

**PRESSURE BUILDUP CALCULATIONS**

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WELL Cities Service Petroleum Co. - Turner D #1

FORMATION Devonian  
PRODUCING INTERVAL 12263-12288

.1)	Q - PRODUCING RATE, BPD, .....	303	
(2)	U - VISCOSITY, CENT, .....	.600	
(3)	B - FVF .....	1.07	
(4)	M - SLOPE OF B-U CURVE, PSI/CYCLE .....	3.9	
(5)	H - THICKNESS OF PRODUCING ZONE, FEET, ....	25	
(6)	K - PERM., MD. = $162.5 Q U B / M H$ .....	324	
(7)	$P_1$ - PRESSURE ON SLOPE @ 1 HOUR, PSI, .....	4528	
(8)	$P_2$ - PRESSURE @ 1 SEC. = $(P_1 - 3.56 M)$ ....	4514	
(9)	$P_F$ - FLOWING PRESSURE, PSI, .....	4104	
(10)	$2.302(P_2 - P_F) / M$ .....	241	
(11)	$R_W$ - RADIUS OF DRILLED HOLE, INCHES, .....	3.938	
(12)	F - POROSITY, FRACTION, (ESTIMATE) .....	.04	
(13)	C - COMPRESS., VOL/VOL/PSI X $10^6$ .....	$.13 \times 10^6$	
(14)	$2.30 \log_{10} \left\{ \frac{10.5 K}{F C U R_W R_W} \right\} + 0.8$ .....	-5.75	
(15)	S - SKIN, DIMENSIONLESS, = $[(10) - (14)] / 2$ .....	123	
(16)	$\Delta P_S$ - PRESS. DROP DUE TO SKIN = $(.868 M S)$ .....	415	
(17)	$P_F^*$ - FLOWING PRESS. W/NO SKIN = $(P_F + \Delta P_S)$ .....	4519	
(18)	$P_E$ - FINAL PRESSURE, PSI, .....	4547	
(19)	$(P_E - P_1)$ .....	19	
(20)	$\Delta \bar{P} = 1.151(P_E - P_1) / M$ .....	5.61	
(21)	$\bar{T}$ - DIMENSIONLESS TIME @ 1 HOUR (FIG.1) .....	$4.5 \times 10^{-5}$	
(22)	$FR_E^2 = 264 K / U C \bar{T}$ .....	$2.44 \times 10^4$	
(23)	$(P_E - P_F^*)$ .....	28	
(24)	$\log_{10} \bar{R} = (23) / 2 M$ .....	3.59	
(25)	$\bar{R}$ - DRAINAGE RADIUS/RADIUS DRILLED HOLE .....	3900	
(26)	$R_E$ - DRAINAGE RADIUS, FT. = $(25) \times R_W / 12$ .....	1280	1280
(27)	F - POROSITY, FRACTION, = $(22) / (26)(26)$ .....	.015	
(28)	PI - PRODUCTIVITY INDEX = $Q / (P_E - P_F)$ .....	.683	
(29)	PI* - PI W/NO SKIN = $Q / (P_E - P_F^*)$ .....	10.82	
(30)	E - COMPLETION EFFICIENCY = $100 \times (28) / (29)$ .....	6.31%	

BEFORE THE  
OIL CONSERVATION COMMISSION  
SANTA FE, NEW MEXICO

EXHIBIT No. 3

CASE 2012-2135