WORKSHEET FOR CALCULATION OF STATIC COLUMN WELLHEAD PRESSURE (P_w)

Form C-122D
Adopted 9-1-65

COMPANY Monsanto Company LEASE Catclaw Federal WELL NO. 1 DATE 6-30-78

LOCATION: Unit G Section 10 Township 22S Range 25E

L 10779 H 10779 L/H 1.00 G .600 % CO_2 ____ % N_2 ____ % H_2S ____

d 2.441 F_r .010763 GH 6467.4 P_{cr} 671 (TABLE IX & X) T_{cr} 358 (TABLE IX & X)

LINE	Rate No. 1		Rate No. 2		Rate No. 3		Rate No. 4			
1 Q_m	1.461	1.461	1.489	1.489	1.535	1.535	1.554	1.554		
2 T_w (W.H. °R)	553	553	555	555	555	555	558	558		
3 T_s (B.H. °R)	623	623	623	623	623	623	623	623		
4 $T = (\frac{T_w + T_s}{2})$	588	588	589	589	589	589	590.5	590.5		
5 Z (Est.)	.870	.919	.918	.919	.918	.929	.929	.932		
6 TZ	511.56	540.37	540.70	541.29	540.70	547.18	548.58	550.35		
7 GH/TZ	12.64	11.968	11.961	11.948	11.961	11.819	11.789	11.752		
8 e^s (Table XIV)	1.599	1.566	1.566	1.565	1.566	1.558	1.556	1.554		
9 $1-e^{-s}$ (Table XIV)	.375	.361	.361	.361	.361	.358	.357	.356		
10 P_t	683.2	683.2	653.2	653.2	623.2	623.2	583.2	583.2		
11 $P_t^2/1000$	466.76	466.76	426.67	426.67	388.38	388.38	340.12	340.2		
12 F_r (Table XV)	.010763	.010763	.010763	.010763	.010763	.010763	.010763	.010763		
13 $F_c = F_r$ TZ	5.51	5.82	5.82	5.83	5.82	5.89	5.90	5.93		
14 $F_c Q_m$	8.04	8.50	8.67	8.68	8.95	9.04	9.18	9.21		
15 $L/H (F_c Q_m)^2$	64.71	72.20	72.09	75.25	79.80	81.72	84.19	84.73		
16 $F_w = L/H (F_c Q_m)^2 (1-e^{-s})$	24.27	26.06	27.11	27.17	28.81	29.26	30.06	30.16		
17 $P_w^2 = P_t^2 + F_w$	491.03	492.82	453.78	453.84	417.19	417.64	370.18	370.37		
18 $P_s^2 = e^s P_w^2$	785.15	771.76	710.61	709.89	653.32	650.68	576.00	575.55		
19 P_s	886.09	878.49	842.98	842.55	808.28	806.64	758.95	758.65		
20 $P = (\frac{P_t + P_s}{2})$	784.64	780.85	748.09	747.88	715.74	714.92	671.07	670.92		
21 $P_r = (P/P_{cr})$	1.17	1.16	1.12	1.12	1.07	1.07	1.00	1.00		
22 $T_r = (T/T_{cr})$	1.64	1.64	1.65	1.65	1.65	1.65	1.65	1.65		
23 Z (Table XI)	.919	.920	.919	.919	.929	.929	.932	.932		

One copy to be filed in District Office (Work copy acceptable)