

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

FORM O-2
8-7-53

83
1-3-91

TYPE TEST: Deliverability Open Flow TEST DATE: 3/09/90 15-181-20256-00-00

COMPANY: GOODLAND GAS COMPANY LEASE: City of Goodland WELL NO.: 1-8

COUNTY: Sherman LOCATION: NW 1/4, NW 1/4 SECTION: 8 TWP: 8S RMO: 39W ACRES:

FIELD: Goodland RESERVOIR: Niobrara PIPELINE CONNECTION: KNEnergy

COMPLETION DATE: 10-12-83 PLUG BACK TOTAL DEPTH: 1211 PACKER SET AT: None

CASING SIZE: 4 1/2" WT.: 9.5#/ft. I.D.: SET AT: 1246 PERP.: 1070 TO: 1102

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

TYPE COMPLETION (Describe): Frac 100,000# SD., 934 Bbl H₂O TYPE FLUID PRODUCTION: Gas

PRODUCING THRU: Casing RESERVOIR TEMPERATURE F: BAR. PRESS - P_a: P_{ria}

GAS GRAVITY - G_g: 0.5810 % 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 10:45 (AM)(PM) TAKEN 2/12 1990 AT 8:00 (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 _w)	FLOWING TEMP. t	WELL-HEAD TEMP. t	CASING WELLHEAD PRESS		TUBING WELLHEAD PRESS		DURATION HOURS	LIQUID PROD. Bbls.
						psig	(P _w)(P _c) psia	psig	(P _w)(P _c) psia		
SHUT-IN	--	--	--	--	--	27	41.4	--	--	72	--
FLOW	0.375	16	2.3	36	--	13	27.4	--	--	24	--

RATE OF FLOW CALCULATIONS

COEFFICIENT (F _c) (F _d) Mcfd	(METER) (PROVER) PRESSURE psia	EXTENSION $\sqrt{P_m \times h_w}$	GRAVITY FACTOR F _g	FLOWING TEMP. FACTOR F _t	DEVIATION FACTOR F _{pv}	RATE OF FLOW R Mcfd	GOR	G _m
0.686	30.4	8.27	1.3119	1.024	1.0013	8	--	--

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P_c)² = 1.714 ; (P_w)² = 0.751 ; P_d = -- % (P_c - 14.4) + 14.4 = -- ; (P_c)² = 0.207 ; (P_d)² = --

$\frac{(P_c)^2 - (P_d)^2}{(P_c)^2 - (P_w)^2}$	$(P_c)^2 - (P_w)^2$	$\frac{P_c^2 - P_a^2}{P_c^2 - P_w^2}$	LOG []	"n"	n x LOG []	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R x ANTILOG Mcfd
1.507	0.963	1.565	0.194	0.85	0.165	1.46	11

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 31st day of Dec, 1990

John Sanders
For Company

Witness (if any)
For Commission

Checked by