

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

|                                                                                                                           |             |                                 |                           |                                      |                         |                                             |                 |                                         |             |
|---------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------|---------------------------|--------------------------------------|-------------------------|---------------------------------------------|-----------------|-----------------------------------------|-------------|
| Type Test<br><input checked="" type="checkbox"/> Initial <input type="checkbox"/> Annual <input type="checkbox"/> Special |             |                                 |                           |                                      |                         | Test Date<br>3-27-82                        |                 | <b>RECEIVED</b><br><br>MAY 12 1982      |             |
| Company<br>Yates Petroleum Corporation                                                                                    |             |                                 |                           |                                      |                         | Connection<br>Transwestern Pipeline Company |                 |                                         |             |
| Pool<br>Pecos Slope Abo Gas                                                                                               |             |                                 |                           |                                      |                         | Formation<br>Abo Gas                        |                 | Unit<br>O. C. D.                        |             |
| Completion Date<br>12-16-82                                                                                               |             | Total Depth<br>4225'            |                           | Plug Back TD<br>4102'                |                         | Elevation<br>3955.5' GR                     |                 | Firm or Lease Name<br>Thomas LN Federal |             |
| Chq. Size<br>4-1/2"                                                                                                       | Wt.<br>9.5# | d<br>4.090                      | Set At<br>4160'           | Perforations:<br>From 3708' To 3950' |                         | Well No.<br>4                               |                 |                                         |             |
| Thq. Size<br>2-3/8"                                                                                                       | Wt.<br>4.7# | d<br>1.995                      | Set At<br>3900'           | Perforations:<br>From - To -         |                         | Unit<br>C                                   | Sec.<br>10      | Twp.<br>6S                              | Rge.<br>25E |
| Type Well - Single - Bradenhead - G.C. or G.O. Multiple<br>Single                                                         |             |                                 |                           |                                      |                         | Packer Set At<br>-                          |                 | County<br>Chaves                        |             |
| Producing Thru<br>Tubing                                                                                                  |             | Reservoir Temp. °F<br>94 @ 3829 |                           | Mean Annual Temp. °F<br>62           |                         | Baro. Press. - P <sub>a</sub><br>13.2       |                 | State<br>New Mexico                     |             |
| L<br>3900                                                                                                                 | H<br>3900   | G <sub>g</sub><br>.663          | % CO <sub>2</sub><br>0.24 | % N <sub>2</sub><br>6.89             | % H <sub>2</sub> S<br>- | Prover<br>-                                 | Meter Run<br>2" | Taps<br>Flanged                         |             |

| FLOW DATA |                        |   |                 |                    |                         | TUBING DATA |                    | CASING DATA |                    | Duration<br>of<br>Flow |             |
|-----------|------------------------|---|-----------------|--------------------|-------------------------|-------------|--------------------|-------------|--------------------|------------------------|-------------|
| NO.       | Prover<br>Line<br>Size | X | Orifice<br>Size | Press.<br>p.s.i.g. | Diff.<br>h <sub>w</sub> | Temp.<br>°F | Press.<br>p.s.i.g. | Temp.<br>°F | Press.<br>p.s.i.g. |                        | Temp.<br>°F |
| SI        |                        |   |                 |                    |                         |             | 1011               |             |                    |                        | days        |
| 1.        | 2.067 x 1.000          |   |                 | 230                | 18.6                    | 60          | 904                | 61          |                    |                        | 24 hrs      |
| 2.        | 2.067 x 1.000          |   |                 | 235                | 24.8                    | 58          | 858                | 61          |                    |                        | 24 hrs      |
| 3.        | 2.067 x 1.000          |   |                 | 240                | 40.6                    | 56          | 767                | 61          |                    |                        | 24 hrs      |
| 4.        | 2.067 x 1.000          |   |                 | 210                | 65.0                    | 55          | 700                | 61          |                    |                        | 24 hrs      |
| 5.        |                        |   |                 |                    |                         |             |                    |             |                    |                        |             |

