Horner's Method</u>	<u>Estimated Reservoir Pressure</u>
Canyon Largo #89	1482	1600	N.A.	1511
Canyon Largo #106	1516	N.A.	N.A.	1512
Canyon Largo #118	1865	1933	N.A.	1933
NCRA#State #1	1848	1941	N.A.	1941
Edna #1	1127	1930	1748	1748
Edna #2	1709	1930	1843	1843
Edna #3	1398	1843	1622	1622
Miller A-1	1371	1575	N.A.	1473
Miller B-2	1114	1932	1324	1324
Miller B-4	1258	1838	1609	1609
Dashko B-1	1269	1486	1356	1356
Dashko B-2	931	1509	1286	1286
Largo Spur 1	1505	1616	1530	1530
Largo Spur 2	1505	N.A.	N.A.	1505
Largo Spur 3	1493	1674	N.A.	1582
Largo Spur 1-A	1383	1761	1582	1582
Zamorra 1	1499	N.A.	N.A.	1499
Byrd 1-23	932	1330	1071	1071
Byrd 5-23	728	955	765	765
Killarney 1	1454	N.A.	N.A.	-----
Lybrook 1-19	1522	N.A.	N.A.	1522
New Mexico Fed.G-1	1436	1563	N.A.	1500



Geo. Inc. Blvd 1-A

BHP Building

7-30-62 to 8-6-62

Cum. Prod. = 10,762 bbls

Avg. Stabilized Prod. Rate = 22 b/d

Reservoir Prod. Time  $T = \frac{10,762}{22} = 489.2 \text{ da.}$

Start in date 7-30-62

Date	At	$\Delta P$	Pressure
8-1-62	2	0.00407	
8-3-62	4	0.00811	
8-6-62	7	0.0141	

Monitor Calculation of Average Pressure

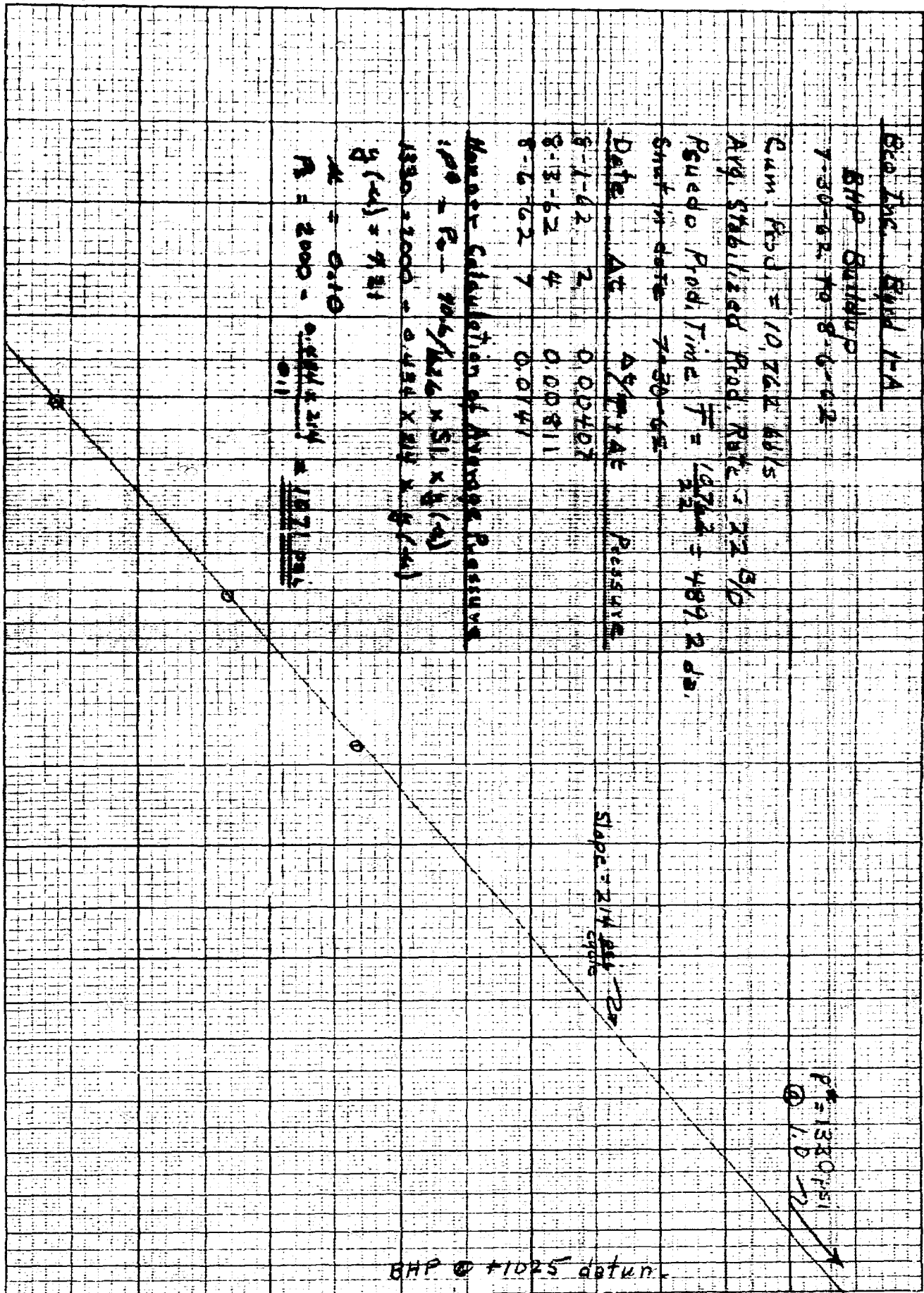
$$iP_0 = P_2 - \frac{70.6}{h_{L2}} \times SL \times q(u)$$

$$1330 = 2000 - \frac{0.434 \times 214 \times q(u)}{0.1}$$

$$q(u) = 7.31$$

$$M = 0.10$$

$$R = 2000 - \frac{0.434 \times 214 \times 7.31}{0.1} = 1330 \text{ psi}$$



Dimensionless Time  $\frac{T}{\Delta t}$

0.1

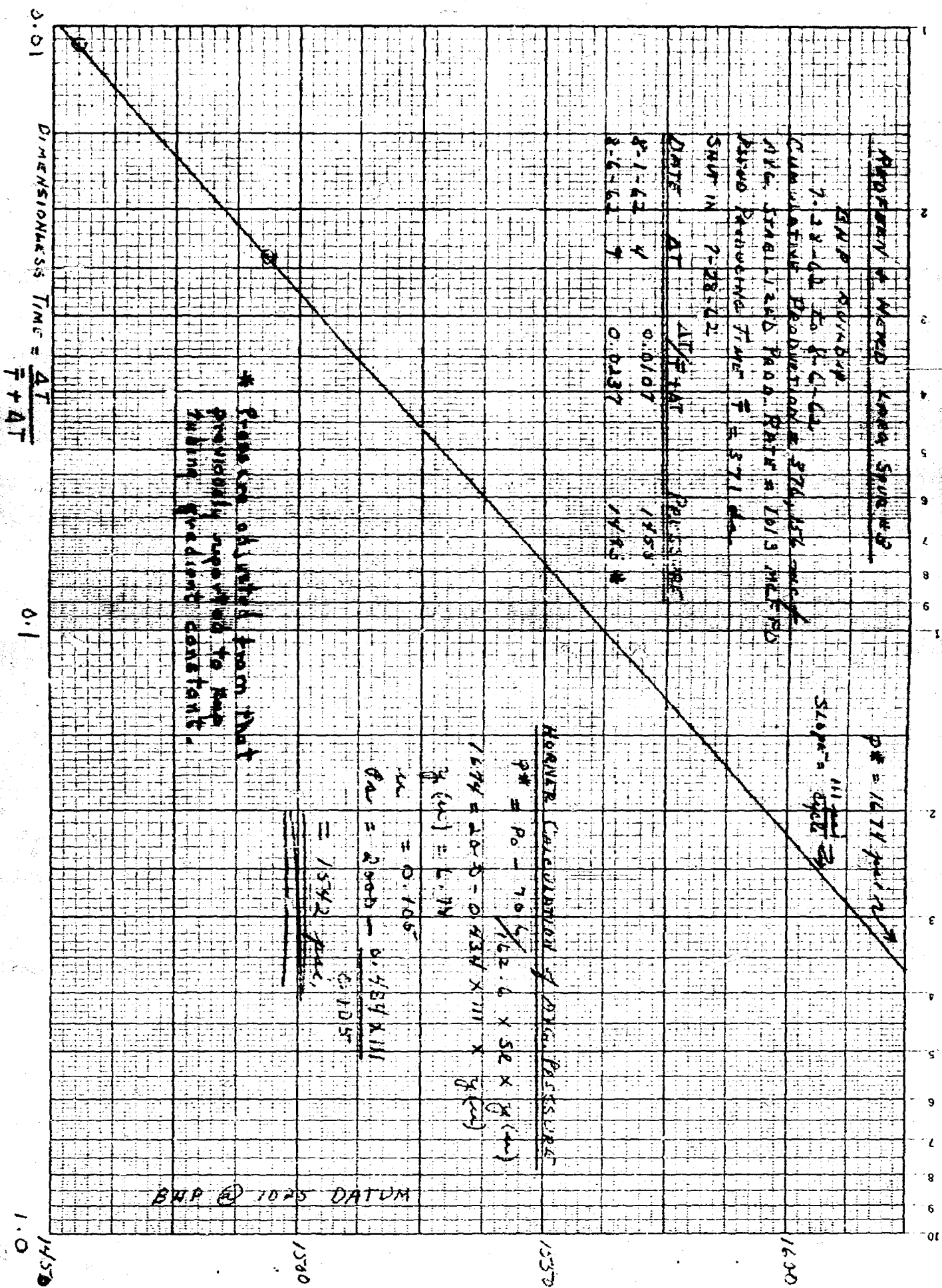
0.1

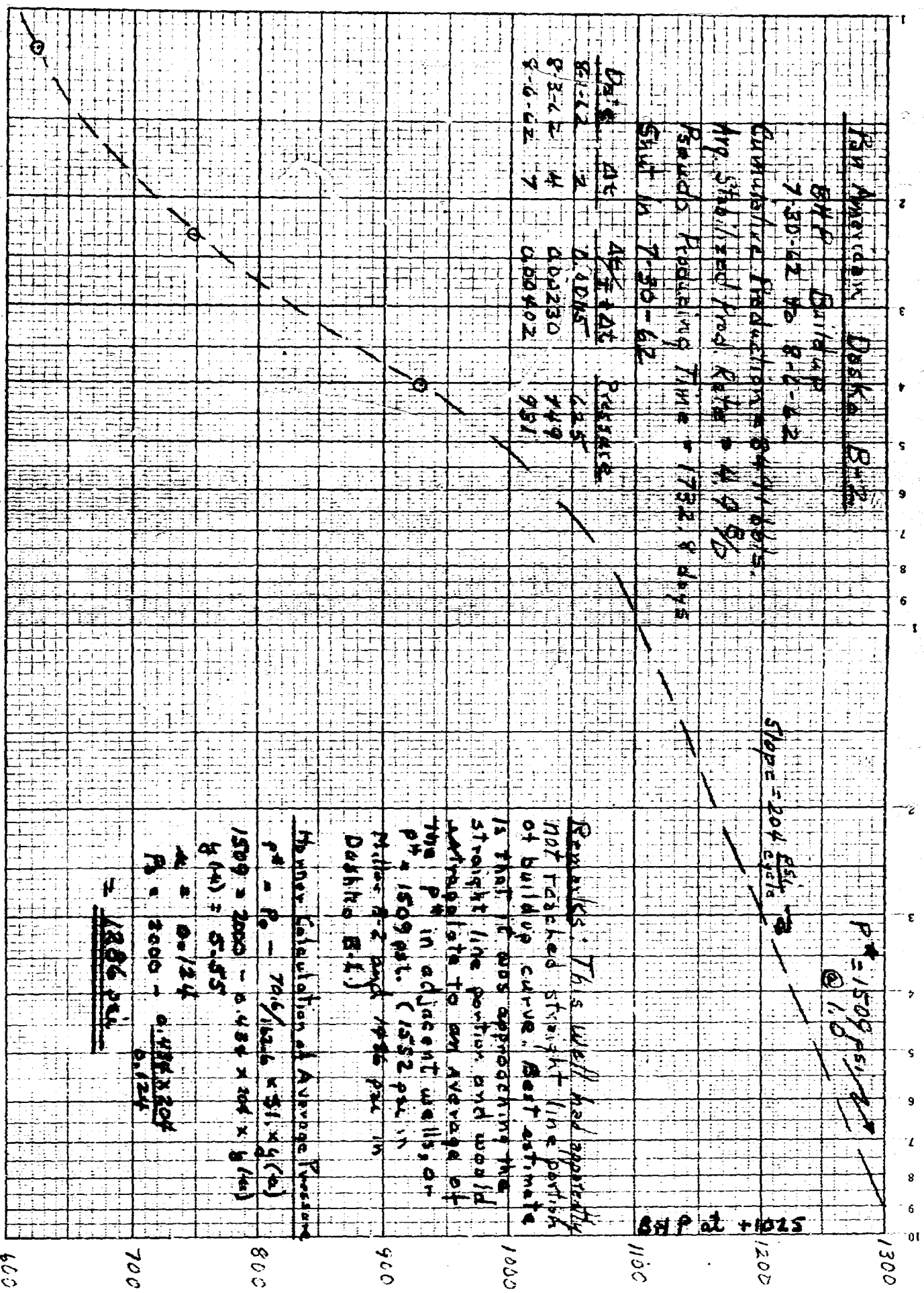
800

900

1000

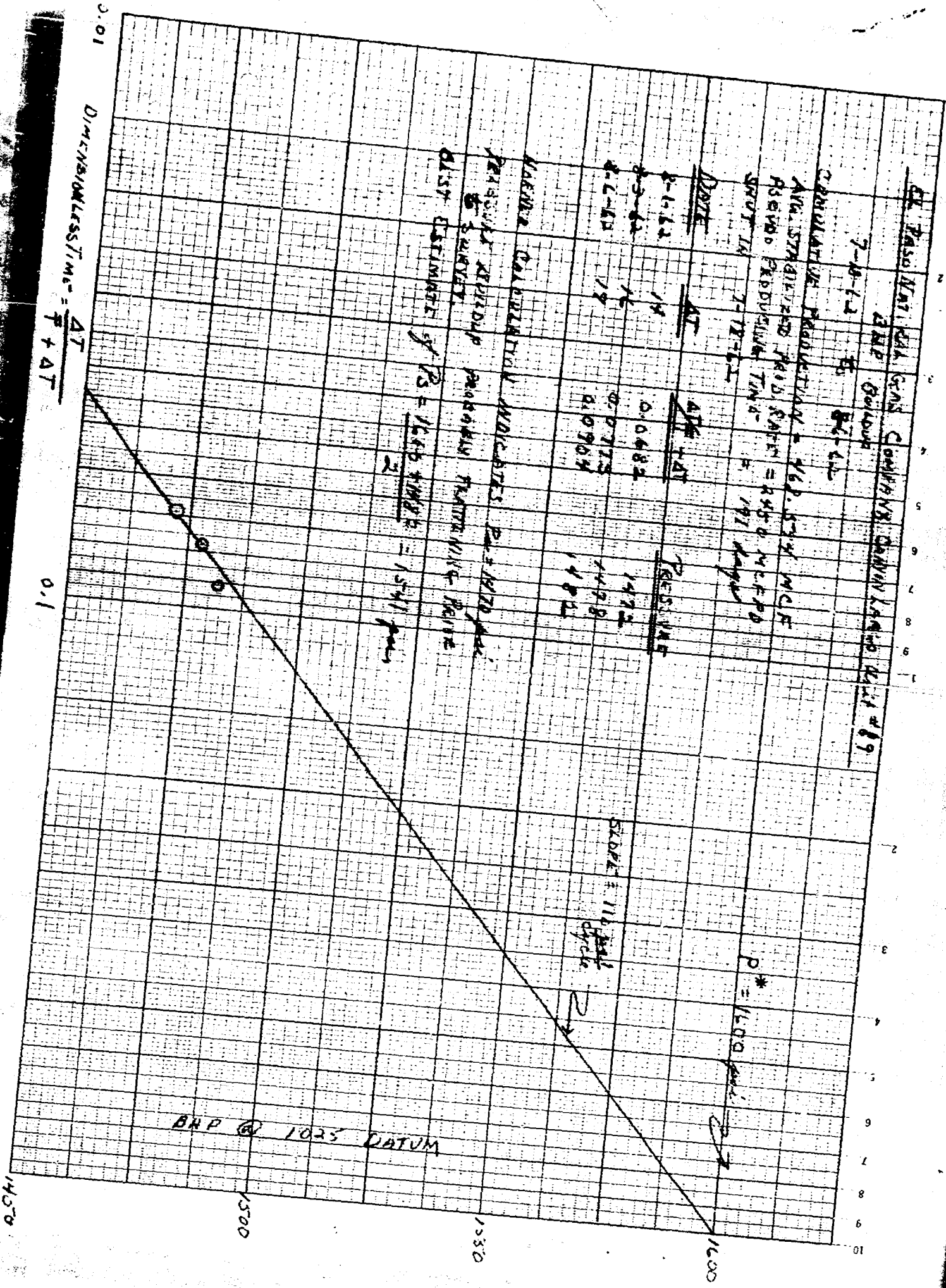
1100

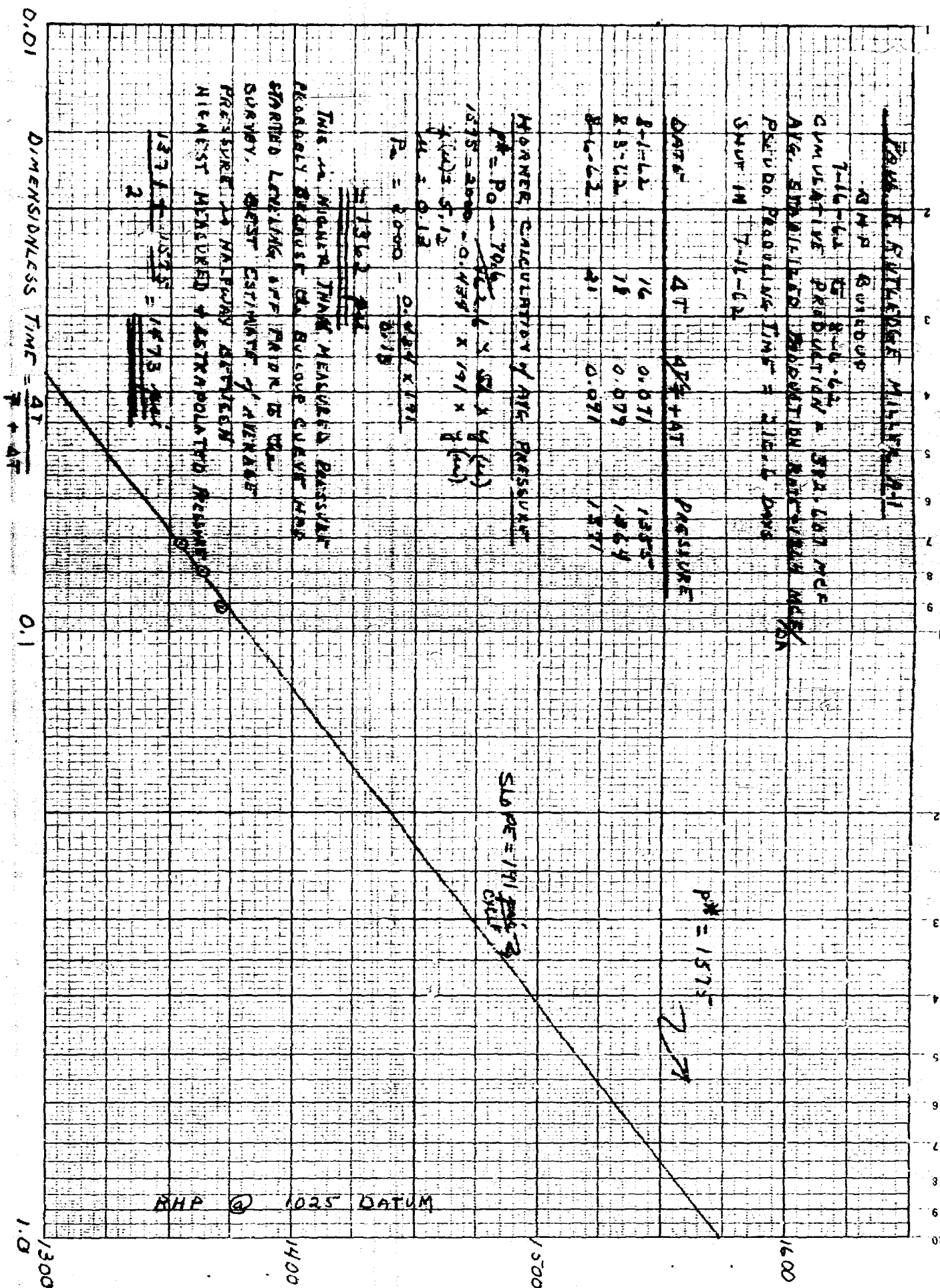




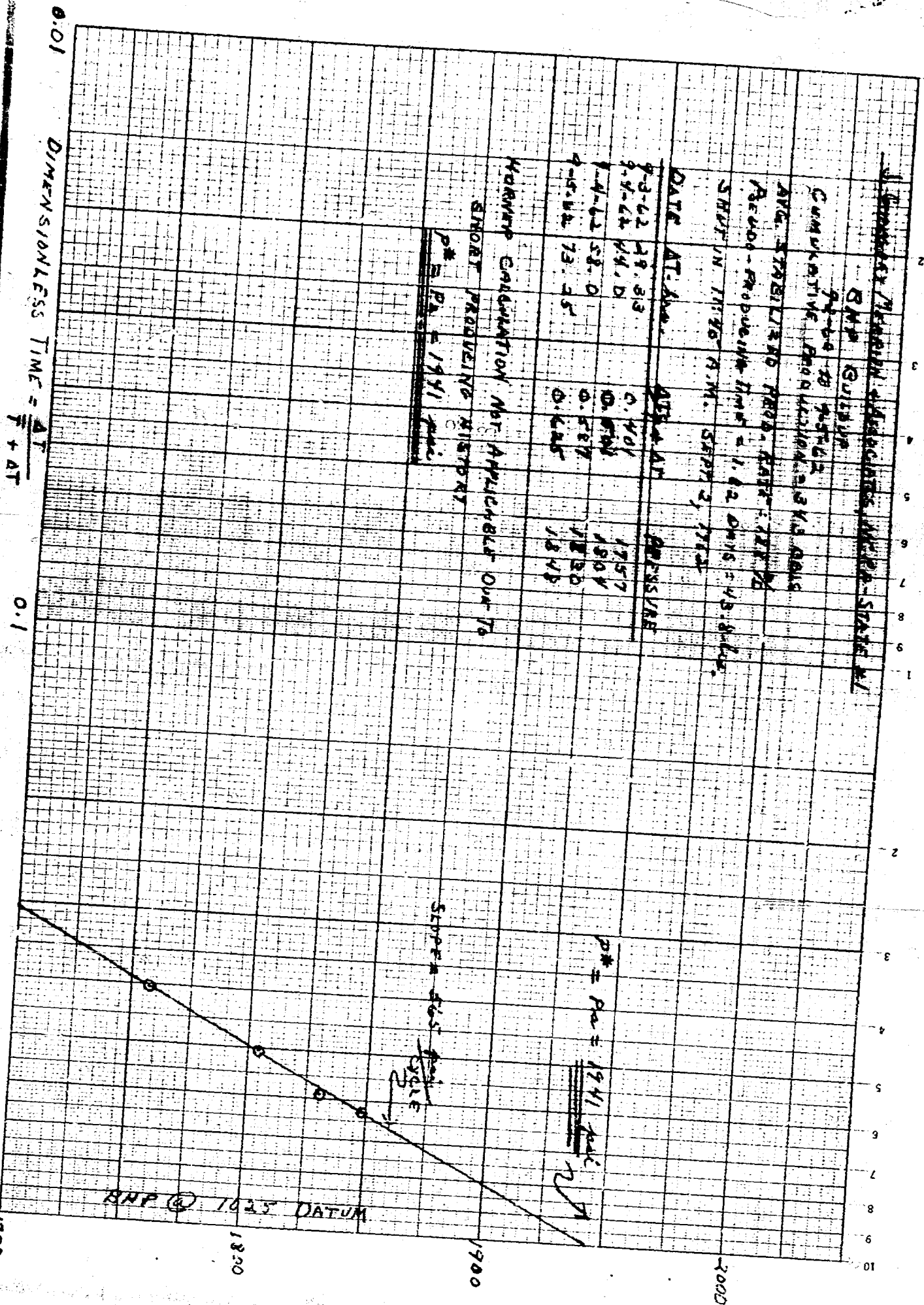
0.001      Dimensionless Time      0.01       $\Delta t / T + \Delta t$       0.1

