MILLER TESTING COMPANY

Box 547

GREAT BEND, KANSAS

Company CITIES SERVICE OIL COMPANY

Lease and Well No. MOORE #B-4

County NESS State KANSAS Date 4-23-65

Formation Test No. #1 Total Depth 4402

Interval Tested 4393 To 4402 Anchor Length 9'

Size Hole 7 7/8 Size Drill Pipe 4½ACME 4½FH Size Packer 6 3/4

Mud Weight 10.3 Viscosity 40 Bottom Hole Temp. 118 °F

Chokes: Top 1/2 Bottom 1/2 Ticket No. 7351

RECOVERY

WEAK STEADY BLOW THROUGHOUT TEST

120' GAS IN PIPE
103' HEAVY OIL CUT MUD

Lease and Well No. MOORE #B-4

COMPANY CITIES SERVICE OIL COMPANY DATE 4-23-65

LEASE MOORE WELL NO. B-4 TEST NO. 1 TICKET NO. 7351

	TIME	PSI
INITIAL HYDRO MUD PRESSURE	---	2505
INITIAL CLOSED IN PRESSURE	30 MINS	1266
INITIAL FLOW	----	26
FINAL FLOW	75 MINS	57
FINAL CLOSED IN PRESSURE	30 MINS	1171
FINAL HYDRO MUD PRESSURE	----	2452

TOTAL DEPTH 4402

PACKER DEPTH 4393

BT. NO. 2162 DEPTH 4397

	1ST FLOW PRESSURE		INITIAL CIP		2ND FLOW PRESSURE		FINAL CIP	
	TIME DEFL. .000"	PSI TEMP. CORR.	TIME DEFL. .000"	PSI TEMP. CORR.	TIME DEFL. .000"	PSI TEMP. CORR.	TIME DEFL. .000"	PSI TEMP. CORR.
P0	.000	26	.000	26	.000	36	.000	57
P1	5 .042	26	5 .042	43	10 .083	36	5 .042	121
P2	10 .083	26	10 .083	173	20 .167	40	10 .083	718
P3	15 .125	26	15 .125	1150	30 .250	43	15 .125	1042
P4			20 .167	1202	40 .333	47	20 .167	1107
P5			25 .209	1237	50 .416	52	25 .209	1150
P6			30 .250	1266	60 .500	57	30 .250	1171
P7								
P8								
P9								
P10								
	5 MINUTE INTERVAL		5 MINUTE INTERVAL		10 MINUTE INTERVAL		5 MINUTE INTERVAL	

REMARKS

SPECIAL PRESSURE DATA

MILLER TESTING COMPANY

Box 547

GREAT BEND, KANSAS

Company CITIES SERVICE OIL COMPANY

Lease and Well No. MOORE #B-4

County NESS State KANSAS Date 4-24-65

Formation Test No. #2 Total Depth 4412

Interval Tested 4402 To 4412 Anchor Length 10'

Size Hole 7 7/8 Size Drill Pipe 4½ ACME 4½ FH Size Packer 6 3/4

Mud Weight 10.1 Viscosity 47 Bottom Hole Temp. 118 °F

Chokes: Top 1/2 Bottom 1/2 Ticket No. 7352

RECOVERY

FAIR BLOW THROUGHOUT TEST

180' GAS IN PIPE
189' HEAVY OIL CUT MUD
63' SLIGHTLY MUDDY OIL

COMPANY CITIES SERVICE OIL COMPANY DATE 4-24-65

LEASE MOORE WELL NO. B-4 TEST NO. 2 TICKET NO. 7352

	TIME	PSI
INITIAL HYDRO MUD PRESSURE	----	2452
INITIAL CLOSED IN PRESSURE	30 MINS	1266
INITIAL FLOW	----	29
FINAL FLOW	75 MINS	104
FINAL CLOSED IN PRESSURE	30 MINS	1138
FINAL HYDRO MUD PRESSURE	----	2387

TOTAL DEPTH 4412

PACKER DEPTH 4402

BT. NO. 2162 DEPTH 4407

	1ST FLOW PRESSURE		INITIAL CIP		2ND FLOW PRESSURE		FINAL CIP	
	TIME DEFL. .000"	PSI TEMP. CORR.	TIME DEFL. .000"	PSI TEMP. CORR.	TIME DEFL. .000"	PSI TEMP. CORR.	TIME DEFL. .000"	PSI TEMP. CORR.
P0	.000	29	.000	35	.000	55	.000	104
P1	5 .042	31	5 .042	173	10 .083	60	5 .042	934
P2	10 .083	33	10 .083	1161	20 .167	69	10 .083	1031
P3	15 .125	35	15 .125	1216	30 .250	78	15 .125	1081
P4			20 .167	1237	40 .333	86	20 .167	1107
P5			25 .209	1252	50 .416	95	25 .209	1121
P6			30 .250	1266	60 .500	104	30 .250	1138
P7								
P8								
P9								
P10								
	5 MINUTE INTERVAL		5 MINUTE INTERVAL		10 MINUTE INTERVAL		5 MINUTE INTERVAL	

