

## NEW MEXICO OIL CONSERVATION COMMISSION

Form C-122

Revised 12-1-55

## MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Pool Undesignated Formation Devonian County Lea  
Initial X Annual \_\_\_\_\_ Special \_\_\_\_\_ Date of Test August 9, 1962  
Company Shell Oil Company Lease Harris Federal Well No. 1  
Unit N Sec. 27 Twp. 23S Rge. 34E Purchaser None  
Casing 7 5/8" Wt. 33.7# I.D. 6.765 Set at 14,655' Perf. - To -  
Tubing 2 3/8" Wt. 4.7# I.D. 1.995 Set at 14,636' Perf. - To -  
Gas Pay: From 14,655' To 14,832' L 14,636 xGMix. .756 -GL 11,065 Bar.Press. 13.2  
Producing Thru: Casing \_\_\_\_\_ Tubing X Type Well Single  
Single-Bradenhead-G. G. or G.O. Dual  
Date of Completion: August 9, 1962 Packer 14,620' Reservoir Temp. -

## OBSERVED DATA

Tested Through (~~Stem~~) (~~Stem~~) (Meter) Type Taps Flange

| No. | Flow Data                             |                                          |                | Tubing Data             |              | Casing Data    |              | Duration<br>of Flow<br>Hr. |
|-----|---------------------------------------|------------------------------------------|----------------|-------------------------|--------------|----------------|--------------|----------------------------|
|     | ( <del>Stem</del> )<br>(Line)<br>Size | ( <del>Stem</del> )<br>(Orifice)<br>Size | Press.<br>psig | Diff.<br>h <sub>w</sub> | Temp.<br>°F. | Press.<br>psig | Temp.<br>°F. |                            |
| SI  |                                       |                                          |                |                         |              | 4509           |              | 46 hrs.                    |
| 1.  | 4                                     | 1.750                                    | 255            | 28.00                   | 88           | 4363           |              | 3 hrs.                     |
| 2.  | 4                                     | 1.750                                    | 255            | 73.00                   | 68           | 4262           |              | 1 hrs.                     |
| 3.  | 4                                     | 2.000                                    | 340            | 70.00                   | 42           | 4119           |              | 2 hrs.                     |
| 4.  | 4                                     | 2.500                                    | 375            | 58.00                   | 58           | 3909           |              | 1 hrs.                     |
| 5.  | 4                                     | 2.500                                    | 150            | 30.00                   | 94           | 4319           |              | 2 hrs.                     |

## FLOW CALCULATIONS

| No. | Coefficient<br>(24-Hour) | $\sqrt{h_w p_f}$ | Pressure<br>psia | Flow Temp.<br>Factor<br>F <sub>t</sub> | Gravity<br>Factor<br>F <sub>g</sub> | Compress.<br>Factor<br>F <sub>pv</sub> | Rate of Flow<br>Q-MCFPD<br>@ 15.025 psia |
|-----|--------------------------|------------------|------------------|----------------------------------------|-------------------------------------|----------------------------------------|------------------------------------------|
| 1.  | 19.27                    | 86.67            | 268.2            | .9741                                  | .9292                               | 1.025                                  | 1,550                                    |
| 2.  | 19.27                    | 139.92           | 268.2            | .9924                                  | .9292                               | 1.029                                  | 2,558                                    |
| 3.  | 25.58                    | 157.25           | 353.2            | 1.0178                                 | .9292                               | 1.048                                  | 3,985 31.6.8                             |
| 4.  | 42.13                    | 150.06           | 388.2            | 1.0019                                 | .9292                               | 1.047                                  | 6,161 6.16.2                             |
| 5.  | 42.13                    | 69.97            | 163.2            | .9688                                  | .9292                               | 1.015                                  | 2,694                                    |

