

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 65-0 (A-E)  
HOURS 0-112  
CATALYST

| FRESH FEED                                |        |                        |                    | WET GAS                                                                     |                             | RECYCLE                                   | COMBINED<br>FEED                 | EFFLUENT                              | NET CHANGE |         | YIELD BASIS H <sub>2</sub> + CO FED |           |        |         |                                |             |                |                  |  |  |
|-------------------------------------------|--------|------------------------|--------------------|-----------------------------------------------------------------------------|-----------------------------|-------------------------------------------|----------------------------------|---------------------------------------|------------|---------|-------------------------------------|-----------|--------|---------|--------------------------------|-------------|----------------|------------------|--|--|
|                                           | %      | m/hr                   | #/hr               | %                                                                           | At Wt. Balance<br>m/hr #/hr | m/hr                                      | m/hr                             | m/hr                                  | m/hr       | #/hr    | #/MCF                               | #/gal     | gal/hr | gal/MCF | YIELDS                         | BASIS       | BROWNSVILLE    | DESIGN FEED RATE |  |  |
| CO<br>28.010                              | 37.004 | 15.435                 | 432.33             | 7.633                                                                       | 1.023 28.65                 | 3.262                                     | 18.697                           | 4.285                                 | -14.412    | -403.68 |                                     |           |        |         |                                |             |                |                  |  |  |
| H <sub>2</sub><br>8.016                   | 60.439 | 25.211                 | 50.83              | 37.541                                                                      | 5.032 10.14                 | 16.040                                    | 41.251                           | 21.072                                | -20.179    | - 40.69 |                                     |           |        |         | 400 EP                         | 82.52       | 8.013          | 98.0             |  |  |
| CO <sub>2</sub><br>44.010                 | 2.003  | 0.835                  | 36.75              | 30.639                                                                      | 4.106 180.71                | 13.092                                    | 13.927                           | 17.198                                | 3.271      | 143.96  | 9.333                               |           |        |         | 400-550                        | 12.72       | 1.235          | 91.4             |  |  |
| N <sub>2</sub><br>28.016                  | 0.159  | 0.066                  | 1.85               | 1.567                                                                       | 0.210 5.88                  | 0.670                                     | 0.736                            | 0.880                                 |            |         |                                     |           |        |         | 550 +                          | 4.76        | 0.462          | 114.6            |  |  |
| CH <sub>4</sub><br>16.042                 | 0.395  | 0.165                  | 2.65               | 11.090                                                                      | 1.486 23.84                 | 4.739                                     | 4.904                            | 6.225                                 | 1.321      | 21.19   | 1.374                               |           |        |         |                                |             |                |                  |  |  |
| C <sub>2</sub> H <sub>6</sub><br>28.028   |        |                        |                    | 2.377                                                                       | 0.319 8.95                  | 1.016                                     | 1.016                            | 1.335                                 | 0.319      | 8.95    | 0.580                               |           |        |         |                                |             |                |                  |  |  |
| C <sub>3</sub> H <sub>8</sub><br>30.028   |        |                        |                    | 1.779                                                                       | 0.238 7.16                  | 0.760                                     | 0.760                            | 0.998                                 | 0.238      | 7.16    | 0.464                               |           |        |         | PROPYLENE                      | 44.3        | 7.18           |                  |  |  |
| C <sub>4</sub> +C <sub>5</sub>            |        |                        |                    |                                                                             |                             |                                           |                                  |                                       |            | 37.30   | 2.418                               |           |        |         | C <sub>3</sub> POLY GASO.      | 87.5        | 6.28           | 1.050            |  |  |
| C <sub>6</sub> H <sub>12</sub><br>42.078  |        |                        |                    | 2.873                                                                       | 0.385 16.20                 | 1.228                                     | 1.228                            | 1.613                                 | 0.385      | 16.20   | 1.050                               | 4.32      | 3.750  | 0.243   | C <sub>3</sub> POLY TAR        | 12.5        | 0.90           | 0.120            |  |  |