| RATE OF FLOW CALCULATIONS |                          |                  |                            |                                        |                                     |                                               |                         |
|---------------------------|--------------------------|------------------|----------------------------|----------------------------------------|-------------------------------------|-----------------------------------------------|-------------------------|
| NO.                       | Coefficient<br>(24 Hour) | $\sqrt{h_w P_m}$ | Pressure<br>P <sub>m</sub> | Flow Temp.<br>Factor<br>F <sub>t</sub> | Gravity<br>Factor<br>F <sub>g</sub> | Super<br>Compress.<br>Factor, F <sub>pv</sub> | Rate of Flow<br>Q, Mcfd |
| 1                         | 4.946                    | 67.3             | 243.2                      | 1.000                                  | 1.228                               | 1.023                                         | 418                     |
| 2                         | 4.946                    | 78.5             | 248.2                      | 1.002                                  | 1.228                               | 1.024                                         | 489                     |
| 3                         | 4.946                    | 101.4            | 253.2                      | 1.004                                  | 1.228                               | 1.024                                         | 633                     |
| 4                         | 4.946                    | 120.4            | 223.2                      | 1.005                                  | 1.228                               | 1.021                                         | 751                     |
| 5                         |                          |                  |                            |                                        |                                     |                                               |                         |

| NO. | P <sub>r</sub> | Temp. °R | T <sub>r</sub> | Z    | Gas Liquid Hydrocarbon Ratio _____ Mcf/bbl.         |
|-----|----------------|----------|----------------|------|-----------------------------------------------------|
| 1   | .37            | 520      | 1.44           | .956 | A.P.I. Gravity of Liquid Hydrocarbons _____ Deg.    |
| 2   | .38            | 518      | 1.43           | .954 | Specific Gravity Separator Gas .663 X X X X X X X X |
| 3   | .38            | 516      | 1.43           | .954 | Specific Gravity Flowing Fluid X X X X X .663       |
| 4   | .34            | 515      | 1.43           | .959 | Critical Pressure 659 P.S.I.A. 659 P.S.I.A.         |
| 5   |                |          |                |      | Critical Temperature 361 R 361 R                    |

P<sub>c</sub> 1024.2    P<sub>c</sub><sup>2</sup> 1049.0

| NO. | P <sub>c</sub> | P <sub>w</sub> | P <sub>w</sub> <sup>2</sup> | P <sub>c</sub> <sup>2</sup> - P <sub>w</sub> <sup>2</sup> |
|-----|----------------|----------------|-----------------------------|-----------------------------------------------------------|
| 1   | 841.3          |                | 843.6                       | 205.4                                                     |
| 2   | 759.0          |                | 762.2                       | 286.8                                                     |
| 3   | 608.7          |                | 614.2                       | 434.8                                                     |
| 4   | 508.7          |                | 516.5                       | 532.5                                                     |
| 5   |                |                |                             |                                                           |

(1)  $\frac{P_c^2}{P_c^2 - P_w^2} = 1.9700$     (2)  $\left[ \frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.6125$

AOF = Q  $\left[ \frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1211 \text{ mcfpd}$

|                                       |  |                               |  |                               |  |
|---------------------------------------|--|-------------------------------|--|-------------------------------|--|
| Absolute Open Flow 1211 Mcfd @ 15.025 |  | Angle of Slope @ _____        |  | Slope, n .705                 |  |
| Remarks: _____                        |  |                               |  |                               |  |
| Approved By Division _____            |  | Conducted By:<br>David Weaver |  | Calculated By:<br>Al Springer |  |
|                                       |  |                               |  | Checked By: _____             |  |

WORKSHEET FOR CALCULATION OF ST. COLUMN WELLHEAD PRESSURE (P<sub>w</sub>)

