

Flow Time	1st 4	Min.	2nd 60	Min.	Date	2-6-64	Ticket Number	381226 S
Closed In Press. Time	1st 30	Min.	2nd 30	Min.	Kind of Job	OPEN HOLE	Halliburton District	GREAT BEND
Pressure Readings	Field		Office Corrected		Tester	C. L. NUTTING	Witness	F. MC COLLUM
Depth Top Gauge	4282	Ft.	No	Blanked Off	Drilling Contractor	PEEL BROS. DRLG. CO.		
BT. P.R.D. No.	232		12	Hour Clock	Elevation	2236' KB	Top Packer	-
Initial Hydro Mud Pressure	2260		2286		Total Depth	4304'	Bottom Packer	4286'
Initial Closed in Pres.	1134		1215		Interval Tested	4286-4304'	Formation Tested	Ft. Scott
Initial Flow Pres.	9	1	9		Casing or Hole Size	7 7/8"	Casing } Top	Perfs. } Bot.
	-	2	12					
Final Flow Pres.		1	8		Surface Choke	1"	Bottom Choke	3/4"
Final Closed in Pres.	252		249		Size & Kind Drill Pipe	4 1/2" FH 480' Flex. WT.	Drill Collars Above Tester	- I.D. - LENGTH
Final Hydro Mud Pressure	2260		2286		Mud Weight	10.3	Mud Viscosity	43
Depth Cen. Gauge		Ft.		Blanked Off	Temperature	111	*F Est. Anchor Size & Length	ID 3.75 OD 5.00 X 18
BT. P.R.D. No.				Hour Clock	Depths Mea. From	Kelly Bushing	Depth of Tester Valve	4273' Ft.
Initial Hydro Mud Pres.					TYPE AMOUNT		Depth Back Pres. Valve	Ft.
Initial Closed in Pres.					Cushion	-		
Initial Flow Pres.		1			Recovered	25	Feet of	Mud with oil specks
Final Flow Pres.		2			Recovered		Feet of	
Final Closed in Pres.		1			Recovered		Feet of	
Final Hydro Mud Pres.		2			Recovered		Feet of	
Depth Bot. Gauge	4300	Ft.	Yes	Blanked Off	Oil A.P.I. Gravity		Water Spec. Gravity	
BT. P.R.D. No.	1462		12	Hour Clock	Gas Gravity		Surface Pressure	psi
Initial Hydro Mud Pres.	2343		2293		Tool Opened	10:51 AM	A.M. P.M.	Tool Closed 12:25 PM A.M. P.M.
Initial Closed in Pres.	1229		1222		Remarks	Tool opened at 10:51 AM with a weak blow for a 4 minute first flow. Rotated tool at 10:51		
Initial Flow Pres.	9	1	19			for a 30 minute initial closed in pressure. Re-		
Final Flow Pres.	27	2	22			opened tool at 11:25 with a weak blow for a 60		
Final Closed in Pres.	269		257			minute second flow. Took a 30 minute final		
Final Hydro Mud Pres.	2307		2293			closed in pressure.		

Legal Location C SE SW 6 20 21  
 Field Area WILDCAT  
 County NESS  
 State KANSAS

FORMATION TEST DATA

Gauge No. 232			Depth 4282			Clock 12		hour			Ticket No. 381226		
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 <sub>0</sub>	.000	9	.000		8	.000	12	.000		16			
P <sub>1</sub>	.025	8	.020		26	.100	12	.201		249			
P <sub>2</sub>			.040		58	.200	13						
P <sub>3</sub>			.060		115	.300	14						
P <sub>4</sub>			.080		235	.400	16						
P <sub>5</sub>			.100		463								
P <sub>6</sub>			.120		773								
P <sub>7</sub>			.140		973								
P <sub>8</sub>			.160		1096								
P <sub>9</sub>			.180		1167								
P <sub>10</sub>			.200		1215								

Gauge No. 1462			Depth 4300			Clock 12		hour		
	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 <sub>0</sub>	.000	19	.000		15	.000	22	.000		22
P <sub>1</sub>	.026	15	.0198		36	.1005	18	.200		257
P <sub>2</sub>			.0396		68	.2010	20			
P <sub>3</sub>			.0594		128	.3015	21			
P <sub>4</sub>			.0792		272	.4020	22			
P <sub>5</sub>			.0990		585					
P <sub>6</sub>			.1188		860					
P <sub>7</sub>			.1386		1025					
P <sub>8</sub>			.1584		1122					
P <sub>9</sub>			.1782		1184					
P <sub>10</sub>			.1980		1222					
Reading Interval			3			15		Minutes		

