

# BACK-PRESSURE TEST FOR NATURAL GAS WELLS

Form C-122

| TYPE TEST: <input checked="" type="checkbox"/> INITIAL <input type="checkbox"/> ANNUAL <input type="checkbox"/> RETEST                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              | TEST DATE<br>7-08-82                       |                                                      |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------------------------------|------------------------------------------------------|-------------|-------------|-------------|-----------------------------|-----------------------|--|-------------|--|-----------------------|-----|-----------------------------|-------------|---------------------------|---------|-------------|---------|-----------------------------|----|--|--|--|--|------|----|------|----|---------------|-----|---|----|------|----|------|----|---------------|-----|----|----|------|----|-------|----|---------------|-----|----|----|------|----|-------|----|---------------|-----|----|----|------|----|-------|----|--|--|--|--|--|--|--|
| COMPANY<br>GRACE Petroleum Corporation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              | CONNECTION<br>Southern Union Gathering Co. |                                                      |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| FIELD<br>East Lusk (Morrow)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ALLOCATED POOL NO.<br>Morrow | RESERVOIR<br>2450' FSI & 660' FWI          | UNIT                                                 |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| COMPLETION DATE<br>6-17-82                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | TOTAL DEPTH<br>13850         | PLUS BACK TO<br>13654                      | ELEVATION<br>3604.4 KB                               |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| FARM OR LEASE NAME<br>West Tonto "A" Fed. Com                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                              |                                            | WELL NO.<br>1-Y                                      |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| CSG. SIZE<br>5 1/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | WT.<br>17.20                 | SET AT<br>13835'                           | PERFORATIONS: FROM TO<br>13454 to 13650              |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| TBG. SIZE<br>2-3/8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | WT.<br>4.7                   | SET AT<br>13360                            | PERFORATIONS: FROM TO                                |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| TYPE COMPLETION (DESCRIBE)<br>Single                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              |                                            | PACKER SET AT<br>13360                               |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| PRODUCING THRU<br>Tubing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                              |                                            | STATE<br>New Mexico                                  |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| RESERVOIR TEMP. F<br>206 @ 13552                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                              |                                            | MEAN GROUND TEMP. F<br>BARO. PRESS. - P <sub>g</sub> |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| 13552                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                            | PROVER METER RUN TAPS                                |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| <table border="1"> <thead> <tr> <th colspan="4">FLOW DATA</th> <th colspan="2">TUBING DATA</th> <th colspan="2">CASING DATA</th> <th rowspan="2">DURATION OF FLOW, HR.</th> </tr> <tr> <th>NO.</th> <th>CHOKE (LINE) X ORIFICE SIZE</th> <th>PRESS. PSIG</th> <th>DIFF. (INCHES) (XXX00015)</th> <th>TEMP. F</th> <th>PRESS. PSIG</th> <th>TEMP. F</th> <th>CHOKE (LINE) X ORIFICE SIZE</th> </tr> </thead> <tbody> <tr> <td>SI</td> <td></td> <td></td> <td></td> <td></td> <td>3743</td> <td>77</td> <td>Pkr.</td> </tr> <tr> <td>1.</td> <td>2.068 x 1.000</td> <td>563</td> <td>4</td> <td>92</td> <td>3435</td> <td>78</td> <td>7/64</td> </tr> <tr> <td>2.</td> <td>2.068 x 1.000</td> <td>573</td> <td>18</td> <td>96</td> <td>2667</td> <td>78</td> <td>10/64</td> </tr> <tr> <td>3.</td> <td>2.068 x 1.000</td> <td>573</td> <td>36</td> <td>98</td> <td>2336</td> <td>78</td> <td>16/64</td> </tr> <tr> <td>4.</td> <td>2.068 x 1.000</td> <td>573</td> <td>48</td> <td>99</td> <td>1861</td> <td>78</td> <td>20/64</td> </tr> <tr> <td>5.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> |                              |                                            |                                                      | FLOW DATA   |             |             |                             | TUBING DATA           |  | CASING DATA |  | DURATION OF FLOW, HR. | NO. | CHOKE (LINE) X ORIFICE SIZE | PRESS. PSIG | DIFF. (INCHES) (XXX00015) | TEMP. F | PRESS. PSIG | TEMP. F | CHOKE (LINE) X ORIFICE SIZE | SI |  |  |  |  | 3743 | 77 | Pkr. | 1. | 2.068 x 1.000 | 563 | 4 | 92 | 3435 | 78 | 7/64 | 2. | 2.068 x 1.000 | 573 | 18 | 96 | 2667 | 78 | 10/64 | 3. | 2.068 x 1.000 | 573 | 36 | 98 | 2336 | 78 | 16/64 | 4. | 2.068 x 1.000 | 573 | 48 | 99 | 1861 | 78 | 20/64 | 5. |  |  |  |  |  |  |  |
| FLOW DATA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |                                            |                                                      | TUBING DATA |             | CASING DATA |                             | DURATION OF FLOW, HR. |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| NO.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | CHOKE (LINE) X ORIFICE SIZE  | PRESS. PSIG                                | DIFF. (INCHES) (XXX00015)                            | TEMP. F     | PRESS. PSIG | TEMP. F     | CHOKE (LINE) X ORIFICE SIZE |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| SI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                                            |                                                      |             | 3743        | 77          | Pkr.                        |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.068 x 1.000                | 563                                        | 4                                                    | 92          | 3435        | 78          | 7/64                        |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.068 x 1.000                | 573                                        | 18                                                   | 96          | 2667        | 78          | 10/64                       |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.068 x 1.000                | 573                                        | 36                                                   | 98          | 2336        | 78          | 16/64                       |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2.068 x 1.000                | 573                                        | 48                                                   | 99          | 1861        | 78          | 20/64                       |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |
| 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                                            |                                                      |             |             |             |                             |                       |  |             |  |                       |     |                             |             |                           |         |             |         |                             |    |  |  |  |  |      |    |      |    |               |     |   |    |      |    |      |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |               |     |    |    |      |    |       |    |  |  |  |  |  |  |  |

