FORM 1540
(REV. 4-15-63)

NORTHERN NATURAL GAS COMPANY
BACK-PRESSURE CALCULATION SHEET

TYPE TEST: ☐ INITIAL ☐ ANNUAL ☐ RETEST ☐ SPECIAL TEST DATE: _____

OPERATOR _____ LEASE _____ WELL NO. _____

SEC. _____ TWP. _____ RNG. _____ BLK. _____ SUR. _____ COUNTY _____ STA. NO. _____ PIPELINE CONN. _____

GA SYSTEM _____ FIELD _____ RESERVOIR _____

CSG. SIZE _____ WT. _____ TBG. SIZE _____ WT. _____ PERFS: _____ TO _____

TYPE COMPLETION _____ PACKER@ _____ ft. AVG. VERTICAL DEPTH _____ ft.

TYPE LIQUID PRODUCED _____ LIQUID COMPOSITION _____ API GRAVITY _____

GAS GRAVITY (G_g)(G_m) Assume .660 CO_2 _____ % N_2 _____ % H_2S _____ P_{cr} 670 psia T_{cr} 378 °R

PRODUCING THRU _____ TYPE TAPS _____ (PROVER)(METER) SIZE _____ BAR. PRESS _____

METER OR PROVER DATA

RATE NO.	OBSERVED DATA: ORIFICE SIZE IN.	(METER) (PROVER) TEMP. °F	(METER) (PROVER) PRESSURE PSIG	$(P_m)(P_p)$ PSIA	DIFF. (H_w)	COMPRESSABILITY FACTOR: $\frac{(P_m)(P_p)}{P_{cr}}$	$\frac{(T_m)(T_p)}{T_{cr}}$	Z	REMARKS (QUALITY OF MEASUREMENT)
1	5/32	68	809	823.4		1.23	1.40	.847	
2									
3									
4									
5									

FLOW RATE CALCULATION

RATE NO.	COEFF. MCF/DAY	$(P_m H_w)$ (P_p)	EXTENSION $\sqrt{P_m H_w}$	GRAVITY FACTOR	METER TEMP. FACTOR	DEVIATION FACTOR	FLOW RATE MCF/DAY	LENGTH OF FLOW	REMARKS (TYPE OF FLOW)
1	.4088	823.4		1.231	0.9924	1.087	447	2 hrs.	
2									
3									
4									
5									

WELLHEAD SHUT-IN AND FLOWING DATA

RATE NO.	CASING PRESSURE DATA: PSIG	(P_c) & $(P_w)(P_t)$ PSIA	$\frac{(P_w)(P_t)}{P_c}$	(P_c^2) & $(P_w^2)(P_t^2)$	TUBING PRESSURE DATA: PSIG	(P_c) & $(P_w)(P_t)$ PSIA	$\frac{(P_w)(P_t)}{P_c}$	(P_c^2) & $(P_w^2)(P_t^2)$	WELL-HEAD TEMP. °F	REMARKS (QUALITY OF PRESSURES)
SHUT IN	832	846.4		716						Hours shut in:
1	807	821.4		675						
2										
3										
4										
5										

SUMMARY

RATE NO.	WATER PROD. BBLS.	LIQUID PETR. BBLS.	GOR MCF/BBL	$(P_c^2 - P_w^2)$	Q	$(P_c^2 - P_f^2)$
1				41	447	
2						
3						
4						
5						

REMARKS: _____

WH slope (n): _____ ABS slope (n): _____

WH potential: _____ MCF/D after _____ hr.

ABS potential: _____ MCF/D after _____ hr.