C-122D  
Rev. 9-1-65

COMPANY Nates Petroleum Corp. LEASE Thomas LN Fed WELL NO. 44 DATE 5/10/82

LOCATION: Unit C Section 16 Township 6S Range 25E

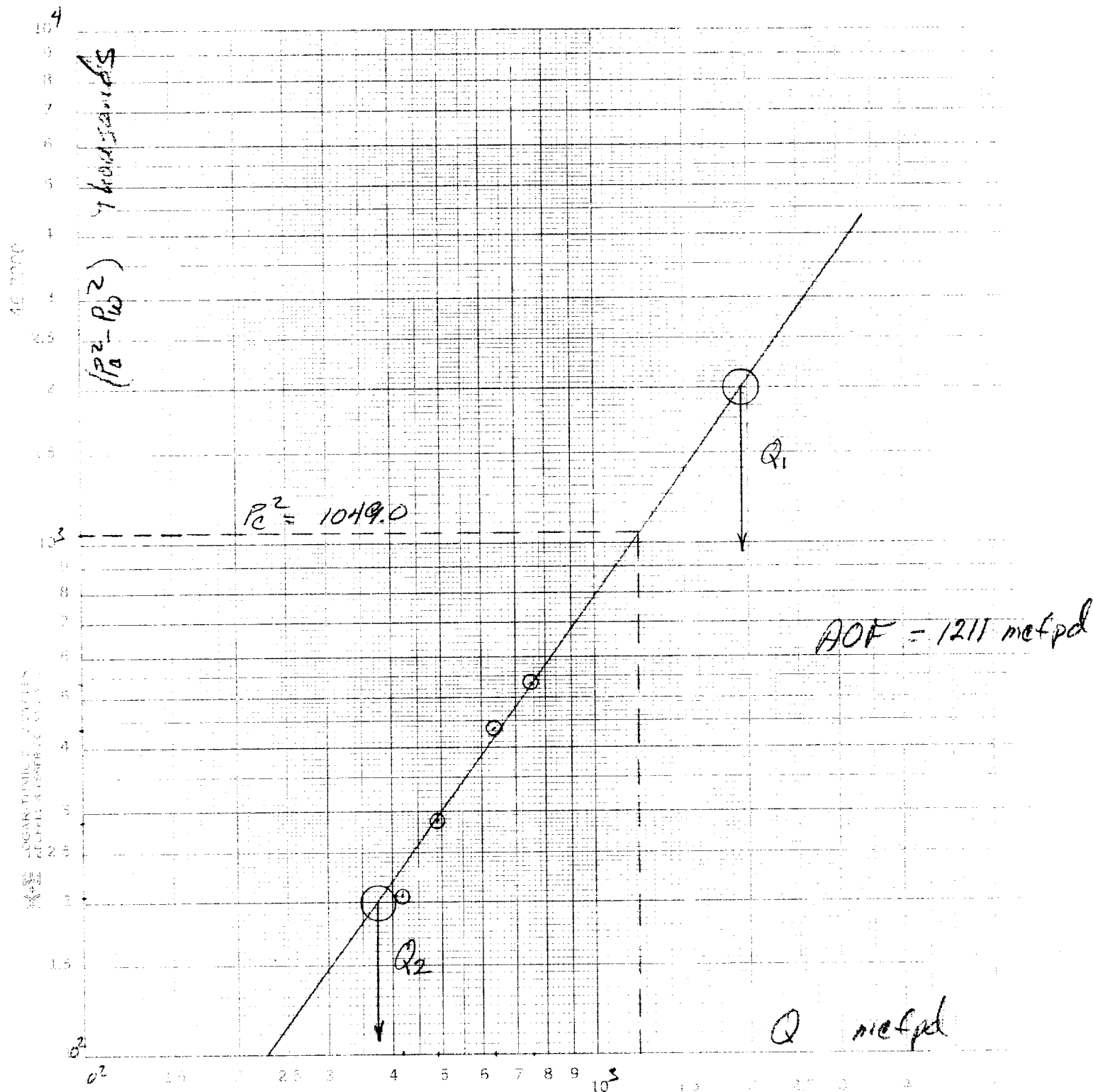
L 3900 H 3900 LH 1,000 G .663 % CO<sub>2</sub> 0.24 % N<sub>2</sub> 6.89 % H<sub>2</sub>S ---