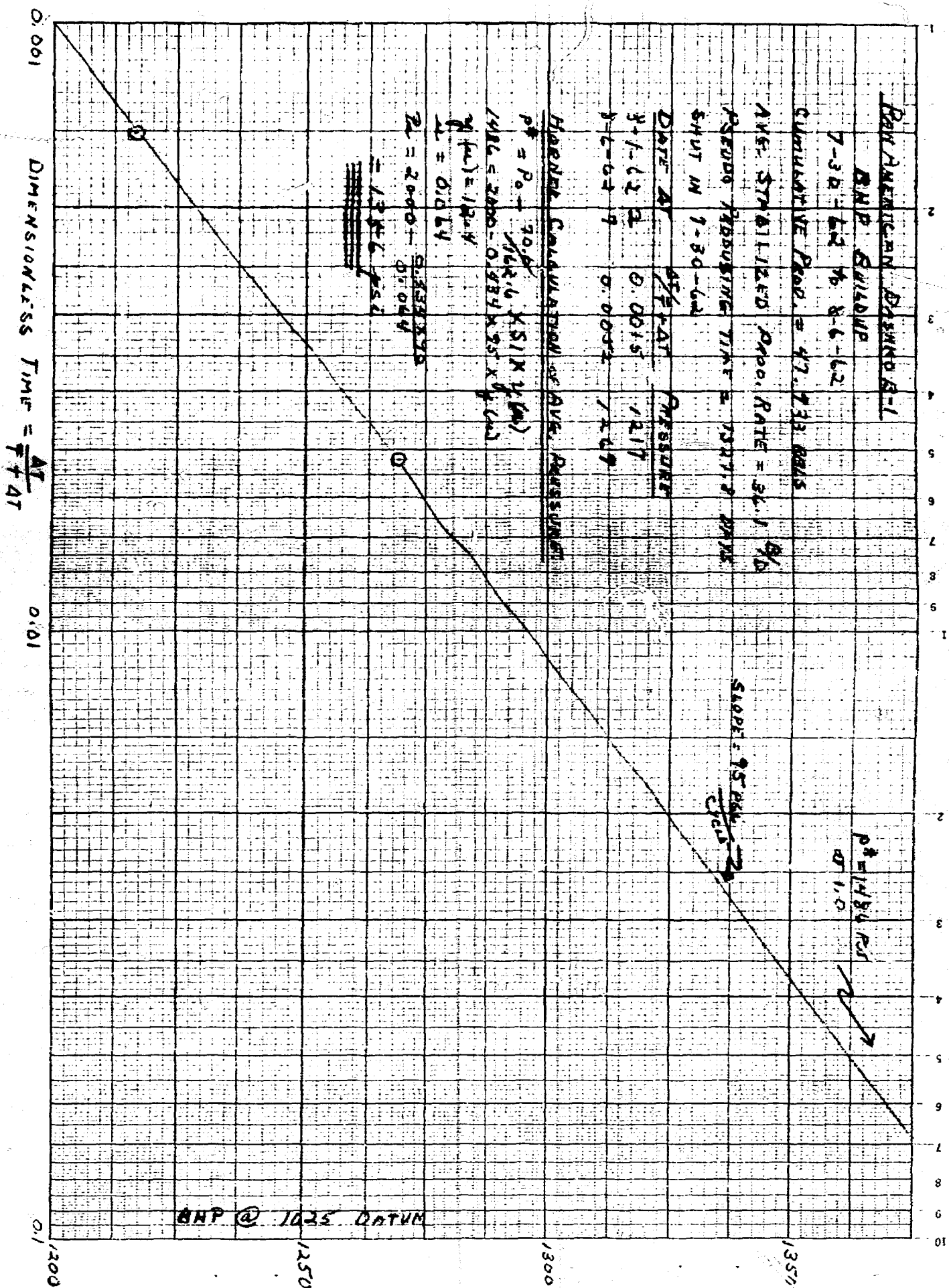


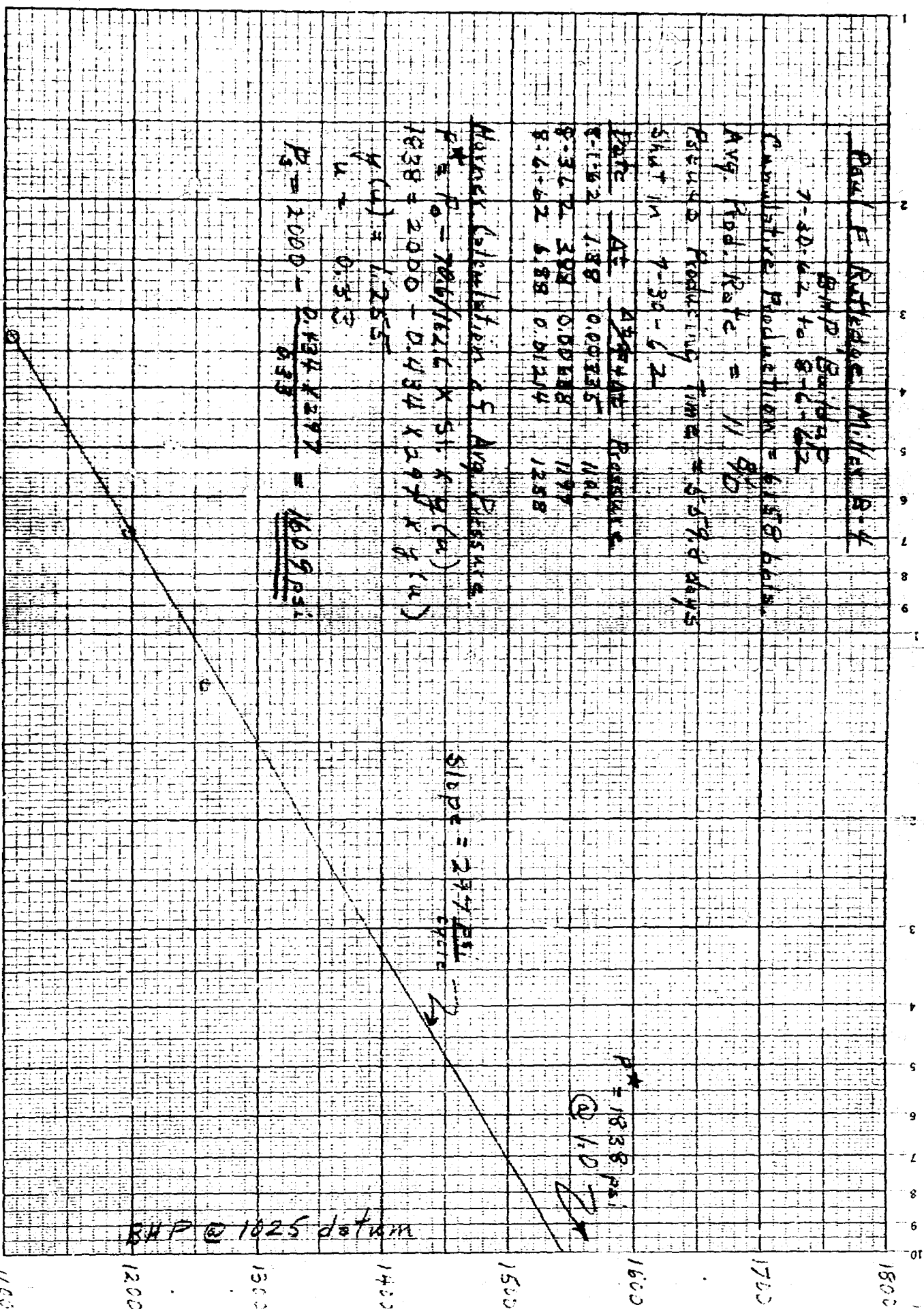












0.001 Dimensionless Time =  $\frac{\Delta t}{T + 4t}$  0.01

0.1

Reed Bank & Hard 6-19-62 5000 1-A

BHP 6-19-62 7-28-62 4-8-6-62

Current/Static Production = 20053 bbl/d

Avg. Stabilized Prod. Rate = 218 b/d

Accum. Production Time T = 733.2 days

Shut in 7-28-62

Date	Δt	ΔP/Δt	Pressure
8-1-62	4	0.00542	1315
8-6-62	9	0.0121	1303

Heave Calculation of Avg. Pressure

$$P_w = P_o - 70.6/12.2 \times S_1 \times y(u)$$

$$1761 = 2000 - 0.434 \times 190 \times y(u)$$

$$y(u) = 2.90$$

$$u = 0.177$$

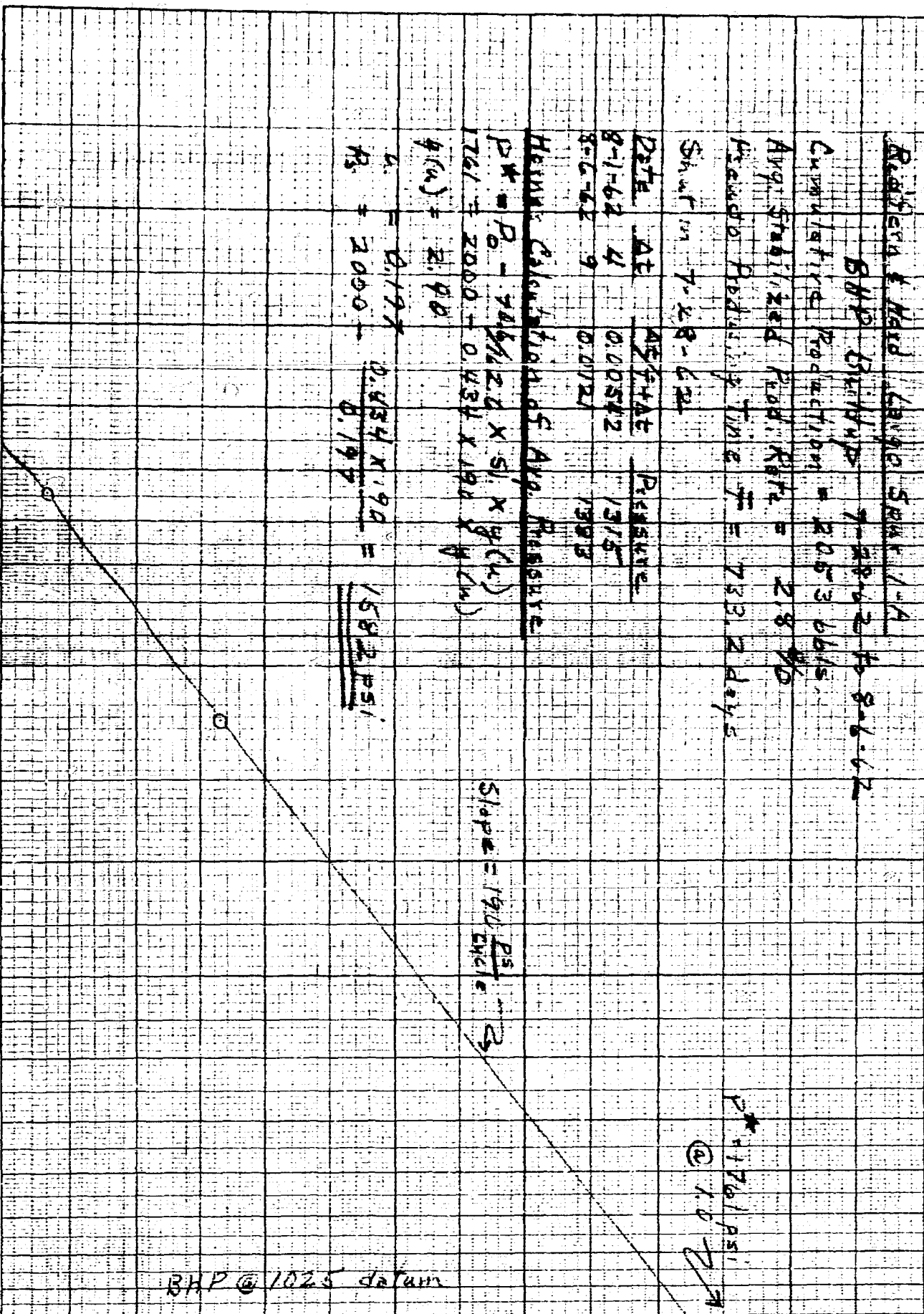
$$R_s = 2000 - \frac{0.434 \times 190}{0.177} = \underline{\underline{1582 \text{ PSI}}}$$

$$\text{Slope} = 190 \frac{\text{PSI}}{\text{cycle}} \sim 3$$

$$P_w = 1761 \text{ PSI}$$

$$\text{@ } 1.0 \text{ day}^{-1}$$

BHP @ 1025 datum

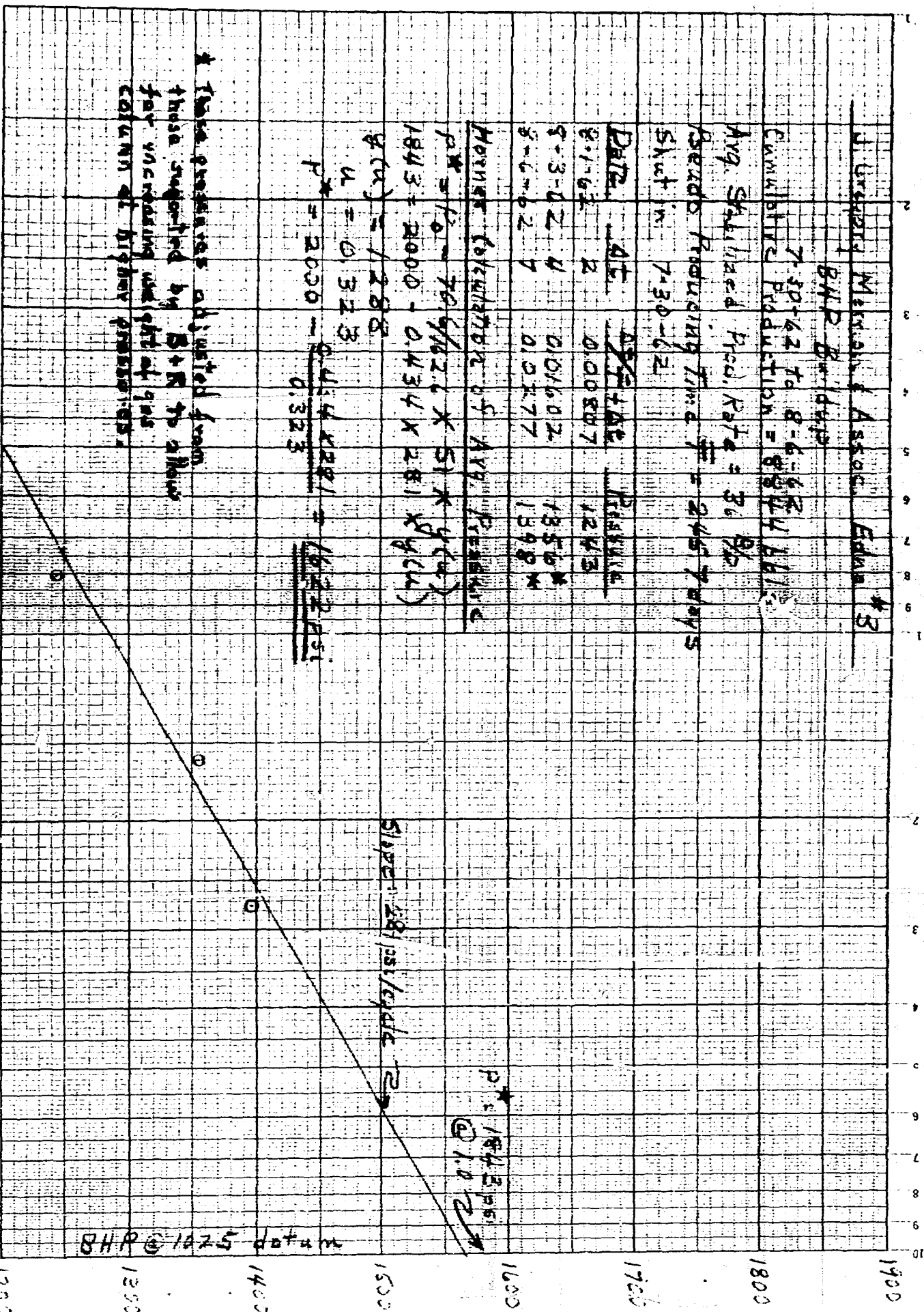


0.001 Dimensionless Time =  $\frac{\Delta t}{T + \Delta t}$

0.01

0.1





\* These pressures adjusted from those suggested by B & R to allow for increasing weight of gas column at higher pressures.

.001      Dimensionless Time =  $\frac{\Delta t}{P + \Delta t}$       .01



U. S. GEOLOGICAL SURVEY  
BUREAU OF MINERAL RESOURCES  
WASHINGTON, D. C. 20540

W. B. BORDO

7-30-62 to 8-6-62

Cumulative Production = 422.2 bbl

Avg. Stabilized Prod. Rate = 5.5 bbl/d

Steady Production Time = 4.4 days = 747.6 deg

Start in 7-30-62

Slope = 387 deg/decade

Date	AE	APF+AT	Pressure
8-1-62	2	0.0020	926
8-3-62	4	0.0052	1045
8-6-62	7	0.00904	1127

Warner Calculation of Avg. Pressure

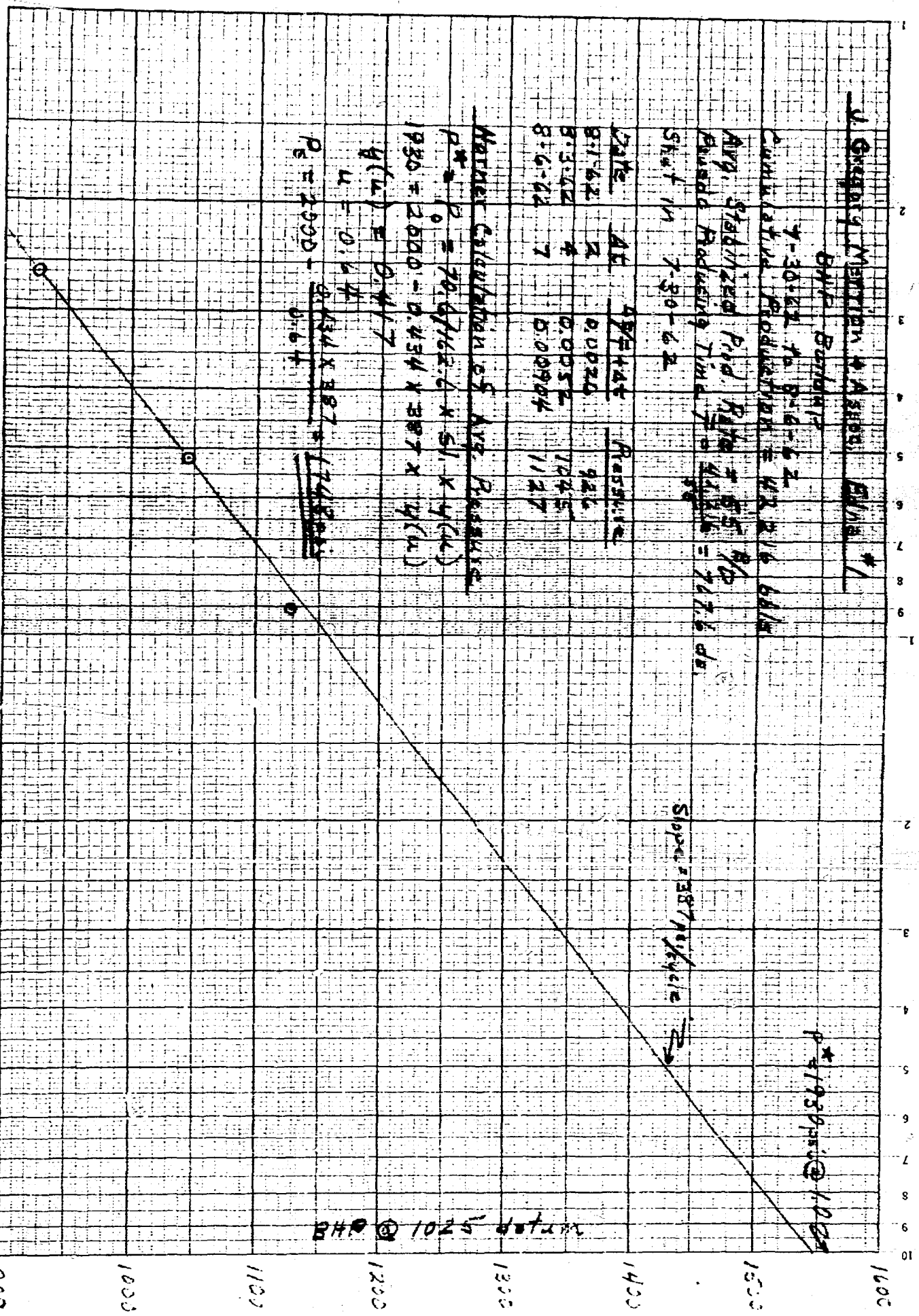
$$P_w = P_o = 70.67162 \times 6 \times 51 \times y(u)$$

