

Flow Time	1st	Min.	2nd	Min.	Date	11-10-64	Ticket Number	419044 - S	Legal Location Sec. - Twp. - Eng.
Closed In Pres. Time	1st	Min.	2nd	Min.	Kind of Job	OPEN HOLE	Halliburton District	GREAT BEND	
Pressure Readings	Field		Office Corrected		Tester	MR. NUTTING	Witness	MR. CRAIG	
Depth Top Gauge	4282 Ft.		NO Blanked Off		Drilling Contractor	PEEL BROTHERS INCORPORATED IC			SEC. 6 - 20 - 21
BT. P.R.D. No.	566		12 Hour Clock		Elevation	2242' D.F.	Top Packer	-	
Initial Hydro Mud Pressure	2265		2252		Total Depth	4304'	Bottom Packer	4292'	
Initial Closed in Pres.	1314		1317		Interval Tested	4292' - 4304'	Formation Tested	FORT SCOTT	Well No.
Initial Flow Pres.	10	1	15		Casing or Hole Size	7 5/8"	Casing Perfs. } Top Bot.	-	
Final Flow Pres.	10	1	13						
Final Flow Pres.	19	2	26		Surface Choke	1"	Bottom Choke	3/4"	Test No.
Final Closed in Pres.	1258		1255		Size & Kind Drill Pipe	4 1/2"	Drill Collars Above Tester	-	
Final Hydro Mud Pressure	2189		2237		Mud Weight	10.2	Mud Viscosity	47	
Depth Cen. Gauge	Ft.		Blanked Off		Temperature	112	Anchor Size & Length	ID 3.75" X 12 OD 5.00"	Field Area
BT. P.R.D. No.			Hour Clock		Depths Mea. From	DERRICK FLOOR	Depth of Tester Valve	4273' Ft.	
Initial Hydro Mud Pres.					Cushion	-	Depth Back Pres. Valve	-	
Initial Closed in Pres.					Recovered	55	Feet of	Oil & gas cut mud	County
Initial Flow Pres.	1				Recovered	366	Feet of	Gas in drill pipe	
Final Flow Pres.	1				Recovered		Feet of		
Final Closed in Pres.					Recovered		Feet of		NESS
Final Hydro Mud Pres.					Oil A.P.I. Gravity	-	Water Spec. Gravity	-	
Depth Bot. Gauge	4300 Ft.		YES Blanked Off		Gas Gravity	-	Surface Pressure	-	
BT. P.R.D. No.	239		12 Hour Clock		Tool Opened	11:33 PM	A.M. P.M. Tool Closed	2:16 AM	State
Initial Hydro Mud Pres.	2274		2270		Remarks	Opened tool for 6 minute 1st flow with a			
Initial Closed in Pres.	1333		1329		weak blow. Closed tool for 30 minute initial				
Initial Flow Pres.	18		1		closed in pressure. Reopened tool for 90 minute				KANSAS
Final Flow Pres.	27		2		2nd flow with good blow. Closed tool for 37				
Final Flow Pres.	27		1		minute final closed in pressure.				
Final Closed in Pres.	1269		1265						Owner's District
Final Hydro Mud Pres.	2238		2250						

FORMATION TEST DATA

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Gauge No. 566			Depth 4282'			Clock 12 hour		Ticket No. 419044		
First Flow Period			Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.
P ₀	.000	15	.000		13	.000	19	.000		26
P ₁	.0058	13	.0197		34	.099	18	.0237		59
P ₂	.0116	13	.0394		68	.198	19	.0474		105
P ₃	.0174	13	.0591		115	.297	21	.0711		177
P ₄	.0232	13	.0788		192	.396	22	.0948		307
P ₅	.0290	13	.0985		334	.495	24	.1185		613
P ₆	.0350	13	.1182		680	.594	26	.1422		955
P ₇			.1379		1082			.1659		1130
P ₈			.1576		1240			.1896		1202
P ₉			.1773		1293			.2133		1229
P ₁₀			.1970		1317			.2370		1255

