

NORTHERN NATURAL GAS COMPANY
BACK-PRESSURE CALCULATION SHEET

TYPE TEST: INITIAL ANNUAL RETEST SPECIAL TEST DATE: _____

OPERATOR _____ LEASE _____ WELL NO. _____
 SEC. _____ TWP _____ RING. _____ COUNTY _____ STA. NO. _____ PIPELINE CONN. _____
 BLK. _____ SUR. _____
 SA SYSTEM _____ FIELD _____ RESERVOIR _____

LOG. 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 CO₂ _____ % N₂ _____ % H₂S _____ P_{cr} 670 psia T_{cr} 378 °F
 PRODUCING THRU _____ TYPE TAPS _____ (PROVER)(METER) SIZE _____ BAR. PRESS. _____

METER OR PROVER DATA

RATE NO.	ORIFICE SIZE IN.	OBSERVED DATA				COMPRESSABILITY FACTOR			REMARKS (QUALITY OF MEASUREMENT)
		(METER) (PROVER) TEMP °F	(METER) (PROVER) PRESSURE PSIG	(P _m)(P _p) PSIA	DIFF. (H _w)	(P _m)(P _p) / P _{cr}	(T _m)(T _p) / T _{cr}	Z	
1	5/32	68	809	823.4		1.23	1.40	1.847	
2									
3									
4									
5									

FLOW RATE CALCULATION

RATE NO.	COEFF. MCF/DAY	(P _m H _w) (P _p)	EXTENSION √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									

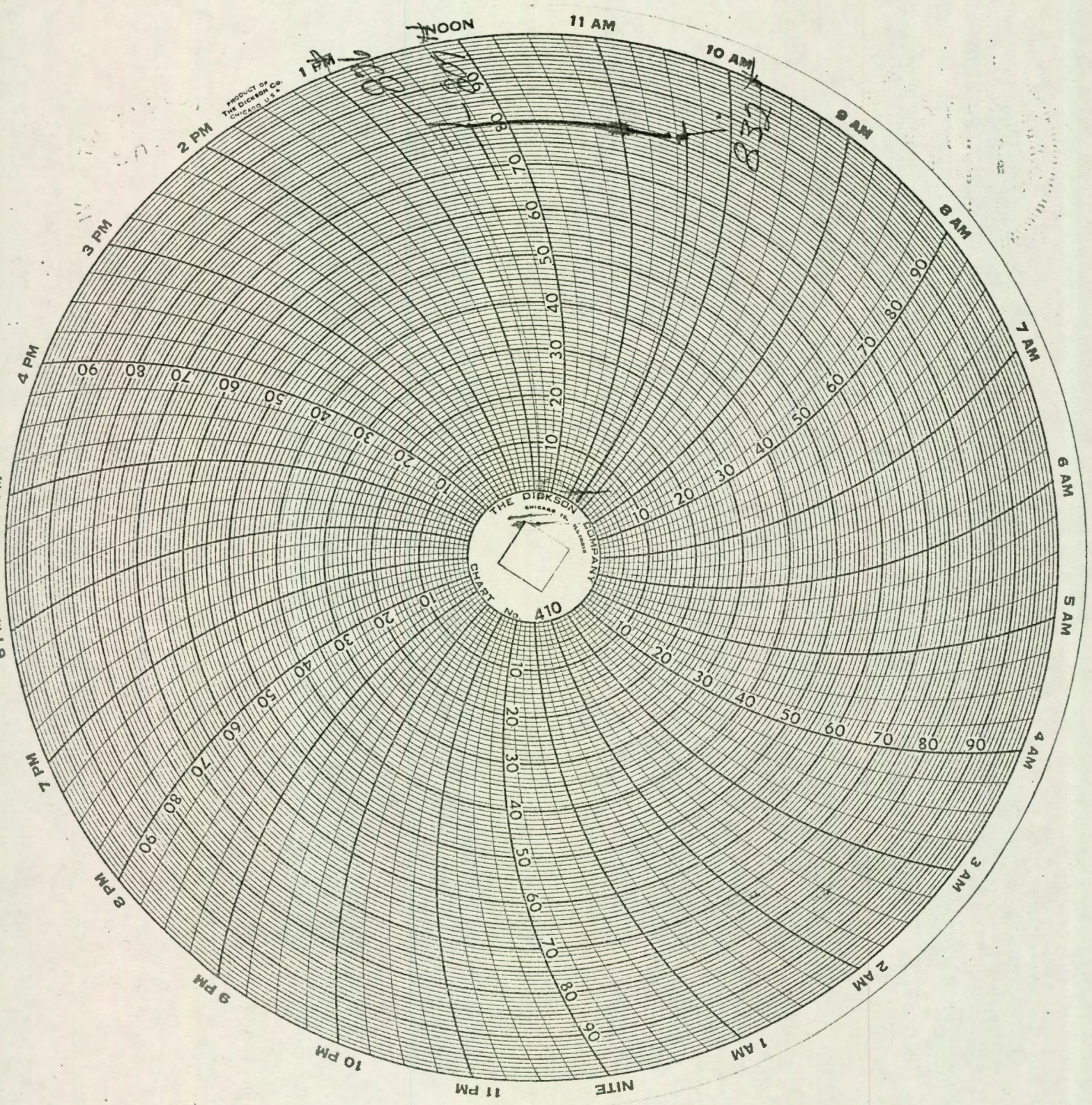
WELLHEAD SHUT-IN AND FLOWING DATA

RATE NO.	CASING PRESSURE DATA				TUBING PRESSURE DATA				WELL-HEAD TEMP °F	REMARKS (QUALITY OF PRESSURES)
	PSIG	(P _c) & (P _w)(P _f) PSIA	(P _w)(P _f) / P _c	(P _c ²) & (P _w ²)(P _f ²)	PSIG	(P _c) & (P _w)(P _f) PSIA	(P _w)(P _f) / P _c	(P _c ²) & (P _w ²)(P _f ²)		
SHUT IN	832	846.4		716						Hours shut in:
1	807	821.4		675						
2										
3										
4										
5										