REMARKS

SPECIAL PRESSURE DATA

MILLER TESTING COMPANY
Box 547
GREAT BEND, KANSAS

Company CITIES SERVICE OIL COMPANY

Lease and Well No. MOORE #B-4

County NESS State KANSAS Date 4-24-65

Formation Test No. #3 Total Depth 4422

Interval Tested 4412 To 4422 Anchor Length 10'

Size Hole 7 7/8 Size Drill Pipe 4½ ACME-4½ FH Size Packer 6 3/4

Mud Weight 10.1 Viscosity 47 Bottom Hole Temp. 120 ° F

Chokes: Top 1/2 Bottom 1/2 Ticket No. 7353

RECOVERY

GOOD BLOW THROUGHOUT TEST

660' GAS IN PIPE
519' FREE OIL
180' SLIGHTLY MUDDY OIL
240' MUDDY OIL

939' FLUID

Lease and Well No. MOORE #B-4

COMPANY CITIES SERVICE OIL COMPANY, DATE 4-24-65

LEASE MOORE WELL NO. B-4 TEST NO. 3 TICKET NO. 7353

	TIME	PSI
INITIAL HYDRO MUD PRESSURE	---	2461
INITIAL CLOSED IN PRESSURE	30 MINS	1358
INITIAL FLOW	---	43
FINAL FLOW	80 MINS	348
FINAL CLOSED IN PRESSURE	30 MINS	1349
FINAL HYDRO MUD PRESSURE	----	2364

TOTAL DEPTH 4422

PACKER DEPTH 4412

BT. NO. 2162 DEPTH 4417

	1ST FLOW PRESSURE		INITIAL CIP		2ND FLOW PRESSURE		FINAL CIP	
	TIME DEFL. .000"	PSI TEMP. CORR.	TIME DEFL. .000"	PSI TEMP. CORR.	TIME DEFL. .000"	PSI TEMP. CORR.	TIME DEFL. .000"	PSI TEMP. CORR.
P0	.000	43	.000	112	.000	161	.000	348
P1	5 .042	52	5 .042	1301	10 .083	192	5 .042	1313
P2	10 .083	59	10 .083	1332	20 .167	225	10 .083	1332
P3	15 .125	86	15 .125	1346	30 .250	259	15 .125	1341
P4	20 .167	112	20 .167	1351	40 .333	294	20 .167	1344
P5			25 .209	1355	50 .416	323	25 .209	1349
P6			30 .250	1358	60 .500	348	30 .250	1349
P7								
P8								
P9								
P10								
	5 MINUTE INTERVAL		5 MINUTE INTERVAL		10 MINUTE INTERVAL		5 MINUTE INTERVAL	

