

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

FORM NO. 8-7-88

15-023-20281-0000

TYPE TEST: Deliverability Open Flow TEST DATE: 8/21/90

COMPANY: Harvest Energy Company LEASE: Steffen WELL NO.: #1-9

COUNTY: Cheyenne LOCATION: NENNE SECTION: 9 TWP: T3S RNG: R39W ACRES:

FIELD: Bird City RESERVOIR: Niobrara PIPELINE CONNECTION: Williams Natural Gas

COMPLETION DATE: 4/18/90 PLUG BACK TOTAL DEPTH: 1379 PACKER SET AT: N/A

CASING SIZE: 4 1/2 WT. 10.5" I.D. 4.052" SET AT 1421" PERF. 1304' TO 1322'

TUBING SIZE: N/A WT. I.D. SET AT PERF. TO

TYPE COMPLETION (Describe): Single gas TYPE FLUID PRODUCTION:

PRODUCING THRU: Casing RESERVOIR TEMPERATURE, F: 92 BAR. PRESS - P_a: 14.4 Psia

GAS GRAVITY - G_g: .5897 % CARBON DIOXIDE: 1.609 % NITROGEN: 4.513 API GRAVITY OF LIQUID:

VERTICAL DEPTH (H): 1316' TYPE METER CONN.: orifice (METER RUN) (PROVER) SIZE: 2"

SHUT-IN PRESSURE: SHUT IN 4/18 19.90 AT (AM)(PM) TAKEN 8/16 19.90 AT (AM)(PM)

FLOW TEST: STARTED 8/20 19.90 AT (AM)(PM) TAKEN 8/21 19.90 AT (AM)(PM)

OBSERVED DATA

DURATION OF SHUT-IN _____ HR.

SHUT-IN OR FLOW	ORIFICE SIZE in.	(METER) (PROVER) PRESSURE psig	DIFF. in. (h _w)(h _d)	FLOWING TEMP. t	WELL-HEAD TEMP. t	CASING WELLHEAD PRESS.		TUBING WELLHEAD PRESS.		DURATION HOURS	LIQUID PROD. Bbls.
						psig	(P _w)(P _p)(P _c) psia	psig	(P _w)(P _p)(P _c) psia		
SHUT-IN						280		N/A			
FLOW	.500	52	90	60	60	43		N/A		24	

RATE OF FLOW CALCULATIONS

COEFFICIENT (P _c) ² / (P _w) ² - (P _d) ²	(METER) (PROVER) PRESSURE psia	EXTENSION √P _w h _w	GRAVITY FACTOR P _g	FLOWING TEMP. P _L	DEVIATION FACTOR P _{pv}	RATE OF FLOW R Mcfd	GOR	Q _m
1.2214026	66.4	77.304592	1.3019	1.0	1.0047	123.50319		

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P_c)² = 86.67136 (P_w)² = 3.29476 P_d = _____ % (P_c - 14.4) + 14.4 = _____ (P_w)² = 0.207 (P_d)² = _____

(P _c) ² - (P _w) ²	(P _c) ² - (P _w) ²	(P _c ² - P _d ²) / (P _c ² - P _w ²)	LOG []	"n"	n = LOG []	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R = ANTILOG Mcfd
86.46436	83.3766	1.0370339	.0157929	.85	.013424	1.0313926	127.38

OPEN FLOW 127.38

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 20th day of November, 1990.

[Signature]

Witness (if any)

NOV 26 1990

For Company

For Commission

CONSERVATION DIVISION
 Wichita, Kansas

Checked by