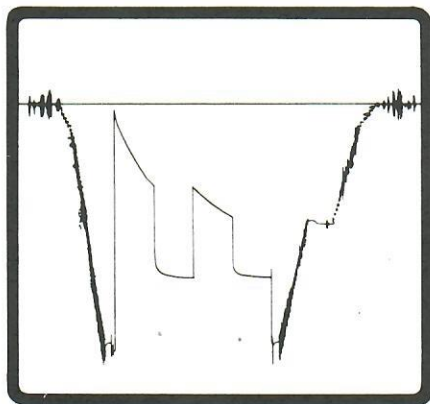




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MAR 5 1985

COLO. OIL & GAS CONS. CL. #



FORMATION TESTING SERVICE REPORT

DATE	3/5
TIME	
WELL	
DATE	
TIME	
WELL	
DATE	
TIME	
WELL	
DATE	
TIME	
WELL	



Duncan, Oklahoma 73536



A Halliburton Company

NOMENCLATURE

B	= Formation Volume Factor (Res Vol / Std Vol)	—
C_t	= System Total Compressibility	(Vol / Vol) / psi
DR	= Damage Ratio	—
h	= Estimated Net Pay Thickness	Ft
k	= Permeability	md
m	{ = (Liquid) Slope Extrapolated Pressure Plot	psi/cycle
		(Gas) Slope Extrapolated m(P) Plot
		MM psi ² /cp/cycle
m(P*)	= Real Gas Potential at P*	MM psi ² /cp
m(P _f)	= Real Gas Potential at P _f	MM psi ² /cp
AOF ₁	= Maximum Indicated Absolute Open Flow at Test Conditions	MCFD
AOF ₂	= Minimum Indicated Absolute Open Flow at Test Conditions ..	MCFD
P*	= Extrapolated Static Pressure	Psig
P _f	= Final Flow Pressure	Psig
Q	= Liquid Production Rate During Test	BPD
Q ₁	= Theoretical Liquid Production w/ Damage Removed	BPD
Q _g	= Measured Gas Production Rate	MCFD
r _i	= Approximate Radius of Investigation	Ft
r _w	= Radius of Well Bore	Ft
S	= Skin Factor	
t	= Total Flow Time Previous to Closed-in	Minutes
Δt	= Closed-in Time at Data Point	Minutes
T	= Temperature Rankine	°R
φ	= Porosity	—
μ	= Viscosity of Gas or Liquid	cp
Log	= Common Log	



TICKET NO. 57092200
15-OCT-84
LAMAR

FORMATION TESTING SERVICE REPORT

LEGAL LOCATION SEC. - TWP. - RNG.	31-12S-50W	FIELD AREA	BLEDSOE RANCH	COUNTY	CHEYENNE	STATE	COLORADO	DR
LEASE NAME	22 C-31	WELL NO.	1	TEST NO.	5499.1 - 5513.1	TESTED INTERVAL	CHAMPLIN PETROLEUM COMPANY	LEASE OWNER/COMPANY NAME

EQUIPMENT & HOLE DATA

FORMATION TESTED: MARMATON
NET PAY (ft): _____
GROSS TESTED FOOTAGE: 14.0
ALL DEPTHS MEASURED FROM: KELLY BUSHING
CASING PERFS. (ft): _____
HOLE OR CASING SIZE (in): 7.875
ELEVATION (ft): 0
TOTAL DEPTH (ft): 5513.0
PACKER DEPTH(S) (ft): 5492. 5499
FINAL SURFACE CHOKE (in): _____
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal): 8.90
MUD VISCOSITY (sec): 55
ESTIMATED HOLE TEMP. (°F): _____
ACTUAL HOLE TEMP. (°F): 148 @ 5507.5 ft