$$1980 = 2000 - 0.434 \times 387 \times y(u)$$

$$y(u) = 0.417$$

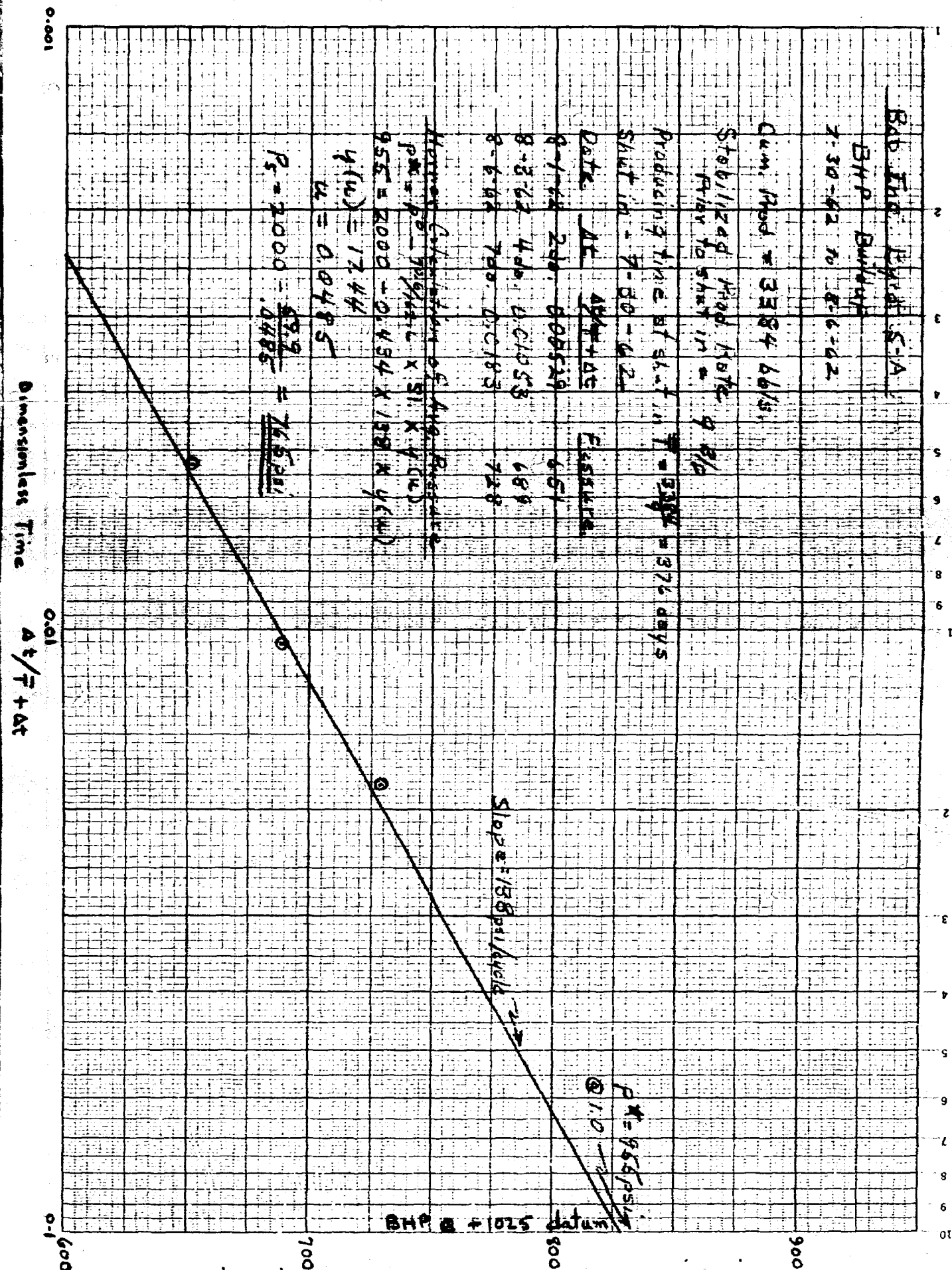
$$u = 0.64$$

$$P_o = 2000 - \frac{0.434 \times 387 \times 174.3}{0.64}$$



0.001      0.01      0.1







El Paso Nat Gas Co. Coalbed Gas Unit #118

GWP 64,100 to 8-6-62

Cumulative Production = 60,166.5

Avg Steady Prod Rate = 130.4%

Pseudo Fracturing Time  $T = 4.68$  days

Shut in 7-24-62

Date	At	Pressure
8-1-62	3	0.391
8-3-62	5	0.517
8-6-62	8	0.631

Notes: Calculations - Not Applicable

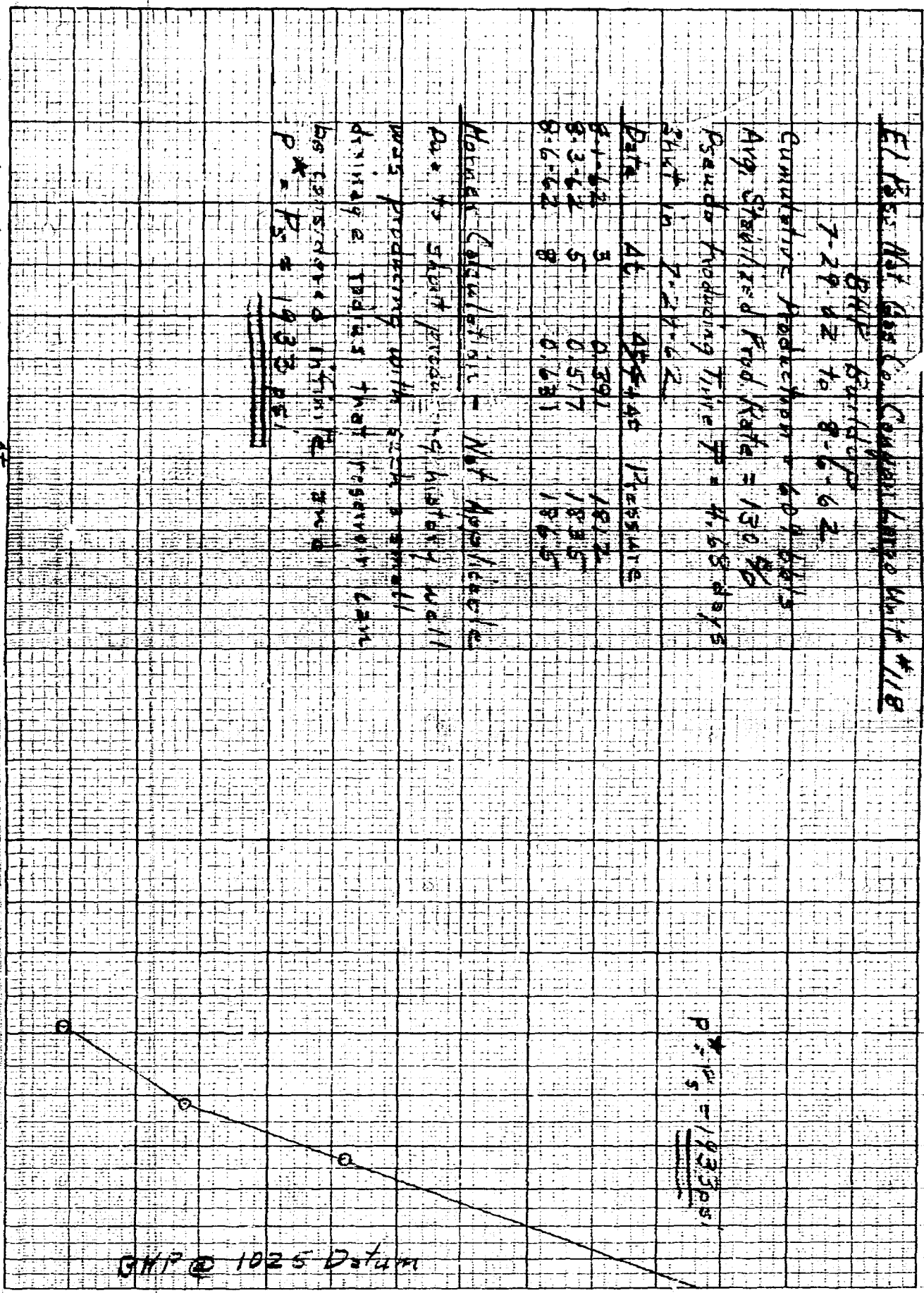
As to short production history well

was producing with such a small

drainage radius that reservoir can

be considered infinite and

$P_s = 1933$  psi



GWP @ 1025 Datum

$P_s = 1933$  psi

0.01 Dimensionless Time =  $\frac{t}{t + \Delta t}$  0.1

1.0

Redfern & Hord Lago Slat #1

BHP 24/14/45

7-12-62 to 8-6-62

Cumulative Production = 1,020,735 MCF

Avg. Stabilized Prod. Rate = 8/8 MCF/PSD

Residual Production Time = 7 = 1260 days

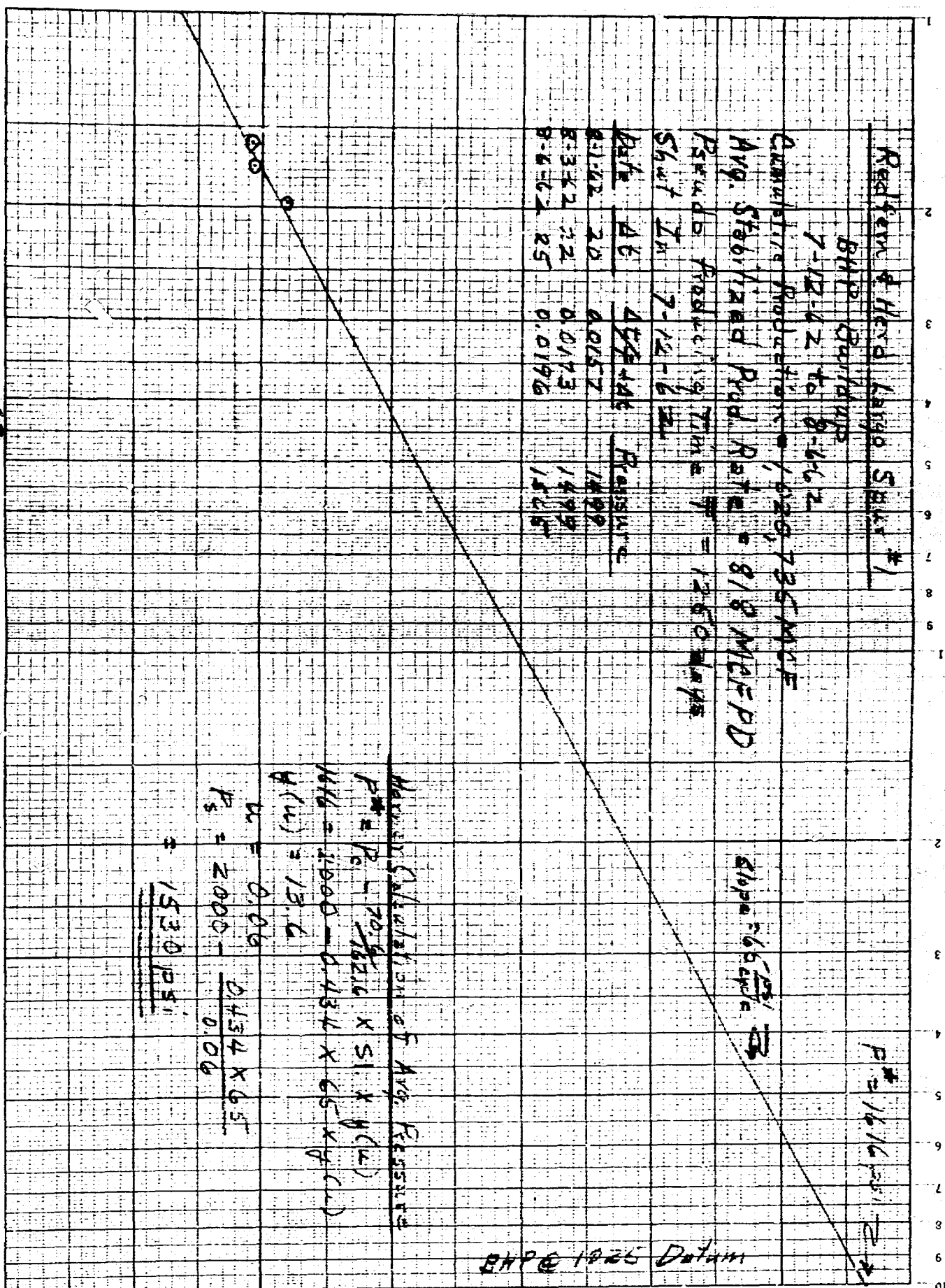
Shut In 7-12-62

Date	At	454445	Pressure
8-1-62	20	0.0157	1480
8-3-62	22	0.0173	1495
8-6-62	25	0.0196	1525

P# = 1616 PSI

2100 = 664 PSI

BHP @ 1935 Datum



Normal Calculation of Avg. Pressure

$P^* = P_s - 70.8 \times 1624 \times S.I. \times y(u)$

$1616 = 2000 - 0.434 \times 65 \times y(u)$

$y(u) = 13.6$

$u = 0.06$

$P_s = 2000 - \frac{0.434 \times 65}{0.06}$

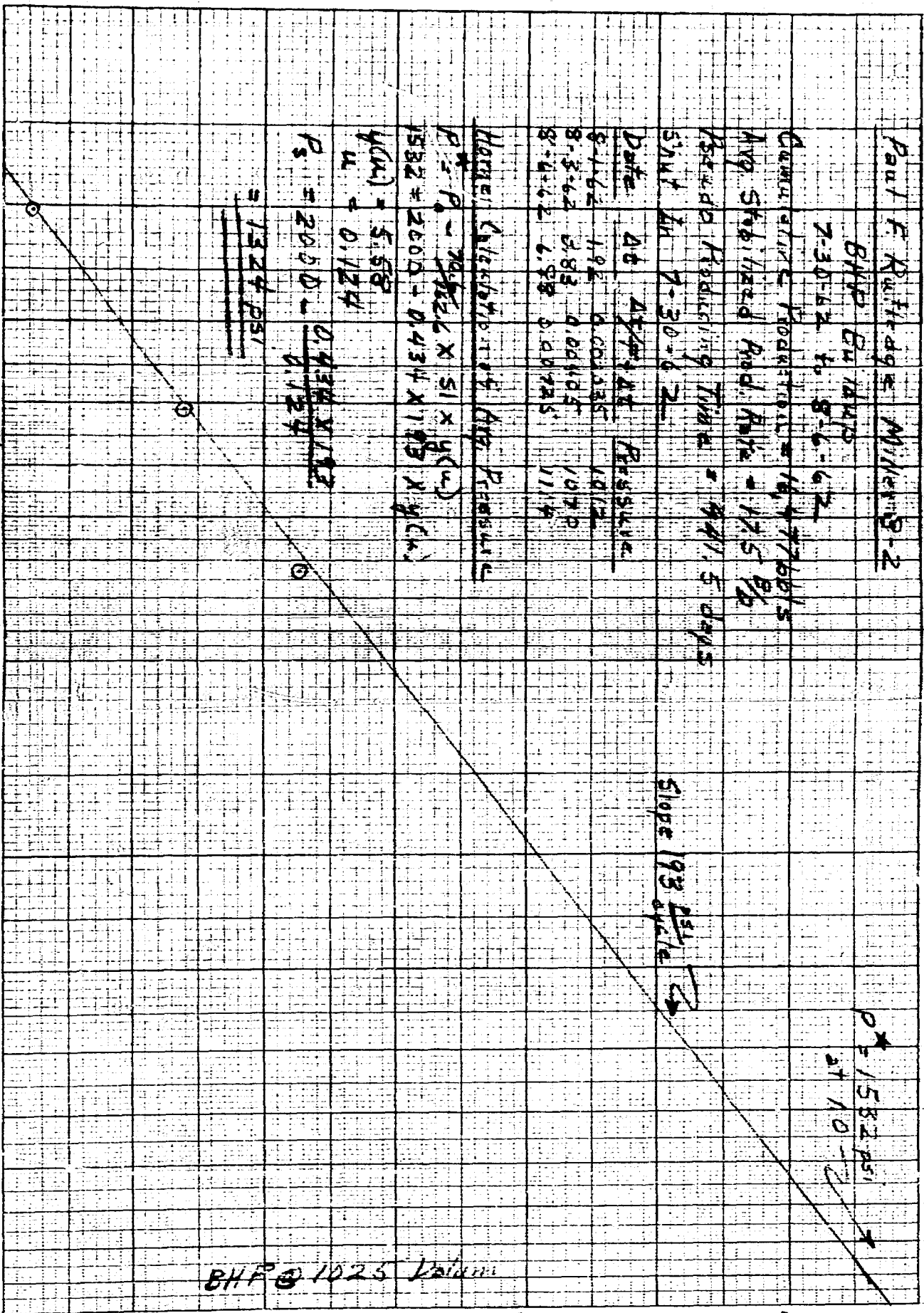
$= 1530 \text{ PSI}$

O.C.I. Dimensionless Time =  $\frac{A}{t} \times \frac{B}{A}$

0.1

1450  
1.6





0.001 Dimensionless Time  $\frac{dt}{P+dt}$  0.01 0.1 1000 1100 1200 1300

SKETCH 01 CO. MONTANA, FEDERAL 0-1

BMP BUILD-UP  
7-23-62 to 8-6-62

Cumulative Production 344,000 MCF

Aug. Stabilized Flowing Rate = 1137 MCF/D

Perforating Time = 303.6 days

Shift in 7-23-62

Date AT 4/1/64 Pressure

8-1-62 9 0.030 1422

8-1-62 14 0.044 1436

Horizontal Collection indicates  $P_s = 1444$  PSI

However, curve had probably begun to level off prior to running the survey.

Best estimate of average pressure 1/2 halfway between highest measured and extrapolated

Pressure = 1433 PSI

$P_s = 1433$  PSI

$P_s = 1433$  PSI

\*  $P = 1563$  PSI

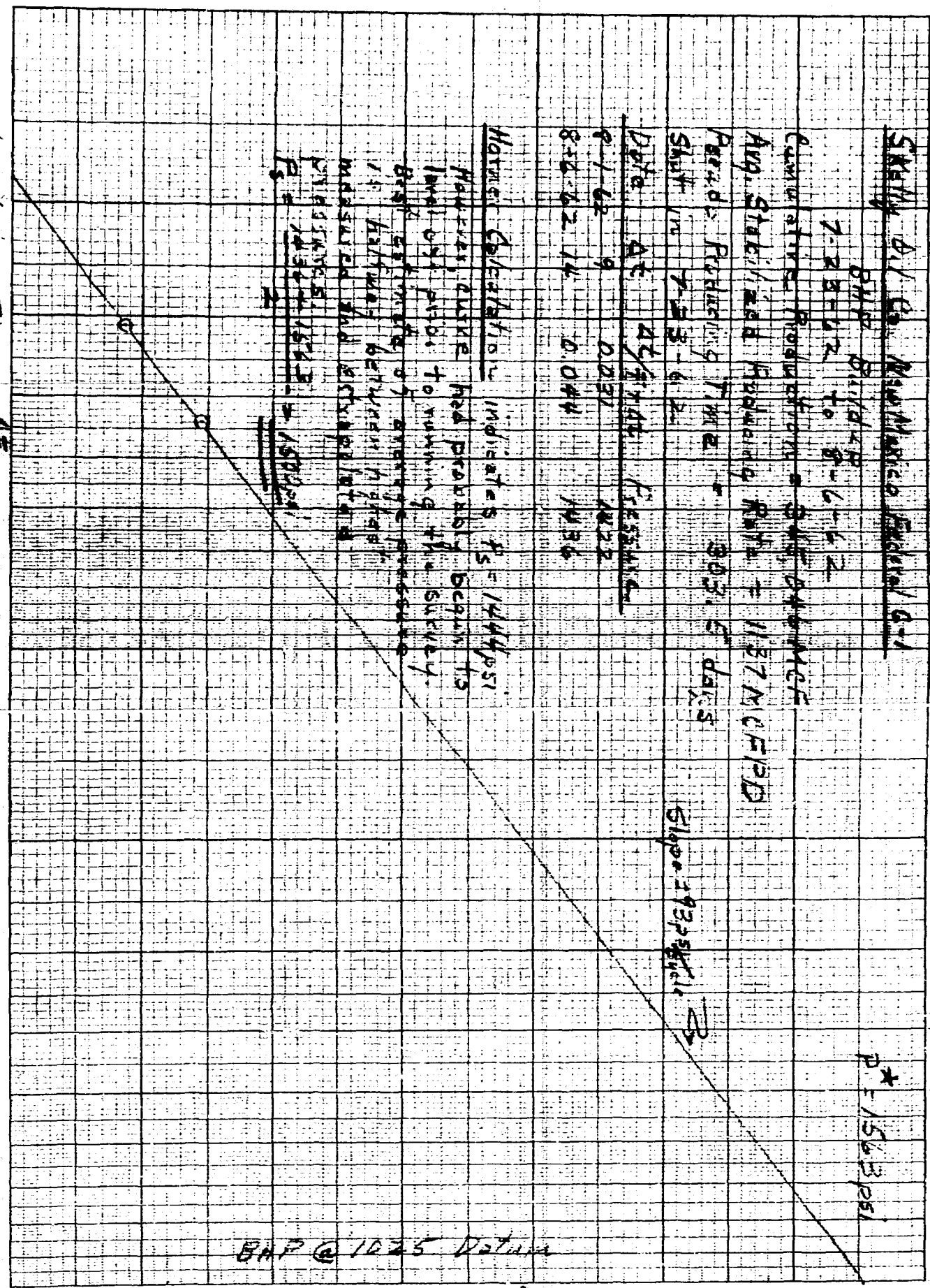
Slope = 193 PSI

BMP @ 1025 Datum

0.01 Dimensionless Time =  $\frac{A}{4\Delta t}$

0.1

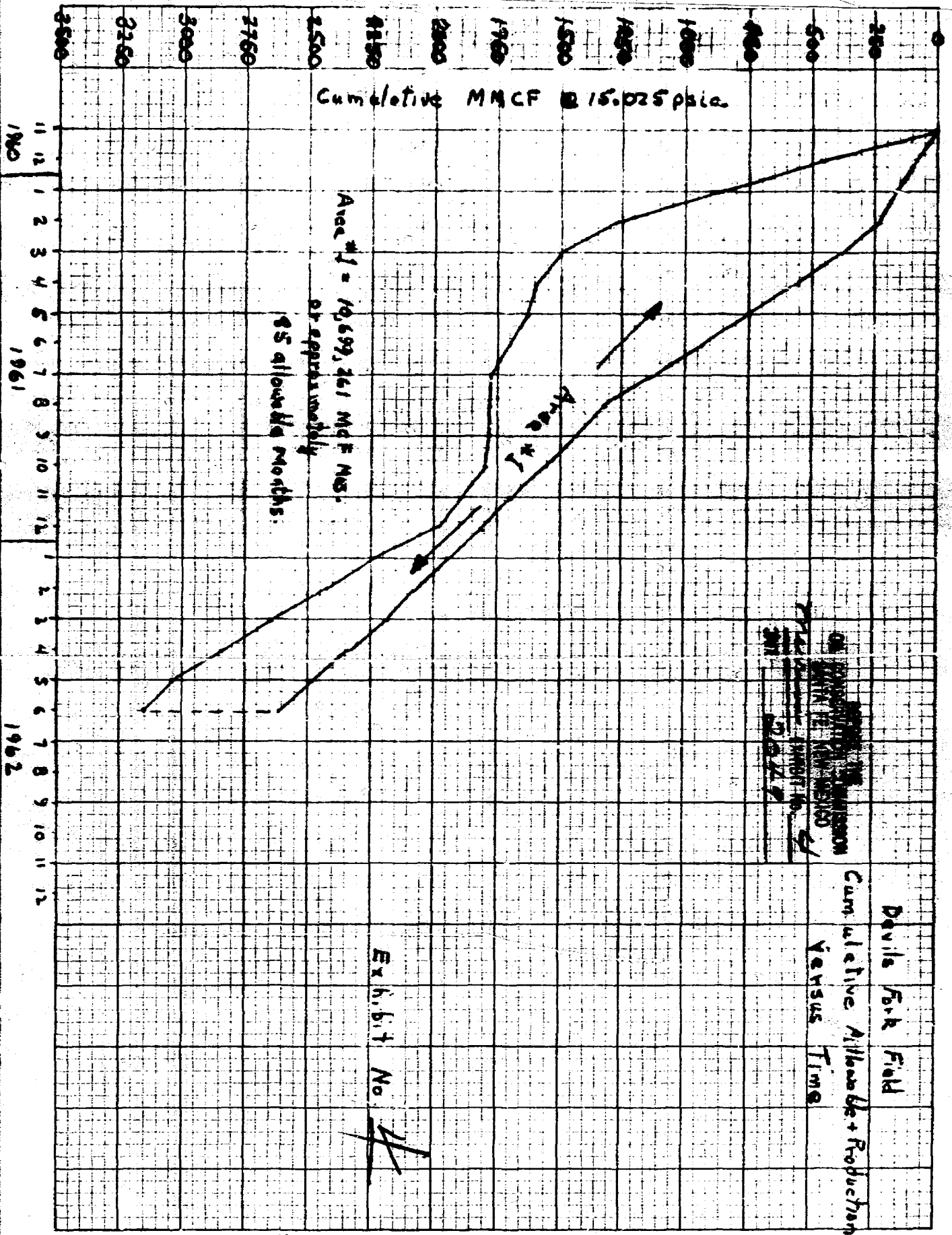
1.0



DEVILS FORK FIELD TOTAL GAS PRODUCTION FIGURES

DATE	ALLOWABLE	PRODUCTION	STATUS
Nov. 1960	77,098	469,519	(392,421)
Dec.	79,674	407,230	(719,977)
Jan. 1961	81,877	395,711	(1,033,811)
Feb.	154,368	241,496	(1,120,939)
Mar.	176,425	85,481	(1,029,995)
Apr.	186,075	26,269	(870,189)
May	192,276	79,557	(757,470)
June	186,075	77,447	(648,842)
July	192,276	4,431	(160,997)
Aug.	121,845	3,073	(312,285)
Sept.	123,709	15,685	(234,841)
Oct.	129,753	91,369	(195,817)
Nov.	123,699	94,114	(166,292)
Dec.	127,607	269,647	(308,272)
Jan. 1962	130,031	172,114	(350,355)
Feb.	98,354	232,380	(484,381)
Mar.	179,710	179,748	(484,419)
Apr.	138,464	210,382	(556,337)
May	121,296	107,340	(542,381)
	2,620,622	3,162,993	(10,699,261)

6705  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF LAND MANAGEMENT  
 DENVER, COLORADO  
 RECEIVED  
 MAY 1962





# SKELLY NEW MEXICO FEDERAL 1-G GAS PRODUCTION FIGURES

DATE	ALLOWABLE	PRODUCTION	STATUS
Nov. 1960	0	0	0
Dec.	0	0	0
Jan. 1961	2,203	3,995	(1,792)
Feb.	19,296	35,640	(18,136)
Mar.	21,364	23,121	(19,893)
Apr.	20,675	3,410	(2,628)
May	21,364	2,399	16,337
June	20,675	0	32,012
July	21,364	0	58,376
Aug.	24,828	0	83,264
Sept.	14,386	200	97,381
Oct.	14,865	47,946	64,385
Nov.	14,386	50,265	28,481
Dec.	14,865	84,918	(41,632)
Jan. 1962	14,865	28,833	(55,600)
Feb.	9,806	0	(45,794)
Mar.	19,107	0	(26,687)
Apr.	14,343	29,055	(41,399)
May	13,195	0	(28,204)
			103,200

BEFORE THE  
 ON COMMISSION  
 STATE OF NEW MEXICO  
 my commission No. 7 page 1  
 CASE 2049

# REDFERN AND HERD #3 GAS PRODUCTION FIGURES

DATE	ALLOWABLE	PRODUCTION	STATUS
Nov. 1960	11,014	62,274	(51,260)
Dec.	11,382	21,196	(61,074)
Jan. 1961	11,382	29,770	(79,462)
Feb.	19,296	47,896	(108,062)
Mar.	21,364	20,408	(107,604)
Apr.	20,675	0	(86,931)
May	21,364	0	(65,567)
June	20,675	0	(44,892)
July	21,364	0	(23,528)
Aug.	24,828	0	1,300
Sept.	14,386	0	15,686
Oct.	14,865	0	38,551
Nov.	14,386	0	44,937
Dec.	14,865	26,911	32,891
Jan. 1962	14,865	2,047	45,709
Feb.	9,806	0	55,515
Mar.	19,107	5,475	69,147
Apr.	14,343	33,052	50,438
May	13,195	8,088	55,545
			(220,003)