Gauge No. 239			Depth 4300'			Clock 12		hour		
P ₀	.000	27	.000		25	.000	25	.000		35
P ₁	.006	25	.0201		45	.1077	25	.0248		68
P ₂	.012	25	.0402		75	.2154	27	.0496		114
P ₃	.018	25	.0603		119	.3231	30	.0744		187
P ₄	.024	25	.0804		186	.4308	32	.0992		334
P ₅	.030	25	.1005		301	.5385	34	.1240		659
P ₆	.036	25	.1206		584	.6460	35	.1488		1020
P ₇			.1407		1130			.1736		1165
P ₈			.1608		1254			.1984		1220
P ₉			.1809		1307			.2232		1241
P ₁₀			.2010		1329			.2480		1265
Reading Interval 1			3			15		3.7 Minutes		

REMARKS:

SPECIAL PRESSURE DATA

Flow Time	1st	Min.	2nd	Min.	Date	11-11-64	Ticket Number	419045 S
Closed In Pres. Time	1st	Min.	2nd	Min.	Kind of Job	OPEN HOLE	Halliburton District	GREAT BEND
Pressure Readings	Field		Office Corrected		Tester	NUTTING - COBB	Witness	J. CREIG
Depth Top Gauge	4364	Ft.	no	Blanked Off	Drilling Contractor	PEEL BROTHERS INCORPORATED	LC	
BT. P.R.D. No.	566		12	Hour Clock	Elevation	2242' DF	Top Packer	--
Initial Hydro Mud Pressure	2183		2262		Total Depth	4384'	Bottom Packer	4374'
Initial Closed in Pres.	1305		1373		Interval Tested	4374' - 4384'	Formation Tested	Mississippi
Initial Flow Pres.	18	1	19		Casing or Hole Size	7 5/8"	Casing Perfs.	Top Bot.
Final Flow Pres.	36	2	50		Surface Choke	1"	Bottom Choke	3/4"
Final Flow Pres.	36	1	40		Size & Kind Drill Pipe	4 1/2" ACME	Drill Collars Above Tester	none
Final Flow Pres.	145	2	148				I.D. - LENGTH	
Final Closed in Pres.	1305		1366		Mud Weight	10.1	Mud Viscosity	49
Final Hydro Mud Pressure	2183		2240		Temperature		Anchor Size & Length	10 3/4" X 10'
Depth Can. Gauge		Ft.		Blanked Off				
BT. P.R.D. No.				Hour Clock	Depths Meas. From	Derrick Floor	Depth of Tester Valve	4355 Ft.
Initial Hydro Mud Pres.					Cushion	none	Depth Back Pres. Valve	--
Initial Closed in Pres.					Recovered	252	Feet of free oil.	
Initial Flow Pres.		1			Recovered	122	Feet of gassy muddy oil.	
Final Flow Pres.		1			Recovered		Feet of	
Final Flow Pres.		2			Recovered		Feet of	
Final Closed in Pres.					Oil A.P.I. Gravity		Water Spec. Gravity	
Final Hydro Mud Pres.					Gas Gravity		Surface Pressure	psi
Depth Bot. Gauge	4380	Ft.	yes	Blanked Off	Tool Opened	1:52 A.M.	Tool Closed	5:09 P.M.
BT. P.R.D. No.	239		12	Hour Clock	Remarks	Tool opened with a fair blow for 15 minute		
Initial Hydro Mud Pres.	2475		2280		first flow. Closed tool for a 45 minute initial			
Initial Closed in Pres.	1437		1381		closed in pressure. Reopened tool for a 75 minute			
Initial Flow Pres.	29	1	33		second flow with a fair blow. Closed tool for a			
Final Flow Pres.	48	2	61		62 minute final closed in pressure.			
Final Flow Pres.	48	1	48					
Final Flow Pres.	163	2	154					
Final Closed in Pres.	1437		1371					
Final Hydro Mud Pres.	2418		2250					