TICKET NUMBER: 57092200

DATE: 10-4-84 TEST NO: 1

TYPE DST: OPEN HOLE

HALLIBURTON CAMP:
LAMAR

TESTER: KUEHLE

WITNESS: COOPER

DRILLING CONTRACTOR:
MURFIN DRILLING #14

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
PIT SAMPLE	<u>1.380 @ 66 °F</u>	<u>2406 ppm</u>
BOTTOM SAMPLE	<u>0.300 @ 56 °F</u>	<u>12030 ppm</u>
SAMPLE WATER	<u>0.280 @ 70 °F</u>	<u>13000 ppm</u>
	<u>@ °F</u>	<u>ppm</u>
	<u>@ °F</u>	<u>ppm</u>
	<u>@ °F</u>	<u>ppm</u>

SAMPLER DATA

Pstg AT SURFACE: 350
cu.ft. OF GAS: 1.25
cc OF OIL: 1050
cc OF WATER: 1100
cc OF MUD: 0
TOTAL LIQUID cc: 2150

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): 39.6 @ 60°F
GAS/OIL RATIO (cu.ft. per bbl): 189
GAS GRAVITY: _____

CUSHION DATA

TYPE	AMOUNT	WEIGHT
------	--------	--------

RECOVERED:

635' OF GAS CUT OIL WITH A TRACE OF MUD
586' OF SALTY WATER WITH TRACE OF MUD

MEASURED FROM
TESTER VALVE

















REMARKS:

TOP AND MIDDLE SAMPLES OF GAS CUT OIL CONTAINED A TRACE OF WATER

SAMPLER OIL HAD A TRACE OF MUD (OR SOLIDS).

GRIND OUT: 47.4% OIL, 52% WATER, .6% SOLIDS.

X STAIR STEPPING OCCURRED ON BOTH GAUGES.

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	4872.5	
3		DRILL COLLARS.....	6.250	2.250	492.5	
50		IMPACT REVERSING SUB.....	6.000	2.750	1.0	5364.9
3		DRILL COLLARS.....	6.250	2.250	93.6	
5		CROSSOVER.....	6.250	2.250	1.0	
11		HANDLING SUB & CHOKE ASSEMBLY...	4.500	3.826	4.0	
13		DUAL CIP SAMPLER.....	5.000	0.750	7.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	5474.5
80		AP RUNNING CASE.....	5.000	2.250	4.0	5476.5
15		JAR.....	5.030	1.750	5.0	
16		VR SAFETY JOINT.....	5.000	1.000	3.0	
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	5491.5
70		OPEN HOLE PACKER.....	6.750	1.530	6.0	5499.0
20		FLUSH JOINT ANCHOR.....	5.000	3.400	7.0	
83		HT-500 TEMPERATURE CASE.....	5.000		1.5	5507.5
81		BLANKED-OFF RUNNING CASE.....	5.000		4.0	5510.0
TOTAL DEPTH					5513.0	

EQUIPMENT DATA

TICKET NO: 57092200

CLOCK NO: 18764 HOUR: 12



GAUGE NO: 294

DEPTH: 5510.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	148.6			
2	1.0	144.7	-3.8		
3	2.0	146.6	1.9		
4	3.0	155.2	8.6		
5	4.0	155.1	-0.1		
6	5.0	160.4	5.3		
7	6.0	183.6	23.1		
8	7.0	193.7	10.1		
9	8.0	205.0	11.3		
10	9.0	217.9	12.9		
11	10.0	229.3	11.4		
12	12.0	252.8	23.4		
C 13	13.5	270.3	17.5		
FIRST CLOSED-IN					
C 1	0.0	270.3			
2	1.0	561.8	291.5	0.9	1.167
3	2.0	702.5	432.2	1.7	0.892
4	3.0	794.3	524.0	2.5	0.737
5	4.0	869.5	599.2	3.1	0.639
6	5.0	931.6	661.3	3.6	0.570
7	6.0	990.5	720.2	4.2	0.510
8	7.0	1031.6	761.3	4.6	0.467
9	8.0	1064.8	794.5	5.0	0.431
10	9.0	1097.9	827.6	5.4	0.398
11	10.0	1121.8	851.5	5.8	0.371
12	12.0	1164.8	894.5	6.4	0.328
13	14.0	1199.0	928.7	6.9	0.293
14	16.0	1226.1	955.8	7.3	0.266
15	18.0	1247.8	977.5	7.7	0.243
16	20.0	1265.7	995.4	8.1	0.224
17	22.0	1281.9	1011.6	8.4	0.208
18	24.0	1297.3	1027.0	8.7	0.194
19	26.0	1309.2	1039.0	8.9	0.182
D 20	28.5	1322.1	1051.8	9.2	0.169
SECOND FLOW					
E 1	0.0	332.2			
2	3.0	332.8	0.5		
3	6.0	345.6	12.8		
4	9.0	354.3	8.8		
5	12.0	383.8	29.4		
6	15.0	404.5	20.8		
7	18.0	424.9	20.4		
8	21.0	450.2	25.3		
9	24.0	474.3	24.1		
10	27.0	480.9	6.7		
11	30.0	497.3	16.4		