| C <sub>8</sub> H <sub>18</sub><br>44.094  |        |                        |                    | 0.269                                                                       | 0.036 1.59                  | 0.115                                     | 0.115                            | 0.151                                 | 0.036      | 1.59    | 0.103                               | 4.24      | 0.375  | 0.024   |                                |             |                |                  |  |  |
| C <sub>10</sub> H <sub>16</sub><br>56.104 |        |                        |                    | 2.002                                                                       | 0.268 15.04                 | 0.855                                     | 0.855                            | 1.123                                 | 0.268      | 15.04   | 0.975                               | 8.00      | 3.008  | 0.195   |                                |             |                |                  |  |  |
| C <sub>12</sub> H <sub>10</sub><br>68.120 |        |                        |                    | 0.777                                                                       | 0.104 6.04                  | 0.332                                     | 0.332                            | 0.436                                 | 0.104      | 6.04    | 0.392                               | 4.86      | 1.243  | 0.081   | C <sub>4</sub> H <sub>8</sub>  | 5.00        | --             | --               |  |  |
| C <sub>14</sub> H <sub>10</sub><br>70.130 |        |                        |                    | 0.917                                                                       | 0.123 8.63                  | 0.392                                     | 0.392                            | 0.515                                 | 0.123      | 8.63    | 0.559                               | 5.48      | 1.583  | 0.103   | C <sub>4</sub> POLY GASO.      | 5.98        | 13.16          | 2.201            |  |  |
| C <sub>16</sub> H <sub>12</sub><br>72.146 |        |                        |                    | 0.244                                                                       | 0.033 2.38                  | 0.104                                     | 0.104                            | 0.137                                 | 0.033      | 2.38    | 0.154                               | 8.28      | 0.453  | 0.029   | C <sub>4</sub> H <sub>10</sub> | 4.86        | (6.04)<br>5.63 | (1.243)<br>1.158 |  |  |
| C <sub>18</sub> H <sub>12</sub><br>84.158 |        |                        |                    | 0.292                                                                       | 0.039 3.28                  | 0.125                                     | 0.125                            | 0.164                                 | 0.039      | 3.28    | 0.213                               | 5.54      | 0.592  | 0.038   | C <sub>4</sub> FREE GASO.      |             |                | 11.531           |  |  |
| C <sub>2</sub> -C <sub>6</sub>            |        |                        |                    |                                                                             |                             |                                           |                                  |                                       |            | 53.16   | 3.446                               |           | 11.004 | 0.713   | C <sub>4</sub> POLY TAR        | 7.53        | 1.88           | 0.250            |  |  |
| TOTAL                                     |        | 41.712                 | 524.41             |                                                                             | 13.402 318.49               | 42.730                                    | 84.442                           | 63.841                                |            |         |                                     |           |        |         |                                |             |                |                  |  |  |
| H <sub>2</sub> +CO                        | 97.443 | 40.646                 | 15425              | SCFH                                                                        | 6.055                       | 19.302                                    | 59.948                           | 25.357                                | -34.591    |         |                                     |           |        |         |                                |             |                |                  |  |  |
| H <sub>2</sub> /CO                        |        | 1.63                   | Factor             | 648298                                                                      | 4.92                        | 4.92                                      | 2.21                             | 4.92                                  | 1.40       |         |                                     |           |        |         | 10 # RVP 480 EP<br>GASOLINE    | 14.890      | 0.9653         | 5233             |  |  |
| Weight Recovery, %                        | 88.09  | Catalyst Age, hrs.     | 56                 | Space Velocity, vhr                                                         | 1281                        | RECOVERED OIL                             | 0.445**                          | 62.44                                 | 4.048      |         | 9.710                               | 0.629     |        |         | GAS OIL                        | 1.129       | 0.0732         | 397              |  |  |
| Pressure, psig                            | 416    | Inlet Velocity, Ft/sec | 0.99               | Catalyst                                                                    |                             | TOTAL OIL                                 |                                  | 115.60                                | 7.494      |         | 20.714                              | 1.342     |        |         | FUEL OIL                       | 0.529       | 0.0343         | 186              |  |  |
| Temperature, °F                           | 663    | Bed Depth, Ft          | 18.26              | Weight, #                                                                   | 1981                        | WATER SOLUBLE<br>CHEMICALS                | 0.378**                          | 20.08                                 | 1.302      | 7.926   | 2.533                               | 0.164     |        |         | POLY TAR                       | 0.370       | 0.0240         | 130              |  |  |