FORMATION TEST DATA

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Gauge No. 566			Depth 4364'			Clock 12 hour			Ticket No. 419045		
First Flow Period			Initial Closed In Pressure			Second Flow Period			Final Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.	
P ₀	.000	19*	.000		40	.000	50	.000		148	
P ₁	.0206	18	.0302		1333	.0992	64	.0408		1332	
P ₂	.0412	25	.0604		1357	.1984	86	.0816		1348	
P ₃	.0618	30	.0906		1364	.2976	108	.1226		1353	
P ₄	.0824	34	.1208		1366	.3968	125	.1632		1357	
P ₅	.1030	40	.1510		1368	.4960	148	.2040		1359	
P ₆			.1812		1370			.2448		1361	
P ₇			.2114		1371			.2856		1363	
P ₈			.2416		1371			.3264		1365	
P ₉			.2718		1372			.3672		1366	
P ₁₀			.3020		1373			.4080		1366	

Gauge No. 239			Depth 4380'			Clock 12 hour				
P ₀	.000	33	.000		48	.000	61	.000		154
P ₁	.022	30	.0321		1347	.107	72	.0435		1340
P ₂	.044	35	.0642		1366	.214	94	.0870		1354
P ₃	.066	40	.0963		1373	.321	115	.1305		1359
P ₄	.088	44	.1284		1375	.428	133	.1740		1363
P ₅	.110	48	.1605		1377	.535	154	.2175		1365
P ₆			.1926		1378			.2610		1366
P ₇			.2247		1379			.3045		1368
P ₈			.2568		1380			.3480		1369
P ₉			.2889		1380			.3915		1370
P ₁₀			.3210		1381			.4350		1371

Reading Interval	3		4.5		15		6.2	Minutes
REMARKS:	* Questionable							

SPECIAL PRESSURE DATA

Flow Time	1st 10 Min.	2nd 28 Min.	Date	11-11-64	Ticket Number	419046 - S
Closed In Press. Time	1st 30 Min.	2nd 18 Min.	Kind of Job	OPEN HOLE	Halliburton District	GREAT BEND
Pressure Readings	Field	Office Corrected	Tester	NUTTING - COBB	Witness	CREIG
Depth Top Gauge	4380' Ft.	NO Blanked Off	Drilling Contractor	PEEL BROTHERS, INCORPORATED		BM
BT. P.R.D. No.	566	12 Hour Clock	Elevation	2242' D.F.	Top Packer	-
Initial Hydro Mud Pressure	2380	2348	Total Depth	4394'	Bottom Packer	4384'
Initial Closed in Pres.	1371	1375	Interval Tested	4384' - 4394'	Formation Tested	MISSISSIPPI
Initial Flow Pres.	10 48	1 61	Casing or Hole Size	7 5/8"	Casing { Top - Perf. { Bot. -	
Final Flow Pres.	48 134	1 49 2 147	Surface Choke	1"	Bottom Choke	3/4"
Final Closed in Pres.	1362	1357	Size & Kind Drill Pipe	1 1/2" ACME	Drill Collars Above Tester	-
Final Hydro Mud Pressure	2284	2283	Mud Weight	10.1	Mud Viscosity	49
Depth Cen. Gauge		Blanked Off	Temperature	113 °F Est. °F Actual	Anchor Size & Length	ID 3.75" OD 5.00" X 10'
BT. P.R.D. No.		Hour Clock	Depths Mes. From	DERRICK FLOOR	Depth of Tester Valve	4375' Ft.
Initial Hydro Mud Pres.			TYPE AMOUNT		Depth Back Pres. Valve	NONE Ft.
Initial Closed in Pres.			Cushion	NONE		
Initial Flow Pres.	1		Recovered	316' Feet of oil		
Final Flow Pres.	2		Recovered	125' Feet of heavy gas & oil cut mud		
Final Closed in Pres.	1		Recovered	Feet of		
Final Hydro Mud Pres.	2		Recovered	Feet of		
Depth Bot. Gauge	4390' Ft.	YES Blanked Off	Oil A.P.I. Gravity	38	Water Spec. Gravity	-
BT. P.R.D. No.	239	12 Hour Clock	Gas Gravity	-	Surface Pressure	0# psi
Initial Hydro Mud Pres.	2366	2363	Tool Opened	4:16 PM A.M. P.M.	Tool Closed	5:24 A.M. P.M.
Initial Closed in Pres.	1378	1383	Remarks	Packer set; Tool opened @ 4:16 PM with a strong blow for a 10 minute first flow. Tool closed @ 4:26. Rotated tool for a 30 minute initial closed in pressure. Tool reopened @ 4:56 with a strong blow. Tool closed @ 5:24. Took a 18 minute final closed in pressure. Off bottom @ 5:42.		
Initial Flow Pres.	27 64	1 74				
Final Flow Pres.	64 145	1 55 2 151				
Final Closed in Pres.	1369	1364				
Final Hydro Mud Pres.	2274	2295				