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
12	33.0	513.1	15.8		
13	36.0	527.2	14.1		
14	39.0	538.9	11.7		
15	42.0	548.8	10.0		
F 16	44.8	557.5	8.7		
SECOND CLOSED-IN					
F 1	0.0	557.5			
2	1.0	744.7	187.2	1.0	1.754
3	2.0	805.0	247.5	1.9	1.479
4	3.0	856.9	299.4	2.9	1.310
5	4.0	899.2	341.7	3.7	1.196
6	5.0	937.1	379.6	4.6	1.105
7	6.0	968.3	410.8	5.4	1.032
8	7.0	999.8	442.4	6.3	0.968
9	8.0	1023.8	466.3	7.1	0.917
10	9.0	1046.1	488.6	7.8	0.872
11	10.0	1062.3	504.8	8.5	0.836
12	12.0	1095.1	537.6	9.9	0.769
13	14.0	1124.0	566.5	11.3	0.714
14	16.0	1146.3	588.8	12.6	0.667
15	18.0	1167.4	609.9	13.8	0.627
16	20.0	1185.7	628.3	14.9	0.593
17	22.0	1203.7	646.3	16.0	0.563
18	24.0	1219.5	662.0	17.0	0.535
19	26.0	1232.8	675.3	18.0	0.511
20	28.0	1244.5	687.0	18.9	0.489
21	30.0	1256.0	698.5	19.8	0.469
22	35.0	1278.8	721.3	21.9	0.426
23	40.0	1298.9	741.4	23.7	0.391
24	45.0	1314.4	756.9	25.4	0.361
25	50.0	1328.2	770.7	26.9	0.336
26	55.0	1339.1	781.6	28.3	0.314
27	60.0	1348.9	791.4	29.6	0.295
28	70.0	1365.2	807.7	31.8	0.263
29	80.0	1378.0	820.6	33.7	0.238
30	90.0	1388.2	830.7	35.4	0.217
G 31	93.2	1389.6	832.1	35.9	0.211

REMARKS:

TICKET NO: 57092200

CLOCK NO: 28316 HOUR: 12



GAUGE NO: 374

DEPTH: 5476.5

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	164.9			
2	1.0	162.5	-2.4		
3	2.0	162.8	0.3		
4	3.0	165.7	2.9		
5	4.0	169.2	3.5		
6	5.0	172.9	3.7		
7	6.0	176.6	3.7		
8	7.0	210.8	34.2		
9	8.0	217.5	6.7		
10	9.0	220.8	3.3		
11	10.0	227.0	6.3		
12	12.0	244.1	17.0		
C 13	13.5	257.2	13.2		
FIRST CLOSED-IN					
C 1	0.0	257.2			
1 2	3.0	762.8	505.6	2.4	0.744
3	4.0	843.2	585.9	3.1	0.643
4	5.0	909.7	652.5	3.7	0.566
5	6.0	965.5	708.3	4.1	0.514
6	7.0	998.0	740.7	4.6	0.468
7	8.0	1039.0	781.8	5.0	0.430
8	9.0	1068.0	810.8	5.4	0.399
9	10.0	1090.4	833.1	5.7	0.372
10	12.0	1135.9	878.7	6.4	0.327
11	14.0	1166.3	909.0	6.9	0.294
12	16.0	1195.2	937.9	7.3	0.266
13	18.0	1217.6	960.4	7.7	0.243
14	20.0	1236.6	979.4	8.1	0.225
15	22.0	1254.4	997.2	8.4	0.208
16	24.0	1270.8	1013.6	8.7	0.194
17	26.0	1283.6	1026.4	8.9	0.182
D 18	28.5	1299.4	1042.2	9.2	0.169
SECOND FLOW					
E 1	0.0	341.0			
2	3.0	340.5	-0.5		
3	6.0	342.6	2.1		
4	9.0	349.4	6.8		
5	12.0	368.5	19.0		
6	15.0	389.4	20.9		
7	18.0	408.4	19.0		
8	21.0	430.9	22.5		
9	24.0	445.1	14.2		
10	27.0	463.1	18.0		
11	30.0	478.4	15.3		
12	33.0	494.7	16.2		

