

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

6-7-79

TYPE TEST: Deliverability Open Flow TEST DATE: 2/22/79 15-023-20088-00-00

COMPANY: Kansas-Nebraska Natural Gas LEASE: Lampe WELL NO.: 2-33

COUNTY: Cheyenne LOCATION: NW4 SECTION: 33 TWP: 35 RMD: 41W ACRES:

FIELD: Wildcat RESERVOIR: Niobrara PIPELINE CONNECTION: None

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

CASING SIZE: 4 1/2" WT.: 9.5# LD.: SET AT: 1396' PERF.: TO: 1406'

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

TYPE COMPLETION (See back): Single (Gas) TYPE FLUID PRODUCTION: None

PRODUCING THRU: Casino RESERVOIR TEMPERATURE: BAR. PRESS - P₀: Est. Bar. Press @ 12.6 Psia

GAS GRAVITY - G_g: Calculated with .572 Actual SG .592 BTU 978 (Dry) % CARBON DIOXIDE: % NITROGEN: API GRAVITY OF LIQUID:

VERTICAL DEPTH (M): TYPE METER CORR.: None METER (M) (PROVER) SIZE: Tested with 2" Critical Flow

SHUT-IN PRESSURE SHUT IN: 19 AT (AM) TAKEN 2/22 10:00 AM

FLOW TEST STARTED: 2/22 2:55 (AM) TAKEN 2/23 3:10 (AM)

OBSERVED DATA

DURATION OF SHUT-IN 2 wks +

SHUT-IN OR FLOW	ORIFICE SIZE in.	WELLHEAD (PROVER) PRESSURE psig	DIFF. in. (h ₁ -h ₂)	FLOWING TEMP. °F	WELL HEAD TEMP. °F	CASING WELLHEAD PRESS		TUBING WELLHEAD PRESS		DURATION HOURS	LIQUID PROD. Bbls.
						psig	P ₁ , P ₂ , P _c psig	psig	P ₁ , P ₂ , P _c psig		
SHUT-IN						277.5	290.1	NO	TBG		
FLOW	7/32	118.2		53		118.2	130.8	"	"	24	None

RATE OF FLOW CALCULATIONS

COEFFICIENT (M ² /h)	(WELLHEAD) (PROVER) PRESSURE psig	EXTENSION $\sqrt{P_{wh} h_w}$	GRAVITY FACTOR P _g	FLOWING TEMP. FACTOR P _L	DEVIATION FACTOR P _{pr}	RATE OF FLOW R Mcfd	GOR	G _g
.8608	130.8		1.322	1.007	1.011	152	176	1.15

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P_c)² = 84.2 (P_w)² = 17.1 P₀² = (P_c - 14.4) + 14.4 = 69.8 (P_c)² = 0.2

$\frac{(P_c)^2 - (P_w)^2}{(P_c)^2 - (P_0)^2}$	$\frac{(P_c)^2 - (P_w)^2}{(P_c)^2 - (P_0)^2}$	$\frac{(P_c)^2 - (P_w)^2}{(P_c)^2 - (P_0)^2}$	LOG []	"	" = LOG []	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R = ANTILOG Mcfd
0.84	0.67	1.2519	0.0976	0.658	0.0642	1.1594	176

OPEN FLOW 176 Mcfd @ 14.65 psia DELIVERABILITY 176 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 27 day of February, 1979

Terence P. Pahr
 For Company

Witness (if any)

For Corporation

Checked by

$$Q = C (P_c^2 - P_w^2)^n$$

$$C = \frac{176}{(290^2)^{0.658}} = .1012$$

TYPE TEST: In. Annual TEST DATE: 2/22/79

COMPANY: Kansas-Nebraska Natural Gas LEASE: LAMPE WELL NO.: #1-33
 COUNTY: Cheyenne LOCATION: NW¼ SECTION: 33 TWP: 3S RMO: 41W ACRES:
 FIELD: Wildcat RESERVOIR: Niobrara PIPELINE CONNECTION: None

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

CASING SIZE WT. ID. SET AT PERF. TO
4 1/2" 9.5W 1396' 1406'

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

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

PRODUCING THRU: Casing RESERVOIR TEMPERATURE: BAR PRESS - P: Est. Bar. Press. @ 12.6 Psia

GAS GRAVITY - G: Calculated with .572 Actual S.G. .592 BTU 978 (Dry) % CARBON DIOXIDE: % NITROGEN: API GRAVITY OF LIQUID:

VERTICAL DEPTH (M): TYPE METER CORR.: None GOR (PROVER) SIZE: Tested with 2" Critical Flow Prover

REMARKS: Well open @ 10:05 A.M. 2/22/79

OBSERVED DATA DURATION OF SHUT-IN: 2 wks

RATE NO.	ORIFICE SIZE In.	(PROVER) PRESSURE psig	DIFF. (h ₁) (h ₂)	FLOWING TEMP. I	WELL HEAD TEMP. I	CASING WELLHEAD PRESS. psig		TUBING WELLHEAD PRESS. psig		DURATION HOURS	LIQUID PROD. Bbls.
						(P ₁) (P ₂)	(P _w) (P ₁) (P ₂)	(P _w) (P ₁) (P ₂)			
SHUT IN						277.5	290.1	NO	TBG		
1	1/8	269.7		59		269.7	282.3	"	"	1	None
2	3/16	259.0		59		259.0	271.6	"	"	1	None
3	1/4	241.5		59		241.5	254.1	"	"	1	None
4	5/16	215.7		58		215.7	228.3	"	"	1	None

RATE OF FLOW CALCULATIONS

RATE NO.	COEFFICIENT (P ₁) (P ₂) M ³ M	(PROVER) PRESSURE psig	EXTENSION √P ₁ h ₁ h ₂	GRAVITY FACTOR P _g	FLOWING TEMP FACTOR F _t	DEVIATION FACTOR F _{pv}	RATE OF FLOW Q M ³ Day	GOR	Q _{sc}
1	.2716	282.3		1.322	1.001	1.022	104		
2	.6237	271.6		1.322	1.001	1.021	229		
3	1.115	254.1		1.322	1.001	1.020	382		
4	1.714	228.3		1.322	1.002	1.018	528		

PRESSURE CALCULATIONS

RATE NO.	P ₁ psig	P ₂ psig	P _w psig	(P ₁) ² THOUSANDS	(P ₂) ² THOUSANDS	PLOTTING POINTS		SHUT-IN P _w - P ₂ / P ₁ - P ₂
						(P ₁) ² - (P ₂) ² THOUSANDS	Q M ³ Day	
1		290.1	282.3	84.2	79.7	4.5	104	
2		290.1	271.6	84.2	73.8	8.4	229	
3		290.1	254.1	84.2	64.6	19.6	382	
4		290.1	228.3	84.2	52.1	32.1	528	

INDICATED WELLHEAD OPEN FLOW: 993 M³ @ 14.85 psig $\gamma_g =$.658

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 27 day of February, 1979

Witness (if any)
 For Commission

Francis J. Palka
 For Company

Checked by