FORMATION TEST DATA

5

Legal Location NE-SW

6-20-21

Field Area

WILDCAT

County

NESS

State KANSAS

Lease Name

Well No.

Test No.

Lease Owner/Company Name

Owner's District

Gauge No. 566			Depth 4380'			Clock 12 hour			Ticket No. 419046		
	First Flow Period		Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure			
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t + \theta}{\theta}$	PSIG Temp. Corr.	
P ₀	.000	17	.000		49	.000	61	.000		147	
P ₁	.0136	20	.0194		1353	.0320	68	.0124		1326	
P ₂	.0272	27	.0388		1363	.0640	83	.0248		1335	
P ₃	.0408	34	.0582		1366	.0960	100	.0372		1341	
P ₄	.0544	41	.0776		1368	.1280	118	.0496		1345	
P ₅	.068	49	.0970		1370	.179	147 *	.0620		1348	
P ₆			.1164		1372			.0744		1350	
P ₇			.1358		1373			.0868		1352	
P ₈			.1552		1373			.0992		1354	
P ₉			.1746		1374			.1116		1355	
P ₁₀			.194		1375			.124		1357	

Gauge No.			239			Depth			4390' L			Clock			12			hour		
P ₀	.000	31	.000		55	.000	74	.000		151										
P ₁	.014	32	.0206		1364	.0341	76	.013		1335										
P ₂	.028	36	.0412		1371	.0682	92	.026		1344										
P ₃	.042	42	.0618		1375	.1023	108	.039		1349										
P ₄	.056	50	.0824		1376	.1364	125	.052		1353										
P ₅	.070	55	.1030		1378	.191	151*	.065		1356										
P ₆			.1236		1380			.078		1358										
P ₇			.1442		1381			.091		1360										
P ₈			.1648		1382			.104		1362										
P ₉			.1854		1383			.117		1363										
P ₁₀			.206		1383			.130		1364										
Reading interval			2			3			5			1.8			Minutes					

REMARKS:

* LAST INTERVAL = 8 MINUTES.

SPECIAL PRESSURE DATA

FIELD

PRESSURE BUILDUP CALCULATIONS

FORMATION

1600

FORMATION TEMPERATURE

1600

- Q = PRODUCTION RATE, BPD, 71.5
- h = THICKNESS OF FORMATION, FEET, 3.0
- Q = FLOW RATE, BPD, 72
- M = SLOPE OF B-1 CURVE, PSI/CYCLE 28
- H = THICKNESS OF PRODUCING ZONE, FEET, 10
- K = PERM., MD. = $162.5 Q U B / M H$ 53
- (1) P_1 = PRESSURE ON SLOPE @ 1 HOUR, PSI, 1366
- (2) P_2 = PRESSURE @ 1 SEC. = $(P_1 - 3.56 M)$ 1267
- (3) P_f = FLOWING PRESSURE, PSI, 154
- (10) $2.303(P_2 - P_f) / M$ +91.5
- (11) R_w = RADIUS OF DRILLED HOLE, INCHES, 3.5
- (12) F = POROSITY, FRACTION, (ESTIMATE) 15
- (13) C = COMPRESS. VOL. (VOL./PSI) X 10⁶ 10
- (14) $2.303(P_2 - P_f) / M$ +402
- (15) B = SKIN, DIMENSIONLESS, = $[10] - 1.1] / 2$ -43
- (16) ΔP_s = PRESS. DROP DUE TO SKIN = $(.363 M B)$ +106
- (17) P_f^* = FLOWING PRESS. W/NO SKIN = $(P_f + \Delta P_s)$ 125
- (18) P_e = SHUT-IN PRESSURE, PSI, 1382
- (19) $P_e - P_f$ 1228
- (20) $P_e - P_f$ 651
- (21) T = DIMENSIONLESS TIME @ 1 HOUR (P. 8.1) 1.2
- (22) $P_e^2 = .64 K / \mu C T$ 1228
- (23) $P_e - P_f$ 167
- (24) $\log_{10} T = .15 / 2 M$ 2.99
- (25) $\bar{r}$ = DRAINAGE RADIUS / RADIUS DRILLED HOLE 1.1
- (26) R_e = DRAINAGE RADIUS, FT. = $(25) (.354 / 12)$ 1.1
- (27) F = POROSITY, FRACTION, = $(22) / (25)(26)$ 122
- (28) P_i = PRODUCTIVITY INDEX = $Q / (P_e - P_f)$ 634
- (29) $P_e - P_f$ 402