## PRESSURE CALCULATIONS

Gas Liquid Hydrocarbon Ratio 43.041 cf/bbl. Specific Gravity Separator Gas .695  
Gravity of Liquid Hydrocarbons 56 deg. API Specific Gravity Flowing Fluid .7547  
F<sub>c</sub> 9.936 (1-e<sup>-s</sup>) .533 P<sub>c</sub> 4522.2 P<sub>c</sub><sup>2</sup> 20,450.3

| No. | $\frac{R_g}{P_t}$<br>P <sub>t</sub> (psia) | P <sub>t</sub> <sup>2</sup> | F <sub>c</sub> Q | (F <sub>c</sub> Q) <sup>2</sup> | (F <sub>c</sub> Q) <sup>2</sup><br>(1-e <sup>-s</sup> ) | P <sub>w</sub> <sup>2</sup> | P <sub>c</sub> <sup>2</sup> -P <sub>w</sub> <sup>2</sup> | Cal.<br>P <sub>w</sub> | $\frac{P_w}{P_c}$ |
|-----|--------------------------------------------|-----------------------------|------------------|---------------------------------|---------------------------------------------------------|-----------------------------|----------------------------------------------------------|------------------------|-------------------|
| 1.  | 4376.2                                     | 19151.1                     | 15.401           | 237.191                         | 126.423                                                 | 19277.5                     | 1172.8                                                   | 4390.6                 | 97.1              |
| 2.  | 4275.2                                     | 18277.3                     | 25.416           | 645.973                         | 344.304                                                 | 18621.6                     | 1823.7                                                   | 4315.3                 | 95.4              |
| 3.  | 4132.2                                     | 17066.8                     | 39.595           | 1567.764                        | 835.618                                                 | 17908.4                     | 2547.5                                                   | 4231.2                 | 93.6              |
| 4.  | 3922.2                                     | 15383.6                     | 61.216           | 3747.399                        | 1927.364                                                | 17381.0                     | 3069.3                                                   | 4169.0                 | 92.2              |
| 5.  | 4332.2                                     | 18767.9                     | 26.767           | 716.472                         | 381.879                                                 | 19149.8                     | 1300.5                                                   | 4376.0                 | 96.8              |

Absolute Potential: 41,000 MCFPD; n 1.000

COMPANY Shell Oil Company  
ADDRESS P. O. Box 1858, Roswell, New Mexico  
AGENT and TITLE A. L. Ellard - Gas Tester  
WITNESSED \_\_\_\_\_  
COMPANY \_\_\_\_\_

## REMARKS

Slope greater than 1.000, a slope of 1.000 drawn through 24 hour rate of flow.

## INSTRUCTIONS

This form is to be used for reporting multi-point back pressure tests on gas wells in the State, except those on which special orders are applicable. Three copies of this form and the back pressure curve shall be filed with the Commission at Box 871, Santa Fe.

The log log paper used for plotting the back pressure curve shall be of at least three inch cycles.

## NOMENCLATURE

$Q$  = Actual rate of flow at end of flow period at W. H. working pressure ( $P_w$ ).  
MCF/da. @ 15.025 psia and 60° F.

$P_c$  = 72 hour wellhead shut-in casing (or tubing) pressure whichever is greater.  
psia

$P_w$  = Static wellhead working pressure as determined at the end of flow period.  
(Casing if flowing thru tubing, tubing if flowing thru casing.) psia

$P_t$  = Flowing wellhead pressure (tubing if flowing through tubing, casing if flowing through casing.) psia

$P_f$  = Meter pressure, psia.

$h_w$  = Differential meter pressure, inches water.

$F_g$  = Gravity correction factor.

$F_t$  = Flowing temperature correction factor.