| Recycle Ratio                             | 1.02   | Bed Density, #/CF      | 164                | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) = 12.3 |                             | TOTAL LIQUID<br>PRODUCTS C <sub>4</sub> + |                                  | 135.68                                | 8.796      |         | 23.247                              | 1.506     |        |         | TOTAL                          | 16.918      | 1.0968         | 5946             |  |  |
| FRESH FEED CONVERSION — %                 |        |                        |                    | TOTAL FEED CONVERSION — %                                                   |                             |                                           |                                  | SELECTIVITY                           |            |         |                                     | NET WATER |        |         |                                | W. S. CHEM. |                |                  |  |  |
| Contraction                               | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                                                                          | H <sub>2</sub>              | CO+H <sub>2</sub>                         | C <sub>2</sub> +C <sub>4</sub> + | GROSS WATER                           |            | 144.13  | 9.344                               | 17.425    | 1.130  | TOTAL   | 19.451                         | 1.2610      | 6836           |                  |  |  |
| 67.97                                     | 93.37  | 80.04                  | 85.10              | 77.08                                                                       | 48.92                       | 57.70                                     | 78.44                            | HYDROCARBON<br>TOTAL—C <sub>1</sub> + |            | 172.98  | 11.214                              |           |        |         |                                |             |                |                  |  |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

#9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 65-1 (F-J)  
HOURS 112-232  
CATALYST

| FRESH FEED                                |        |                        |                    | WET GAS                   |                             |                     | RECYCLE                                                                | COMBINED<br>FEED | EFFLUENT                              | NET CHANGE                                | YIELD BASIS H <sub>2</sub> + CO FED |            |        |        |         |                                           |                          |              |                         |         |     |
|-------------------------------------------|--------|------------------------|--------------------|---------------------------|-----------------------------|---------------------|------------------------------------------------------------------------|------------------|---------------------------------------|-------------------------------------------|-------------------------------------|------------|--------|--------|---------|-------------------------------------------|--------------------------|--------------|-------------------------|---------|-----|
|                                           | %      | m/hr                   | #/hr               | %                         | At Wt. Balance<br>m/hr #/hr |                     | m/hr                                                                   | m/hr             | m/hr                                  | m/hr                                      | #/hr                                | CONDENSATE |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE |                          |              |                         |         |     |
|                                           |        |                        |                    |                           |                             |                     |                                                                        |                  |                                       |                                           |                                     | #/MCF      | #/gal  | gal/hr | gal/MCF |                                           | CORRECTED<br>RECOVERY, % | gal/hr       | TREATING<br>RECOVERY, % | gal/hr  |     |
| CO<br>28.010                              | 37.359 | 15.248                 | 427.10             | 9.124                     | 1.296                       | 36.30               | 3.917                                                                  | 19.165           | 5.213                                 | -13.952                                   | -390.80                             |            |        |        |         |                                           |                          |              |                         |         |     |
| H <sub>2</sub><br>8.016                   | 60.124 | 24.540                 | 49.47              | 39.130                    | 5.560                       | 11.21               | 16.798                                                                 | 41.338           | 22.358                                | -18.980                                   | - 38.28                             |            |        |        |         | 400 EP                                    | 80.76                    | 6.581        | 98.0                    | 5.449   |     |
| CO <sub>2</sub><br>44.010                 | 2.084  | 0.851                  | 37.45              | 29.208                    | 4.150                       | 182.64              | 12.538                                                                 | 13.389           | 16.688                                | 3.299                                     | 145.19                              |            |        |        |         | 400-550                                   | 11.36                    | 0.928        | 91.4                    | 0.846   |     |