Page 2  
2049

## VAL RESSE &amp; ASSOCIATES 1-19 LYBROOK GAS PRODUCTION FIGURES

DATE	ALLOWABLE	PRODUCTION	STATUS
Nov. 1960	11,014	69,907	(58,893)
Dec.	11,382	32,693	(80,204)
Jan. 1961	11,382	24,067	(92,889)
Feb.	19,296	45,408	(110,001)
Mar.	21,364	13,024	(110,661)
Apr.	20,675	9,261	(99,247)
May	21,364	0	(77,883)
June	20,675	0	(57,208)
July	21,364	0	(35,844)
Aug.	24,828	0	(11,016)
Sept.	14,386	0	3,370
Oct.	14,865	0	18,735
Nov.	14,386	10,211	22,410
Dec.	14,865	39,106	(1,831)
Jan. 1962	14,865	42,779	(29,745)
Feb.	9,806	74,578	(94,517)
Mar.	19,107	45,286	(120,696)
Apr.	14,343	20,563	(126,916)
May	13,195	0	(113,721)
			(1,186,257)

Ex 7 page 3

2049

# Redfern and Herd #2 Largo Spur Gas Production Figures

DATE	ALLOWABLE	PRODUCTION	STATUS
Nov. 1960	11,014	103,807	(92,793)
Dec.	11,382	112,850	(194,268)
Jan. 1961	11,382	154,242	(337,121)
Feb.	19,296	32,407	(350,232)
Mar.	21,364	0	(328,868)
Apr.	20,675	0	(308,193)
May	21,364	0	(286,829)
June	20,675	0	(266,154)
July	21,364	0	(244,790)
Aug.	24,828	0	(219,962)
Sept.	14,386	0	(205,576)
Oct.	14,865	0	(190,711)
Nov.	14,386	0	(176,325)
Dec.	14,865	0	(161,460)
Jan. 1962	14,865	0	(146,595)
Feb.	9,806	0	(136,789)
Mar.	19,107	0	(117,682)
Apr.	14,343	0	(103,339)
May	13,195	0	(90,144)
			(31,937,821)

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2049



REDFERN & HERD #1 LARGO SPUR GAS PRODUCTION FIGURES

DATE	ALLOWABLE	PRODUCTION	STATUS
Nov. 1960	11,014	92,446	(81,432)
Dec.	11,382	101,575	(171,625)
Jan. 1961	11,382	108,947	(269,190)
Feb.	19,296	26,081	(275,975)
Mar.	21,364	0	(254,611)
Apr.	20,675	0	(233,936)
May	21,364	0	(212,572)
June	20,675	0	(191,897)
July	21,364	0	(170,533)
Aug.	24,828	148	(145,653)
Sept.	14,386	0	(131,467)
Oct.	14,865	1,555	(118,157)
Nov.	14,386	3,472	(107,243)
Dec.	14,865	0	(92,378)
Jan. 1962	14,865	0	(77,513)
Feb.	9,896	0	(67,707)
Mar.	19,107	0	(48,600)
Apr.	14,343	240	(34,497)
May	13,195	0	(21,302)
			(2,706,488)

7 page 5  
2049

EL PASO NATURAL GAS COMPANY CANYON LARGO UNIT #89  
GAS PRODUCTION FIGURES

DATE	ALLOWABLE	PRODUCTION	STATUS
Nov. 1960	11,014	71,143	(60,129)
Dec.	11,382	93,622	(142,369)
Jan. 1961	11,382	55,725	(186,712)
Feb.	19,296	6,005	(173,421)
Mar.	21,364	0	(152,057)
Apr.	20,675	0	(131,382)
May	21,364	0	(110,028)
June	20,675	0	(89,343)
July	21,364	0	(67,978)
Aug.	24,828	0	(43,151)
Sept.	14,386	6,855	(25,620)
Oct.	14,865	14,272	(35,857)
Nov.	14,386	0	(20,641)
Dec.	14,865	0	(5,776)
Jan. 1962	9,806	0	9,089
Feb.	19,107	0	18,895
Mar.	14,343	0	38,002
Apr.	13,195	0	52,345
May		18,064	47,476
			( 1,087,818)

7 page 6  
2049

PAUL F. RUTLEDGE 1-A MILLER PRODUCTION GAS FIGURES

DATE	ALLOWABLE	PRODUCTION	STATUS
Nov. 1960	11,014	59,428	(48,414)
Dec.	11,382	36,799	(73,831)
Jan. 1961	11,382	10,338	(72,787)
Feb.	19,296	38,600	(92,091)
Mar.	21,364	17,801	(88,528)
Apr.	20,675	0	(67,853)
May	21,364	0	(46,489)
June	20,675	0	(25,814)
July	21,364	0	( 4,450)
Aug.	24,828	0	20,378
Sept.	14,386	0	34,764
Oct.	14,865	16,763	32,866
Nov.	14,386	21,555	25,697
Dec.	14,865	49,994	(9,432)
Jan. 1962	15,865	46,795	(41,362)
Feb.	9,806	39,420	(70,976)
Mar.	19,107	33,819	(85,688)
Apr.	14,343	10,107	(81,452)
May	13,195	0	(68,257)
			(783,719)

7 page 7  
2049

# EPNG, CIU # 106 GAS PRODUCTION FIGURES

Date	Allowable	Production	Status
November, 1960	0	0	0
December	0	0	0
January, 1961	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
January, 1962	0	0	0
February	0	0	0
March	5,332	0	0
April	9,806	3,331	2,001
May	19,107	29,690	(17,883)
	14,343	33,032	(31,808)
	13,195	38,312	(55,777)
		0	(42,582)
			(146,049)

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2049



BCO. INC., ZAMORA # 1 GAS PRODUCTION FIGURES

Date	Allowable	Production	Status
November 1960	0	0	0
December	0	0	0
January, 1961	0	0	0
February	0	0	0
March	0	0	0
April	5,513	0	0
May	20,675	0	0
June	21,364	5,990	5,990
July	20,675	66,892	20,196
August	21,364	69,124	(25,390)
September	20,828	0	(73,800)
October	14,386	0	(88,186)
November	14,865	0	(27,657)
December	14,386	0	(13,271)
January, 1962	14,865	0	1,594
February	14,865	60,031	15,980
March	9,806	42,018	(29,196)
April	10,107	78,592	(56,339)
May	14,343	54,389	(125,190)
	13,195	68,676	(215,740)
		78,647	(281,192)
			(1,017,296)

Ex 7 page 9  
2049

Miner 4

PETROLEUM TECHNOLOGISTS, INC

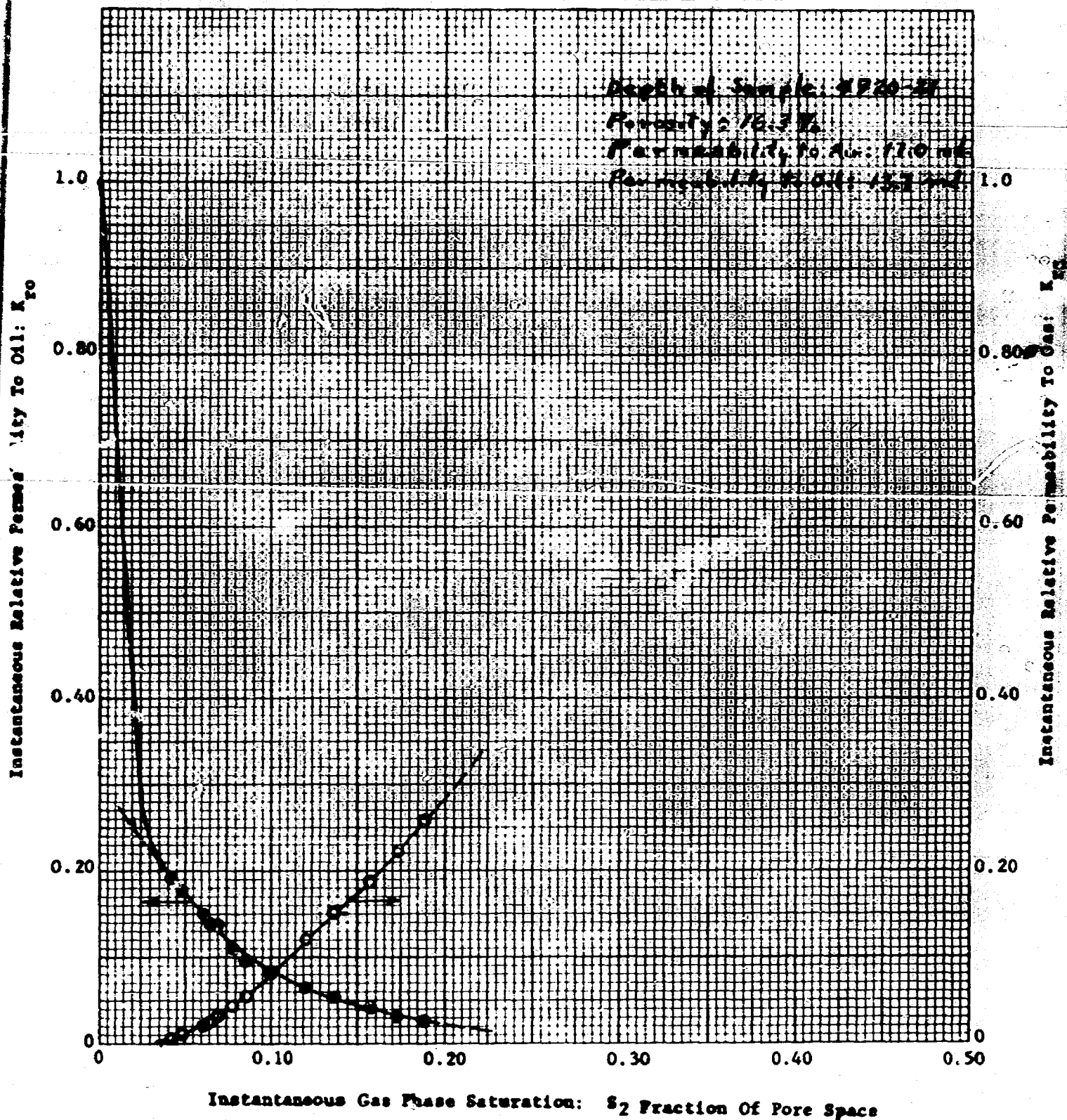
File No. BA-3042-S

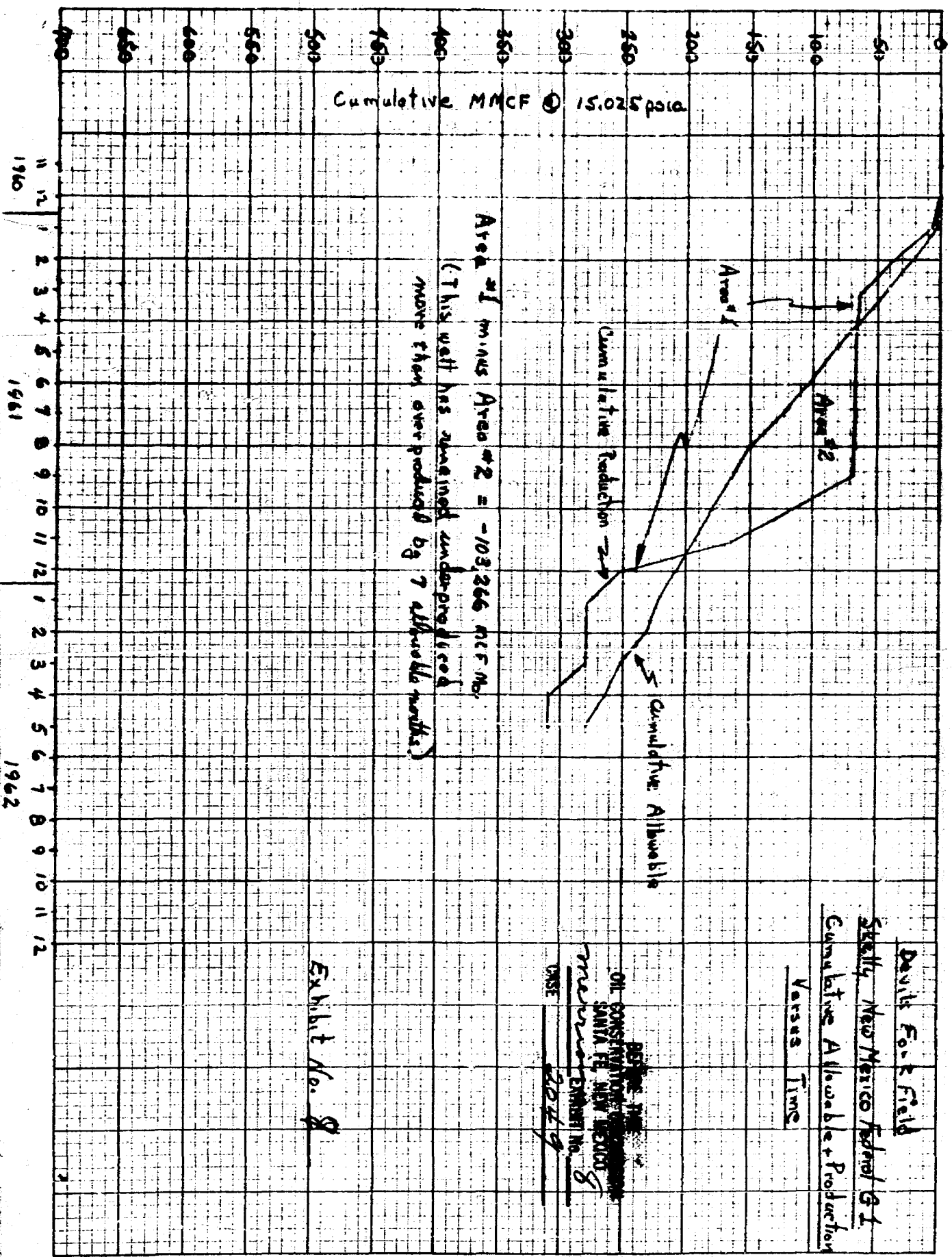
**INSTANTANEOUS RELATIVE PERMEABILITY TO GAS AND OIL VS. CORRESPONDING  
GAS PHASE SATURATION**

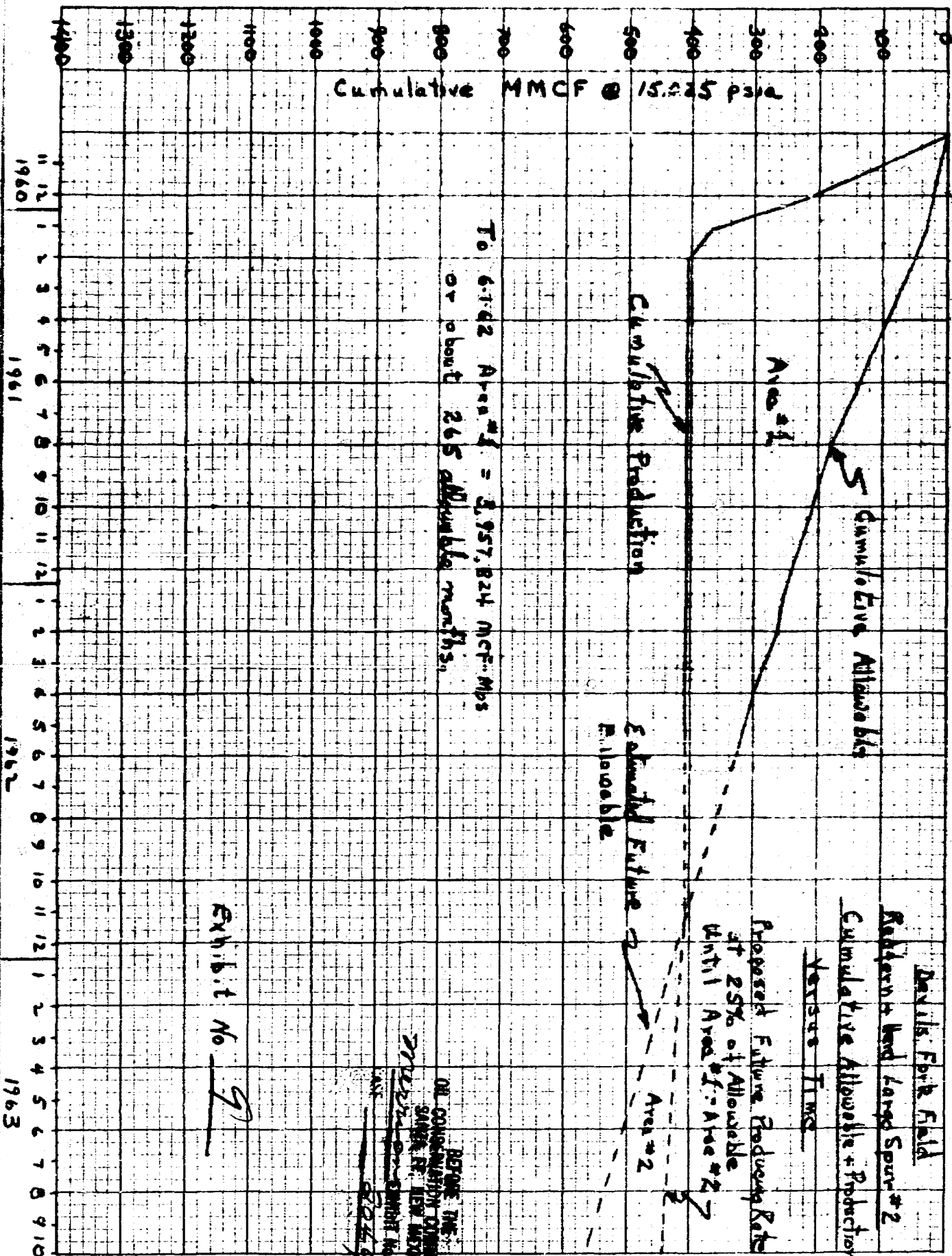
Sample No. 2 The British-American  
Company Oil Producing Company  
Reservoir Gallup Sand

Well Marye "B" No. 4  
Field Bisti

Depth 4920-21









**ECONOMIC EVALUATION**  
**AVERAGE GAS WELL - DEVILS FORK GAS FIELD**

**ASSUMPTION:** Spacing - 320 acre/ well  
 Recoverable Reserve - 5,300 MCF/acre = 1,696 MM/Location  
 Liquids - 8 bbls/ MM @ \$2.00/bbl  
 Well Cost - \$80,000.00  
 Conditions - 15.025 psi @ 60° F

<u>Year</u>	<u>Annual Prod. MMcf</u>	<u>Gas &amp; Liquid Value (14.6¢/Mcf)</u>	<u>Less Royalty &amp; Taxes (23.14%)</u>	<u>Operating Expense</u>	<u>Net to Operator</u>	<u>Discounted Present Worth @ 6%</u>
<b>IF INITIAL PRODUCTION RATE IS 800 MCF/D</b>						
1	292	\$42,632	\$9,865	\$1,800	\$30,967	\$30,967
2	292	42,632	9,865	1,800	30,967	28,375
3	292	42,632	9,865	1,800	30,967	26,769
4	292	42,632	9,865	1,800	30,967	25,254
5	223	32,558	7,534	1,800	23,224	17,867
6	182	26,572	6,149	1,800	18,623	13,517
7	127	18,542	4,291	1,800	12,451	8,525
	1,696					\$150,385
<b>Fair Market Value @ 2/3 of Present Worth</b>						\$100,257
<b>IF INITIAL PRODUCTION RATE IS 1,000 MCF/D</b>						
1	365	\$53,290	\$12,331	\$1,800	\$39,159	\$ 39,159
2	365	53,290	12,331	1,800	39,159	35,882
3	365	53,290	12,331	1,800	39,159	33,851
4	292	42,632	9,865	1,800	30,967	25,254
5	182	26,572	6,149	1,800	18,623	14,328
6	127	18,542	4,291	1,800	12,451	9,037
	1,696					\$156,387
<b>Fair Market Value @ 2/3 of Present Worth</b>						\$104,258

BEFORE THE  
 OIL CONSERVATION COMMISSION  
 SANTA FE, NEW MEXICO.  
*Redfern Herd* EXHIBIT 1  
2049

2

**ECONOMIC EVALUATION**  
**AVERAGE GAS WELL - DEVILS FORK GAS FIELD**

**ASSUMPTIONS:** Spacing - 160 acre/well  
 Recoverable Reserve - 5,300 MCF/acre = 848 MMCF PERLOC  
 Liquids - 8 bbls/million @ \$2.00/bbl  
 Well Cost - \$80,000.00  
 Conditions - 15.025 psi & 60° F

<u>Year</u>	<u>Annual Prod. MMcf</u>	<u>Gas &amp; Liquid Value (14.6¢/Mcf)</u>	<u>Less Royalty &amp; Taxes (23.14%)</u>	<u>Operating Expense</u>	<u>Net to Operator</u>	<u>Discounted Present Worth @ 6%</u>
<b><u>IF INITIAL PRODUCTION RATE IS 400 MCF/D</u></b>						
1	146	\$21,316	\$4,932	\$1,800	\$14,584	\$14,165
2	146	21,316	4,932	1,800	14,584	13,363
3	146	21,316	4,932	1,800	14,584	12,686
4	146	21,316	4,932	1,800	14,584	11,988
5	146	21,316	4,932	1,800	14,584	11,279
6	<u>118</u>	<u>17,228</u>	<u>3,987</u>	<u>1,800</u>	<u>11,441</u>	<u>8,384</u>
	<u>848</u>					<u>\$71,550</u>

Fair Market @ 2/3 of Present Worth

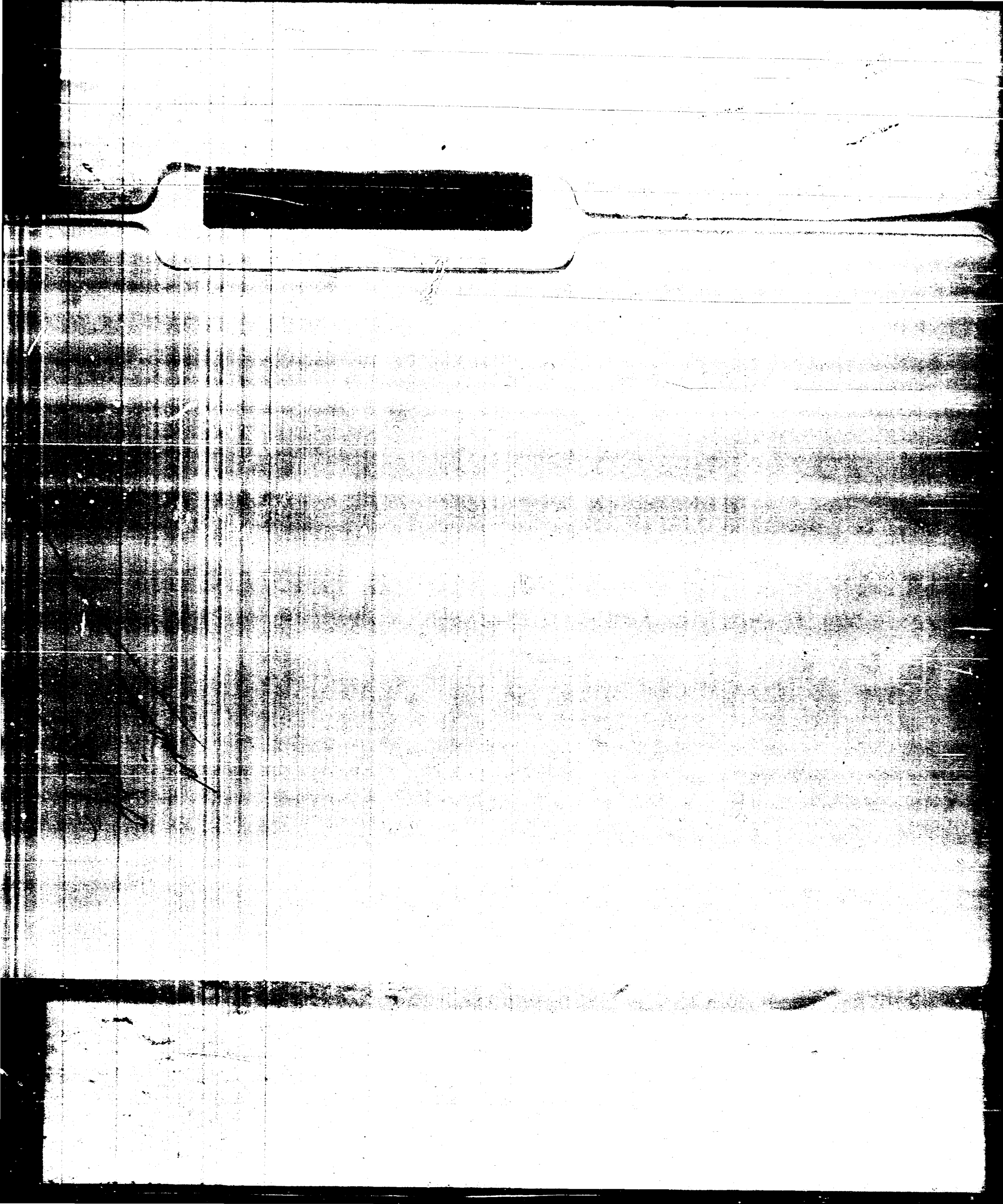
\$47,700

<b><u>IF INITIAL PRODUCTION RATE IS 500 MCF/D</u></b>						
1	182	\$26,572	\$6,149	\$1,800	\$18,623	\$18,088
2	182	26,572	6,149	1,800	18,623	17,064
3	182	26,572	6,149	1,800	18,623	16,098
4	182	26,572	6,149	1,800	18,623	15,187
5	<u>120</u>	<u>17,520</u>	<u>4,054</u>	<u>1,800</u>	<u>11,666</u>	<u>8,975</u>
	<u>848</u>					<u>\$75,412</u>

Fair Market @ 2/3 of Present Worth

\$50,275

BEFORE THE  
OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO  
*Redfern & Herd* EXHIBIT No. 2  
CASE 2049



**REDFERN & HERD, INC.**

WILCO BUILDING  
MIDLAND, TEXAS

POST OFFICE BOX 1747  
TELEPHONE MUTUAL 4-8881

1962 SEP 11 September 11, 1962

IN REPLY REFER TO  
FILE:

Re: Case 2049  
Devils Fork-Gallup  
Rio Arriba County, N.M.