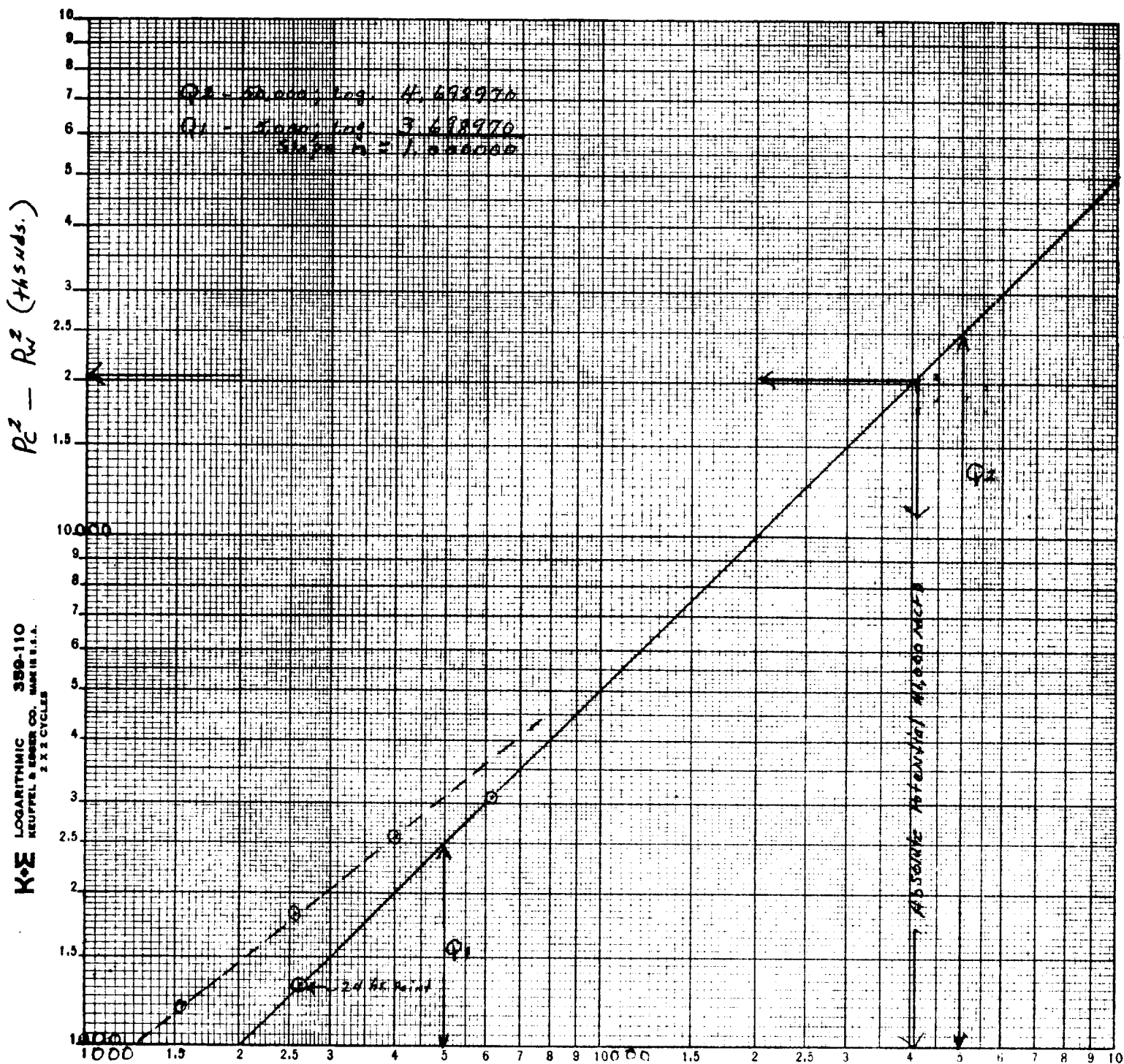
$F_{pv}$  = Supercompressability factor.

$n$  = Slope of back pressure curve.

Note: If  $P_w$  cannot be taken because of manner of completion or condition of well, then  $P_w$  must be calculated by adding the pressure drop due to friction within the flow string to  $P_t$ .

# GAS WELL BACK PRESSURE CURVE

County Le Field Undesignated  
Operator SHELL OIL COMPANY  
Lease HARRIS FEDERAL Well No. 1  
Volume 41,000 MCF/24 hr.  
Date AUGUST 9, 1962



Q - MCFD - 15.025 psia