11-11-68

SLF 1.2-42

(1)	Q = PRODUCING RATE, BPD, ...	<u>1.1</u>
(2)	U = VISCOSITY, CENT, ...	<u>3.0</u>
(3)	B = PVF, ...	<u>1.2</u>
(4)	M = SLOPE OF B-U CURVE, PSI/CYCLE, ...	<u>58</u>
(5)	H = THICKNESS OF PRODUCING ZONE, FEET, ...	<u>10</u>
(6)	K = PERM., MD. = $162.5 Q U B / M H$, ...	<u>295</u>
(7)	P ₁ = PRESSURE ON SLOPE @ 1 HOUR, PSI, ...	<u>1525</u>
(8)	P ₂ = PRESSURE @ 1 SEC. = $(P_1 - 3.53 M)$, ...	<u>1340</u>
(9)	P _f = FLOWING PRESSURE, PSI, ...	<u>51</u>
(10)	$2.302(P_2 - P_f) / M$, ...	<u>+65.9</u>
(11)	R _W = RADIUS OF DRILLED HOLE, INCHES, ...	<u>3.25</u>
(12)	φ = POROSITY, FRACTION, (ESTIMATE), ...	<u>0.2</u>
(13)	C = COMPRESS., VOL./VOL./PSI × 10 ⁶ , ...	<u>1.5</u>
(14)	LOG ₁₀ $\left[\frac{10.16}{Q U B / M} \right]$, ...	<u>+4.56</u>
(15)	SKIN, DIMENSIONLESS = $(14.18) \times \dots$, ...	<u>+30.6</u>
(16)	ΔP _{sk} = PRESS. DROP DUE TO SKIN = $(1.288 M B)$, ...	<u>+1010</u>
(17)	P _f [*] = FLOWING PRESS. W/NO SKIN = $(P_f + ΔP_{sk})$, ...	<u>116</u>
(18)	P ₂ = FINAL PRESSURE, PS., ...	<u>208</u>
(19)	$P_2 - P_f$, ...	<u>8</u>
(20)	ΔP = $(1.288 M B) \times (P_2 - P_f)$, ...	<u>1242</u>
(21)	T = DIMENSIONLESS TIME @ 1 HOUR, ...	<u>1285</u>
(22)	FOF = $204 \times / U B T$, ...	<u>7700</u>
(23)	$(P_2 - P_f)$, ...	<u>222</u>
(24)	LOG ₁₀ T = $(2.51) / 2 M$, ...	<u>2.12</u>
(25)	R = DRAINAGE RADIUS/RATING DRILLED HOLE, ...	<u>130</u>
(26)	R _E = DRAINAGE RADIUS, FT. = $(2.51 \times R_W / \phi)$, ...	<u>1410</u>
(27)	φ = POROSITY, FRACTION, = $(20 - 120) \times 26$, ...	<u>.112</u>
(28)	P ₁ = PRODUCTIVITY INDEX = $Q / (P_1 - P_f)$, ...	<u>.15</u>
(29)	P ₁ [*] = P ₁ W/NO SKIN = $P_1 + ΔP_{sk}$, ...	<u>833</u>

FIELD DATA
FORMATION
PRESSURE BUILDUP CALCULATIONS
WELL
APPROXIMATE INITIAL