REMARKS:

### SPECIAL PRESSURE DATA

Flow Time	1st 7	Min.	2nd 60	Min.	Date	2-7-64	Ticket Number	381227
Closed In Press. Time	1st 30	Min.	2nd 30	Min.	Kind of Job	Open Hole	Halliburton District	Great Bend
Pressure Readings	Field		Office Corrected		Tester	C.L. Nutting	Witness	F. McCollum
Depth Top Gauge	4343	Ft.	no	Blanked Off	Drilling Contractor	Peel Bros. Inc.		
BT. P.R.D. No.	232		12	Hour Clock	Elevation	2236' KB	Top Packer	
Initial Hydro Mud Pressure	2351		2299		Total Depth	4365'	Bottom Packer	4347'
Initial Closed in Pres.	27		23		Interval Tested	4347-4365'	Formation Tested	Conglomerate
Initial Flow Pres.	9	1 2	17 17		Casing or Hole Size	7 7/8"	Casing Perfs.	Top Bot.
Final Flow Pres.	18	1 2	16 22		Surface Choke	1"	Bottom Choke	3/4"
Final Closed in Pres.	18		25		Size & Kind Drill Pipe	480' flx wt. 4 1/2" FH	Drill Collars Above Tester	I.D. - LENGTH
Final Hydro Mud Pressure	2333		2299		Mud Weight	10.3	Mud Viscosity	45
Depth Cen. Gauge		Ft.		Blanked Off	Temperature	111	Anchor Size & Length	ID 3.75" OD 5.00" X 18'
BT. P.R.D. No.				Hour Clock	Depths Mea. From	Kelly bushing	Depth of Tester Valve	4334 Ft.
Initial Hydro Mud Pres.					Cushion	TYPE AMOUNT	Depth Back Pres. Valve	Ft.
Initial Closed in Pres.					Recovered	30 Feet of	drlg fluid	
Initial Flow Pres.		1 2			Recovered	Feet of		
Final Flow Pres.		1 2			Recovered	Feet of		
Final Closed in Pres.					Recovered	Feet of		
Final Hydro Mud Pres.					Oil A.P.I. Gravity		Water Spec. Gravity	
Depth Bot. Gauge	4361	Ft.	yes	Blanked Off	Gas Gravity		Surface Pressure	psi
BT. P.R.D. No.	1462		12	Hour Clock	Tool Opened	6:28 7:05 AM	Tool Closed	6:35 8:05 AM
Initial Hydro Mud Pres.	2343		2313		Remarks	Open tool at 6:28 AM with a weak blow.		
Initial Closed in Pres.	36		34			Closed at 6:35 for 30 mins. Reopen tool at		
Initial Flow Pres.	18	1 2	29 29			7:05 no blow. Closed at 8:05 for 32 mins.		
Final Flow Pres.	36	1 2	29 34			Off bottom at 8:37.		
Final Closed in Pres.	36		36			No special reading adaptable.		
Final Hydro Mud Pres.	2343		2313					

Legal Location Sec. - Twp. - Rng. Lease Name G SE SW 6-20-21 Well No. Test No. Field Area WILD CAT Lease Owner/Company Name NESS County State KANSAS Owner's District