REMARKS

SPECIAL PRESSURE DATA

DST #2

DATE: 4-24-65
ELEV - 2297
G.D. 4407

PRESSURE BUILDUP CALCULATIONS

FIELD SCHABEN WELL MOORE "S" #6

FORMATION MISS. (OSAGE) PRODUCING INTERVAL 4402-4412

(1)	Q - PRODUCING RATE, BPD, ...	4.5
(2)	U - VISCOSITY, CENT, ...	3.0
( )	B - FVF	1.2
(4)	M - SLOPE OF B-U CURVE, PSI/CYCLE	248
(5)	H - THICHNESS OF PRODUCING ZONE, FEET, ...	10
(6)	K - PERM., MD. = 162.5 Q U B/ M H	11.45
(7)	P_1 - PRESSURE ON SLOPE @ 1 HOUR, PSI, ...	1186
(8)	P_2 - PRESSURE @ 1 SEC. = (P_1 - 3.56 M)	313
(9)	P_F - FLOWING PRESSURE, PSI, ...	92
(10)	$2.302(P_2 - P_F)/M$	+2.05
(11)	R_W - RADIUS OF DRILLED HOLE, INCHES, ...	3.94 R_W^2 = 15.52
(12)	F - POROSITY, FRACTION, (ESTIMATE)	.15
(13)	C - COMPRESS., VOL/VOL/PSI x 10^6	10
(14)	$2.30 LOG_{10} \left(\frac{10.5\ K}{F\ C\ U\ R_W\ R_W} \right) + 0.8$	+1.343
( )	S - SKIN, DIMENSIONLESS, = [(10) - (14)]/2	+.353
(16)	ΔP_S - PRESS. DROP DUE TO SKIN = (.868 M S)	+76
(17)	P_F^* - FLOWING PRESS. W/NO SKIN = (P_F + ΔP_S)	+168
(18)	P_E - FINAL PRESSURE, PSI, ...	1273
(19)	$(P_E - P_1)$	87
(20)	$\Delta \overline{P}$ = $1.151(P_E - P_1)/M$	.404
(21)	$\overline{T}$ - DIMENSIONLESS TIME @ 1 HOUR (FIG.1)	.205
(22)	FR_E^2 = 264 K / U C $\overline{T}$	491
(23)	$(P_E - P_F^*)$	1105
(24)	$LOG_{10} \overline{R}$ = (23)/ 2 M	2.23
(25)	$\overline{R}$ - DRAINAGE RADIUS/RADIUS DRILLED HOLE	170
(26)	R_E - DRAINAGE RADIUS, FT. = (25) x R_W/12	55.2 R_E^2 = 3045
(27)	F - POROSITY, FRACTION, = (22)/(26)(26)	.155
( )	PI - PRODUCTIVITY INDEX = $Q/(P_E - P_F)$	.041 ; = 52 B/D
(29)	PI* - PI W/NO SKIN = $Q/(P_E - P_F^*)$	.0439 56 B/D
(30)	E - COMPLETION EFFICIENCY = 100 x (28)/(29)	

DST # 3
DATE 4-24-65
ELEV 2297
G.D - 4417

PRESSURE BUILDUP CALCULATIONS

FIELD Schaben WELL [illegible] "B" #1

FORMATION Miss [illegible] PRODUCING INTERVAL 4412-4422

No.	Item	Value	Notes
(1)	Q - PRODUCING RATE, BPD.	164	
(2)	U - VISCOSITY, CENT.	3.0	
(3)	B - FVF	1.2	
(4)	M - SLOPE OF B-U CURVE, PSI/CYCLE	45	
(5)	H - THICKNESS OF PRODUCING ZONE, FEET.	10	
(6)	K - PERM., MD. = 162.6 Q U B/ M H	216	
(7)	P_1 - PRESSURE ON SLOPE @ 1 HOUR, PSI.	1360	
(8)	P_2 - PRESSURE @ 1 SEC. = (P_1 - 3.56 M)	1200	
(9)	P_F - FLOWING PRESSURE, PSI.	304	
(10)	$2.302(P_2 - P_F)/M$	45.8	
(11)	R_W - RADIUS OF DRILLED HOLE, INCHES.	3.94	$R_W^2 = 15.52$
(12)	F - POROSITY, FRACTION, (ESTIMATE)	.15	
(13)	C - COMPRESS., VOL/VOL/PSI X 10^6	10	
(14)	$2.30 LOG_{10} \left\{ \frac{10.5\ K}{F\ C\ U\ R_W\ R_W} \right\} + 0.8$	+4.28	
(15)	S - SKIN, DIMENSIONLESS, = [(10) - (14)]/2	+20.8	
(16)	ΔP_S - PRESS. DROP DUE TO SKIN = (.868 M S)	812	
(17)	P_F^* - FLOWING PRESS. W/NO SKIN = ($P_F + \Delta P_S$)	1116	
(18)	P_E - FINAL PRESSURE, PSI.	1377	
(19)	($P_E - P_1$)	17	
(20)	$\Delta \bar{P} = 1.151(P_E - P_1)/M$	.435	
(21)	$\bar{T}$ - DIMENSIONLESS TIME @ 1 HOUR (FIG. 1)	.193	
(22)	$FR_E^2 = 264\ K / U\ C\ \bar{T}$	9850	
(23)	($P_E - P_F^*$)	261	
(24)	$LOG_{10} \bar{R}$ = (23)/ 2 M	2.90	
(25)	$\bar{R}$ - DRAINAGE RADIUS/RADIUS DRILLED HOLE	795	
(26)	R_E - DRAINAGE RADIUS, FT. = (25) x R_W/12	261	R_E^2 = 6[illegible]0C[illegible]
(27)	F - POROSITY, FRACTION, = (22)/(26)(26)	.145	
(28)	PI - PRODUCTIVITY INDEX = Q/($P_E - P_F$)	.154	[illegible] 2[illegible] B/D
(29)	PI* - PI W/NO SKIN = Q/($P_E - P_F^*$)	.636	[illegible] 775 B/D
(30)	E - COMPLETION EFFICIENCY = 100 X (28)/(29)		