| N <sub>2</sub><br>28.016                  | 0.193  | 0.079                  | 2.21               | 1.509                     | 0.214                       | 6.00                | 0.648                                                                  | 0.727            | 0.862                                 |                                           |                                     |            |        |        |         | 550 +                                     | 7.88                     | 0.642        | 114.6                   | 0.756   |     |
| CH <sub>4</sub><br>16.042                 | 0.240  | 0.098                  | 1.57               | 9.768                     | 1.388                       | 22.27               | 4.194                                                                  | 4.292            | 5.582                                 | 1.290                                     | 20.70                               | 1.371      |        |        |         |                                           |                          |              |                         |         |     |
| C <sub>2</sub> H <sub>6</sub><br>28.028   |        |                        |                    | 2.292                     | 0.326                       | 9.14                | 0.984                                                                  | 0.984            | 1.310                                 | 0.326                                     | 9.14                                | 0.605      |        |        |         |                                           |                          |              |                         |         |     |
| C <sub>3</sub> H <sub>8</sub><br>35.028   |        |                        |                    | 1.725                     | 0.245                       | 7.37                | 0.741                                                                  | 0.741            | 0.986                                 | 0.245                                     | 7.37                                | 0.488      |        |        |         | PROPYLENE                                 | 4.06                     | 7.07         |                         |         |     |
| C <sub>4</sub> +C <sub>5</sub>            |        |                        |                    |                           |                             |                     |                                                                        |                  |                                       |                                           | 37.21                               | 2.464      |        |        |         | C <sub>3</sub> POLY GASO.                 | 87.5                     | 6.19         | 1.035                   |         |     |
| C <sub>6</sub> H <sub>12</sub><br>42.078  |        |                        |                    | 2.913                     | 0.414                       | 17.42               | 1.251                                                                  | 1.251            | 1.665                                 | 0.414                                     | 17.42                               | 1.154      | 4.32   | 4.032  | 0.267   | C <sub>3</sub> POLY TAR                   | 12.5                     | 0.88         | 0.117                   |         |     |
| C <sub>8</sub> H <sub>18</sub><br>44.094  |        |                        |                    | 0.277                     | 0.039                       | 1.72                | 0.119                                                                  | 0.119            | 0.158                                 | 0.039                                     | 1.72                                | 0.114      | 4.24   | 0.408  | 0.027   |                                           |                          |              |                         |         |     |
| C <sub>10</sub> H <sub>16</sub><br>56.104 |        |                        |                    | 1.893                     | 0.269                       | 15.09               | 0.813                                                                  | 0.813            | 1.082                                 | 0.269                                     | 15.09                               | 0.999      | 5.00   | 3.018  | 0.200   |                                           | #/gal                    | #/hr         | gal/hr                  | RVP     |     |
| C <sub>12</sub> H <sub>10</sub><br>68.120 |        |                        |                    | 0.727                     | 0.103                       | 5.99                | 0.312                                                                  | 0.312            | 0.415                                 | 0.103                                     | 5.99                                | 0.397      | 4.86   | 1.233  | 0.082   | C <sub>4</sub> H <sub>8</sub>             | 5.00                     | --           | --                      | 68.0    |     |
| C <sub>14</sub> H <sub>10</sub><br>70.130 |        |                        |                    | 0.931                     | 0.132                       | 9.26                | 0.400                                                                  | 0.400            | 0.532                                 | 0.132                                     | 9.26                                | 0.613      | 5.45   | 1.699  | 0.113   | C <sub>4</sub> POLY GASO.                 | 5.98                     | 13.20        | 2.208                   | 1.5     |     |
| C <sub>16</sub> H <sub>12</sub><br>72.146 |        |                        |                    | 0.244                     | 0.035                       | 2.53                | 0.105                                                                  | 0.105            | 0.140                                 | 0.035                                     | 2.53                                | 0.168      | 8.25   | 0.482  | 0.032   | C <sub>4</sub> H <sub>10</sub>            | 4.86                     | 5.99<br>5.17 | 1.233<br>1.064          | 68.0    |     |
| C <sub>18</sub> H <sub>12</sub><br>84.158 |        |                        |                    | 0.259                     | 0.037                       | 3.11                | 0.111                                                                  | 0.111            | 0.148                                 | 0.037                                     | 3.11                                | 0.208      | 5.54   | 0.561  | 0.037   | C <sub>4</sub> -FREE GASO.                |                          |              | 10.226                  | 5.8     |     |
