

WORKSHEET FOR CALCULATION OF STATIC COLUMN WELLHEAD PRESSURE (P_w)COMPANY Atlantic Richfield LEASE McDonald State (WN) WELL NO. 22 DATE 06/17/74LOCATION: Unit A Section 26 Township 22 Range 36L 3120 H 3120 L/H 1.000 G .669 % CO₂ % N₂ % H₂S d 1.995 F_r .018231 GH 2087 P_{cr} 670 T_{cr} 378

TABLE IX & X

LINE	1st Rate			2nd Rate			3rd Rate			4th Rate		
	Trial 1	Trial 2	Trial 1	Trial 2	Trial 1	Trial 2	Trial 1	Trial 2	Trial 1	Trial 2	Trial 1	Trial 2
1 Q_m	.263	.263	.419	.419	.558	.558	.679	.679	.679	.679	.679	.679
2 T_w (W.H. °R)	534	534	534	534	534	534	534	534	534	534	534	534
3 T_s (B.H. °R)	550	550	550	550	550	550	550	550	550	550	550	550
4 $T = (\frac{T_w + T_s}{2})$	542	542	542	542	542	542	542	542	542	542	542	542
5 Z (Est.)	.952	.949	.961	.960	.968	.969	.973	.977	.973	.977	.977	.977
6 TZ	516.0	514.4	520.9	520.3	524.7	525.2	527.4	529.5	527.4	529.5	529.5	529.5
7 GH/TZ	4.045	4.057	4.007	4.011	3.978	3.974	3.957	3.941	3.957	3.941	3.941	3.941
8 e^s (Table XIV)	1.164	1.164	1.162	1.162	1.161	1.161	1.160	1.159	1.160	1.159	1.159	1.159
9 $1 - e^s$ (Table XIV)	.141	.141	.140	.140	.139	.138	.138	.137	.138	.137	.137	.137
10 P_t	254.2	254.2	206.2	206.2	165.2	165.2	123.2	123.2	123.2	123.2	123.2	123.2
11 $P_t^2/1000$	64.6	64.6	42.5	42.5	27.3	27.3	15.2	15.2	15.2	15.2	15.2	15.2
12 F_r (Table XV)	.018231	.018231	.018231	.018231	.018231	.018231	.018231	.018231	.018231	.018231	.018231	.018231
13 $F_c = F_r T_z$	9.407	9.377	9.496	9.486	9.565	9.575	9.614	9.654	9.614	9.654	9.654	9.654
14 $F_c Q_m$	2.474	2.466	3.979	3.975	5.337	5.343	6.528	6.555	6.528	6.555	6.555	6.555
15 $L/H (F_c Q_m)^2$	6.121	6.082	15.830	15.798	28.486	28.545	42.617	42.968	42.617	42.968	42.968	42.968
16 $F_w = L/H (F_c Q_m)^2 (1 - e^s)$	.861	.858	2.209	2.206	3.948	3.952	5.878	5.904	5.878	5.904	5.904	5.904
17 $P_w^2 = P_t^2 + F_w$	65.5	65.5	44.7	44.7	31.2	31.2	21.1	21.1	21.1	21.1	21.1	21.1
18 $P_s^2 = e^s P_w^2$	76.2	76.2	52.0	52.0	36.3	36.3	24.4	24.4	24.4	24.4	24.4	24.4
19 P_s	276.0	276.1	228.0	228.0	190.4	190.4	156.3	156.3	156.3	156.3	156.3	156.3
20 $P = (\frac{P_t + P_s}{2})$	265.1	265.2	217.1	217.1	177.8	177.8	139.7	139.8	139.7	139.8	139.8	139.8
21 $P_r = (P/P_{cr})$	.40	.40	.32	.32	.27	.27	.21	.21	.21	.21	.21	.21
22 $T_r = (T/T_{cr})$	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43
23 Z (Table XI)	.949	.949	.960	.960	.969	.969	.977	.977	.977	.977	.977	.977