## RATE OF FLOW CALCULATIONS

| NO. | COEFFICIENT (24-HOUR) | $\sqrt{h_w P_m}$ | PRESSURE P <sub>m</sub> | FLOW TEMP. FACTOR, F <sub>t</sub> | GRAVITY FACTOR, F <sub>g</sub> | SUPER COMPRESS. FACTOR, F <sub>pv</sub> | RATE OF FLOW Q, MCFD |
|-----|-----------------------|------------------|-------------------------|-----------------------------------|--------------------------------|-----------------------------------------|----------------------|
| 1.  | 5.073                 | 48.0             | 576                     | .9706                             | 1.234                          | 1.049                                   | 306                  |
| 2.  | 5.073                 | 102.7            | 586                     | .9671                             | 1.234                          | 1.049                                   | 652                  |
| 3.  | 5.073                 | 145.2            | 586                     | .9653                             | 1.234                          | 1.047                                   | 920                  |
| 4.  | 5.073                 | 167.7            | 586                     | .9645                             | 1.234                          | 1.047                                   | 1060                 |
| 5.  |                       |                  |                         |                                   |                                |                                         |                      |

| NO. | P <sub>t</sub> | TEMP. R | T <sub>t</sub> | Z    |
|-----|----------------|---------|----------------|------|
| 1.  | .86            | 552     | 1.47           | .908 |
| 2.  | .87            | 556     | 1.48           | .910 |
| 3.  | .87            | 558     | 1.49           | .912 |
| 4.  | .87            | 559     | 1.49           | .912 |
| 5.  |                |         |                |      |

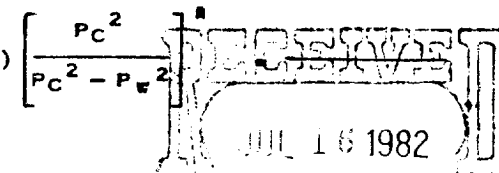
GAS LIQUID HYDROCARBON RATIO 36 MCF/ BBL  
 API GRAVITY OF LIQUID HYDROCARBONS 50.2 DEG.  
 SPECIFIC GRAVITY SEPARATOR GAS .657 XXXXXXXXXX  
 SPECIFIC GRAVITY FLOWING FLUID .733  
 CRITICAL PRESSURE 670 PSIA 668 PSIA  
 CRITICAL TEMPERATURE 375 R 401 R

P<sub>f</sub> 5839 P<sub>f</sub><sup>2</sup> 34094

| NO. | P <sub>s</sub> | P <sub>s</sub> <sup>2</sup> | P <sub>c</sub> <sup>2</sup> - P <sub>w</sub> <sup>2</sup> |
|-----|----------------|-----------------------------|-----------------------------------------------------------|
| 1.  | 5445           | 29648                       | 4446                                                      |
| 2.  | 4409           | 19439                       | 14655                                                     |
| 3.  | 4104           | 16843                       | 17251                                                     |
| 4.  | 3053           | 9321                        | 24773                                                     |
| 5.  |                |                             |                                                           |

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

$$WHAOF = Q \left[ \frac{P_c^2}{P_c^2 - P_w^2} \right]^n =$$



OIL & GAS  
U.S. GEOLOGICAL SURVEY  
ROSWell, NEW MEXICO

|                                                  |                                      |                                |                      |
|--------------------------------------------------|--------------------------------------|--------------------------------|----------------------|
| CALCULATED WELLHEAD OPEN FLOW <u>1370</u> MCFD @ |                                      | ANGLE OF SLOPE @ <u>54.0</u>   | SLOPE, n <u>.727</u> |
| REMARKS: <u>3.38 bbls. cond.</u>                 |                                      |                                |                      |
| APPROVED BY COMMISSION:                          | CONDUCTED BY:<br>Thurmond-McGlothlin | CALCULATED BY:<br>J. W. Chisum | CHECKED BY:          |

(OVER)

I. J. W. Chisum, BEING FIRST DULY SWORN ON OATH, STATE THAT I AM FAMILIAR WITH FACTS AND FIGURES SET FORTH IN THIS REPORT, AND THAT THE REPORT IS TRUE AND CORRECT.