72 hr. WH potential _____ MCF/D

Stabl. WH potential _____ MCF/D

DEL @ _____ after _____ hr: _____ MCF/D

DEL @0.8 P_c after 72 hr: _____ MCF/D

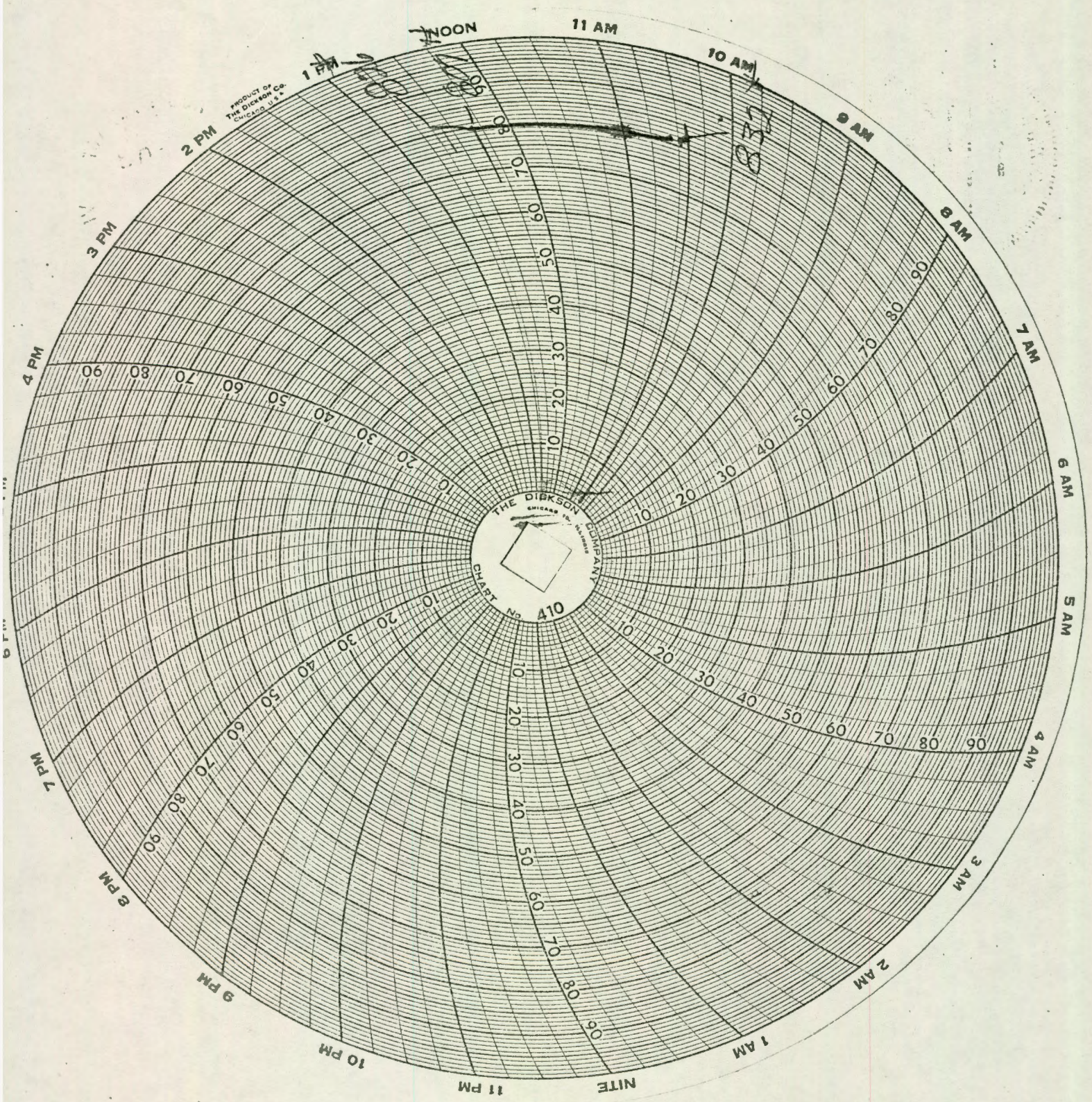
Stabl. DEL @P_L = _____ psig: _____ MCF/D

72 hr to t_{rb} hr stabl factor: _____

_____ hr to 72 hr stabl factor: _____

TESTED BY: _____ WITNESSED BY: _____

CALCULATED BY: _____ CHECKED BY: _____


NOON
11 AM
10 AM
9 AM
8 AM
7 AM
6 AM
5 AM
4 AM
3 AM
2 AM
1 AM
NITE
11 PM
10 PM
9 PM
8 PM
7 PM
6 PM
5 PM
4 PM
3 PM
2 PM
1 PM
PRODUCT OF THE DICKSON Co. CHICAGO U.S.A.
THE DICKSON COMPANY
CHICAGO
CHART No. 410