SUMMARY

RATE NO.	WATER PROD. BBL.	LIQUID PETR. BBL.	GOR MCF/BBL	(P _c ² - P _w ²)	Q	(P _c ² - P _f ²)	WH slope (n): _____	ABS slope (n): _____
1				41	447		WH potential: _____	MCF/D after _____ hr.
2							ABS potential: _____	MCF/D after _____ hr.
3							72 hr. WH potential _____	MCF/D
4							Stabl. WH potential _____	MCF/D
5							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 _r hr stabl factor: _____	
							_____ hr to 72 hr stabl factor: _____	

REMARKS: _____
 TESTED BY: _____ WITNESSED BY: _____
 CALCULATED BY: _____ CHECKED BY: _____



PRODUCT OF
THE DICKSON CO.
CHICAGO, U.S.A.

THE DICKSON COMPANY
CHICAGO, ILL.
CHART NO. 410

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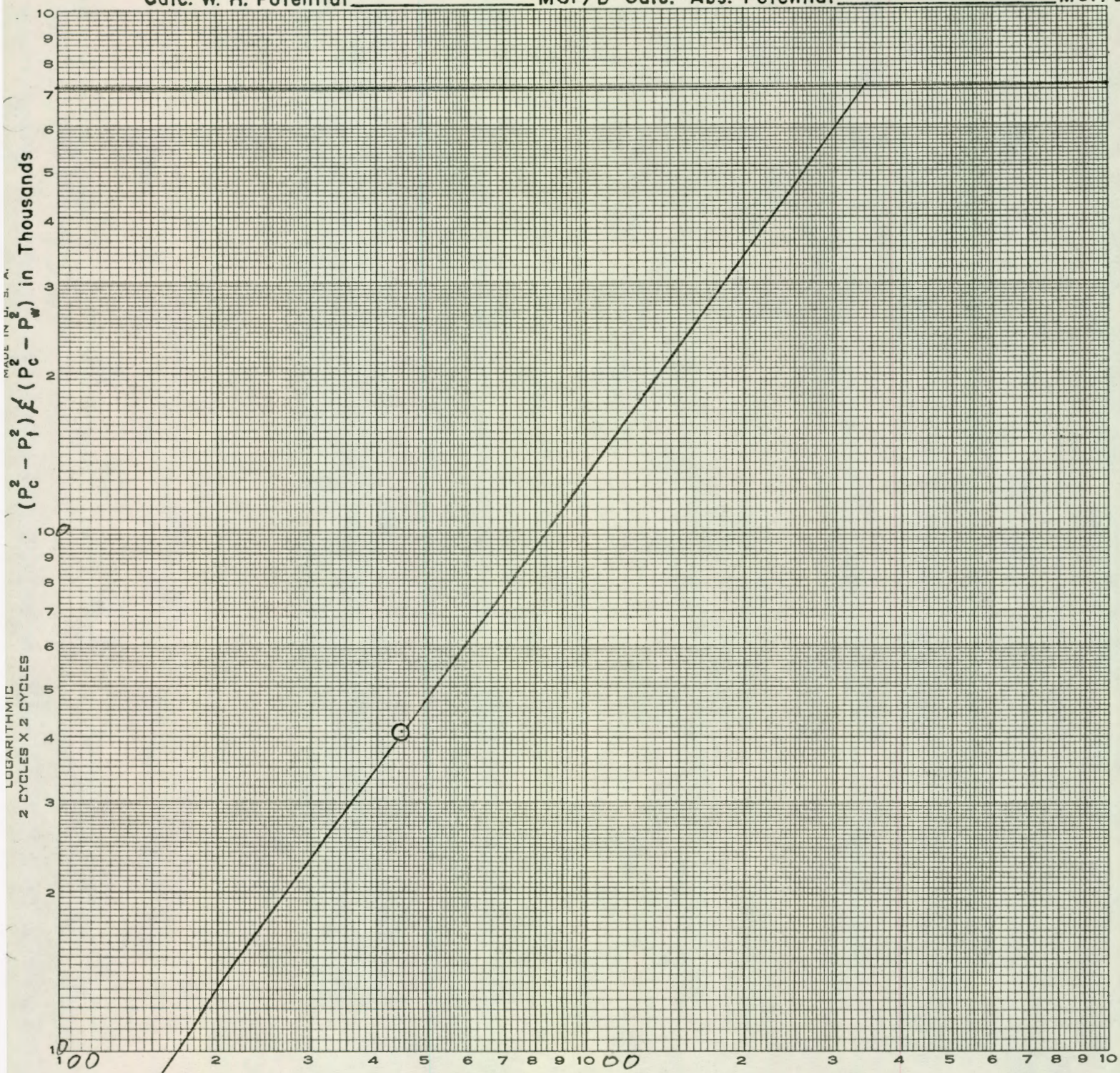
BACK PRESSURE CURVE

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



LOGARITHMIC 2 CYCLES X 2 CYCLES

3400 MCF/D W/H O F P_Q in MCF/Day
.700 slope