

15-023-20042-00-00

STATE OF KANSAS - CORPORATION COMMISSION  
ONE POINT STABILIZED OPEN FLOW OR DELIVERABILITY TEST

FORM G-2  
8-7-58

TYPE TEST:  Deliverability  Open Flow TEST DATE: 9/28/77

COMPANY Kan-Nabr. Nat. Gas Co. LEASE [REDACTED] WELL NO. 1-32

COUNTY Cheyenne LOCATION 1320' FNL - 1320' FNL SECTION 32 TWP 3S RNG 41W ACRES 160

FIELD Wildcat RESERVOIR Niobrara PIPELINE CONNECTION None

COMPLETION DATE \_\_\_\_\_ PLUG BACK TOTAL DEPTH \_\_\_\_\_ PACKER SET AT \_\_\_\_\_

CASING SIZE 4 1/2" WT. 9.5# I.D. 1621' SET AT 1450' PERF. TO 1470'

TUBING SIZE No. TEG WT. I.D. SET AT PERF. TO

TYPE COMPLETION (Describe) Single (Gas) TYPE FLUID PRODUCTION None

PRODUCING THRU Casing RESERVOIR TEMPERATURE F --- BAR. PRESS - P<sub>a</sub> Est. Bar. Press 13.0 Psia

GAS GRAVITY - G<sub>g</sub> 598 % CARBON DIOXIDE --- % NITROGEN --- API GRAVITY OF LIQUID ---

VERTICAL DEPTH (H) 598 TYPE METER CONN. None (METER SIZE) (PROVER) SIZE 2" Critical Flow Prover

SHUT-IN PRESSURE: SHUT IN 1977 AT 11:00 (AM) TAKEN 9/29/1977 AT 11:00 (AM)

FLOW TEST: STARTED 9/28 1977 AT 11:00 (AM) TAKEN 9/29/1977 AT 11:00 (AM)

OBSERVED DATA

DURATION OF SHUT-IN 300 hrs.

SHUT-IN OR FLOW	ORIFICE SIZE in.	(METER) (PROVER) PRESSURE psig	DIFF. in. (h <sub>w</sub> )(h <sub>d</sub> )	FLOWING TEMP. t	WELL-HEAD TEMP. t	CASING WELLHEAD PRESS		TUBING WELLHEAD PRESS		DURATION HOURS	LIQUID PROD. Bbls.
						psig	(P <sub>w</sub> )(P <sub>f</sub> )(P <sub>c</sub> ) psia	psig	(P <sub>w</sub> )(P <sub>f</sub> )(P <sub>c</sub> ) psia		
SHUT-IN						302.0	315.5	NO TBG			
FLOW	5/16"	221	--	66°	--	221.0	234.0	"	"	24	None <i>26.3% Drawdown</i>

RATE OF FLOW CALCULATIONS

COEFFICIENT (F <sub>b</sub> )(F <sub>d</sub> ) Mcfd	(METER) (PROVER) PRESSURE psia	EXTENSION $\sqrt{P_m \times h_w}$	GRAVITY FACTOR F <sub>g</sub>	FLOWING TEMP. FACTOR F <sub>t</sub>	DEVIATION FACTOR F <sub>pv</sub>	RATE OF FLOW R Mcfd	GOR	G <sub>m</sub>
1.714	234.0	--	1.293	0.9943	1.020	525.9		

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P<sub>c</sub>)<sup>2</sup> = 99.2 ; (P<sub>w</sub>)<sup>2</sup> = 54.7 ; P<sub>d</sub> = \_\_\_\_\_ % (P<sub>c</sub> - 14.4) + 14.4 = \_\_\_\_\_ ; (P<sub>w</sub>)<sup>2</sup> = 0.207 ; (P<sub>d</sub>)<sup>2</sup> = .2

$\frac{(P_c)^2 - (P_w)^2}{(P_c)^2 - (P_d)^2}$	$(P_c)^2 - (P_w)^2$	$\frac{P_c^2 - P_a^2}{P_c^2 - P_d^2}$	LOG [ ]	"n"	n x LOG [ ]	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R x ANTILOG Mcfd
99.0	44.5	2.22	3464	.723	2504	1.28	936.102

