

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

FORM G-2  
8-7-53  
82  
23-9

TYPE TEST:  Deliverability  Open Flow TEST DATE: 3/09/90 15-181-20239-00-00

COMPANY: GOODLAND GAS COMPANY LEASE: Armstrong WELLS NO.: 2-2

COUNTY: Sherman LOCATION: NW/4 SECTION: 2 TWP: 8S RMO: 39W ACRES:

FIELD: Goodland RESERVOIR: Niobrara PIPELINE CONNECTION: KNEnergy

COMPLETION DATE: 2/10/83 PLUG BACK TOTAL DEPTH: 1054 PACKER SET AT: None

CASING SIZE: 4 1/2" WT: 9.5#/ft. I.D.: 1062 SET AT: 970 PERFORATION: 990 TO:

TUBING SIZE: None WT: I.D.: SET AT: PERFORATION: TO:

TYPE COMPLETION (Describe): 100,000# Sand, 40 tons CO<sub>2</sub> & 800 SEF/Bbl TYPE FLUID PRODUCTION: Gas

PRODUCING THRU: Casing RESERVOIR TEMPERATURE: BAR. PRESS - P<sub>a</sub>: Paia

GAS GRAVITY - G<sub>e</sub>: 0.5837 % CARBON DIOXIDE: 1.98 % NITROGEN: 2.790 API GRAVITY OF LIQUID: --

VERTICAL DEPTH (H): TYPE METER CONN.: Orifice-Flange (METER RUN) (PROVER) SIZE: 2.067

SHUT-IN PRESSURE: SHUT IN 2/9 1990 AT 10:00 (AM)(PM) TAKEN 2/12 1990 AT 11:00 (AM)(PM)

FLOW TEST: STARTED 2/22 1990 AT 8:00 (AM)(PM) TAKEN 2/23 1990 AT 8:00 (AM)(PM)

**OBSERVED DATA** DURATION OF SHUT-IN: 72 HR.

SHUT-IN OR FLOW	ORIFICE SIZE In.	(METER) (PROVER) PRESSURE psig	DIFF. In. (h <sub>w</sub> )	FLOWING TEMP. t	WELL-HEAD TEMP. t	CASINO WELL-HEAD PRESS		TUBING WELL-HEAD PRESS		DURATION HOURS	LIQUID PROD. Bbls.
						psig	(P <sub>w</sub> )(P <sub>i</sub> )(P <sub>c</sub> ) psia	psig	(P <sub>w</sub> )(P <sub>i</sub> )(P <sub>c</sub> ) psia		
SHUT-IN	--	--	--	--	--	27	41.4	--	--	72	--
FLOW	0.875	15	30.3	30	--	14	28.4	--	--	24	--

**RATE OF FLOW CALCULATIONS**

COEFFICIENT (F <sub>e</sub> ) (Z <sub>e</sub> ) Mcfd	(METER) (PROVER) PRESSURE psia	EXTENSION $\sqrt{P_m x h_w}$	GRAVITY FACTOR P <sub>g</sub>	FLOWING TEMP. FACTOR P <sub>t</sub>	DEVIATION FACTOR P <sub>pv</sub>	RATE OF FLOW R Mcfd	GOR	G <sub>m</sub>
3.824	29.4	29.82	1.3089	1.030	1.0013	154	--	--

**(OPEN FLOW) (DELIVERABILITY) CALCULATIONS**

(P<sub>c</sub>)<sup>2</sup> = 1.714 ; (P<sub>w</sub>)<sup>2</sup> = 0.807 ; 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> = --

$\frac{(P_c)^2 - (P_w)^2}{(P_c)^2 - (P_d)^2}$	$(P_c)^2 - (P_w)^2$	$\frac{P_c^2 - P_a^2}{P_c^2 - P_w^2}$	LOG [ ]	"n"	n x LOG [ ]	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R x ANTILOG Mcfd
1.507	0.907	1.661	0.220	0.85	0.187	1.54	237

OPEN FLOW 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 31<sup>st</sup> day of Dec 1990.

*John P. Sanders*  
For Company

Witness (if any)  
For Commission

GOODLAND GAS COMPANY  
Wichita, Kansas

Checked by