

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

FORM NO. 8-7-58

15-023-20280-0000

11-26-90

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

COMPANY: Harvest Energy Company LEASE: Steffen WELL NO.: #1-3

COUNTY: Cheyenne LOCATION: NW SE SE SECTION: 3 TWP: T3S RNG: R39W ACRES:

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

COMPLETION DATE: 4/18/90 PLUG BACK TOTAL DEPTH: 1436' PACKER SET AT: N/A

CASING SIZE: 4 1/2" WT.: 9.5# L.D.: 4,090 SET AT: 1466' PERF.: 1372' TO: 1390'

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

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

PRODUCING THRU: Casing RESERVOIR TEMPERATURE: 84 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 (ft): 1384' TYPE METER CONN.: orifice (METER RUN)(PROVER) SIZE: 2"

SHUT-IN PRESSURE: SHUT IN 4/18 190 AT (AM)(PM) TAKEN 8/16 19 90 AT (AM)(PM)
 FLOW TEST: STARTED 8/20 190 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 PHOD. Rble.
						psig	(P _w)(P _e)(P _c) psia	psig	(P _w)(P _e)(P _c) psia		
SHUT-IN						280		N/A			
FLOW	.500	60	52	60	60	120		N/A		24	

RATE OF FLOW CALCULATIONS

COEFFICIENT (P _w)(P _e) / Mafd	(METER) (PROVER) PRESSURE psia	EXTENSION √P _m h _w	GRAVITY FACTOR P _g	FLOWING TEMP. P _L	DEVIATION FACTOR P _{pv}	RATE OF FLOW R Mafd	GOR	G _m
1.2401263	74.4	62.199678	1.3019	1.0	1.0063	101.06		

(OPEN FLOW) (DELIVERABILITY) CALCULATIONS

(P_e)² = 86,67136 (P_w)² = 18,06336 P_d² = _____ % (P_e - 14.4) + 14.4 = _____ (P_w)² = 0.207 (P_d)² = _____

(P _e) ² - (P _w) ²	(P _e) ² - (P _w) ²	$\frac{P_e^2 - P_d^2}{P_e^2 - P_w^2}$	LOG []	"n"	n = LOG []	ANTILOG	OPEN FLOW DELIVERABILITY EQUALS R = ANTILOG Mafd
86,46436	68,608	1.2602664	.1004623	.85	.085393	1.217287	123.02

OPEN FLOW 123.02 Mafd @ 14.65 psia DELIVERABILITY Mafd @ 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.

Witness (if any) _____
 For Commission _____

NOV 26 1990
 For Company _____

Checked by _____