New Mexico Oil Conservation Commission  
Morgan Hall  
State Land Office Building  
Santa Fe, New Mexico

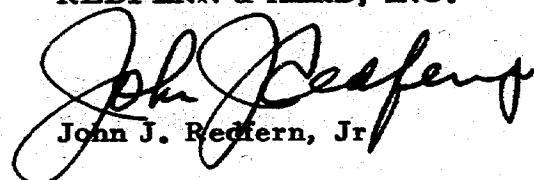
Gentlemen:

We regret that other business does not permit personal representation at the above hearing. We do not feel that we could add anything to the record at this time.

We wish to recommend that the present field rules be continued on a temporary basis. We support the recommendation that all gas produced be metered.

Very truly yours,

REDFERN & HERD, INC.

  
John J. Redfern, Jr.

JJR: BJB

Aug 17th  
hearing

Return to OCO

CO-2044  
EPNG EX 1

**PROPOSED SPECIAL RULES AND REGULATIONS IN THE  
DEVILS FORK GALLUP GAS POOL**

The term "General Rules" used herein refers to the General Rules and Regulations for Prorated Gas Pools of Northwest New Mexico contained in Order No. R-1670.)

**A. WELL LOCATION AND ACREAGE REQUIREMENTS**

**Rule 1:**

Pertains to pool wells and wildcat wells--General Rules applicable.

**Special Rule 2: ✓**

Each well drilled or recompleted within the Devils Fork Gallup Gas Pool on a standard proration unit, after the effective date of this Rule, shall be drilled not closer than 660' to any boundary line of the tract, nor closer than 330' to a quarter-quarter section line or subdivision inner boundary line. Any well drilled to and producing from the Devils Fork Gallup Gas Pool prior to the effective date of this Order, at a location conforming to the spacing requirements in effect at the time said well was drilled, shall be considered to be located in conformance with this Rule.

**Rule 3:**

Pertains to exceptions to the spacing provisions--General Rules applicable.

**Rule 4:**

Pertains to the exception of these rules to Statewide Rule 104, paragraph (k)--General Rules applicable.

**Special Rule 5 (A):**

The acreage allocated to a gas or oil well for proration purposes shall be known as the gas or oil proration unit for that well. Each well completed or recompleted in the Devils Fork Gallup Gas Pool on a standard proration unit as a gas well shall be located on a proration unit on approximately 320 acres comprising any two contiguous quarter sections of a single governmental section being a legal subdivision of the U. S. Public Land Surveys, and each well completed or recompleted in the Devils Fork Gallup Gas Pool on a standard proration unit as an oil well shall be located on a proration unit of approximately 80 acres comprising any two contiguous quarter-quarter sections of a single governmental section being a legal subdivision of the U. S. Public Land Surveys. Any gas proration unit containing between 316 and 324 acres shall be considered to contain the number of acres in a standard unit for the purposes of computing allowables.



Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool  
Page 2.

Rule 5 (B):

Provides for administrative approval for non-standard proration units--  
General Rules applicable.

B. NOMINATIONS AND PRORATION SCHEDULE

Rule 6 (A):

Provides for preliminary nominations--General Rules applicable.

Rule 6 (B):

Defines the term "gas purchasers"--General Rules applicable.

Rule 7 (A):

Provides for supplemental nominations--General Rules applicable.

Rule 7 (B):

Provides that wells shall be listed on a proration schedule--General  
Rules applicable.

C. ALLOCATION AND GRANTING OF ALLOWABLES

Rule 8 (A):

Provides that total gas allowable of the pool shall be equal to the preliminary  
or supplemental nominations with any adjustments which the Commission  
deems advisable--General Rules applicable.

Rule 8 (B) 1:

Provides no gas well to be given an allowable until certain forms have  
been filed--General Rules applicable.

Rule 8 (B) 2:

Provides that deliverability test must be taken--General Rules applicable.

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 3.

**Special Rule 8 (B) 3:**

No oil well shall be given an allowable until Form C-104 and Form C-110 have been filed, together with a plat (Form C-128) showing acreage attributed to said well and the location of all wells on the lease.

**Special Rule 8 (B) 4:**

The allowable for an oil well shall be determined in accordance with the provisions of Statewide Rule 505.

**Rule 8 (C):**

Provides when allowables to newly completed gas well shall commence--  
General Rules applicable.

**Special Rule 8 (D):**

Allowables to wells whose classification has changed from oil to gas, based on the results of a gas-oil ratio test, will commence on the effective date of the new gas-oil ratio as provided in Special Rule 28; provided that:

- Rule 10C  
Here of*
- 1) A deliverability test is taken in conformance with the provisions of ~~Order R-333-C and D, as amended by Order R-333-E and~~ is submitted to the Commission within 45 days of the effective date of reclassification. In no event will a gas allowable be granted for a date more than 45 days prior to the date the well's initial deliverability and shut-in pressure test is reported to the Commission on Form C-122-A, in conformance with the provisions of Orders R-333-C and D, as amended by Order R-333-E;
  - 2) A plat, Form C-128, showing the acreage attributed to said gas well and the location of all wells on the lease, and a new Form C-104 and Form C-110 has been filed.

**Special Rule 8 (E):**

Allowables to wells whose classification has changed from gas to oil based on the results of a gas-oil ratio test, will commence on the effective date of the the new gas-oil ratio as provided in Special Rule 28, provided that a plat, Form C-128, showing the acreage attributed to said oil well and the location of all wells on the lease and a new Form C-104 and C-110 has been filed.

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
**Page 4.**

**Rule 9 (A):**

**Provides method for calculating "AD factor"--General Rules applicable.**

**Rule 9 (B):**

**Provides for allowable which shall be assigned to marginal wells--General Rules applicable.**

**Rule 9 (C) 1 and 2:**

**Provides for specific method of calculating allowables--General Rules applicable.**

**Rule 9 (D):**

**Provides that deliverability tests become effective on February 1st of the year following the year in which test is taken--General Rules applicable.**

**Special Rule 9 (E):**

**Oil wells in the Devils Fork Gallup Gas Pool on an 80 acre standard proration unit shall be permitted to produce a gas limit determined by multiplying the following factors:**

**(The normal unit allowable for Northwestern New Mexico) X (The proportional factor of 2.33) X (The limiting gas-oil ratio for the Devils Fork Gallup Gas Pool)**

**Rule 10 (A):**

**Provides for procedures in case acreage assigned to a well is increased--General Rules applicable.**

**Rule 10 (B):**

**Provides for effective date of a new allowable due to change in deliverability after retest or after recompletion or workover--General Rules applicable.**

**Rule 10 (C):**

**Provides that deliverability be determined in accordance with the provisions of Order R-333-C and D, as amended by R-333-E, and provides for exceptions to annual deliverability test requirements--General Rules applicable.**

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 5.

**Special Rule 10 (C):**

Gas wells in the Devils Fork Gallup Gas Pool shall have deliverability tests taken in conformance with the procedure outlined in Section B (procedure pertaining to the Mesa Verde Formation) of Order R-333-C and D, as amended by Order R-333-E.

**Rule 11:**

Provides that the Commission may assign minimum allowables in order to prevent premature abandonment--General Rules applicable.

**Rule 12:**

Provides that all production shall be charged against the well's allowable--General Rules applicable.

**D. BALANCING OF PRODUCTION**

**Rule 13:**

Provides for balancing dates and proration periods--General Rules applicable.

**Rule 14 (A):**

Provides that underproduction accrued in one proration period may be carried forward into the next proration period before cancellation--General Rules applicable.

**Rule 14 (B):**

Provides for method of making up underproduction--General Rules applicable.

**Special Rule 14 (C):**

The status of the gas area, as defined in the following formula, of the Devils Fork Gallup Gas Pool shall be determined as of February 1st and August 1st each year in the following manner:

- 1) The volumetric equivalent of gas for the gas area, based on the total production from the oil area, shall be calculated from the formula below:

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 6.

$$V = \frac{A \times Q}{a} \times C \quad \text{where } C = r_1 - r_2 + \left( \frac{0.3199 P_r B}{Z} \right)$$

A = The gas area which is the total acreage dedicated to gas wells (acres).

a = The oil area which is the total acreage dedicated to oil wells (acres).

Note: The acreage to be added for any oil or gas well which receives its first allowable during a six month balancing period, for that period only, shall be calculated by the following formula:

$$\Delta a \text{ or } \Delta A = a \left( \frac{d}{D} \right) \text{ or } A \left( \frac{d}{D} \right)$$

where  $\Delta a$  or  $\Delta A$  = acreage to be added to oil or gas area respectively.

a or A = Acreage dedicated to the well.

d = Days well received allowable during proration period.

D = Total days during proration period.

Q = Total oil production from oil area (bbls. /6 months).

$r_1$  = Average produced GOR for the oil area determined by dividing the total gas production of the oil area by the total oil production of the oil area for the previous six months proration period (cu. ft./bbl.).

$r_2$  = Solution GOR determined from the characteristic performance curve for the oil at  $P_r$  (cu. ft./bbl.).

$P_r$  = Average reservoir pressure based on the pressures obtained on the most recent bottom hole pressure survey as provided in Special Rule 29.

B = The oil reservoir volume factor determined from the characteristic performance curve for the oil at  $P_r$ .

Z = Deviation factor for gas at  $P_r$  and 147° F for average gravity of produced gas from gas wells.

V = The volumetric equivalent of gas for the gas area, cubic feet for the six months rounded off to the nearest MCF.



**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 7.

$$0.3199 = \text{constant} = \frac{520 \times 5.61}{15.025 \times 607} \quad (607 = 147^\circ \text{ F} + 460^\circ \text{ R})$$

where  $147^\circ$  = the initial bottom hole temperature, assumed to remain constant.

- 2) The volumetric equivalent of gas for the gas area determined in 1) above shall be compared with the actual production from the gas area.
  - a) If the actual production from the gas area exceeds such volumetric equivalent plus any permitted production remaining as determined in b) below, then the nominations by gas purchasers during the succeeding six month period shall be adjusted by the Commission so that the volumetric withdrawals from the gas area shall be restricted for the purpose of balancing the cumulative equivalent volumetric withdrawals from each area.
  - b) If the actual production from the gas area is less than the volumetric equivalent for the gas area, then no adjustments will be made but the difference between the volumes will be carried forward as permitted production of gas from the gas area in subsequent balancing periods.

**Rule 15 (A):**

Provides that overproduction accrued in one proration period may be carried forward into the next proration period--General Rules applicable.

**Rule 15 (B):**

Provides that any time a well is six times overproduced its current allowable it shall be shut-in until it is underproduced less than six times its current allowable--General Rules applicable.

**Rule 15 (C):**

Provides for method of making up overproduction--General Rules applicable.

**Rule 15 (D):**

Provides that overproduction may be made up at a lesser rate than complete shut-in--General Rules applicable.

**Rule 15 (E):**

Provides that allowable assigned to a well through cancellation and redistribution shall be applied against overproduction--General Rules applicable.

Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool  
Page 8.

**E. CLASSIFICATION OF WELLS**

**Rule 16 (A):**

Provides for classification of marginal well--General Rules applicable.

**Rule 16 (B):**

Provides that Secretary-Director may reclassify wells--General Rules applicable.

**Rule 17:**

Provides that a marginal well is not permitted to accumulate underproduction--General Rules applicable.

**Rule 18:**

Provides for method of reclassification of a marginal well to a non-marginal well--General Rules applicable.

**Rule 19:**

Provides that a reworked or recompleted well shall be classified as non-marginal upon reconnection--General Rules applicable.

**Rule 20:**

Provides that all wells not classified as marginal wells shall be classified as non-marginal wells--General Rules applicable.

**F. REPORTING OF PRODUCTION**

**Rules 21 (A) (B) (C) and (D):**

Provides that gas production shall be metered separately and reported to the Commission in accordance with appropriate Statewide Rules--General Rules applicable.

**G. GENERAL**

**Rule 22:**

No flare provision--General Rules applicable.

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 9.

**Rule 23:**

Provides that failure to comply with Order will result in cancellation of allowable--General Rules applicable.

**Rule 24:**

Provides that all transporters shall file connection notices--General Rules applicable.

**H. MISCELLANEOUS SPECIAL POOL RULES**

**Special Rule 25:**

The vertical limits of the Devils Fork Gallup Gas Pool shall be the Gallup Formation.

**Special Rule 26:**

A gas well in the Devils Fork Gallup Gas Pool shall be any well producing with a gas liquid ratio of 30,000 cu. ft. of gas per barrel of liquid hydrocarbons or more; or, any well which produces liquid hydrocarbons with a gravity of 60° API or greater.

**Special Rule 27:**

An oil well in the Devils Fork Gallup Gas Pool shall be a well producing with a gas liquid ratio of less than 30,000 cu. ft. of gas per barrel of liquid hydrocarbons, and the liquid hydrocarbons have a gravity of less than 60° API.

**Special Rule 28:**

Gas-oil ratio tests shall be taken on all wells in the Devils Fork Gallup Gas Pool and on all wells producing from the Gallup Formation within one mile of the boundaries of the Devils Fork Gallup Gas Pool and not within another designated pool during the first fifteen days of the months of January, April, July, and October of each year. Tests shall be 24-hour tests, being the final 24 hours of a 72-hour period during which the well shall be produced at a constant rate of production to be determined by the operator, but in no event shall the rate be less than that necessary to produce the gas limit if the well is capable of producing the gas limit. Results of such tests shall be filed on Commission Form C-116 within ten days after the close of each test period and shall become effective on the first of the month following the test period. At least 72 hours prior

42  
70

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 10.

to commencement of any such gas-oil ratio tests, each operator shall file with the Aztec office of the Commission a Test Schedule for its wells, specifying the time each of its wells is to be tested. Copies of the Test Schedule shall also be furnished to all offset operators. The Secretary-Director may extend the 15-day testing period if future development indicates that 15 days does not allow sufficient time for operators to adequately test all of their wells.

**Special Rule 29:**

The average reservoir pressure shall be determined during the months of April and October each year after each well has been shut-in for a minimum of 3 days and calculated to a common datum, which shall be the subsea depth of the gas-oil contact. The pressures on individual wells shall be determined in the following manner:

- 1) Subsurface pressure tests shall be taken on all flowing oil wells (pumping wells exempted) in accordance with the procedure outlined in Statewide Rule 302, except with respect to shut-in time and datum as provided above.
- 2) Wellhead shut-in pressure shall be obtained on all gas wells and calculated to bottom hole conditions at the subsea datum of the gas-oil contact in accordance with the standard procedure as outlined in the "Manual for Back Pressure Tests for Natural Gas Wells in the State of New Mexico."
- 3) Information obtained on these tests shall be reported on Form C-124 in compliance with the provisions of Statewide Rules 302 and 1123, and the Commission shall use the arithmetic average of the pressures so reported for the pressure,  $P_r$ , in the calculations as provided in Special Rule 14 (C).

**Special Rule 30:**

No acreage shall be simultaneously dedicated to an oil well and to a gas well in the Devils Fork Gallup Gas Pool

**Special Rule 31:**

In order to prevent waste, the gas-oil ratio limitation for the Devils Fork Gallup Gas Pool shall be 2,000 cu. ft. of gas per barrel of oil produced.

Special Rule 10 (C):

Gas wells in the Devils Fork Gallup Gas Pool shall have deliverability tests taken in conformance with the following procedure:

(A) INITIAL DELIVERABILITY AND SHUT-IN PRESSURE TEST.

1. Within (45) forty-five days after a newly completed well is connected to a gas transportation facility the operator shall accomplish a deliverability and shut-in pressure test in conformance with the following paragraph (B).

(B) THE ANNUAL DELIVERABILITY AND SHUT-IN PRESSURE TESTS.

These tests shall be taken by unrestrictedly producing the well into the pipeline through either the casing or tubing, but not both. The daily flowing rate shall be determined for a one (1) day test flow period, following a minimum conditioning period of three (3) consecutive days production. There shall be no interruption of production during the four (4) days of conditioning and test. All such production during the three (3) day conditioning period plus the one (1) day deliverability test period shall be at static wellhead working pressures not in excess of seventy-five (75) per cent of the previous annual seven (7) day shut-in pressure of such well if such previous annual shut-in pressure information is available; otherwise, the seven (7) day initial shut-in pressure of such well shall be used.

In the event that existing line pressure does not permit a drawdown as specified above, with the well producing unrestrictedly into the pipeline, the operator shall request an exception to this requirement on the Form C-122-A. The request shall state the reasons for the necessity for the exception.

The static wellhead working pressure ( $P_w$ ) of any well under test shall be the calculated static tubing pressure if the well is flowing through the casing; or the calculated static casing pressure if the well is flowing through the tubing. The static wellhead working pressure ( $P_w$ ) shall be calculated by applying the tables and procedures as set out in New Mexico Oil Conservation Commission manual entitled "Method of Calculating Pressure Loss Due to Friction in Gas Well Flow Strings". This manual is more specifically known as release 4-G-9-FLT-NW.



To obtain the shut-in pressure of a well under test the well shall be shut-in immediately after the deliverability test for the full period of seven (7) consecutive days. Such shut-in pressure shall be measured within the next succeeding twenty-four (24) hours following the seven (7) day shut-in period aforesaid. The seven (7) day shut-in pressure shall be measured on the string through which the well flowed during the conditioning and test flow periods.

All wellhead pressures as well as the flowing meter pressure shall be taken at the end of the deliverability test period with a dead-weight gauge. The dead-weight readings taken shall be recorded on the flow chart in psia.

The orifice meter chart shall be changed, and so arranged as to reflect upon a single chart the flow data for the gas from each well for the full three (3) day conditioning and one (1) day deliverability test period. Corrections shall be made for pressure base, measured flowing temperature, specific gravity and supercompressibility (superexpansibility), provided however, that if the specific gravity of gas from any well under test is not available, then and in that event an estimated specific gravity may be assumed therefor, based upon that of gas from nearby wells, the specific gravity of which has been actually determined by measurement.

The one (1) day test flow period volume shall be calculated from the readings at the end of the test period as determined from the test period orifice meter chart. The volume used in this calculation shall be corrected to New Mexico Oil Conservation Commission standard conditions.

The daily average rate of flow shall be corrected for meter error by the multiplication by a correction factor determined by dividing the square root of the chart flowing meter pressure psia into the square root of the dead-weight flowing meter pressure psia.

The daily volume of flow shall be calculated by applying the Basic Orifice meter formula.

$$Q = C' \sqrt{h_w P_f}$$

Where:

Q = Metered volume of flow MCFD @ 15.025, 60°F. and .60 specific gravity.

$Q$  = The 24 hour basic orifice meter flow factor as taken from New Mexico Oil Conservation Commission release "4G-12-BPT State" and corrected for flowing temperature, gravity and supercompressibility.

$h_w$  = Differential meter pressure at end of test flow period from flow period chart.

$P_f$  = Flowing meter pressure at end of test flow period from flow period chart.

The basic orifice meter flow factors, flowing temperature factor and specific gravity factor shall be determined from New Mexico Oil Conservation Commission release No. "4G-12-BPT-State".

The test flow period corrected flowing meter pressure, psig, shall be used to determine the supercompressibility factor. Correction shall be made for supercompressibility (deviation from Boyle's law) for flowing meter pressures in excess of 100 psig by the use of Simplified Supercompressibility tables published by this Commission.

Deliverability pressure, as used herein for the Devils Ford Gallup Gas Pool production, is a defined pressure applied to each well and used in the process of comparing the abilities of wells in this formation to produce at static wellhead working pressures equal to fifty (50) per cent, of the seven (7) day shut-in pressure of the respective individual wells.

The deliverability of gas at the "deliverability pressure" of any well under test shall be calculated from the test data derived from the tests hereinabove required by use of the following deliverability formula:

$$D = Q \frac{\left[ \left( P_c^2 - P_d^2 \right) \right]}{\left[ \left( P_c^2 - P_w^2 \right) \right]}$$

WHERE:

- D = Deliverability at the deliverability pressure, ( $P_d$ ) MCF/da, (at Standard Condition of 15.025 psia and 60°F).
- Q = Daily flow rate in MCF/da, at wellhead pressure ( $P_w$ )
- $P_c$  = 7-day shut-in casing (or tubing) wellhead pressure, psia.
- $P_d$  = Deliverability pressure; half of the individual well 7-day shut-in pressure,  $P_c$ , psia.
- $P_w$  = Static wellhead working pressure, as calculated utilizing the actual flowing wellhead pressure at the end of the test flow period and the New Mexico Oil Conservation Commission Pressure Loss due to Friction Tables. (Casing pressure if flowing through the tubing, or tubing pressure if flowing through the casing).
- n = Average pool slope of back pressure curve (.75)

Any test hereinabove provided for will be considered unacceptable if the average flow rate for the deliverability test flow period is 25 per cent in excess of the average daily production during the three (3) day conditioning period. "A deliverability test" not meeting this requirement shall be retested.

The annual deliverability and shut-in pressure tests as required hereinabove shall be reported upon Commission Form C-122-A and filed in triplicate, with the Commission within the month next after completion of such tests. Form C-122-A shall be signed by the operator or agent designated as the operator.

The test chart or photostat thereof shall be made available to the Commission upon its request.

# CALCULATIONS TO DETERMINE EQUIVALENT VOLUMETRIC WITHDRAWALS

Case 2049  
EAG  
Ex 2

$$V = \frac{A \times Q}{a} \times C$$

$$\text{where } C = r_1 - r_2 + \frac{(T_h)}{(T_r)} \frac{(P_r)}{(P_b)} \frac{(B)}{(Z)} 5.61$$

1 Barrel  
Stock Tank  
Oil 5.61 ft.<sup>3</sup>

$$\times 1.43 =$$

8.02  
ft.<sup>3</sup>

This 8.02 ft.<sup>3</sup> of reservoir space exists at 2,015 psia and 147° F and must be corrected to 15.025 psia and 60° F, and for deviation from Perfect Gas.