*J. W. Chisum*

,Agent

SIGNATURE AND TITLE OF AFFIANT

Thurmond-McGlothlin, Inc.

COMPANY

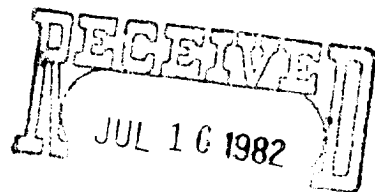
SUBSCRIBED AND SWORN TO BEFORE ME THIS 12 DAY OF July, 1982

MY COMMISSION EXPIRES 10-31-85

*Katherine R. Burrell*

NOTARY PUBLIC

Katherine R. Burrell



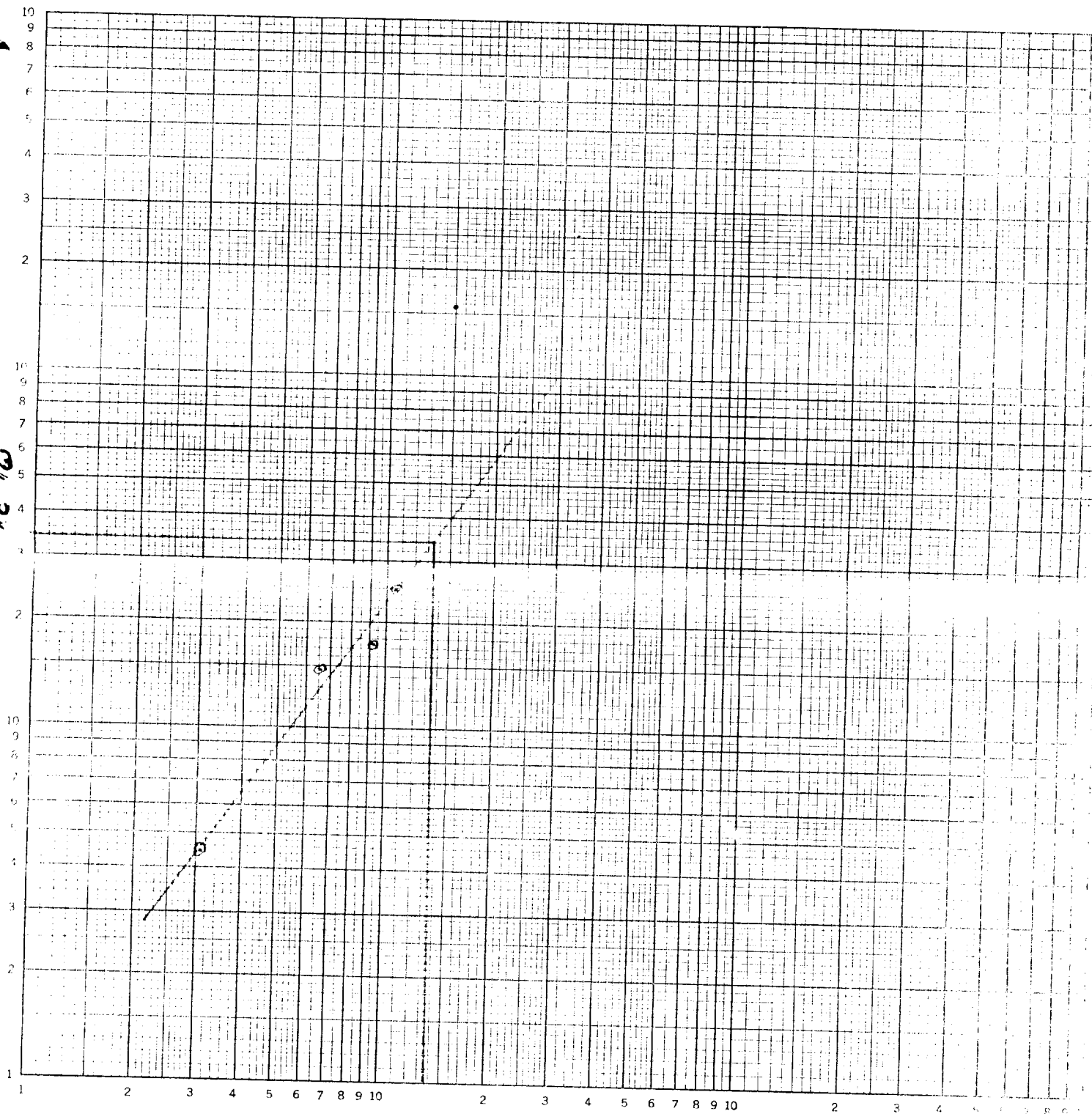
OIL & GAS  
U.S. GEOLOGICAL SURVEY  
ROSWELL, NEW MEXICO

OPERATOR: GRACE Petroleum Company  
 LEASE: West Tonto Federal COM.  
 WELL NO.: #1-Y  
 DATE: 7-08-82

46 7402

$p_c^2 - p_w^2$

LOGARITHMIC 3 X 3 CYCLES  
KEUFFEL & ESSER CO. MADE IN U.S.A.



$Q \rightarrow \text{MCF/D}$

AOE - 1370 MCF/D

$\theta - 54.0$

$n - .727$