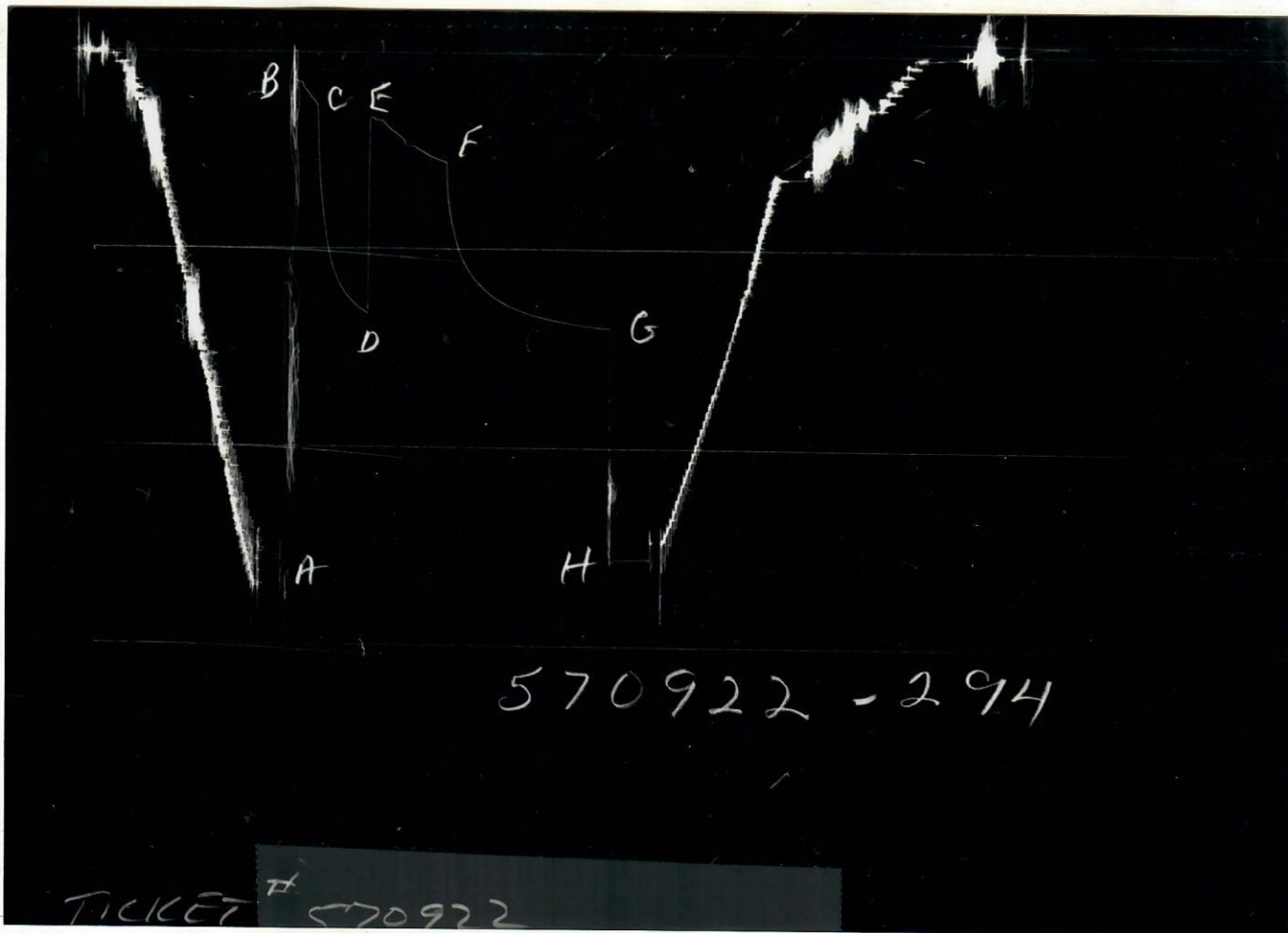
REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
13	36.0	509.2	14.5		
14	39.0	522.8	13.7		
15	42.0	534.5	11.7		
F 16	44.8	542.8	8.3		
SECOND CLOSED-IN					
F 1	0.0	542.8			
2	1.0	735.0	192.2	1.0	1.766
3	2.0	792.0	249.2	1.9	1.482
4	3.0	837.6	294.8	2.8	1.316
5	4.0	880.7	337.9	3.8	1.190
6	5.0	908.8	366.0	4.6	1.104
7	6.0	940.1	397.3	5.4	1.032
8	7.0	965.3	422.5	6.2	0.972
9	8.0	987.1	444.4	7.0	0.921
10	9.0	1009.0	466.2	7.8	0.875
11	10.0	1029.1	486.3	8.5	0.835
12	12.0	1062.9	520.1	9.9	0.769
13	14.0	1092.7	550.0	11.3	0.713
14	16.0	1115.9	573.1	12.6	0.667
15	18.0	1138.2	595.4	13.8	0.627
16	20.0	1157.5	614.7	14.9	0.593
17	22.0	1176.5	633.7	16.0	0.562
18	24.0	1191.0	648.2	17.0	0.536
19	26.0	1207.1	664.3	18.0	0.511
20	28.0	1220.5	677.7	18.9	0.490
21	30.0	1232.0	689.2	19.8	0.469
22	35.0	1257.2	714.4	21.9	0.426
23	40.0	1278.7	735.9	23.7	0.391
24	45.0	1295.3	752.6	25.4	0.361
25	50.0	1310.9	768.1	26.9	0.336
26	55.0	1324.5	781.7	28.3	0.314
27	60.0	1336.4	793.6	29.6	0.295
28	70.0	1353.6	810.8	31.8	0.263
29	80.0	1367.3	824.5	33.7	0.238
30	90.0	1376.4	833.6	35.4	0.217
G 31	93.2	1379.4	836.6	35.9	0.211