OPEN FLOW 936.1 Mcfd @ 14.65 psia DELIVERABILITY Mcfd @ 14.65 psia

The undersigned authority, on behalf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Executed this the 30th day of September 1977

STATE CORPORATION COMMISSION *[Signature]*  
For Company

Witness (if any)

NOV 25 1977

Checked by

**STATE OF KANSAS - CORPORATION COMMISSION**  
**MULTIPOINT BACK PRESSURE TEST**

FORM CG-1

TYPE TEST:  Initial     Annual     Special    TEST DATE: 9/28/77

COMPANY: Kan.-Nebr. Nat. Gas Co.    LEASE: Zwegardt    WELL NO.: 1-32

COUNTY: Cheyenne    LOCATION: 1320' FNL - 1320' FWL    SECTION: 32    TWP: 3S    RNG: 41W    ACRES: 160

FIELD: Wildcat    RESERVOIR: Niobrara    PIPELINE CONNECTION: None

COMPLETION DATE:    PLUG BACK TOTAL DEPTH:    PACKER SET AT:

CASING SIZE: 4 1/2"    WT.: 9.5#    ID:    SET AT: 1621'    PERF.: 1450'    TO: 1470'

TUBING SIZE: NO TBG    WT.:    ID:    SET AT:    PERF.:    TO:

TYPE COMPLETION (Describe): Single (Gas)    TYPE FLUID PRODUCTION: None

PRODUCING THRU: Casing    RESERVOIR TEMPERATURE F: ---    Est. Bar. Press 13.0 Psia    BAR PRESS - P<sub>a</sub>: ~~13.0~~

GAS GRAVITY - G<sub>g</sub>: .598    % CARBON DIOXIDE: ---    % NITROGEN: ---    API GRAVITY OF LIQUID: ---

VERTICAL DEPTH (H):    TYPE METER CONN.: None    (NUMBER) (PROVER) SIZE: 2"

REMARKS: Test ran with 2" Critical Flow Prover.

**OBSERVED DATA**

DURATION OF SHUT-IN 3 ~~4~~ wks.

RATE NO.	ORIFICE SIZE in.	(PROVER) PRESSURE psig	DIEP. (h <sub>w</sub> ) (h <sub>d</sub> )	FLOWING TEMP. t	WELL-HEAD TEMP. t	CASING WELL-HEAD PRESS.		TUBING WELL-HEAD PRESS.		DURATION HOURS	LIQUID PROD. Bbls.
						psig	(P <sub>w</sub> )(P <sub>t</sub> )(P <sub>c</sub> ) psia	psig	(P <sub>w</sub> )(P <sub>t</sub> )(P <sub>c</sub> ) psia		
SHUT IN						302	315.0	NO	TBG		
1	2/32"	290		63°		290	303.0	"	"	1	None 3.7% Draw
2	1/4"	283		63°		283	296.0	"	"	1	" 6.2% Draw
3	5/16"	271		63°		271	284.0	"	"	1	" 10.2% DD
4	3/8"	254		64°		254	267.0	"	"	1	" 15.8% DD
5	7/16"	234		64°		234	247.0	"	"	1	" 22.5% DD

**RATE OF FLOW CALCULATIONS**

RATE NO.	COEFFICIENT (F <sub>d</sub> )(F <sub>p</sub> ) Mcfd	(PROVER) PRESSURE psia	EXTENSION $\sqrt{P_m z h_w}$	GRAVITY FACTOR F <sub>g</sub>	FLOWING TEMP FACTOR F <sub>t</sub>	DEVIATION FACTOR F <sub>ov</sub>	RATE OF FLOW Q Mcfd	GOR	$\eta_m$
1	0.8608	303.0	-	1.293	0.9971	1.027	345.34		
2	1.115	296.0	-	1.293	0.9971	1.026	436.56		
3	1.214	284.0	-	1.293	0.9971	1.025	643.26		
4	2.439	267.0	-	1.293	0.9962	1.024	858.95		
5	3.495	247.0	-	1.293	0.9962	1.022	1,136.42		