FORMATION TEST DATA

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Flow Time	1st 2	Min.	2nd 90	Min.	Date	2-7-64	Ticket Number	381228 S
Closed In Press. Time	1st 30	Min.	2nd 31	Min.	Kind of Job	OPEN HOLE	Halliburton District	GREAT BEND
Pressure Readings	Field		Office Corrected		Tester	C. L. NUTTING	Witness	MR. MC COLLUM
Depth Top Gauge	4353	Ft.	Blanked Off No		Drilling Contractor	PEEL BROS. INC.		
BT. P.R.D. No.	232		Hour Clock 12		Elevation	2236' KB	Top Packer	-
Initial Hydro Mud Pressure	2351		2289		Total Depth	4377'	Bottom Packer	4361'
Initial Closed in Pres.	1342		1337		Interval Tested	4361-4377'	Formation Tested	Mississippi
Initial Flow Pres.	18		1 2	17 22	Casing or Hole Size	7 7/8"	Casing Perfs.	{ Top Bot.
Final Flow Pres.	81		1 2	17 79	Surface Choke	1"	Bottom Choke	3/4"
Final Closed in Pres.	1061		1056		Size & Kind Drill Pipe	4 1/2" FH-480' Flex.	Drill Collars Above Tester	I.D. - LENGTH -
Final Hydro Mud Pressure	2315		2276		Mud Weight	10.2	Mud Viscosity	43
Depth Cen. Gauge		Ft.	Blanked Off		Temperature	112	Anchor Size & Length	ID 3.75" X OD 5.00
BT. P.R.D. No.			Hour Clock		Depths Mea. From	Kelly Bushing	Depth of Tester Valve	4344' Ft.
Initial Hydro Mud Pres.					Cushion	none	Depth Back Pres. Valve	Ft.
Initial Closed in Pres.					Recovered	40	Feet of	Heavy oil cut mud
Initial Flow Pres.			1 2		Recovered	120	Feet of	Oil cut mud
Final Flow Pres.			1 2		Recovered		Feet of	
Final Closed in Pres.					Recovered		Feet of	
Final Hydro Mud Pres.					Oil A.P.I. Gravity		Water Spec. Gravity	
Depth Bot. Gauge	4373	Ft.	Blanked Off Yes		Gas Gravity		Surface Pressure	psi
BT. P.R.D. No.	1462		Hour Clock 12		Tool Opened	10:16 PM	Tool Closed	12:18 AM
Initial Hydro Mud Pres.	2343		2303		Remarks	Tool opened at 10:16 PM with a weak blow		
Initial Closed in Pres.	1346		1350			for a 2 minute first flow. Rotated tool at 10:18		
Initial Flow Pres.	36		1 2	33 41		for a 30 minute initial closed in pressure. Re-		
Final Flow Pres.	90		1 2	30 90		opened tool at 10:58 with a weak blow for a 90 min.		
Final Closed in Pres.	1058		1067			second flow. Closed at 12:18 AM for a 31 minute		
Final Hydro Mud Pres.	2307		2287			final closed in pressure.		

Legal Location Sec. - Twp. - Rng. C SE SW 6 20 21  
 Lease Name O'BRIEN  
 Well No. A-1  
 Test No. 3  
 Field Area Wildcat  
 County NESS  
 Lease Owner/Company Name GILES SERVICE OIL COMPANY  
 State KANSAS  
 Owner's District WANDAC

FORMATION TEST DATA

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Gauge No. 232		Depth 4353		Clock 12 hour		Ticket No. 381228				
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 <sub>0</sub>	.000	17	.000		17	.000	22	.900		79
P <sub>1</sub>	.009	17	.0197		902	.119	39	.0205		113
P <sub>2</sub>			.0394		1127	.238	51	.0410		180
P <sub>3</sub>			.0591		1206	.357	63	.0615		309
P <sub>4</sub>			.0788		1250	.476	71	.0820		533
P <sub>5</sub>			.0985		1279	.595	79	.1025		737
P <sub>6</sub>			.1182		1299			.1230		854
P <sub>7</sub>			.1379		1313			.1435		928
P <sub>8</sub>			.1576		1323			.1640		983
P <sub>9</sub>			.1773		1331			.1845		1025
P <sub>10</sub>			.1970		1337			.2050		1056

Gauge No. 1462		Depth 4373		Clock 12 hour								
	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 <sub>0</sub>	.000	33	.000		30	.000	41	.000		90		
P <sub>1</sub>	.010	30	.0192		1030	.1196	51	.020		127		
P <sub>2</sub>			.0384		1163	.2392	64	.040		201		
P <sub>3</sub>			.0576		1226	.3588	73	.060		369		
P <sub>4</sub>			.0768		1268	.4784	82	.080		627		
P <sub>5</sub>			.0960		1294	.5980	90	.100		792		
P <sub>6</sub>			.1152		1314			.120		888		
P <sub>7</sub>			.1344		1326			.140		953		
P <sub>8</sub>			.1536		1336			.160		1000		
P <sub>9</sub>			.1728		1344			.180		1038		
P <sub>10</sub>			.1920		1350			.200		1067		
Reading Interval			3				18				3.1	Minutes