| C <sub>2</sub> -C <sub>6</sub>            |        |                        |                    |                           |                             |                     |                                                                        |                  |                                       |                                           | 55.12                               | 3.651      |        | 11.431 | 0.758   | C <sub>4</sub> POLY TAR                   | 7.53                     | 1.89         | 0.251                   |         |     |
| TOTAL                                     |        | 40.816                 | 517.80             |                           | 14.208                      | 330.05              | 42.931                                                                 | 83.747           | 64.316                                |                                           |                                     |            |        |        |         |                                           |                          |              |                         |         |     |
| H <sub>2</sub> +CO                        | 97.483 | 39.788                 | 15100              | SCFH                      | 6.856                       |                     | 20.715                                                                 | 60.503           | 27.571                                | -32.932                                   |                                     |            |        |        |         |                                           |                          | gal/hr       | gal / MCF               | Bbl/Day |     |
| H <sub>2</sub> /CO                        |        | 1.61                   | Factor             | 662251                    | 4.29                        |                     | 4.29                                                                   | 2.16             | 4.29                                  | 1.36                                      |                                     |            |        |        |         | 10 # RVP 480 EP<br>GASOLINE               | 13.498                   | 0.8939       | 4846                    |         |     |
| Weight Recovery, %                        | 89.09  | Catalyst Age, hrs.     |                    |                           |                             | Space Velocity, vhr |                                                                        | 1214             | RECOVERED OIL                         |                                           | 0.375**                             | 52.25      | 3.460  | 8.149  | 0.540   | GAS OIL                                   | 0.846                    | 0.0560       | 304                     |         |     |
| Pressure, psig                            | 414    | Inlet Velocity, Ft/sec |                    |                           |                             | 0.99                | Catalyst                                                               |                  |                                       | TOTAL OIL                                 |                                     |            | 107.37 | 7.111  | 19.580  | 1.298                                     | FUEL OIL                 | 0.736        | 0.0487                  | 284     |     |
| Temperature, °F                           | 665    | Bed Depth, Ft          |                    |                           |                             | 18.84               | Weight, #                                                              |                  | 1954                                  | WATER SOLUBLE<br>CHEMICALS                |                                     | 0.375**    | 19.89  | 1.317  | 7.935   | 2.507                                     | 0.166                    | POLY TAR     | 0.368                   | 0.0244  | 132 |
| Recycle Ratio                             | 1.05   | Bed Density, #/CF      |                    |                           |                             | 157                 | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) = |                  | 11.1                                  | TOTAL LIQUID<br>PRODUCTS C <sub>4</sub> + |                                     |            | 127.26 | 8.428  | 22.087  | 1.464                                     | TOTAL                    | 15.448       | 1.0830                  | 5546    |     |
| FRESH FEED CONVERSION — %                 |        |                        |                    | TOTAL FEED CONVERSION — % |                             |                     |                                                                        | SELECTIVITY      |                                       |                                           |                                     | NET WATER  |        |        |         | W. S. CHEM.                               |                          |              |                         |         |     |
| Contraction                               | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub>              | CO+H <sub>2</sub>   | C <sub>2</sub> + /C <sub>4</sub> +                                     |                  | GROSS WATER                           |                                           |                                     | 135.71     | 8.987  | 16.411 | 1.087   | TOTAL                                     | 17.955                   | 1.1890       | 6446                    |         |     |
| 65.19                                     | 91.50  | 77.34                  | 82.77              | 72.80                     | 45.91                       | 54.43               | 77.58                                                                  |                  | HYDROCARBON<br>TOTAL—C <sub>1</sub> + |                                           |                                     | 164.47     | 10.898 |        |         |                                           |                          |              |                         |         |     |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