**PRESSURE CALCULATIONS**

RATE NO.	P <sub>t</sub> psia	P <sub>c</sub> psia	P <sub>w</sub> psia	(P <sub>c</sub> ) <sup>2</sup> THOUSANDS	(P <sub>w</sub> ) <sup>2</sup> THOUSANDS	PLOTING POINTS		100 $\frac{P_w - P_a}{P_c - P_a}$
						(P <sub>c</sub> ) <sup>2</sup> - (P <sub>w</sub> ) <sup>2</sup> THOUSANDS	Q Mcfd	
1		315.0	303.0	99.2	91.8	7.4	345.3	
2		315.0	296.0	99.2	87.6	11.6	436.6	
3		315.0	284.0	99.2	80.6	18.6	643.3	
4		315.0	267.0	99.2	71.3	27.9	858.9	
5		315.0	247.0	99.2	61.0	38.2	1,136.4	

INDICATED WELL-HEAD OPEN FLOW 2.145 Mcfd @ 13.0 psia    "n" = .723

The undersigned authority, on behalf of the Company, states that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Executed this the 30th day of September, 1977.

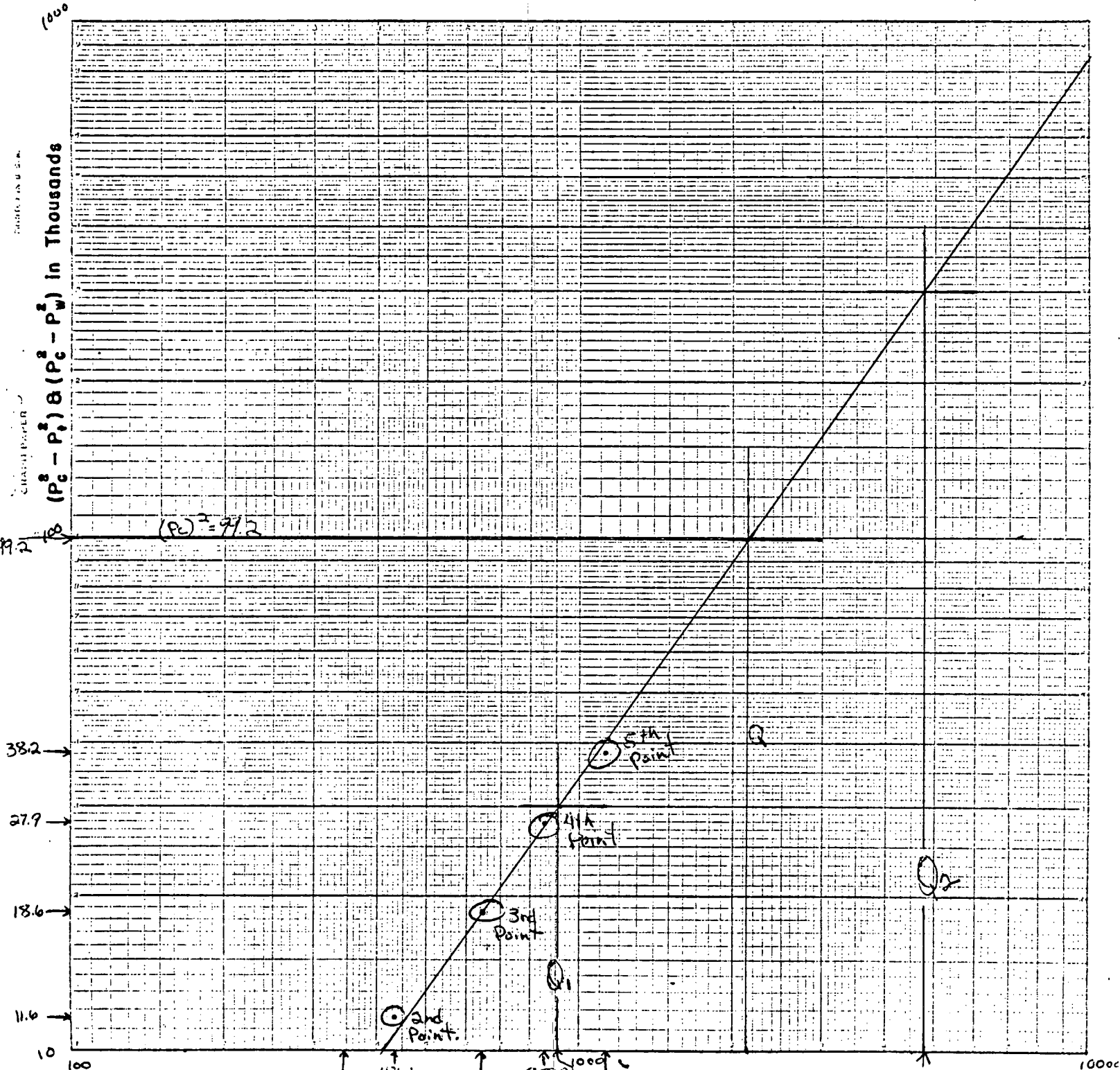
NOV 2 1977

*[Signature]*  
For Company

Witness (if any):

# BACK PRESSURE CURVE

Operator Ken. Neb. Nat. Gas. Co. Lease Zweygardt Well No. 1-32  
 County Cheyenne Field Wildcat Location CNWA Sec 32-25-41W  
 Date of Test 9-23-77 Slope "n" .723 W.H. \_\_\_\_\_ Abs. \_\_\_\_\_  
 Calc. W.H. Potential \_\_\_\_\_ MCF/D Calc. Abs. Potential \_\_\_\_\_ MCF