8.02  
ft.<sup>3</sup>

$$\times \frac{(T_h)}{(T_r)} = \frac{520}{607}$$

6.87  
ft.<sup>3</sup>

$$\times \frac{(P_r)}{(P_b)} = \frac{2015}{15.025}$$

921.33  
ft.<sup>3</sup>

921.33  
ft.<sup>3</sup>

$$\times \frac{(1)}{(Z)} = \frac{1}{0.8058}$$

Deviation from  
Perfect Gas

1143.37  
ft.<sup>3</sup>

- (1) This is the volume of gas which will occupy the same reservoir space as one barrel of stock tank oil and its solution gas.
- (2) The volume determined in (1) is added to the volume of free gas ( $r_1 - r_2$ ) to obtain the total volume voided by the actual production of one barrel of oil.
- (3) In order to determine the total volume voided by the oil area, the volume determined in (2) is then multiplied by  $Q$ --the total oil production from the oil area during the six month period.
- (4) Next, the total space voided by the oil area is reduced to a per-acre basis by dividing the volume determined in (3) by  $a$ --the total acreage dedicated to oil wells.
- (5) The volumetric equivalent of gas for the gas area is determined by multiplying the volume determined in (4) by  $A$ --the total acreage dedicated to gas wells.

$$\text{Recommended Formula: } V = \frac{A \times Q}{a} \times C \quad \text{where } C = r_1 - r_2 + \frac{(0.3199 P_r B)}{(Z)}$$

$$0.3199 = \text{constant} = \frac{T_h \times 5.61}{T_r \times P_b} = \frac{560 \times 5.61}{607 \times 15.025}$$

$$(607 = 147^\circ \text{ F} + 460 \text{ R})$$

where 147° F = the initial bottom hole temperature, assumed to remain constant)

Case 2049

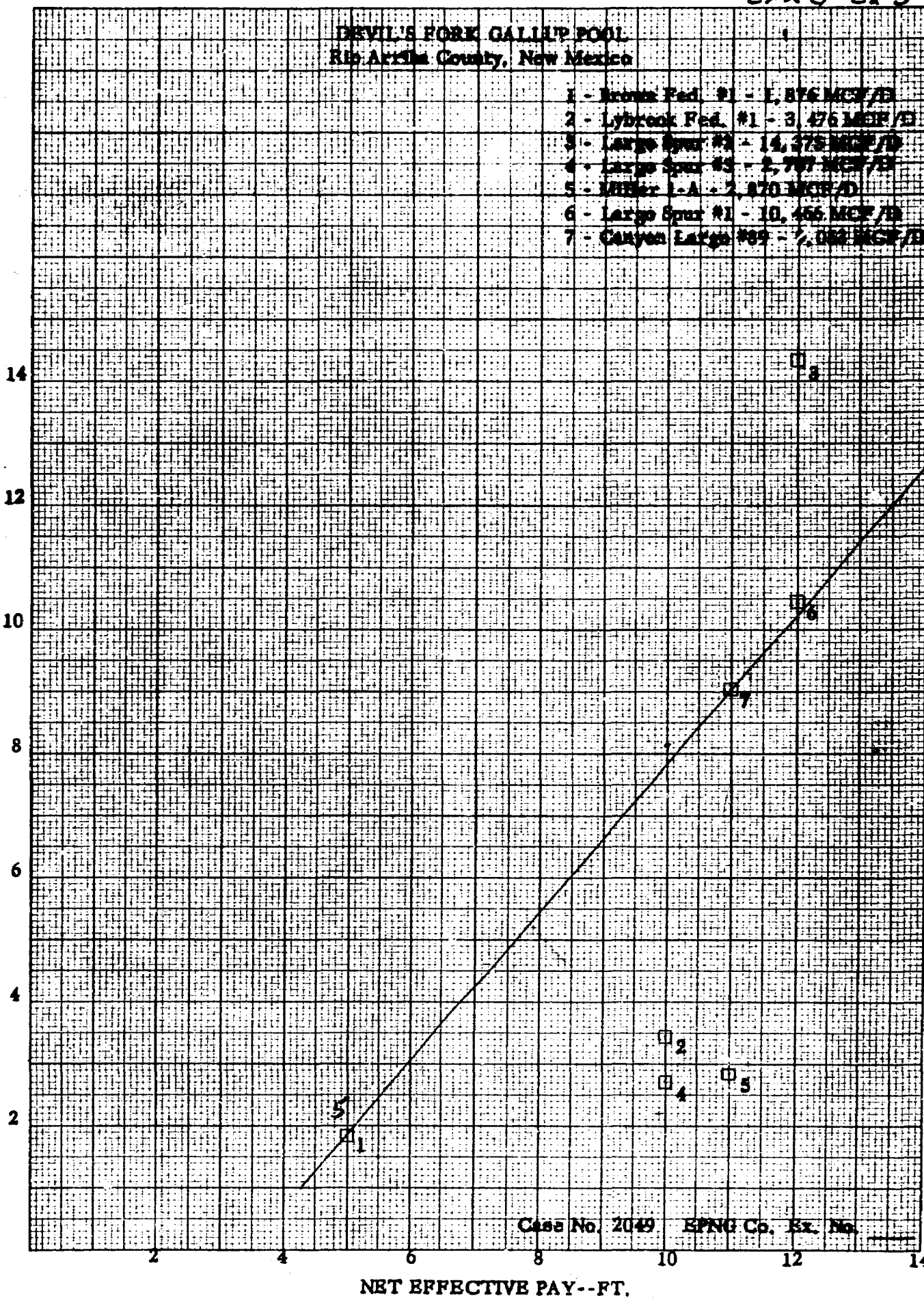
EPNG Ex 3

DEVIL'S FORK GALLUP POOL  
Rio Arriba County, New Mexico

- 1 - Brown Fed. #1 - 1,876 MCF/D
- 2 - Lybrook Fed. #1 - 3,476 MCF/D
- 3 - Large Spur #1 - 14,375 MCF/D
- 4 - Large Spur #3 - 2,707 MCF/D
- 5 - Miller 1-A - 2,870 MCF/D
- 6 - Large Spur #1 - 10,456 MCF/D
- 7 - Canyon Large #89 - 7,082 MCF/D

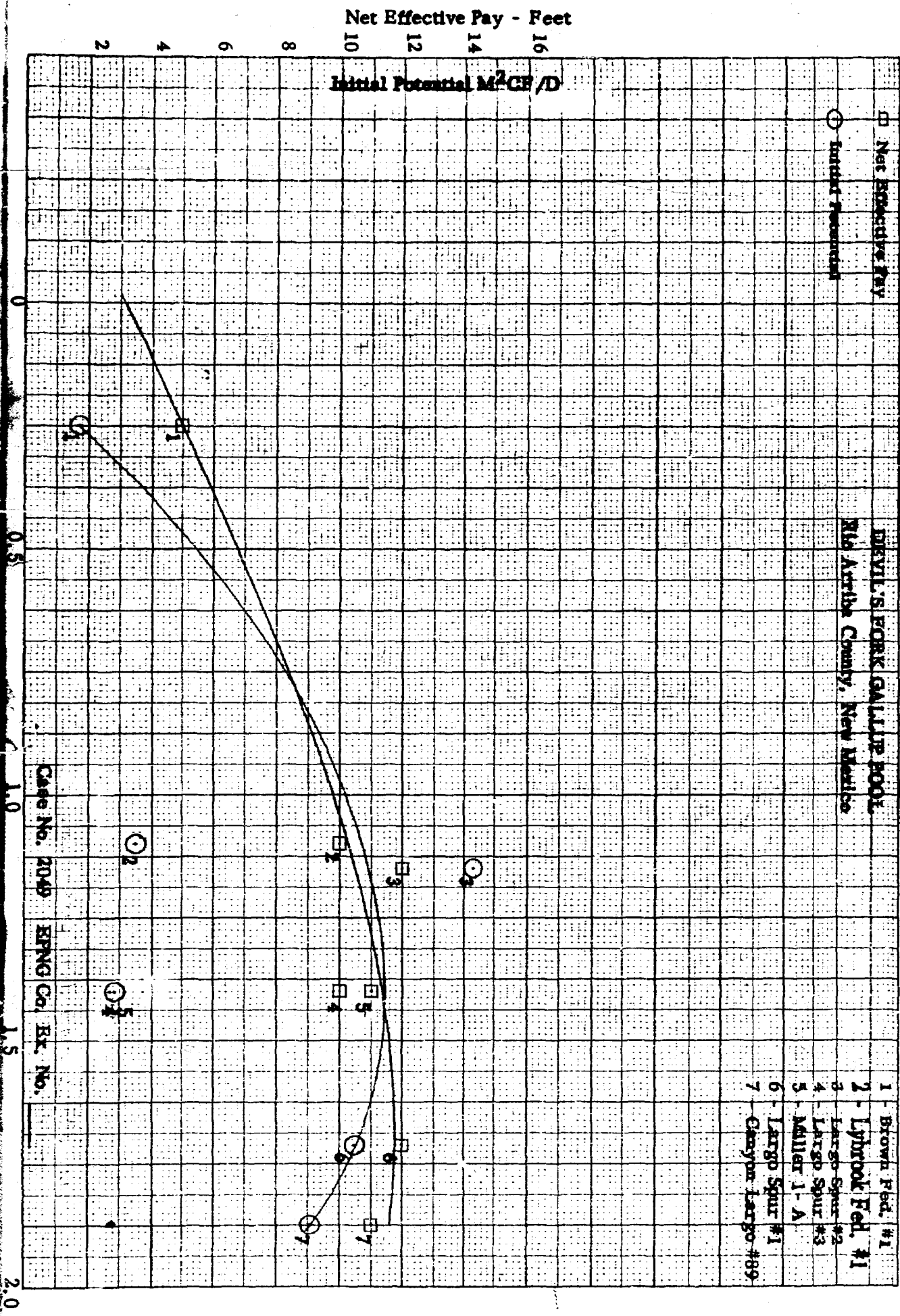
K&E  
10 X 10 TO THE 1/4 INCH  
KEUFFEL & ESSER CO.  
359-11  
MADE IN U.S.A.

INITIAL POTENTIAL--M<sup>2</sup>CF/D





C082  
EP416 Gx4



*Pan  
Am's Exhibits*

THIS IS A GILBERT QUALITY PAPER  
Cotton Fibre Content

No. 2-63

DOCKET: REGULAR HEARING - WEDNESDAY - JANUARY 16, 1963

OIL CONSERVATION COMMISSION - 9 A.M., - MORGAN HALL, STATE LAND OFFICE  
BUILDING, SANTA FE, NEW MEXICO

- ALLOWABLE:**
- (1) Consideration of the oil allowable for February, 1963
  - (2) Consideration of the allowable production of gas for February, 1963, from ten prorated pools in Lea and Eddy Counties, New Mexico, also consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for February, 1963.

CASE 2696: (Dismissed)

Application of Texas Pacific Coal & Oil Company for 40-acre spacing, Lea County, New Mexico. This case has been voluntarily dismissed by the Applicant.

CASE 2049: (Rehearing)

Application of the Oil Conservation Commission on its own motion to reconsider the special rules and regulations for the Devils Fork-Gallup Pool, Rio Arriba County, New Mexico. Upon application of J. Gregory Merrion, rehearing has been granted under the provisions of Rule 1222. The scope of the rehearing shall be limited to evidence concerning wells completed in the Devils Fork-Gallup Pool since September 13, 1962.

CASE 2730:

Southeastern New Mexico nomenclature case calling for an order creating new pools and extending certain existing pools in Eddy, Lea and Roosevelt Counties, New Mexico.

- (a) Create a new oil pool for Wolfcamp production, designated as the North Baish-Wolfcamp Pool and described as:

TOWNSHIP 17 SOUTH, RANGE 32 EAST, NMPM  
Section 10: SW/4

- (b) Create a new oil pool for Devonian production, designated as the Vacuum-Devonian Pool, and described as:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM  
Section 26: SE/4

- (c) Create a new oil pool for Paddock production, designated as the Vacuum-Paddock Pool, and described as:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM

Section 25: NW/4

Section 26: NE/4

- (d) Extend the North Anderson Ranch-Wolfcamp Pool to include:

TOWNSHIP 15 SOUTH, RANGE 32 EAST, NMPM

Section 27: SW/4

- (e) Extend the North Bagley-Upper Pennsylvanian Pool to include:

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM

Section 22: W/2 NE/4 and SE/4 NE/4

Section 23: SW/4

- (f) Extend the Cedar Lake-Abo Pool to include:

TOWNSHIP 17 SOUTH, RANGE 31 EAST, NMPM

Section 19: Lots 3 and 4

- (g) Extend the Justis-Montoya Pool to include:

TOWNSHIP 25 SOUTH, RANGE 38 EAST, NMPM

Section 30: NW/4

- (h) Extend the North Justis-Montoya Pool to include:

TOWNSHIP 24 SOUTH, RANGE 37 EAST, NMPM

Section 35: SE/4

Section 36: SW/4

- (i) Extend the Justis-Tubb-Drinkard Pool to include:

TOWNSHIP 26 SOUTH, RANGE 37 EAST, NMPM

Section 1: NE/4

- (j) Extend the East Millman-Queen-Grayburg Pool to include:

TOWNSHIP 19 SOUTH, RANGE 28 EAST, NMPM

Section 22: SW/4

- (k) Extend the Milnesand-San Andres Pool to include:

TOWNSHIP 8 SOUTH, RANGE 35 EAST, NMPH

Section 5: SW/4

Section 7: N/2

Section 8: NW/4

- (l) Extend the Oil Center-Blinsbry Pool to include:

TOWNSHIP 21 SOUTH, RANGE 36 EAST, NMPH

Section 4: S/2 (Lots 17-24)

- (m) Extend the East Red Lake-Queen Pool to include:

TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPH

Section 2: NE/4 NW/4

- (n) Extend the Shugart Pool to include:

TOWNSHIP 18 SOUTH, RANGE 31 EAST, NMPH

Section 30: N/2

- (o) Extend the North Square Lake Grayburg-San Andres Pool to include:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPH

Section 11: N/2 SW/4

- (p) Extend the Wantz-Abo Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPH

Section 16: SE/4



VERITY, BURR & COOLEY  
ATTORNEYS AND COUNSELORS AT LAW  
SUITE 152 PETROLEUM CENTER BUILDING  
FARMINGTON, NEW MEXICO

GEO. L. VERITY  
JOEL B. BURR, JR.  
WM. J. COOLEY  
NORMAN S. THAYER  
RAY B. JONES

October 29, 1962

TELEPHONE 325-1702

Mr. A. L. Porter  
Oil Conservation Commission  
Post Office Box 871  
Santa Fe, New Mexico

Re: Special Rules and Regulations for the  
Devils Fork-Gallup Pool -- R-1670-B-1

Dear Mr. Porter:

Forwarded herewith is the application of J. Gregory Merrion for rehearing in the referenced case.

Although recent hearings in this case have consumed a great deal of the Commission's time, I feel that the importance and urgency of the matters that would be brought to light at a rehearing justify and warrant a rehearing in this case.

Very truly yours,

VERITY, BURR & COOLEY

BY

*William J. Cooley*  
William J. Cooley

WJC/dh  
Enclosures

cc: Mr. J. Gregory Merrion

DOCKET MAILED

Date 1-3-63

*Sh*

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

APPLICATION OF THE OIL CONSERVATION  
COMMISSION ON ITS OWN MOTION TO RE-  
CONSIDER THE SPECIAL RULES AND REG-  
ULATIONS FOR THE DEVILS FOOT-CALLING  
POOL, RIO ARIZONA COUNTY, NEW MEXICO.

CASE No. 2049  
Order No. R-1670-B-2

ORDER OF THE COMMISSION

BE THE COMMISSION:

This cause came on for reconsideration upon the appli-  
cation of J. Gregory Morrison for a rehearing in Case No. 2049,  
Order No. R-1670-B-1, entered by the Commission on October 18,  
1962.

Now, on this 9th day of November, 1962, the Oil  
Conservation Commission, quorum being present, having con-  
sidered the application for rehearing,

FINDS:

That a rehearing should be granted in the subject case  
in order to hear additional evidence concerning wells com-  
pleted in the Devils Foot-Calling Pool since September 13, 1962,  
the date of the Commission hearing in Case No. 2049.

IT IS THEREFORE ORDERED:

- (1) That a rehearing in the subject case is hereby granted,  
and is set for the Regular Commission Hearing on January 16, 1963.
- (2) That the scope of the rehearing shall be limited to  
evidence concerning wells completed in the Devils Foot-Calling  
Pool since September 13, 1962.

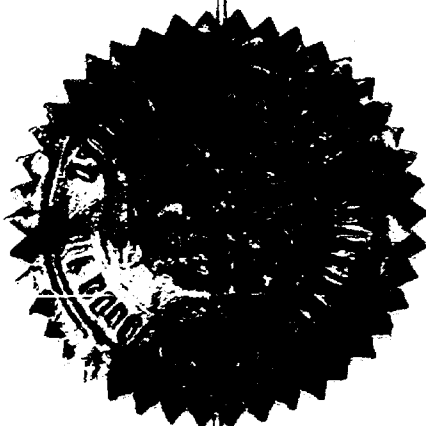
DONE at Santa Fe, New Mexico, on the day and year herein-  
above designated.

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

*E. J. Mc*  
ERWIN L. MECHER, Chairman

*E. S. Walker*  
E. S. WALKER, Member

*A. L. Porter, Jr.*  
A. L. PORTER, JR., Member & Secretary



ROUGH DRAFT

JMD/gar  
Nov. 8, 1962

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

APPLICATION OF THE OIL CONSERVATION  
COMMISSION ON ITS OWN MOTION TO RE-  
CONSIDER THE SPECIAL RULES AND REG-  
ULATIONS FOR THE DEVILS FORK-GALLUP  
POOL, RIO ARriba COUNTY, NEW MEXICO.

CASE No. 2049  
Order No. R-1670-B-~~1~~ 2

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for reconsideration upon the application  
of J. Gregory Merrion for a rehearing in Case No. 2049, Order  
No. R-1670-B-1, entered by the Commission on October 18, 1962.

NOW, on this \_\_\_\_\_ day of November, 1962, the Oil Conser-  
vation Commission, a quorum being present, having considered the  
application for rehearing,

FINDS:

~~X~~ That a rehearing should be granted in the subject case  
in order to hear additional evidence concerning wells completed  
in the Devils Fork-Gallup Pool since September 13, 1962, the date  
the Commission <sup>hearing on</sup> heard Case No. 2049, ~~prior to entry of Order No.~~  
~~R-1670-B-1.~~

IT IS THEREFORE ORDERED:

- (1) That a rehearing in the subject case is hereby granted,  
and is set for the Regular Commission Hearing on <sup>Jan 14, 1963</sup> ~~December 19, 1962.~~
- (2) That the scope of the rehearing shall be limited to  
evidence concerning wells completed in the Devils Fork-Gallup Pool  
since September 13, 1962.

DONE at Santa Fe, New Mexico, on the day and hear herein-  
above designated.

# GAS-OIL RATIO INFORMATION

<u>Date of Test</u>	<u>Test Hours</u>	<u>Oil (Bbls)</u>	<u>Gas (Mcf)</u>	<u>GOR</u>
<b>Byrd 1-23</b>				
<b>Section 23, T-24N, R-7W</b>				
12-8-60	3	2.3	267	116.007
4-23-61	24	55	349	6.348
7-5-61	24	23	210	9.130
10-3-61	24	23	350	15.217
1-12-62	24	23	303	13.174
4-25-62	24	22	159	7.227
7-23-62	24	28	325	11.607
<b>Byrd 5-23</b>				
<b>Section 23, T-24N, R-7W</b>				
9-17-61	24	150	203	1.352
10-5-61	24	30	198	6.600
1-12-62	24	19	242	12.737
4-25-62	24	17	371	21.820
7-23-62	24	13	320	24.615
<b>Love 2-23</b>				
<b>Section 23, T-24N, R-7W</b>				
4-17-61	4	224	98	6.59
7-5-61	24	161	165	1.028
10-3-61	24	90	328	3.720
1-12-62	24	72	236	3.278
4-12-62	24	39	133	3.376
7-10-62	24	36	156	4.325
<b>Honey 3-23</b>				
<b>Section 23, T-24N, R-7W</b>				
7-20-61	10	193	71	368
10-4-61	24	65	267	4.108
1-13-62	24	63	263	4.175
4-13-62	24	32	375	11.792
7-10-62	24	24	356	15.149

BEFORE THE  
OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO

BCO  
CASE 2049  
EXHIBIT No. 3

Exhibit No. 3

<u>Date Of Test</u>	<u>Test Hours</u>	<u>Oil (Bbls)</u>	<u>Gas (Mcf)</u>	<u>GOR</u>
<b>Blahely 6-23</b>				
<b>Section 23, T-24N, R-7W</b>				
11-12-61	24	85	130	1,529
1-18-62	24	53	200	3,774
4-18-62	24	40.1	148	3,691
<b>Lybrook 2-22</b>				
<b>Section 22, T-24N, R-7W</b>				
12-24-60	24	85	275.4	1,486
1-1-61	24	187	296	1,583
7-8-61	24	169	302	1,787
10-2-61	24	120	261	2,162
1-15-62	24	90	257	2,857
4-22-62	24	130	266	2,045
7-23-62	24	92	298	3,207
<b>Lybrook 6-22</b>				
<b>Section 22, T-24N, R-7W</b>				
5-29-61	13	195	67	244
7-7-61	24	47	51	1,085
10-8-61	24	50	439	8,980
1-14-62	24	40.5	268	6,617
4-25-62	24	35	156	4,457
7-25-62	24	21	130	6,190



BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
COMMISSION OF NEW MEXICO FOR  
THE PURPOSE OF CONSIDERING:

CASE No. 2049  
Order No. R-1670-B-3

APPLICATION OF THE OIL CONSERVATION COMMISSION  
ON ITS OWN MOTION TO RECONSIDER THE SPECIAL RULES  
AND REGULATIONS FOR THE DEVILS FORK-GALLUP POOL,  
RIO ARRIERA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for rehearing at 9 o'clock a.m. on  
January 16, 1963, at Santa Fe, New Mexico, before the Oil Conser-  
vation Commission of New Mexico, hereinafter referred to as the  
"Commission."

NOW, on this 30th day of January, 1963, the Commission,  
a quorum being present and fully advised in the premises,

FINDS:

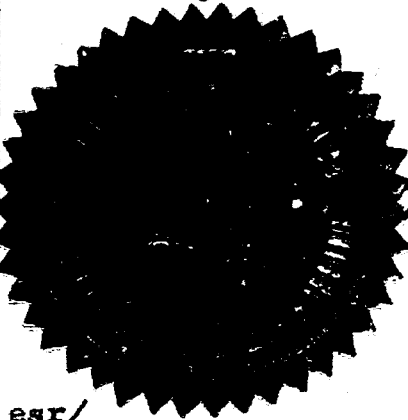
(1) That due public notice having been given as required by  
law, the Commission has jurisdiction of this cause and the subject  
matter thereof.

(2) That the applicant for rehearing, J. Gregory Marrion,  
requested prior to the rehearing that the application for rehearing  
in Case No. 2049 be dismissed.

IT IS THEREFORE ORDERED:

That the application for rehearing in Case No. 2049 is hereby  
dismissed.

DONE at Santa Fe, New Mexico, on the day and year herein-  
above designated.



STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

*Jack M. Campbell*  
JACK M. CAMPBELL, Chairman

*E. S. Walker*  
E. S. WALKER, Member

*A. L. Porter, Jr.*  
A. L. PORTER, Jr., Member & Secretary

esr/

GOVERNOR  
JACK M. CAMPBELL  
CHAIRMAN

State of New Mexico

# Oil Conservation Commission



**LAND COMMISSIONER**  
**E. B. JOHNNY WALKER**  
**MEMBER**

STATE GEOLOGIST  
A. L. PORTER, JR.  
SECRETARY - DISTRICT

P. O. BOX 871  
SANTA FE

**January 30, 1963**

**Mr. William J. Cooley  
Verity, Burr & Cooley  
Attorneys at Law  
152 Petroleum Center Building  
Farmington, New Mexico**

Re: Case No. 2049  
Order No. B-1670-3-3  
Applicant:

**Dear Sir:**

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

**A. L. PORTER, Jr.**  
**Secretary-Director**

15/

**Carbon copy of order also sent to:**

**Notbs OOC** \_\_\_\_\_

Artesia OOC\_\_\_\_\_

**Astec OOC** \_\_\_\_\_X\_\_\_\_\_

**OTHER:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**OIL CONSERVATION COMMISSION**

**P. O. BOX 871**

**SANTA FE, NEW MEXICO**

**November 9, 1962**

**Mr. William J. Cooley  
Verity, Burr & Cooley  
Suite 1200 Metropolitan Center Building  
Birmingham, New Mexico**

**Re: Case No. 2049  
Order No. R-1670-B-2  
J. Gregory Harrison**

**Gentlemen:**

**Enclosed herewith are two copies of the above-referenced  
Commission order recently entered in the subject case.**

**Very truly yours,**

**A. L. PORTER, Jr.,  
Secretary-Director**

**ALP/RCD/eg**

**cc: Oil Conservation Commission - Astor  
Oil Conservation Commission - Hobbs**

C  
O  
P  
Y

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
COMMISSION OF NEW MEXICO FOR  
THE PURPOSE OF CONSIDERING:

CASE No. 2049  
Order No. R-1670-B-1

APPLICATION OF THE OIL CONSERVATION  
COMMISSION ON ITS OWN MOTION TO  
RECONSIDER THE SPECIAL RULES AND  
REGULATIONS FOR THE DEVILS FORK-  
GALLUP POOL, RIO ARriba COUNTY,  
NEW MEXICO.

APPLICATION FOR REHEARING

COMES NOW, J. GREGORY MERRION, by and through his attorneys,  
Verity, Burr & Cooley, 152 Petroleum Center Building, Farmington,  
New Mexico, and respectfully applies to the Commission for a  
rehearing in the above styled and numbered cause.

Applicant believes the decision in Order No. R-1670-B-1  
to be erroneous in the following particulars, to-wit:

1. That Finding No. 2 in said Order is erroneous in that  
development and operation of the Devils Fork-Gallup Pool under  
Order No. R-1670-B has and will result in substantial waste and  
violations of correlative rights.
2. That Finding No. 3 in said Order is erroneous in that the  
proration and production of the Devils Fork-Gallup Pool under the  
existing special rules and regulations for said pool has and will  
result in significant movement of the gas-oil contact into the  
gas column, thereby causing waste and violating correlative rights.
3. That Finding No. 4 of said Order is erroneous in that the  
existing Special Rules and Regulations of the Devils Fork-Gallup  
Pool should not be continued in effect but should be modified  
in several major respects in order to prevent waste and protect  
correlative rights.

4. That said Order makes no finding whatsoever with regard to the substantial body of evidence presented by the applicant herein with regard to the necessity of curtailing gas production from the gas cap in order to prevent waste and protect correlative rights, which evidence, although uncontroverted, does not appear, from reading the Order, to have been considered by the Commission.

5. That said Order makes no finding whatsoever with regard to the substantial body of evidence presented by the applicant herein with regard to the necessity of including the substantial quantity of proven, although undrilled, oil productive acreage in the volumetric equivalent withdrawal formula set forth in Order No. R-1670-B in order to permit the proper functioning of said formula, which evidence, although uncontroverted, does not appear, from reading the Order, to have been considered by the Commission.