FORM 2448

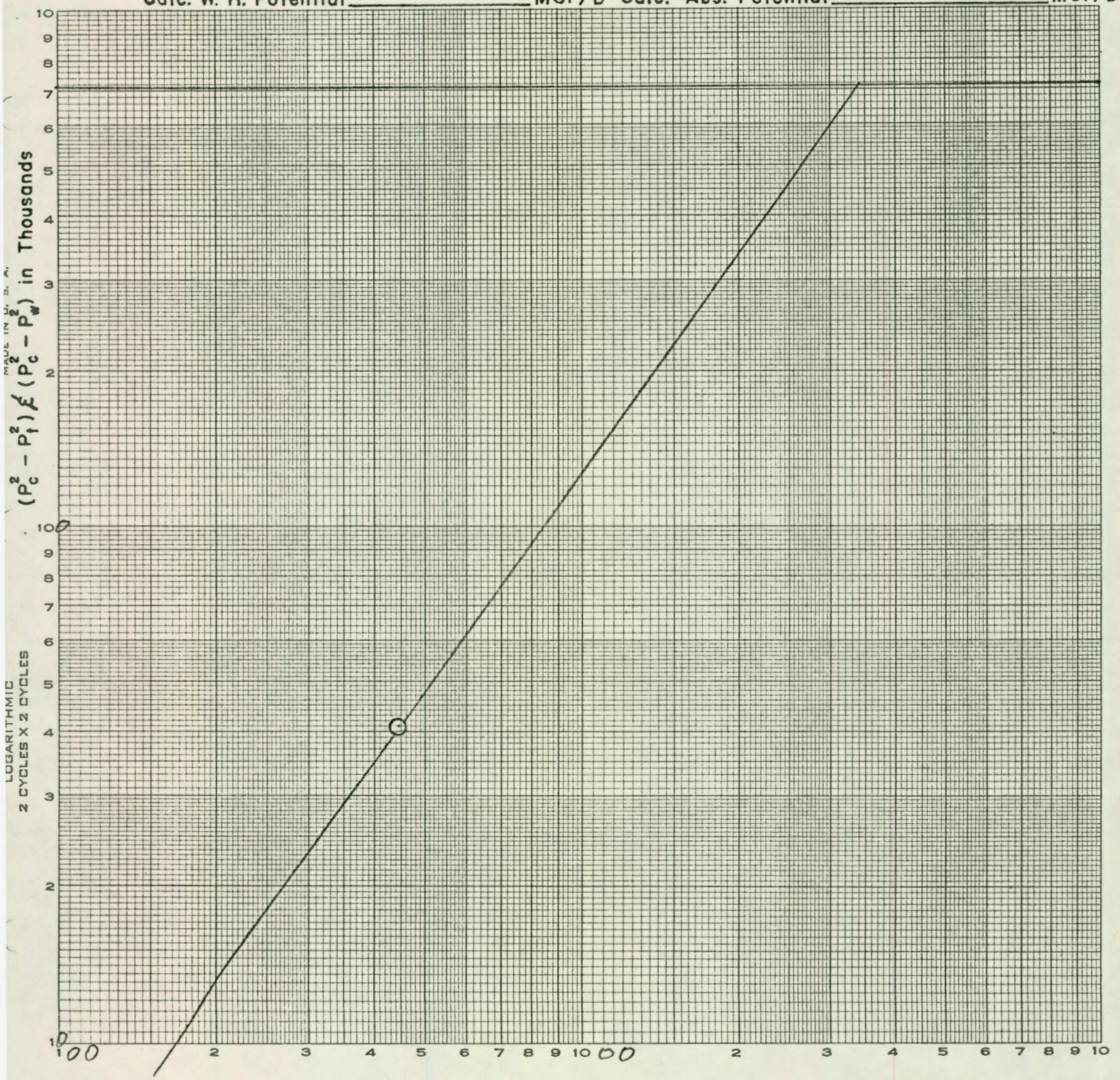
BACK PRESSURE CURVE

Operator _____ Lease _____ Well No. _____

County _____ Field _____ Location _____

Date of Test _____ Slope "n" _____ W. H. _____ Abs.

Calc. W. H. Potential _____ MCF/D Calc. Abs. Potential _____ MCF/D



3400 MCFD WITH OFP

Q in MCF/Day

.700 Slope