

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Type Test ☒ Initial ☐ Annual ☐ Special						Test Date 11/10/82			
Company Harvey E. Yates Company				Connection None					
Pool Austin				Formation Mississippian				Unit	
Completion Date 7/12/82		Total Depth 13407'		Plug Back TD 13407'		Elevation 3976'GL		Farm or Lease Name Richardson Unit	
Coq. Size 5 1/2"	Wt. 17.0	d 4.892	Set At 13360'	Perforations: From 13360' To 13407'				Well No. 1	
Tqg. Size 2 3/8"	Wt. 4.7	d 1.995	Set At 13395'	Perforations: Open To				Unit Sec. Twp. Rge. M 32 13s 36e	
Type Well - Single - Bradenhead - G.G. or G.O. Multiple Single						Packer Set At 13331'		County Lea	
Producing Thru Tubing		Reservoir Temp. °F -		Mean Annual Temp. °F 60		Baro. Press. - P _a 13.2		State New Mexico	
L 13384'	H	G _g 0.6352	% CO ₂ 1.410	% N ₂ 1.148	% H ₂ S	Prover 2"	Meter Run -	Taps -	

FLOW DATA						TUBING DATA		CASING DATA		Duration of Flow	
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. h _w	Temp. °F	Press. p.s.i.g. DWT	Temp. °F	Press. p.s.i.g.		Temp. °F
SI							4160	60	PACKER		4 Months
1.	2"	X	0.1250	635	-	58	4023	60			1.0 hr
2.	2"	X	0.1875	610	-	77	3895	60			1.0 hr
3.	2"	X	0.21875	645	-	57	3680	60			1.0 hr
4.	2"	X	0.250	500	-	42	3450	60			1.0 hr
5.											

RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor Ft.	Gravity Factor F _g	Super Compress. Factor, F _{pv}	Rate of Flow Q, Mcfd
1	0.2648	-	648.2	1.002	1.255	1.059	228.58
2	0.6082	-	623.2	0.984	1.255	1.049	491.01
3	0.8393	-	658.2	1.003	1.255	1.061	737.79
4	1.087	-	513.2	1.018	1.255	1.052	749.76
5							

NO.	R _f	Temp. °R	T _f	Z	Gas Liquid Hydrocarbon Ratio	Dry Gas	Mcf/bbl.
1	0.96	518	1.44	0.891	A.P.I. Gravity of Liquid Hydrocarbons	-	Deg.
2	0.92	537	1.50	0.909	Specific Gravity Separator Gas	0.6352	X X X X X X X X
3	0.98	517	1.44	0.889	Specific Gravity Flowing Fluid	X X X X X	
4	0.76	502	1.40	0.904	Critical Pressure	675	P.S.I.A. - P.S.I.A.
5					Critical Temperature	359	R - R

F_c 5829.2 P_c² 33979.6

NO.	P _i ²	P _w *	P _w ²	P _c ² - P _w ²
1	5716.2		32674.9	1304.7
2	5519.2		30461.6	3518.0
3	5283.2		27912.2	6067.4
4	5037.2		25373.4	8606.2
5				

(1) $\frac{P_c^2}{P_c^2 - P_w^2} = 26.044$ (2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 10.980$

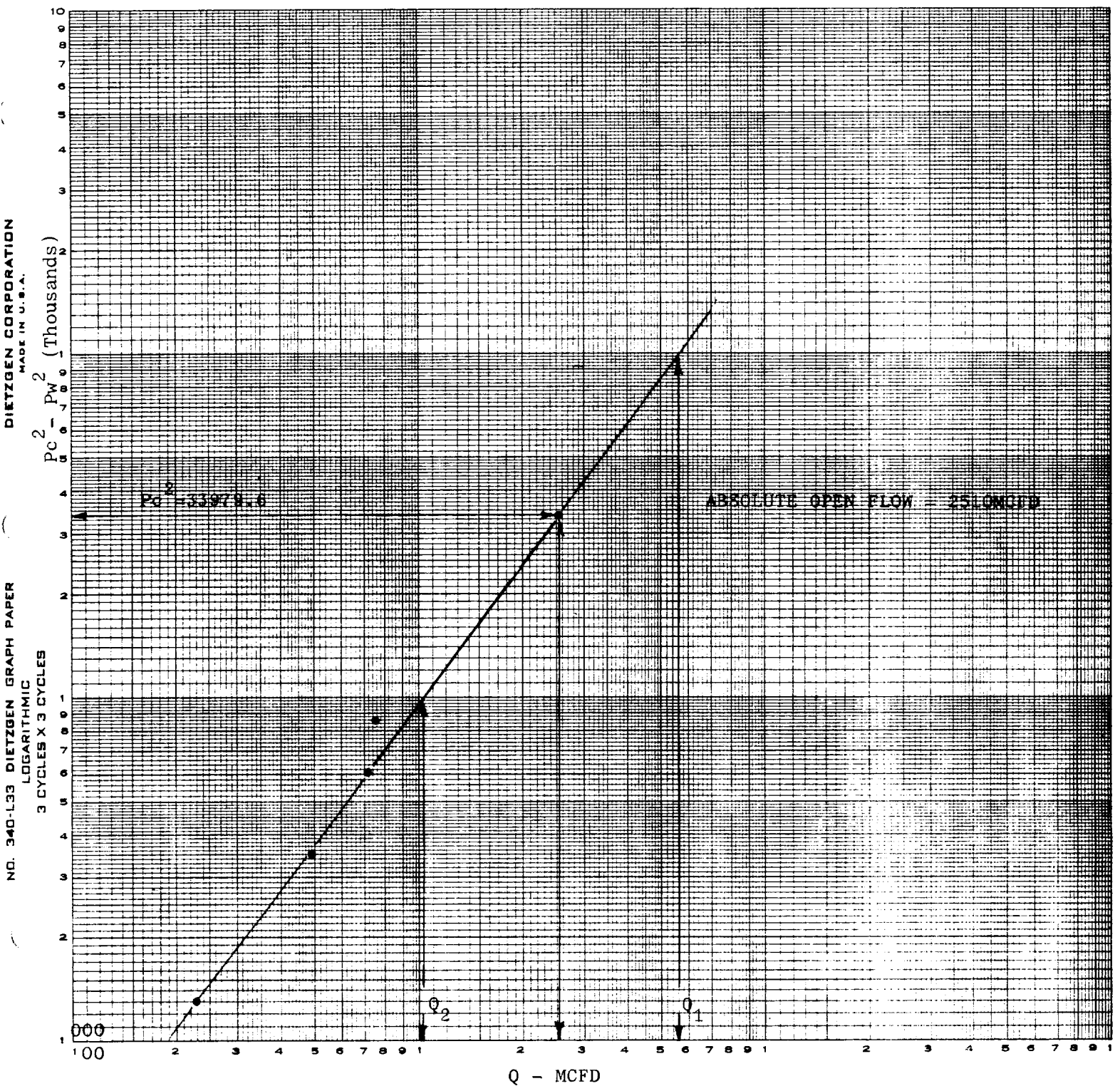
AOF = Q $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 2509.8$