LEGEND:

1 STAIR-STEP

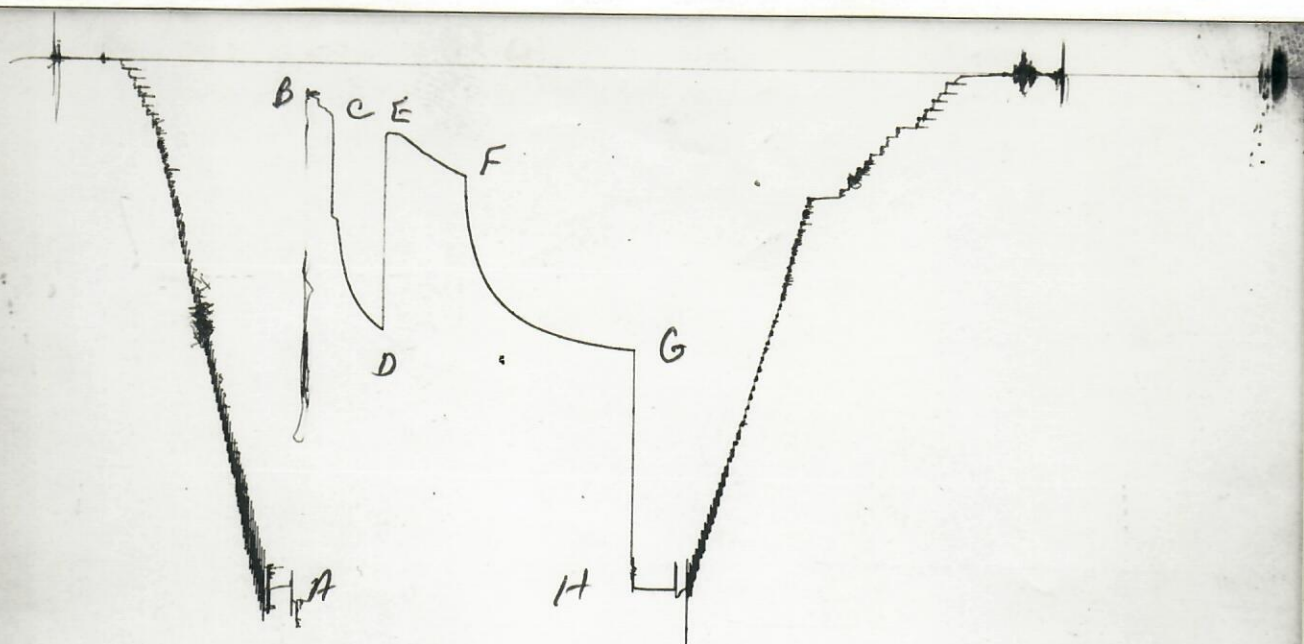
REMARKS:

STAIR STEPPING THROUGHOUT INITIAL FLOW



GAUGE NO: 294 DEPTH: 5510.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2559	2567.7			
B	INITIAL FIRST FLOW	146	148.6	15.0	13.5	F
C	FINAL FIRST FLOW	266	270.3			
C	INITIAL FIRST CLOSED-IN	266	270.3	30.0	28.5	C
D	FINAL FIRST CLOSED-IN	1319	1322.1			
E	INITIAL SECOND FLOW	343	332.2	45.0	44.8	F
F	FINAL SECOND FLOW	545	557.5			
F	INITIAL SECOND CLOSED-IN	545	557.5	90.0	93.2	C
G	FINAL SECOND CLOSED-IN	1395	1389.6			
H	FINAL HYDROSTATIC	2559	2554.5			



570922-374

TICKET # 570922

GAUGE NO: 374 DEPTH: 5476.5 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2541	2555.6			
B	INITIAL FIRST FLOW	146	164.9	15.0	13.5	F
C	FINAL FIRST FLOW	247	257.2			
C	INITIAL FIRST CLOSED-IN	247	257.2	30.0	28.5	C
D	FINAL FIRST CLOSED-IN	1294	1299.4			
E	INITIAL SECOND FLOW	333	341.0	45.0	44.8	F
F	FINAL SECOND FLOW	532	542.8			
F	INITIAL SECOND CLOSED-IN	532	542.8	90.0	93.2	C
G	FINAL SECOND CLOSED-IN	1371	1379.4			
H	FINAL HYDROSTATIC	2541	2548.9			

TEMPERATURE

RECORDER

CHART

$T_m = 148^\circ F$

TICKET #
S-70922

10° each circle

EQUATIONS FOR DST LIQUID WELL ANALYSIS

Transmissibility	$\frac{kh}{\mu} = \frac{162.6 QB}{m}$	$\frac{\text{md-ft}}{\text{cp}}$
Indicated Flow Capacity	$kh = \frac{kh}{\mu} \mu$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Damage Ratio	$DR = .183 \frac{P^* - P_f}{m}$	—
Theoretical Potential w / Damage Removed	$Q_1 = Q DR$	BPD
Approx. Radius of Investigation	$r_i = 4.63 \sqrt{kt}$	ft

EQUATIONS FOR DST GAS WELL ANALYSIS

Indicated Flow Capacity	$kh = \frac{1637 Q_g T}{m}$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{k(t/60)}{\phi \mu c_f r_w^2} + 3.23 \right]$	—
Damage Ratio	$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS}$	—
Indicated Flow Rate (Maximum)	$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$	MCFD
Approx. Radius of Investigation	$r_i = 0.032 \sqrt{\frac{k(t/60)}{\phi \mu c_f}}$	ft