d 1.995 F<sub>1</sub> .01823 GH 2586 P<sub>CF</sub> 659 T<sub>CF</sub> 361

TABLE IX B X

| LINE                                                                                      | 1 <sup>st</sup> rate | 2 <sup>nd</sup> rate | 3 <sup>rd</sup> rate | 4 <sup>th</sup> rate |  |  |  |  |
|-------------------------------------------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|--|--|--|--|
| 1 Q <sub>m</sub>                                                                          | .418                 | .487                 | .633                 | .751                 |  |  |  |  |
| 2 T <sub>w</sub> (W.H. °R)                                                                | 521                  | 521                  | 521                  | 521                  |  |  |  |  |
| 3 T <sub>s</sub> (B.H. °R)                                                                | 554                  | 554                  | 554                  | 554                  |  |  |  |  |
| 4 T = ( $\frac{T_w + T_s}{2}$ )                                                           | 537.5                | 537.5                | 537.5                | 537.5                |  |  |  |  |
| 5 Z (Est.)                                                                                | .868                 | .864                 | .877                 | .887                 |  |  |  |  |
| 6 T <sub>Z</sub>                                                                          | 461.18               | 464.4                | 471.39               | 476.46               |  |  |  |  |
| 7 GH, TZ                                                                                  | 5.609                | 5.568                | 5.486                | 5.424                |  |  |  |  |
| 8 e <sup>S</sup> (Table XIV)                                                              | 1.234                | 1.232                | 1.268                | 1.226                |  |  |  |  |
| 9 1-e <sup>S</sup> (Table XIV)                                                            | .190                 | .188                 | .186                 | .184                 |  |  |  |  |
| 10 P <sub>t</sub>                                                                         | 919.2                | 871.2                | 780.2                | 713.2                |  |  |  |  |
| 11 P <sub>t</sub> <sup>2</sup> /1000                                                      | 841.3                | 759.0                | 608.7                | 508.7                |  |  |  |  |
| 12 F <sub>t</sub> (Table XV)                                                              | .01823               | .01823               | .01823               | .01823               |  |  |  |  |
| 13 F <sub>t</sub> = F <sub>t</sub> T <sub>Z</sub>                                         | 8.410                | 8.466                | 8.573                | 8.691                |  |  |  |  |
| 14 F <sub>c</sub> C <sub>m</sub>                                                          | 3.514                | 4.140                | 5.440                | 6.527                |  |  |  |  |
| 15 L/H (F <sub>c</sub> Q <sub>m</sub> ) <sup>2</sup>                                      | 12.350               | 19.139               | 29.289               | 42.685               |  |  |  |  |
| 16 F <sub>w</sub> = L/H (F <sub>c</sub> Q <sub>m</sub> ) <sup>2</sup> (1-e <sup>S</sup> ) | 2.346                | 3.222                | 5.304                | 7.839                |  |  |  |  |
| 17 P <sub>w</sub> <sup>2</sup> = P <sub>t</sub> <sup>2</sup> + F <sub>w</sub>             | 843.6                | 762.2                | 614.2                | 516.5                |  |  |  |  |
| 18 P <sub>s</sub> <sup>2</sup> = e <sup>S</sup> P <sub>w</sub> <sup>2</sup>               | 1041.0               | 939.0                | 754.3                | 633.2                |  |  |  |  |
| 19 P <sub>s</sub>                                                                         | 1020.3               | 969.0                | 868.5                | 775.3                |  |  |  |  |
| 20 P = ( $\frac{P_t + P_s}{2}$ )                                                          | 968.7                | 920.1                | 824.3                | 754.5                |  |  |  |  |
| 21 P <sub>t</sub> = (P/P <sub>s</sub> )                                                   | 1.47                 | 1.40                 | 1.25                 | 1.14                 |  |  |  |  |
| 22 T <sub>t</sub> = (T/T <sub>g</sub> )                                                   | 1.49                 | 1.49                 | 1.49                 | 1.49                 |  |  |  |  |
| 23 Z (Table XI)                                                                           | .858                 | .864                 | .877                 | .887                 |  |  |  |  |

Yates Petroleum Corp  
 Thomas LAM Fed. #4  
 1C) Sec 10 - 6S - 24E  
 Chaves, New Mexico



$$(P_o^2 - P_w^2)_1 = 2,000$$

$$(P_o^2 - P_w^2)_2 = 200$$

$$Q_1 = 1,900$$

$$Q_2 = 375$$

$$\log Q_1 = 3.27895$$

$$\log Q_2 = 2.57403$$

$$n = .70472$$

$$n = .705$$