

# WORK SHEET FOR STEPWISE CALCULATION

PRESSURE

( $P_c$  &  $P_w$ )

RATE NO. 2

DATE 10-25-76

LEASE NASH UNIT

COMPANY MESA PETROLEUM CORP.

SECTION 12 TOWNSHIP 23S RANGE 29E  
 UNIT F 12445 H 12445 L/H 1.00 G 0.721 CO<sub>2</sub> 0.00 N<sub>2</sub> 0.00 H<sub>2</sub>S 0.00  
 d 2.441 F 0.010763 Q<sub>m</sub> 6.918 M<sup>2</sup> cfd (L/H) (F Q<sub>m</sub>)<sup>2</sup> 0.005544 P<sub>cr</sub> 668 T<sub>cr</sub> 398

| LINE | ITEM                                | SOURCE                 | 1        | 2        | 3        | 4        | 5        | 6   | 7 | 8 | 9 | 10 |
|------|-------------------------------------|------------------------|----------|----------|----------|----------|----------|-----|---|---|---|----|
| 1    | H                                   |                        | 0        | 6223     |          | 12445    |          |     |   |   |   |    |
| 2    | GH                                  |                        | 0        | 4486     |          | 8973     |          |     |   |   |   |    |
| 3    | 37.5GH                              |                        | 0        | 168241   |          | 336482   |          |     |   |   |   |    |
| 4    | P <sub>c</sub> or P <sub>n</sub>    |                        | 2833.2   | 3537.2   | 3526.2   | 4219.2   | 4204.2   |     |   |   |   |    |
| 5    | P <sub>r</sub>                      |                        | 4.24     | 5.30     | 5.28     | 6.32     | 6.29     |     |   |   |   |    |
| 6    | T                                   |                        | 535      | 588      | 588      | 640      | 640      |     |   |   |   |    |
| 7    | T <sub>r</sub>                      |                        | 1.34     | 1.48     | 1.48     | 1.61     | 1.61     |     |   |   |   |    |
| 8    | Z                                   |                        | 0.693    | 0.816    | 0.815    | 0.910    | 0.909    |     |   |   |   |    |
| 9    | P/Z P/Z                             | 4 ÷ 8                  | 4090.67  | 4333.74  | 4325.56  | 4634.96  | 4627.63  |     |   |   |   |    |
| 10   | P/TZ                                | 9 ÷ 6                  | 7.6461   | 7.3766   | 7.3627   | 7.2421   | 7.2307   |     |   |   |   |    |
| 1    | (P/TZ) <sup>2</sup> /1000           | (10 <sup>2</sup> /1000 | 0.058463 | 0.054414 | 0.054209 | 0.052448 | 0.052283 |     |   |   |   |    |
| 2    | L/H(F Q <sub>m</sub> ) <sup>2</sup> |                        | 0.005544 | 0.005544 | 0.005544 | 0.005544 | 0.005544 |     |   |   |   |    |
| 3    |                                     | 11 ÷ 12                | 0.064007 | 0.059958 | 0.059753 | 0.057992 | 0.057827 |     |   |   |   |    |
| 4    | I <sub>n</sub>                      | 10 ÷ 13                | 119.457  | 123.029  | 123.219  | 124.881  | 125.040  |     |   |   |   |    |
| 5    | N=P - P <sub>n</sub> - 1            |                        |          | 704      | 693      | 693      | 678      | 677 |   |   |   |    |
| 6    | N=1 + 1 <sub>n-1</sub>              |                        |          | 242.486  | 242.676  | 248.099  | 248.259  |     |   |   |   |    |
| 7    | M x N                               | 15 x 16                |          | 168174   |          |          | 168320   |     |   |   |   |    |
| 8    | Σ (M x N)                           | Σ 17                   |          | 168174   |          |          | 336494   |     |   |   |   |    |

Delta P =  $\frac{3[336482]}{119.457 + 4[123.219] + 125.040} = \frac{1009445}{737.373} = 1369.0$   
 P = 2833.2 + 1369.0 = 4202.2

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