REMARKS:

### SPECIAL PRESSURE DATA

(1)	Q - PRODUCING RATE, BPD, .....	<u>2.5</u>	
(2)	U - VISCOSITY, CENT, .....	<u>2.5</u>	
(3)	B - FVF .....	<u>1.2</u>	
(4)	M - SLOPE OF B-U CURVE, PSI/CYCLE .....	<u>998</u>	
(5)	H - THICKNESS OF PRODUCING ZONE, FEET, ....	<u>2</u>	
(6)	K - PERM., MD. = 162.5 Q U B / M H .....	<u>6.13</u>	
(7)	P <sub>1</sub> - PRESSURE ON SLOPE @ 1 HOUR, PSI, .....	<u>1263</u>	955
(8)	P <sub>2</sub> - PRESSURE @ 1 SEC. = (P <sub>1</sub> - 3.56 M) ....	<u>-2277</u>	
(9)	P <sub>F</sub> - FLOWING PRESSURE, PSI, .....	<u>90</u>	
(10)	2.302(P <sub>2</sub> - P <sub>F</sub> ) / M .....	<u>-5.71</u>	
(11)	R <sub>W</sub> - RADIUS OF DRILLED HOLE, INCHES, .....	<u>3.94</u>	$K_{10}^2 = 15.51$
(12)	F - POROSITY, FRACTION, (ESTIMATE) .....	<u>.15</u>	
(13)	C - COMPRESS., VOL/VOL/PSI X 10 <sup>6</sup> .....	<u>10</u>	
(14)	2.302 LOG <sub>10</sub> { $\frac{10.5 K}{F C U R_W R_W}$ } + 0.8 .....	<u>.901</u>	
(15)	S - SKIN, DIMENSIONLESS, = [(10) - (14)] / 2 .....	<u>-3.31</u>	
(16)	ΔP <sub>S</sub> - PRESS. DROP DUE TO SKIN = (.868 M S) .....	<u>-2860</u>	
(17)	P <sub>F</sub> * - FLOWING PRESS. W/NO SKIN = (P <sub>F</sub> + ΔP <sub>S</sub> ) .....	<u>-2770</u>	
(18)	P <sub>E</sub> - FINAL PRESSURE, PSI, .....	<u>1570</u>	
(19)	(P <sub>2</sub> - P <sub>F</sub> ) .....	<u>407</u>	
(20)	ΔP = 1.151(P <sub>E</sub> - P <sub>F</sub> ) / M .....	<u>471</u>	
(21)	T - DIMENSIONLESS TIME @ 1 HOUR (FIG.1) .....	<u>180</u>	
(22)	FR <sub>0</sub> <sup>2</sup> = 254 K / U C T .....	<u>359</u>	
(23)	(P <sub>2</sub> - P <sub>F</sub> ) .....	<u>4440</u>	
(24)	LOG <sub>10</sub> FR <sub>0</sub> <sup>2</sup> = (23) / 2 M .....	<u>2.23</u>	
(25)	R̄ - DRAINAGE RADIUS/RADIUS DRILLED HOLE .....	<u>10.7</u>	
(26)	R <sub>E</sub> - DRAINAGE RADIUS, FT. = (25) X R <sub>W</sub> / 12 .....	<u>55.5</u>	$K_{10}^2 = 3080$
(27)	F - POROSITY, FRACTION, = (25) / (25) (26) .....	<u>.1162</u>	
(28)	PI - PRODUCTIVITY INDEX = Q / (P <sub>E</sub> - P <sub>F</sub> ) .....	<u>.0158</u>	26.4
(29)	PI - PI W/NO SKIN = Q / (P <sub>E</sub> - P <sub>F</sub> *) .....	<u>.00513</u>	9.4
(30)	EFFICIENCY = 100 X (28) / (29) .....		

FIELD SANDREX SOUTH WELL CIRCUIT 11" #1  
 FORMATION MISSISSIPPIAN PRODUCING INTERVAL 4361-4377  
 PRESSURE BUILDUP CALCULATIONS