Absolute Open Flow 2510	Mcf @ 15.025	Angle of Slope 53° 41'	Slope, n 0.735
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Remarks: * BOTTOM HOLE PRESSURE @ (-9408) 13384' USED FOR PRESSURE CALCULATIONS

Approved By Division	Conducted By: JARREL WELL TESTING INC	Calculated By: Joe A. Coleman	Checked By: PE #2208 Joe A. Coleman
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COMPANY: Harvey E. Yates Company
 WELL: Richardson Unit, No. 1
 LOCATION: M 32 13s 36e
 COUNTY: Lea
 DATE: November 10, 1982



$$Q_1 = 5600 \text{ MCFD}; \quad \text{Log } Q_1 = 3.74819$$

$$Q_2 = 1030 \text{ MCFD}; \quad \text{Log } Q_2 = 3.01284$$

$$N = 0.73535 = 0.735$$

RECEIVED

NOV 19 1982

REC'D
HOURS OFFICE

NEW-TEX LAB

PHONE 505/393-3561

P. O. BOX 1161

611 W. SNYDER

HOBBS, NEW MEXICO 88240

ANALYSIS CERTIFICATE

CLIENT: JAYCO CELL TESTING CO. ANALYSIS NUMBER: 1048
ADDRESS: BOX 1-87 DATE OF ANAL: 11/12/01
CITY, STATE: HOBBS, NM 88240 DATE RECEIVED: 11/12/01

SAMPLE IDENT: JAYCO - RICHARDSON #1
SAMPLING FREES: 552 PSIG SAMPLING TEMP: 44 DEG F

REMARKS: 552 PSIG

***** GAS ANALYSIS *****

	MOLE PERCENT	BAU / SCF
NITROGEN	1.148	
CARBON DIOXIDE	1.412	
METHANE	88.379	
ETHANE	5.322	1.686
PROPANE	1.356	3.329
ISOBUTANE	2.323	2.127
NORMAL BUTANE	2.337	2.126
ISOPENTANE	2.122	2.237
NORMAL PENTANE	2.236	3.212
HEXANE	2.033	3.214
HEPTANE PLUS	2.271	3.214
TOTAL	100.222	1.493

PROPANE GRAM: 2.51 BUTANE GRAM: 2.01
ETHANE GRAM: 1.67 PENTANE PLUS GRAM: 2.09

HEXANE GRAM (CALC): 2.5322
HEPTANE PLUS GRAM: 2.540

WATER VAPOR PT	PRESSURE (PSIA)	WET	DRY
14.696	1263	1272	
14.687	1262	1270	
14.715	1264	1268	
14.708	1264	1268	

ANALYZED BY: _____

APPROVED BY: _____

Dean Simpson

EX-100

NOV 19 1982

G.C.O.
HOBBS OFFICE

JARREL SERVICES, INC.

POST OFFICE BOX 1654

PHONES 505 393-5396 — 393-8274

HOBBBS, NEW MEXICO 88240

BOTTOM HOLE PRESSURE RECORD

OPERATOR Harvey E. Yates Company
 FIELD Austin
 FORMATION Mississippian
 LEASE Richardson Unit WELL #1
 COUNTY Lea STATE New Mexico
 DATE 11/10/82 TIME 11:00 AM
 Status Shut in
 Test Depth 13331'
 Time S. I. 4 Months Last test date -
 Tub Pres. 4160 DWT BHP last test -
 Cas. Pres. PKR BHP change -
 Elev. 3976' GL Fluid top None
 Datum (-9408)** Water top None
 Temp. ⊙ - Run by JSI #24
 Cal. No. A16786N Chart No. 1

Depth	Pressure	Gradient
0	4160	-
2000	4403	.122
4000	4649	.123
6000	4895	.123
8000	5143	.124
10000	5391	.124
11000	5516	.125
12000	5641	.125
13000	5767	.126
13331	5809	.127
13384 (-9408)	5816 * **	(.127)

* EXTRAPOLATED PRESSURE

** MIDPOINT OF CASING PERFORMANCES