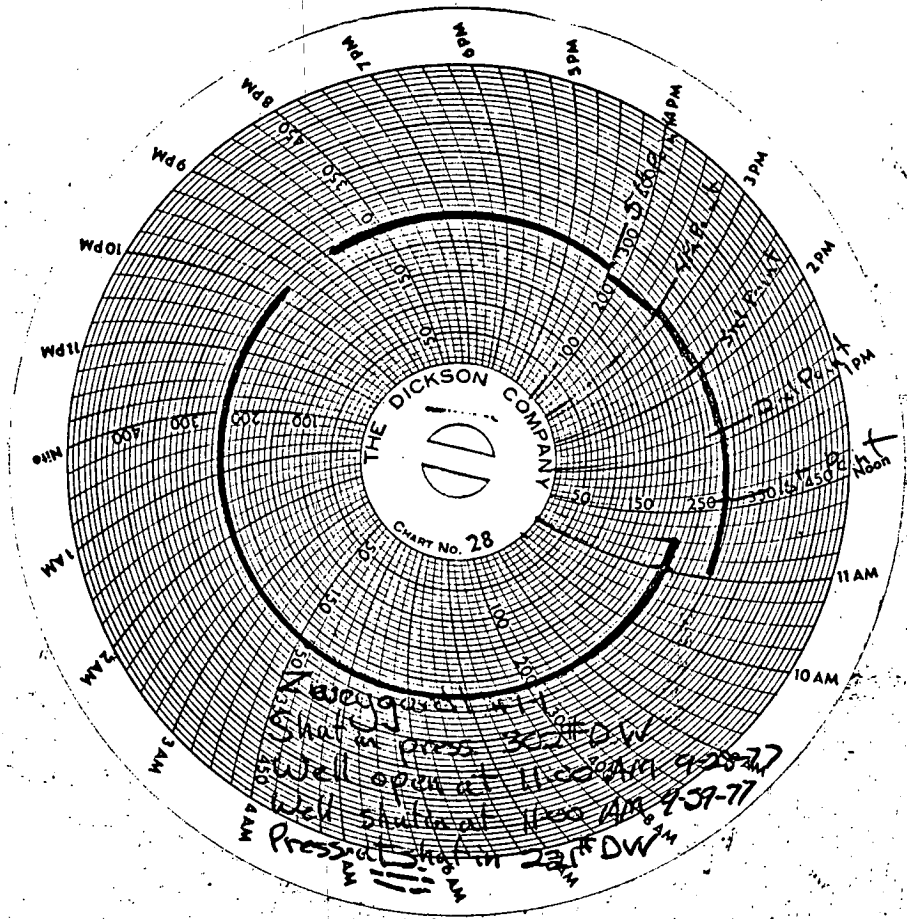


$Q_2 = 4,780; \log. 3.6798$   
 $Q_1 = 906; \log. 2.9571$

$Q \text{ in MCF/Day } Q = 2,145 \text{ Mcf/day}$

$.7227 = .723 = " \text{ STATE CORPORATION COMMISSION}$

NOV 27 1977



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STATE CORPORATION COMMISSION

NOV 27 1977

CONSERVATION DIVISION  
Wichita, Kansas

KAN. - NEBRASKA NATURAL GAS COMPANY, INC.  
Back Pressure Field Data Sheet

Date of Test 9-28 1977

Lease Zwegardt Well No. 1-32 Company Kan-Nebr. Nat. Gas Co.  
 Field Cheyenne County Cheyenne State Kansas Location CNW 4 Sec. 32-35-41W  
 Production Casing 7 1/2" Wt. 9.5# Set at 1421' Perf. 1450' to 1470'  
 Tubing Size NO TBG Set at \_\_\_\_\_ Perf. \_\_\_\_\_ to \_\_\_\_\_  
 Meter run None Conn. \_\_\_\_\_ Shut-in Pressure 302 psig. Well shut in 3 wks.  
 Gravity .598 BHT \_\_\_\_\_ D.W. (Before or After)  
 Test Run on: Casing, Tubing, Annulus (Cross out those not applicable.)  
 Other remarks about test set-up: Well open at 11:00 AM

OBSERVATIONS

Date	Time	Orif. Size	Flow. Temp.	Meter or Prover Pressure psig	Diff. h <sub>w</sub> Inches of Water	Wellhead Working Pressure psig	Remarks
9-28-77	11:15A	2" x .2188	62°	295		295	Blowing Dry
