

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>9/4/81                   |                    |                                                      |  |
| Company<br>Mid-America Petroleum, Inc.                                                                                    |             |                                    |                            | Connection<br>None                     |                         |                                       |                    |                                                      |  |
| Pool<br>East La Rica                                                                                                      |             |                                    |                            | Formation<br>Morrow                    |                         |                                       |                    | Unit                                                 |  |
| Completion Date<br>9/4/81                                                                                                 |             | Total Length<br>13,701             |                            | Plug Back TD<br>13,641                 |                         | Elevation<br>3987 GR                  |                    | Farm or Lease Name<br>New Mexico "B" State           |  |
| Chq. Size<br>5 1/2"                                                                                                       | Wt.<br>20.0 | d<br>4.778                         | Set At<br>13,701           | Perforations:<br>From 13618' To 13635' |                         |                                       |                    | Well No.<br>1                                        |  |
| Thg. Size<br>2 7/8"                                                                                                       | Wt.<br>8.7  | d<br>2.2259                        | Set At<br>13,391           | Perforations:<br>Open Ended            |                         |                                       |                    | Unit    Sec.    Twp.    Rge.<br>H    3    19s    34e |  |
| Type Well - Single - Bradenhead - G.G. or G.O. Multiple<br>Single                                                         |             |                                    |                            |                                        |                         | Packer Set At<br>13392'               |                    | County<br>Lea                                        |  |
| Producing Thru<br>Tubing                                                                                                  |             | Reservoir Temp. °F<br>188 @ 13627' |                            | Mean Annual Temp. °F<br>60             |                         | Baro. Press. - P <sub>a</sub><br>13.2 |                    | State<br>New Mexico                                  |  |
| L<br>13627                                                                                                                | H<br>-      | G <sub>g</sub><br>0.6641           | % CO <sub>2</sub><br>0.637 | % N <sub>2</sub><br>1.112              | % H <sub>2</sub> S<br>- | Prover                                | Meter Run<br>2.900 | Taps<br>F                                            |  |

  

| FLOW DATA |                  |       |              |                 |                      |          | TUBING DATA         |          | CASING DATA     |          | Duration of Flow |
|-----------|------------------|-------|--------------|-----------------|----------------------|----------|---------------------|----------|-----------------|----------|------------------|
| NO.       | Prover Line Size | X     | Orifice Size | Press. p.s.i.g. | Diff. h <sub>w</sub> | Temp. °F | Press. p.s.i.g. DWT | Temp. °F | Press. p.s.i.g. | Temp. °F |                  |
| 51        |                  |       |              |                 |                      |          | 4105                | 60       | PACKER          |          | 91.0 hrs         |
| 1.        | 2.90             | 7/64  | 1.500        | 510             | 9                    | 91       | 3727                |          |                 |          | 1.0              |
| 2.        | 2.90             | 9/64  | 1.500        | 515             | 18                   | 88       | 3503                |          |                 |          | 1.0              |
| 3.        | 2.90             | 11/64 | 1.500        | 525             | 42                   | 83       | 3450                |          |                 |          | 0.75             |
| 4.        | 2.90             | 13/64 | 1.500        | 540             | 68                   | 70       | 3272                |          |                 |          | 0.75             |
| 5.        |                  |       |              |                 |                      |          |                     |          |                 |          |                  |

  

| RATE OF FLOW CALCULATIONS |                       |                  |                         |                       |                               |                                         |                     |
|---------------------------|-----------------------|------------------|-------------------------|-----------------------|-------------------------------|-----------------------------------------|---------------------|
| NO.                       | Coefficient (24 Hour) | $\sqrt{h_w P_m}$ | Pressure P <sub>m</sub> | Flow Temp. Factor Ft. | Gravity Factor F <sub>g</sub> | Super Compress. Factor, F <sub>pv</sub> | Rate of Flow Q, Mcd |
| 1                         | 11.23                 | 68.62            | 523.2                   | 0.9715                | 1.227                         | 1.043                                   | 958.08              |
| 2                         | 11.23                 | 97.51            | 528.2                   | 0.9741                | 1.227                         | 1.044                                   | 1366.40             |
| 3                         | 11.23                 | 150.35           | 538.2                   | 0.9786                | 1.227                         | 1.047                                   | 2122.66             |
| 4                         | 11.23                 | 193.95           | 553.2                   | 0.9905                | 1.227                         | 1.052                                   | 2784.74             |
| 5                         |                       |                  |                         |                       |                               |                                         |                     |

  

|     |                |          |                |       |                              |          |
|-----|----------------|----------|----------------|-------|------------------------------|----------|
| NO. | P <sub>r</sub> | Temp. °R | T <sub>r</sub> | Z     | Gas Liquid Hydrocarbon Ratio | Mcf/bbl. |
| 1   | 0.78           | 551      | 1.49           | 0.920 | 12.768                       |          |
| 2   | 0.79           | 548      | 1.48           | 0.917 | 52.5                         |          |
| 3   | 0.80           | 543      | 1.46           | 0.912 |                              |          |
| 4   | 0.82           | 530      | 1.43           | 0.904 |                              |          |
| 5   |                |          |                |       |                              |          |

  

|                                                              |                  |                             |                                                           |                                                                                                      |  |
|--------------------------------------------------------------|------------------|-----------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------|--|
| P <sub>c</sub> 6260.2    P <sub>c</sub> <sup>2</sup> 39190.1 |                  |                             |                                                           | (1) $\frac{P_c^2}{P_c^2 - P_w^2} = 5.523$ (2) $\left[ \frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 5.097$ |  |
| NO.                                                          | 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> | AOF = Q $\left[ \frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 10819$                                       |  |
| 1                                                            | 6035.2           | 36423.6                     | 2766.5                                                    |                                                                                                      |  |
| 2                                                            | 5887.2           | 34659.1                     | 4531.0                                                    |                                                                                                      |  |
| 3                                                            | 5665.2           | 32094.5                     | 7095.6                                                    |                                                                                                      |  |
| 4                                                            | 5454.2           | 29748.3                     | 9441.8                                                    |                                                                                                      |  |
| 5                                                            |                  |                             |                                                           |                                                                                                      |  |

  

|                    |       |              |                  |         |          |       |
|--------------------|-------|--------------|------------------|---------|----------|-------|
| Absolute Open Flow | 10819 | Mcd @ 15.025 | Angle of Slope θ | 46° 23' | Slope, n | 0.953 |
|--------------------|-------|--------------|------------------|---------|----------|-------|

  

Remarks: \* BOTTOM HOLE PRESSURE @ (-9651) 13627' USED FOR PRESSURE CALCULATIONS  
20.65 BD IN 3.5 hours = 141.60 BD/D

  

|                      |                                        |                                  |                                           |
|----------------------|----------------------------------------|----------------------------------|-------------------------------------------|
| Approved By Division | Conducted By:<br>JARREL SERVICES, INC. | Calculated By:<br>Joe A. Coleman | Checked By:<br>PE #2208<br>Joe A. Coleman |
|----------------------|----------------------------------------|----------------------------------|-------------------------------------------|