6. That Order No. R-1670-B-1 is not supported by substantial evidence on the record as a whole.

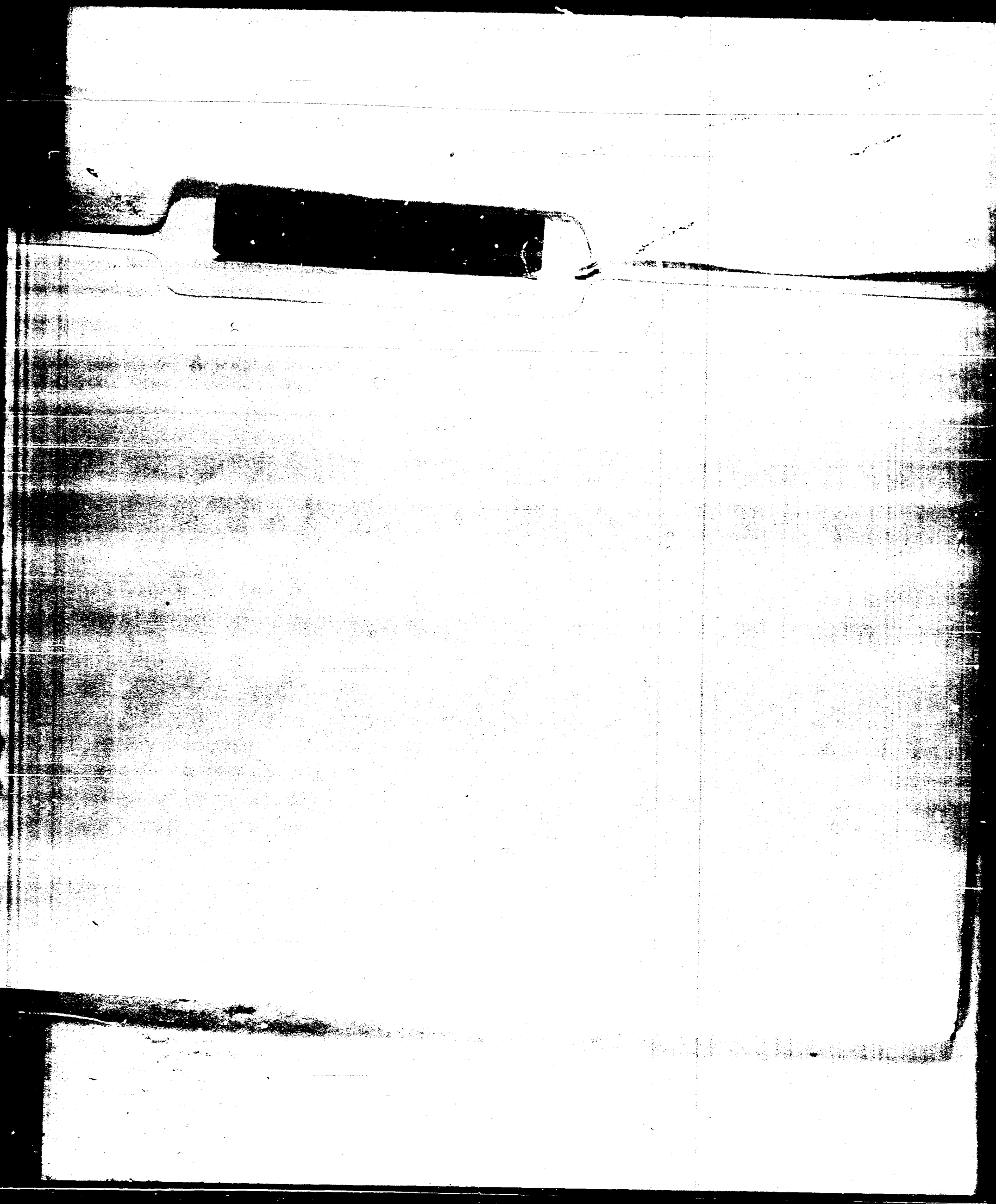
Applicant respectfully urges the Commission to grant this application for rehearing in order to reconsider the matters set forth above and hear additional evidence which has been developed since the last hearing in the above styled and numbered cause as a result of the completion of at least four additional oil wells in the Devils Fork-Gallup Pool since said date.

WHEREFORE, applicant prays the Commission to enter its Order providing for a rehearing in the above styled and numbered cause and setting the same on the docket at the earliest possible date.

J. GREGORY MERRION

By William J. Colby  
his attorney





MAIN OFFICE OCC  
VERITY, BURR & COOLEY  
ATTORNEYS AND COUNSELORS AT LAW  
SUITE 152 PETROLEUM CENTER BUILDING  
FARMINGTON, NEW MEXICO

1963 JAN 14 AM 8:29

GEO. L. VERITY  
JOEL B. BURR, JR.  
WM. J. COOLEY

NORMAN S. THAYER  
RAY S. JONES

January 10, 1963

TELEPHONE 325-1702

*Handwritten initials*

Oil Conservation Commission  
Post Office Box 871  
Santa Fe, New Mexico

Gentlemen:

You are hereby requested to dismiss the application of J. Gregory  
Merrion for rehearing in Case No. 2049, which has been set down  
on your docket on January 16, 1963.

Very truly yours,

VERITY, BURR & COOLEY

By

*Handwritten signature of William J. Cooley*  
William J. Cooley

WJC/dh

cc: Oil Conservation Commission  
Aztec, New Mexico

MAIN OFFICE 000

1962 APR 15 AM 8:23

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION  
OF THE OIL CONSERVATION COMMISSION  
ON ITS OWN MOTION TO RECONSIDER THE  
SPECIAL RULES AND REGULATIONS FOR  
THE DEVILS FORK-GALLUP POOL, RIO  
ARRIBA COUNTY, NEW MEXICO.

2049  
No. 2409

ENTRY OF APPEARANCE

The undersigned, Atwood & Malone of Roswell, New Mexico,  
a firm of attorneys all of whose members are duly licensed to practice  
law in the State of New Mexico, hereby enters its appearance as local  
counsel with Guy Buell, of the Texas Bar, appearing for Pan American  
Petroleum Corporation in said cause.

DATED at Roswell, New Mexico this 12th day of April, 1962.

ATWOOD & MALONE

By Lance R. Malone  
Post Office Drawer 700  
Roswell, New Mexico

## SUPPLEMENTARY REPORT OF KEMNITZ POOL ENGINEERING COMMITTEE

### CONCLUSIONS

1. The Kemnitz Wolfcamp reservoir is behaving as a solution gas drive reservoir.
2. A study of stratification indicated that there were no correlative zones of high permeability continuous through the reservoir.
3. A model study will not aid in determining reservoir conformance to water injection.
4. An analysis of the past performance and pressure history of the individual wells indicates that there is an area of good pressure communication and an area of poor pressure communication in the reservoir. The pressure maintenance calculations were made for the area of good pressure communication only.
5. The area of poor pressure communication will probably not respond favorably to pressure maintenance.
6. Based on available data, this study indicates that pressure maintenance by gas injection will yield a greater profit than primary and waterflood operations.
7. Continued study of the reservoir should be made, particularly to determine the feasibility of supplementing gas injection with water injection.

### RECOMMENDATIONS

1. It is recommended that the Kemnitz Wolfcamp Pool be unitized to protect correlative rights and achieve efficiency and economy of operation.
2. It is recommended that pressure maintenance by gas injection in the South Area be initiated as soon as possible.
3. It is recommended that the study of this reservoir be continued, particularly with regard to the supplementing of gas injection with water injection.

Orig. Transcript

Ex. 6  
Ch. 10 Production Unit  
for # 3 contains  
average production  
from same section  
of Kernitz zone as  
No. 1 well is producing.

10,641 } 0.1  
10,835 }  
870 - Rec. S. W.  
005

1046  
52



# PAN AMERICAN PETROLEUM CORPORATION

P. O. Box 480, Farmington, New Mexico  
September 16, 1960

File: E-620-986.510.1

Subject: Crude Oil Analysis Data  
To Be Used In Equivalent  
Volumetric Withdrawal Formula  
For Devils Fork-Gallup Pool  
Rio Arriba County, New Mexico

Mr. A. L. Porter, Jr.  
New Mexico Oil Conservation Commission  
Santa Fe, New Mexico

Dear Sir:

Attached please find a tabulation of the reservoir volume factor data and solution gas-oil ratio data as a function of pressure which were obtained from the bottom hole sample analysis from Pan American's John S. Dashko "B" No. 1, Devils Fork-Gallup Pool, Rio Arriba County, New Mexico. These data are being furnished for use in the equivalent volumetric withdrawal formula which was recommended by the Devils Fork-Gallup Pool Operators for adoption by the Commission in Case 2049. Also attached for your information is a copy of the graphical presentation of the solution gas-oil ratio data and reservoir volume factor data which were compiled from the Dashko "B" No. 1 bottom hole sample in Pan American's Research Laboratory.

Also attached is a graph showing the gas deviation factor as a function of bottom hole pressure. This graph was computed from the basic data obtained from a gas sample on El Paso's Canyon Largo Unit No. 89 well using the method outlined in the publication "Natural Gasoline and the Volatile Hydrocarbons". This method relates the deviation factor as a function of the reduced pressure and temperature of the gas as computed from the molecular analysis of the gas together with the reservoir temperature and pressure.

Very truly yours,

PAN AMERICAN PETROLEUM CORPORATION

*L. O. Speer, Jr.*

L. O. Speer, Jr.  
Area Superintendent

GWE:en

Attachments

1960 SEP 20  
MAIN OFFICE OCC

Bottom Hole Sample Data

Field: Devils Fork Gallup

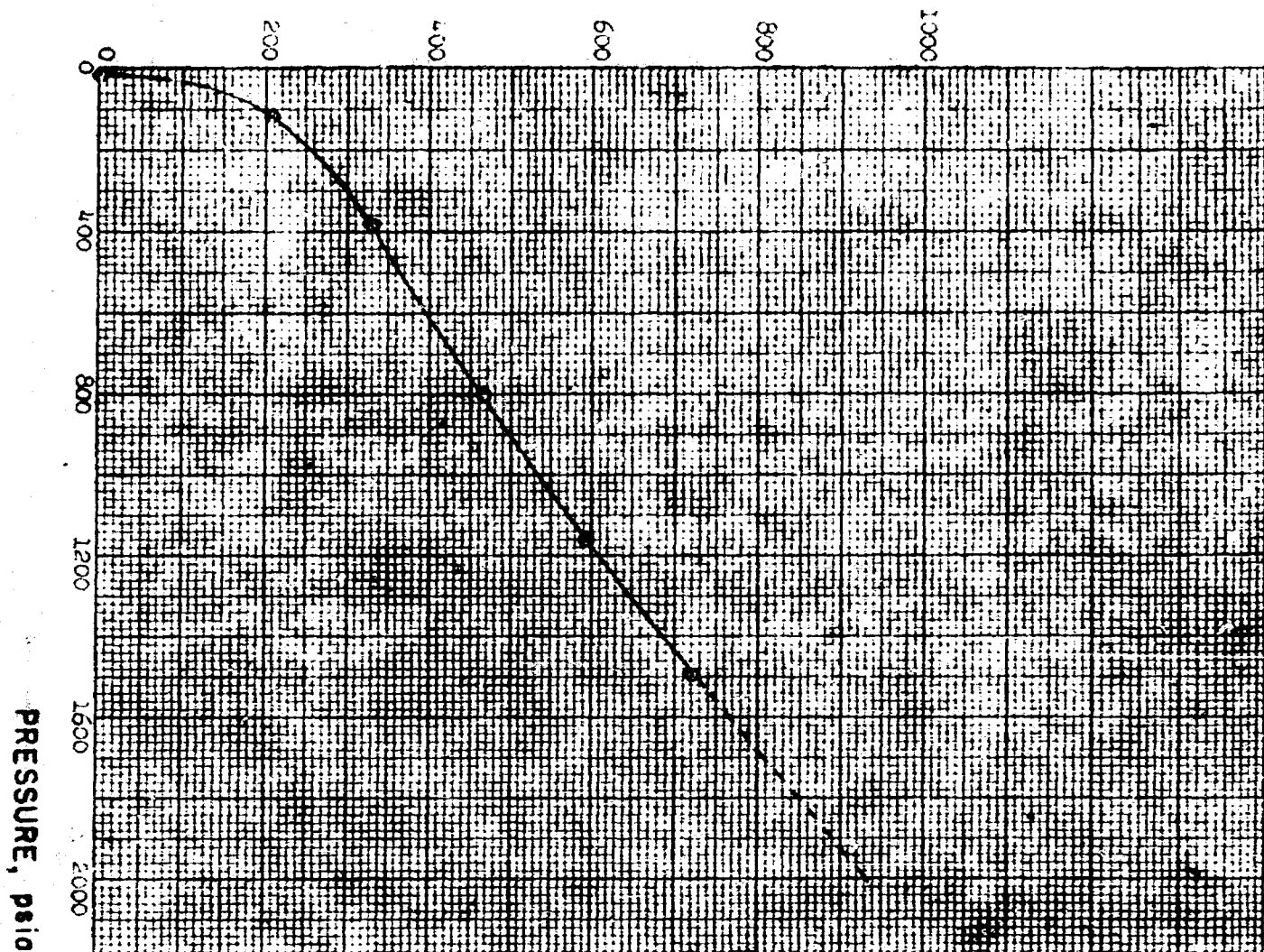
Well: John S. Dashko "B" No. 1

Date Sampled: 8-14-60

Sample Depth Pressure: 1616 psia; Temp: 150°F

<u>Pressure (psia)</u>	<u>Reservoir Volume Factor</u>	<u>Solution GOR ft<sup>3</sup>/Bbl.</u>
2000-	1.434	935
1900-	1.424	890
1800-	1.414	850
1700-	1.404	805
1600-	1.393	765
1500-	1.382	725
1400-	1.371	685
1300-	1.360	647
1200-	1.347	610
1100-	1.335	570
1000-	1.322	535
900-	1.309	498
800-	1.295	463
700-	1.280	429
600-	1.262	396
500-	1.245	365
400-	1.227	335
300-	1.208	300
200-	1.190	255
100-	1.160	195
12	1.045	0

# STD. CU. FT. OF GAS IN SOLUTION PER BBL. OF RESIDUAL OIL



PRESSURE, psia

Figure 3  
**GAS SOLUBILITY**  
 FIELD Draville Fork Outcrop  
 WELL John S. Dasher "B" No. 1  
 SAMPLE NO. BH 884 DATE SAMPLED 8-10-60  
 SAMP. DEPTH PRESS. 1615 psia TEST TEMP. 150 °F  
 DATUM PL. PRESS. 1615 psia  
 ORIG. RESERVOIR PRESS. 2014 psia  
 GAS AND RESIDUAL OIL AT 60°F

# RELATIVE VOLUME OF OIL REFERRED TO RESIDUAL OIL

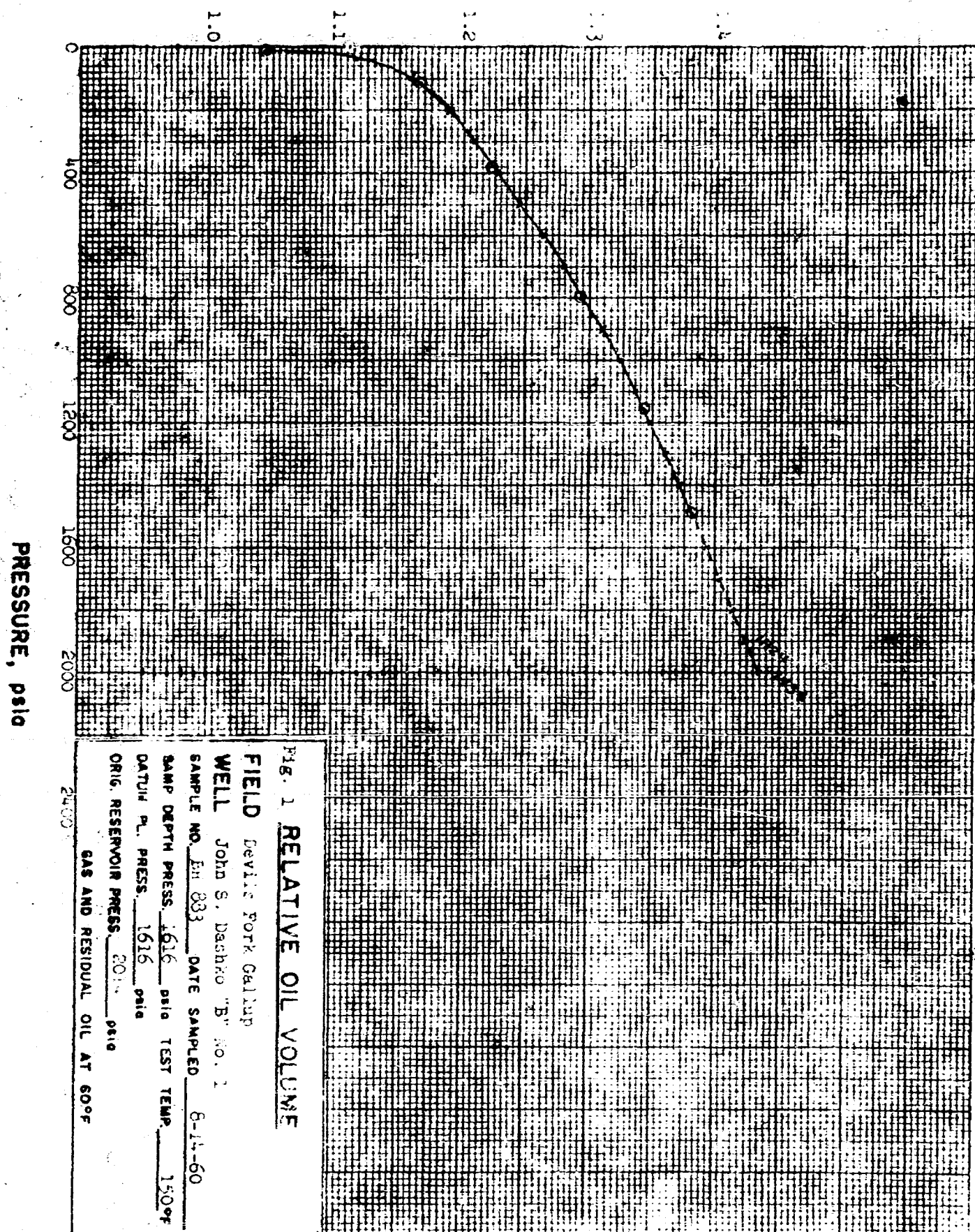
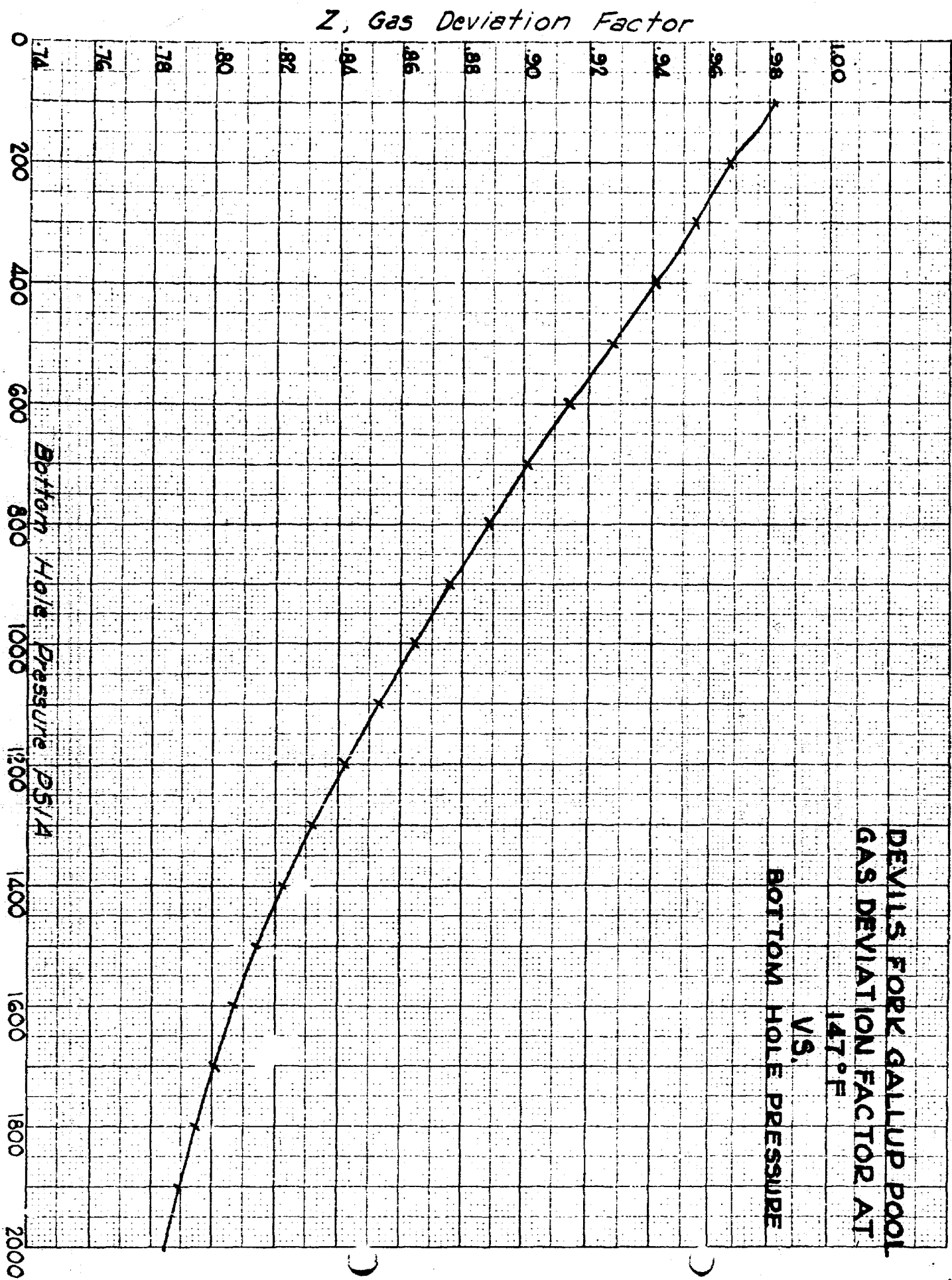


FIG. 1 RELATIVE OIL VOLUME

FIELD Devil's Fork Gallup  
 WELL John S. Dasher "B" No. 1  
 SAMPLE NO. 833 DATE SAMPLED 8-15-60  
 SAMPLE DEPTH PRESS. 1616 psia TEST TEMP. 150°F  
 DATUM PL. PRESS. 1616 psia  
 ORIG. RESERVOIR PRESS. 2011 psia  
 GAS AND RESIDUAL OIL AT 60°F





Case 2049  
EPNG EX 1

**PROPOSED SPECIAL RULES AND REGULATIONS IN THE  
DEVILS FORK GALLUP GAS POOL**

(The term "General Rules" used herein refers to the General Rules and Regulations for Prorated Gas Pools of Northwest New Mexico contained in Order No. R-1670.)

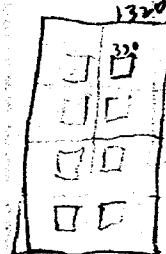
**A. WELL LOCATION AND ACREAGE REQUIREMENTS**

**Rule 1:**

Pertains to pool wells and wildcat wells--General Rules applicable.

**Special Rule 2:**

Each well drilled or recompleted within the Devils Fork Gallup Gas Pool on a standard proration unit, after the effective date of this Rule, shall be drilled not closer than 660' to any boundary line of the tract, nor closer than 330' to a quarter-quarter section line or subdivision inner boundary line. Any well drilled to and producing from the Devils Fork Gallup Gas Pool prior to the effective date of this Order, at a location conforming to the spacing requirements in effect at the time said well was drilled, shall be considered to be located in conformance with this Rule.



**Rule 3:**

Pertains to exceptions to the spacing provisions--General Rules applicable.

**Rule 4:**

Pertains to the exception of these rules to Statewide Rule 104, paragraph (k)--General Rules applicable.

**Special Rule 5 (A):**

The acreage allocated to a gas or oil well for proration purposes shall be known as the gas or oil proration unit for that well. Each well completed or recompleted in the Devils Fork Gallup Gas Pool on a standard proration unit as a gas well shall be located on a proration unit on approximately 320 acres comprising any two contiguous quarter sections of a single governmental section being a legal subdivision of the U. S. Public Land Surveys, and each well completed or recompleted in the Devils Fork Gallup Gas Pool on a standard proration unit as an oil well shall be located on a proration unit of approximately 80 acres comprising any two contiguous quarter-quarter sections of a single governmental section being a legal subdivision of the U. S. Public Land Surveys. Any gas proration unit containing between 316 and 324 acres shall be considered to contain the number of acres in a standard unit for the purposes of computing allowables.

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 2.

**Rule 5 (B):**

Provides for administrative approval for non-standard proration units--  
General Rules applicable.

**B. NOMINATIONS AND PRORATION SCHEDULE**

**Rule 6 (A):**

Provides for preliminary nominations--General Rules applicable.

**Rule 6 (B):**

Defines the term "gas purchasers"--General Rules applicable.

**Rule 7 (A):**

Provides for supplemental nominations--General Rules applicable.