	11:30A		63°	293		293	" "
	11:45A		62°	291		291	" "
	12:00P		63°	290		290	" " 3.9% Drawdown
9-28-77	12:45P	2" x .250	63°	284		284	Blowing Dry
	1:00P		63°	283		283	" " 6.2% Drawdown
9-28-77	1:45P	2" x .3125	63°	273		273	Blowing Dry
	2:00P		63°	271		271	" " 10.2% Drawdown
9-28-77	2:45P	2" x .375	64°	257		257	Blowing Dry
	3:00P		64°	254		254	" " 15.8% Drawdown
9-28-77	3:45P	2" x .4375	64°	237		237	Blowing Dry
	4:00P		64°	234		234	" " 22.5% Drawdown
9-28-77	4:00P	2" x .3125					Well Put on 24 hr. Stabilization Test.
9-29-77	10:15A	2" x .3125	66°	221		221	Blowing Dry
	10:30A		66°	221		221	" "
	10:45A		66°	221		221	" "
	11:00A		66°	221		221	" " 26.8% Drawdown
<p>Sample taken for spec. Grav. and BTH.                  and well shut in at 11:00 AM. <i>SPJ</i></p>							

Tested By Steven Steele  
 Witness Steven McClintock

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NOV 29 1977

CONSERVATION DIVISION  
 Wichita, Kansas

KNNG E21

Lease Name: ZWEYGARDT 01  
County, State: CHEYENNE, KS  
Operator: NOBLE ENERGY INCORPORATED  
Field: CHERRY CREEK  
Reservoir: NIOBRARA  
Location: 32 3S 41W C NW

ZWEYGARDT 01 - NOBLE ENERGY INCORPORATED NIOBRARA as of 04/2004 CHERRY CREEK

