

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

FORM G-3  
 8-7-53  
 1-3-91

TYPE TEST:  Deliverability  Open Flow TEST DATE: 3/09/90 15-181-20267-00-00

COMPANY: GOODLAND GAS COMPANY LEASE: Armstrong WELL NO.: 1-11A

COUNTY: Sherman LOCATION: SW 1/4, SW 1/4, NW 1/4 SECTION: 11 TWP: 8S RNO: 40W ACRES:

FIELD: Goodland RESERVOIR: Niobrara PIPELINE CONNECTION: KNEnergy

COMPLETION DATE: 11-15-83 PLUG BACK TOTAL DEPTH: 1245 PACKER SET AT: None

CASING SIZE: 4 1/2" WT: 9.5#/ft. I.D.: SET AT: 1341 PERF.: 1212 TO: 1237

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

TYPE COMPLETION (Describe): Frac 82,600# Sd., 40 tons CO<sub>2</sub>, 628 Bbls H<sub>2</sub>O TYPE FLUID PRODUCTION: Gas

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

GAS GRAVITY - G<sub>c</sub>: 0.5930 % 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 11:05 (AM)(PM) TAKEN 2/12 1990 AT 8:35 (AM)(PM) Y

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

OBSERVED DATA

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 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	--	--	--	--	--	29	43.4	--	--	72	--
FLOW	0.5	17.4	6.8	34	--	15	29.4	--	--	24	--

RATE OF FLOW CALCULATIONS

COEFFICIENT (F <sub>c</sub> ) <sup>2</sup> (Mcd)	(METER) (PROVER) PRESSURE psia	EXTENSION $\sqrt{P_m h_w}$	GRAVITY FACTOR F <sub>g</sub>	FLOWING TEMP. FACTOR F <sub>t</sub>	DEVIATION FACTOR F <sub>pv</sub>	RATE OF FLOW R Mcd	GOR	G <sub>m</sub>
1.219	31.8	14.66	1.2986	1.026	1.0015	24	--	--

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P<sub>c</sub>)<sup>2</sup> = 1.884 ; (P<sub>w</sub>)<sup>2</sup> = 0.864 ; 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> = --

$\frac{(P_c)^2 - (P_d)^2}{(P_c)^2 - (P_w)^2}$	$(P_c)^2 - (P_w)^2$	$\frac{P_c^2 - P_d^2}{P_c^2 - P_w^2}$	LOG [ ]	"n"	n x LOG [ ]	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R x ANTILOG Mcd
1.677	1.019	1.645	0.216	0.85	0.184	1.53	36

OPEN FLOW Mcd @ 14.65 psia DELIVERABILITY Mcd @ 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

1-2-91

Checked by