**Rule 7 (B):**

Provides that wells shall be listed on a proration schedule--General  
Rules applicable.

**C. ALLOCATION AND GRANTING OF ALLOWABLES**

**Rule 8 (A):**

Provides that total gas allowable of the pool shall be equal to the preliminary  
or supplemental nominations with any adjustments which the Commission  
deems advisable--General Rules applicable.

**Rule 8 (B) 1:**

Provides no gas well to be given an allowable until certain forms have  
been filed--General Rules applicable.

**Rule 8 (B) 2:**

Provides that deliverability test must be taken--General Rules applicable.

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 3.

**Special Rule 8 (B) 3:**

No oil well shall be given an allowable until Form C-104 and Form C-110 have been filed, together with a plat (Form C-128) showing acreage attributed to said well and the location of all wells on the lease.

**Special Rule 8 (B) 4:**

The allowable for an oil well shall be determined in accordance with the provisions of Statewide Rule 505.

**Rule 8 (C):**

Provides when allowables to newly completed gas well shall commence--  
General Rules applicable.

**Special Rule 8 (D):**

Allowables to wells whose classification has changed from oil to gas, based on the results of a gas-oil ratio test, will commence on the effective date of the new gas-oil ratio as provided in Special Rule 28; provided that:

- 1) A deliverability test is taken in conformance with the provisions of Order R-333-C and D, as amended by Order R-333-E and is submitted to the Commission within 45 days of the effective date of reclassification. In no event will a gas allowable be granted for a date more than 45 days prior to the date the well's initial deliverability and shut-in pressure test is reported to the Commission on Form C-122-A, in conformance with the provisions of Orders ~~R-333-C and D, as amended by Order R-333-E;~~ *10 C below*
- 2) A plat, Form C-128, showing the acreage attributed to said gas well and the location of all wells on the lease, and a new Form C-104 and Form C-110 has been filed.

**Special Rule 8 (E):**

Allowables to wells whose classification has changed from gas to oil based on the results of a gas-oil ratio test, will commence on the effective date of the the new gas-oil ratio as provided in Special Rule 28, provided that a plat, Form C-128, showing the acreage attributed to said oil well and the location of all wells on the lease and a new Form C-104 and C-110 has been filed.

*Have?  
in 320.1*

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
**Page 4.**

**Rule 9 (A):**

**Provides method for calculating "AD factor"--General Rules applicable.**

**Rule 9 (B):**

**Provides for allowable which shall be assigned to marginal wells--General Rules applicable.**

**Rule 9 (C) 1 and 2:**

**Provides for specific method of calculating allowables--General Rules applicable.**

**Rule 9 (D):**

**Provides that deliverability tests become effective on February 1st of the year following the year in which test is taken--General Rules applicable.**

**Special Rule 9 (E):**

**Oil wells in the Devils Fork Gallup Gas Pool on an 80 acre standard proration unit shall be permitted to produce a gas limit determined by multiplying the following factors:**

**(The normal unit allowable for Northwestern New Mexico) X (The proportional factor of 2.33) X (The limiting gas-oil ratio for the Devils Fork Gallup Gas Pool)**

**Rule 10 (A):**

**Provides for procedures in case acreage assigned to a well is increased--General Rules applicable.**

**Rule 10 (B):**

**Provides for effective date of a new allowable due to change in deliverability after retest or after recompletion or workover--General Rules applicable.**

**Rule 10 (C):**

**Provides that deliverability be determined in accordance with the provisions of Order R-333-C and D, as amended by R-333-E, and provides for exceptions to annual deliverability test requirements--General Rules applicable.**

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 5.

**Special Rule 10 (C):**

Gas wells in the Devils Fork Gallup Gas Pool shall have deliverability tests taken in conformance with the procedure outlined in Section B (procedure pertaining to the Mesa Verde Formation) of Order R-333-C and D, as amended by Order R-333-E.

**Rule 11:**

Provides that the Commission may assign minimum allowables in order to prevent premature abandonment--General Rules applicable.

**Rule 12:**

Provides that all production shall be charged against the well's allowable--General Rules applicable.

**D. BALANCING OF PRODUCTION**

**Rule 13:**

Provides for balancing dates and proration periods--General Rules applicable.

**Rule 14 (A):**

Provides that underproduction accrued in one proration period may be carried forward into the next proration period before cancellation--General Rules applicable.

**Rule 14 (B):**

Provides for method of making up underproduction--General Rules applicable.

**Special Rule 14 (C):**

The status of the gas area, as defined in the following formula, of the Devils Fork Gallup Gas Pool shall be determined as of February 1st and August 1st each year in the following manner:

- 1) The volumetric equivalent of gas for the gas area, based on the total production from the oil area, shall be calculated from the formula below:



**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 6.

$$V = \frac{A \times Q}{a} \times C \quad \text{where } C = r_1 - r_2 + \left( \frac{0.3199 P_r B}{Z} \right)$$

A = The gas area which is the total acreage dedicated to gas wells (acres).

a = The oil area which is the total acreage dedicated to oil wells (acres).

Note: The acreage to be added for any oil or gas well which receives its first allowable during a six month balancing period, for that period only, shall be calculated by the following formula:

$$\Delta a \text{ or } \Delta A = a \left( \frac{d}{D} \right) \text{ or } A \left( \frac{d}{D} \right)$$

where  $\Delta a$  or  $\Delta A$  = acreage to be added to oil or gas area respectively.

a or A = Acreage dedicated to the well.

d = Days well received allowable during proration period.

D = Total days during proration period.

Q = Total oil production from oil area (bbls./6 months).

$r_1$  = Average produced GOR for the oil area determined by dividing the total gas production of the oil area by the total oil production of the oil area for the previous six months proration period (cu. ft./bbl.).

$r_2$  = Solution GOR determined from the characteristic performance curve for the oil at  $P_r$  (cu. ft./bbl.).

$P_r$  = Average reservoir pressure based on the pressures obtained on the most recent bottom hole pressure survey as provided in Special Rule 29.

B = The oil reservoir volume factor determined from the characteristic performance curve for the oil at  $P_r$ .

Z = Deviation factor for gas at  $P_r$  and 147° F for average gravity of produced gas from gas wells.

V = The volumetric equivalent of gas for the gas area, cubic feet for the six months rounded off to the nearest MCF.

Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool  
Page 7.

66  
82 52 82  
48  
118

$$0.3199 = \text{constant} = \frac{520 \times 5.61}{15.025 \times 607} \quad (607 = 147^\circ \text{ F} + 460^\circ \text{ R})$$

where  $147^\circ$  = the initial bottom hole temperature, assumed to remain constant.

- 2) The volumetric equivalent of gas for the gas area determined in 1) above shall be compared with the actual production from the gas area.
  - a) If the actual production from the gas area exceeds such volumetric equivalent plus any permitted production remaining as determined in b) below, then the nominations by gas purchasers during the succeeding six month period shall be adjusted by the Commission so that the volumetric withdrawals from the gas area shall be restricted for the purpose of balancing the cumulative equivalent volumetric withdrawals from each area.
  - b) If the actual production from the gas area is less than the volumetric equivalent for the gas area, then no adjustments will be made but the difference between the volumes will be carried forward as permitted production of gas from the gas area in subsequent balancing periods.

**Rule 15 (A):**

Provides that overproduction accrued in one proration period may be carried forward into the next proration period--General Rules applicable.

**Rule 15 (B):**

Provides that any time a well is six times overproduced its current allowable it shall be shut-in until it is underproduced less than six times its current allowable--General Rules applicable.

**Rule 15 (C):**

Provides for method of making up overproduction--General Rules applicable.

**Rule 15 (D):**

Provides that overproduction may be made up at a lesser rate than complete shut-in--General Rules applicable.

**Rule 15 (E):**

Provides that allowable assigned to a well through cancellation and redistribution shall be applied against overproduction--General Rules applicable.

Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool  
Page 8.

**E. CLASSIFICATION OF WELLS**

**Rule 16 (A):**

Provides for classification of marginal well--General Rules applicable.

**Rule 16 (B):**

Provides that Secretary-Director may reclassify wells--General Rules applicable.

**Rule 17:**

Provides that a marginal well is not permitted to accumulate underproduction--General Rules applicable.

**Rule 18:**

Provides for method of reclassification of a marginal well to a non-marginal well--General Rules applicable.

**Rule 19:**

Provides that a reworked or recompleted well shall be classified as non-marginal upon reconnection--General Rules applicable.

**Rule 20:**

Provides that all wells not classified as marginal wells shall be classified as non-marginal wells--General Rules applicable.

**F. REPORTING OF PRODUCTION**

**Rules 21 (A) (B) (C) and (D):**

Provides that gas production shall be metered separately and reported to the Commission in accordance with appropriate Statewide Rules--General Rules applicable.

**G. GENERAL**

**Rule 22:**

No flare provision--General Rules applicable.

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**

**Page 9.**

**Rule 23:**

**Provides that failure to comply with Order will result in cancellation of allowable--General Rules applicable.**

**Rule 24:**

**Provides that all transporters shall file connection notices--General Rules applicable.**

**H. MISCELLANEOUS SPECIAL POOL RULES**

**Special Rule 25:**

**The vertical limits of the Devils Fork Gallup Gas Pool shall be the Gallup Formation.**

**Special Rule 26:**

**A gas well in the Devils Fork Gallup Gas Pool shall be any well producing with a gas liquid ratio of 30,000 cu. ft. of gas per barrel of liquid hydrocarbons or more; or, any well which produces liquid hydrocarbons with a gravity of 60° API or greater.**

**Special Rule 27:**

**An oil well in the Devils Fork Gallup Gas Pool shall be a well producing with a gas liquid ratio of less than 30,000 cu. ft. of gas per barrel of liquid hydrocarbons, and the liquid hydrocarbons have a gravity of less than 60° API.**

**Special Rule 28:**

**Gas-oil ratio tests shall be taken on all wells in the Devils Fork Gallup Gas Pool and on all wells producing from the Gallup Formation within one mile of the boundaries of the Devils Fork Gallup Gas Pool and not within another designated pool during the first fifteen days of the months of January, April, July, and October of each year. Tests shall be 24-hour tests, being the final 24 hours of a 72-hour period during which the well shall be produced at a constant rate of production to be determined by the operator, but in no event shall the rate be less than that necessary to produce the gas limit if the well is capable of producing the gas limit. Results of such tests shall be filed on Commission Form C-116 within ten days after the close of each test period and shall become effective on the first of the month following the test period. At least 72 hours prior**

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 10.

to commencement of any such gas-oil ratio tests, each operator shall file with the Aztec office of the Commission a Test Schedule for its wells, specifying the time each of its wells is to be tested. Copies of the Test Schedule shall also be furnished to all offset operators. The Secretary-Director may extend the 15-day testing period if future development indicates that 15 days does not allow sufficient time for operators to adequately test all of their wells.

**Special Rule 29:**

The average reservoir pressure shall be determined during the months of April and October each year after each well has been shut-in for a minimum of 3 days and calculated to a common datum, which shall be the subsea depth of the gas-oil contact. The pressures on individual wells shall be determined in the following manner:

- 1) Subsurface pressure tests shall be taken on all flowing oil wells (pumping wells exempted) in accordance with the procedure outlined in Statewide Rule 302, except with respect to shut-in time and datum as provided above.
- 2) Wellhead shut-in pressure shall be obtained on all gas wells and calculated to bottom hole conditions at the subsea datum of the gas-oil contact in accordance with the standard procedure as outlined in the "Manual for Back Pressure Tests for Natural Gas Wells in the State of New Mexico."
- 3) Information obtained on these tests shall be reported on Form C-124 in compliance with the provisions of Statewide Rules 302 and 1123, and the Commission shall use the arithmetic average of the pressures so reported for the pressure,  $P_r$ , in the calculations as provided in Special Rule 14 (C).

**Special Rule 30:**

No acreage shall be simultaneously dedicated to an oil well and to a gas well in the Devils Fork Gallup Gas Pool

**Special Rule 31:**

In order to prevent waste, the gas-oil ratio limitation for the Devils Fork Gallup Gas Pool shall be 2,000 cu. ft. of gas per barrel of oil produced.



Case 2049  
EPNG - ex 1

**PROPOSED SPECIAL RULES AND REGULATIONS IN THE  
DEVILS FORK GALLUP GAS POOL**

(The term "General Rules" used herein refers to the General Rules and Regulations for Prorated Gas Pools of Northwest New Mexico contained in Order No. R-1670.)

**A. WELL LOCATION AND ACREAGE REQUIREMENTS**

**Rule 1:**

Pertains to pool wells and wildcat wells--General Rules applicable.

**Special Rule 2:**

Each well drilled or recompleted within the Devils Fork Gallup Gas Pool on a standard proration unit, after the effective date of this Rule, shall be drilled not closer than 660' to any boundary line of the tract, nor closer than 330' to a quarter-quarter section line or subdivision inner boundary line. Any well drilled to and producing from the Devils Fork Gallup Gas Pool prior to the effective date of this Order, at a location conforming to the spacing requirements in effect at the time said well was drilled, shall be considered to be located in conformance with this Rule.

**Rule 3:**

Pertains to exceptions to the spacing provisions--General Rules applicable.

**Rule 4:**

Pertains to the exception of these rules to Statewide Rule 104, paragraph (k)--General Rules applicable.

**Special Rule 5 (A):**

The acreage allocated to a gas or oil well for proration purposes shall be known as the gas or oil proration unit for that well. Each well completed or recompleted in the Devils Fork Gallup Gas Pool on a standard proration unit as a gas well shall be located on a proration unit on approximately 320 acres comprising any two contiguous quarter sections of a single governmental section being a legal subdivision of the U. S. Public Land Surveys, and each well completed or recompleted in the Devils Fork Gallup Gas Pool on a standard proration unit as an oil well shall be located on a proration unit of approximately 80 acres comprising any two contiguous quarter-quarter sections of a single governmental section being a legal subdivision of the U. S. Public Land Surveys. Any gas proration unit containing between 316 and 324 acres shall be considered to contain the number of acres in a standard unit for the purposes of computing allowables.

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
**Page 2.**

**Rule 5 (B):**

Provides for administrative approval for non-standard proration units--  
General Rules applicable.

**B. NOMINATIONS AND PRORATION SCHEDULE**

**Rule 6 (A):**

Provides for preliminary nominations--General Rules applicable.

**Rule 6 (B):**

Defines the term "gas purchasers"--General Rules applicable.

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Provides that wells shall be listed on a proration schedule--General  
Rules applicable.

**C. ALLOCATION AND GRANTING OF ALLOWABLES**

**Rule 8 (A):**

Provides that total gas allowable of the pool shall be equal to the preliminary  
or supplemental nominations with any adjustments which the Commission  
deems advisable--General Rules applicable. ✓

**Rule 8 (B) 1:**

Provides no gas well to be given an allowable until certain forms have  
been filed--General Rules applicable. ✓

**Rule 8 (B) 2:**

Provides that deliverability test must be taken--General Rules applicable.

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
**Page 3.**

**Special Rule 8 (B) 3:**

No oil well shall be given an allowable until Form C-104 and Form C-110 have been filed, together with a plat (Form C-128) showing acreage attributed to said well and the location of all wells on the lease.

**Special Rule 8 (B) 4:**

✓ The allowable for an oil well shall be determined in accordance with the provisions of Statwide Rule 505.

**Rule 8 (C):**

Provides when allowables to newly completed gas well shall commence--  
General Rules applicable.

**Special Rule 8 (D):**

Allowables to wells whose classification has changed from oil to gas, based on the results of a gas-oil ratio test, will commence on the effective date of the new gas-oil ratio as provided in Special Rule 28; provided that:

- 1) A deliverability test is taken in conformance with the provisions of Order R-333-C and D, as amended by Order R-333-E and is submitted to the Commission within 45 days of the effective date of reclassification. (In no event will a gas allowable be granted for a date more than 45 days prior to the date the well's initial deliverability and shut-in pressure test is reported to the Commission on Form C-122-A, in conformance with the provisions of Orders R-333-C and D, as amended by Order R-333-E;
- 2) A plat, Form C-128, showing the acreage attributed to said gas well and the location of all wells on the lease, and a new Form C-104 and Form C-110 has been filed.

**Special Rule 8 (E):**

Allowables to wells whose classification has changed from gas to oil ✓ based on the results of a gas-oil ratio test, will commence on the effective date of the the new gas-oil ratio as provided in Special Rule 28, provided that a plat, Form C-128, showing the acreage attributed to said oil well and the location of all wells on the lease and a new Form C-104 and C-110 has been filed.

**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**

**Page 4.**

**Rule 9 (A):**

Provides method for calculating "AD factor"--General Rules applicable.

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**Rule 9 (C) 1 and 2:**

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Oil wells in the Devils Fork Gallup Gas Pool on an 80 acre standard proration unit shall be permitted to produce a gas limit determined by multiplying the following factors:

(The normal unit allowable for Northwestern New Mexico) X (The proportional factor of 2.33) X (The limiting gas-oil ratio for the Devils Fork Gallup Gas Pool)

**Rule 10 (A):**

Provides for procedures in case acreage assigned to a well is increased--General Rules applicable.

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**Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool**  
Page 5.

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Provides that the Commission may assign minimum allowables in order to prevent premature abandonment--General Rules applicable.

**Rule 12:**

Provides that all production shall be charged against the well's allowable--General Rules applicable.

**D. BALANCING OF PRODUCTION**

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Provides for balancing dates and proration periods--General Rules applicable.

**Rule 14 (A):**

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**Rule 14 (B):**

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**Special Rule 14 (C):**

The status of the gas area, as defined in the following formula, of the Devils Fork Gallup Gas Pool shall be determined as of February 1st and August 1st each year in the following manner:

- 1) The volumetric equivalent of gas for the gas area, based on the total production from the oil area, shall be calculated from the formula below:



Proposed Special Rules and Regulations in the  
Devils Fork Gallup Gas Pool  
Page 6.

$$V = \frac{A \times Q}{a} \times C \quad \text{where } C = r_1 - r_2 + \left( \frac{0.3199 P_r B}{Z} \right)$$

A = The gas area which is the total acreage dedicated to gas wells (acres).

a = The oil area which is the total acreage dedicated to oil wells (acres).

Note: The acreage to be added for any oil or gas well which receives its first allowable during a six month balancing period, for that period only, shall be calculated by the following formula:

$$\Delta a \text{ or } \Delta A = a \left( \frac{d}{D} \right) \text{ or } A \left( \frac{d}{D} \right)$$

where  $\Delta a$  or  $\Delta A$  = acreage to be added to oil or gas area respectively.

a or A = Acreage dedicated to the well.

d = Days well received allowable during proration period.

D = Total days during proration period.

Q = Total oil production from oil area (bbls. /6 months).

$r_1$  = Average produced GOR for the oil area determined by dividing the total gas production of the oil area by the total oil production of the oil area for the previous six months proration period (cu. ft./bbl.).

$r_2$  = Solution GOR determined from the characteristic performance curve for the oil at  $P_r$  (cu. ft./bbl.).

$P_r$  = Average reservoir pressure based on the pressures obtained on the most recent bottom hole pressure survey as provided in Special Rule 29.

B = The oil reservoir volume factor determined from the characteristic performance curve for the oil at  $P_r$ .

Z = Deviation factor for gas at  $P_r$  and 147° F for average gravity of produced gas from gas wells.

V = The volumetric equivalent of gas for the gas area, cubic feet for the six months rounded off to the nearest MCF.

*Does this  
change  
only every  
six months  
regardless  
of wells  
drilled?*

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$$0.3199 = \text{constant} = \frac{520 \times 5.61}{15.025 \times 607} \quad (607 = 147^\circ \text{ F} + 460^\circ \text{ R})$$

where 147° = the initial bottom hole temperature, assumed to remain constant.

- 2) The volumetric equivalent of gas for the gas area determined in 1) above shall be compared with the actual production from the gas area.

*mbbl. demand  
proration =*

a) If the actual production from the gas area exceeds such volumetric equivalent plus any permitted production remaining as determined in b) below, then the nominations <sup>and purchases</sup> by gas purchasers during the succeeding six month period shall be adjusted by the Commission so that the volumetric withdrawals from the gas area shall be restricted for the purpose of balancing the cumulative equivalent volumetric withdrawals from each area.

b) If the actual production from the gas area is less than the volumetric equivalent for the gas area, then no adjustments will be made but the difference between the volumes will be carried forward as permitted production of gas from the gas area in subsequent balancing periods.

**Rule 15 (A):**

Provides that overproduction accrued in one proration period may be carried forward into the next proration period--General Rules applicable.

**Rule 15 (B):**

Provides that any time a well is six times overproduced its current allowable it shall be shut-in until it is underproduced less than six times its current allowable--General Rules applicable.

**Rule 15 (C):**

Provides for method of making up overproduction--General Rules applicable.

**Rule 15 (D):**

Provides that overproduction may be made up at a lesser rate than complete shut-in--General Rules applicable.

**Rule 15 (E):**

Provides that allowable assigned to a well through cancellation and redistribution shall be applied against overproduction--General Rules applicable.

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E. CLASSIFICATION OF WELLS

Rule 16 (A):

Provides for classification of marginal well--General Rules applicable.

Rule 16 (B):

Provides that Secretary-Director may reclassify wells--General Rules applicable.

Rule 17:

Provides that a marginal well is not permitted to accumulate underproduction--General Rules applicable.

Rule 18:

Provides for method of reclassification of a marginal well to a non-marginal well--General Rules applicable.

Rule 19:

Provides that a reworked or recompleted well shall be classified as non-marginal upon reconnection--General Rules applicable.

Rule 20:

Provides that all wells not classified as marginal wells shall be classified as non-marginal wells--General Rules applicable.

F. REPORTING OF PRODUCTION

Rules 21 (A) (B) (C) and (D):

Provides that gas production shall be metered separately and reported to the Commission in accordance with appropriate Statewide Rules--General Rules applicable.

G. GENERAL

Rule 22:

No flare provision--General Rules applicable.

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**Rule 23:**

Provides that failure to comply with Order will result in cancellation of allowable--General Rules applicable.

**Rule 24:**

Provides that all transporters shall file connection notices--General Rules applicable.

**H. MISCELLANEOUS SPECIAL POOL RULES**

**Special Rule 25:**

✓ The vertical limits of the Devils Fork Gallup Gas Pool shall be the Gallup Formation.

**Special Rule 26:**

A gas well in the Devils Fork Gallup Gas Pool shall be any well producing with a gas liquid ratio of 30,000 cu. ft. of gas per barrel of liquid hydrocarbons or more; or, any well which produces liquid hydrocarbons with a gravity of 60° API or greater.

**Special Rule 27:**

An oil well in the Devils Fork Gallup Gas Pool shall be a well producing with a gas liquid ratio of less than 30,000 cu. ft. of gas per barrel of liquid hydrocarbons, and the liquid hydrocarbons have a gravity of less than 60° API.

**Special Rule 28:**

Gas-oil ratio tests shall be taken on all wells in the Devils Fork Gallup Gas Pool and on all wells producing from the Gallup Formation within one mile of the boundaries of the Devils Fork Gallup Gas Pool and not within another designated pool during the first fifteen days of the months of January, April, July, and October of each year. Tests shall be 24-hour tests, being the final 24 hours of a 72-hour period during which the well shall be produced at a constant rate of production to be determined by the operator, but in no event shall the rate be less than that necessary to produce the gas limit if the well is capable of producing the gas limit. Results of such tests shall be filed on Commission Form C-116 within ten days after the close of each test period and shall become effective on the first of the month following the test period. At least 72 hours prior

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to commencement of any such gas-oil ratio tests, each operator shall file with the Aztec office of the Commission a Test Schedule for its wells, specifying the time each of its wells is to be tested. Copies of the Test Schedule shall also be furnished to all offset operators. The Secretary-Director may extend the 15-day testing period if future development indicates that 15 days does not allow sufficient time for operators to adequately test all of their wells.

**Special Rule 29:**

The average reservoir pressure shall be determined during the months of April and October each year after each well has been shut-in for a minimum of 3 days and calculated to a common datum, which shall be the subsea depth of the gas-oil contact. The pressures on individual wells shall be determined in the following manner:

- 1) Subsurface pressure tests shall be taken on all flowing oil wells (pumping wells exempted) in accordance with the procedure outlined in Statewide Rule 302, except with respect to shut-in time and datum as provided above.
- 2) Wellhead shut-in pressure shall be obtained on all gas wells and calculated to bottom hole conditions at the subsea datum of the gas-oil contact in accordance with the standard procedure as outlined in the "Manual for Back Pressure Tests for Natural Gas Wells in the State of New Mexico."
- 3) Information obtained on these tests shall be reported on Form C-124 in compliance with the provisions of Statewide Rules 302 and 1123, and the Commission shall use the arithmetic average of the pressures so reported for the pressure,  $P_r$ , in the calculations as provided in Special Rule 14 (C).

**Special Rule 30:**

- ✓ No acreage shall be simultaneously dedicated to an oil well and to a gas well in the Devils Fork Gallup Gas Pool

**Special Rule 31:**

In order to prevent waste, the gas-oil ratio limitation for the Devils Fork Gallup Gas Pool shall be 2,000 cu. ft. of gas per barrel of oil produced.

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