#9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 65-8 (K-N)  
HOURS 232-326  
CATALYST

| FRESH FEED                               |        |                        |                     | WET GAS                                                                                |                             |                                           | RECYCLE                           | COMBINED<br>FEED | EFFLUENT | NET CHANGE |        | YIELD BASIS H <sub>2</sub> + CO FED     |                                    |        |       |                                                            |        |               |                 |       |      |
|------------------------------------------|--------|------------------------|---------------------|----------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------|-----------------------------------|------------------|----------|------------|--------|-----------------------------------------|------------------------------------|--------|-------|------------------------------------------------------------|--------|---------------|-----------------|-------|------|
|                                          | %      | m/hr                   | #/hr                | %                                                                                      | At Wt. Balance<br>m/hr #/hr |                                           | m/hr                              | m/hr             | m/hr     | m/hr       | #/hr   | #/MCF                                   | CONDENSATE<br>#/gal gal/hr gal/MCF |        |       | YIELDS                                                     | BASIS  | BROWNSVILLE   | DESIGN          | FEED  | RATE |
| CO<br>28.010                             | 37.164 | 15.125                 | 423.65              | 10.849                                                                                 | 1.718                       | 48.12                                     | 4.580                             | 19.705           | 6.298    | 13.407     | 375.53 |                                         |                                    |        |       |                                                            |        |               |                 |       |      |
| H <sub>2</sub><br>2.016                  | 60.285 | 24.534                 | 49.46               | 41.618                                                                                 | 6.591                       | 13.29                                     | 17.569                            | 42.103           | 24.160   | 17.943     | 36.17  |                                         |                                    |        |       | 400 EP                                                     | 80.75  | 5.168         | 98.0            | 5.065 |      |
| CO <sub>2</sub><br>44.010                | 2.142  | 0.872                  | 38.37               | 27.228                                                                                 | 4.312                       | 189.77                                    | 11.494                            | 12.366           | 15.806   | 3.440      | 151.40 | 10.059                                  |                                    |        |       | 400-550                                                    | 10.65  | 0.682         | 91.4            | 0.623 |      |
| N <sub>2</sub><br>28.016                 | 0.215  | 0.088                  | 2.47                | 1.363                                                                                  | 0.216                       | 6.05                                      | 0.575                             | 0.663            | 0.791    |            |        |                                         |                                    |        |       | 550 +                                                      | 8.60   | 0.550         | 114.6           | 0.630 |      |
| CH <sub>4</sub><br>16.042                | 0.194  | 0.079                  | 1.27                | 8.745                                                                                  | 1.385                       | 22.22                                     | 3.692                             | 3.771            | 5.077    | 1.306      | 20.95  | 1.392                                   |                                    |        |       |                                                            |        |               |                 |       |      |
| C <sub>2</sub> H <sub>6</sub><br>28.052  |        |                        |                     | 2.009                                                                                  | 0.318                       | 8.92                                      | 0.848                             | 0.948            | 1.166    | 0.318      | 8.92   | 0.593                                   |                                    |        |       |                                                            |        |               |                 |       |      |
| C <sub>2</sub> H <sub>4</sub><br>38.068  |        |                        |                     | 1.646                                                                                  | 0.261                       | 7.85                                      | 0.695                             | 0.695            | 0.956    | 0.261      | 7.85   | 0.522                                   |                                    |        |       | PROPYLENE                                                  | 36.1   | 5.85          |                 |       |      |
| C <sub>1</sub> + C <sub>2</sub>          |        |                        |                     |                                                                                        |                             |                                           |                                   |                  |          |            | 37.72  | 2.507                                   |                                    |        |       | C <sub>3</sub> POLY GASO.                                  | 87.5   | 5.12          | 0.856           |       |      |
| C <sub>3</sub> H <sub>8</sub><br>42.078  |        |                        |                     | 2.429                                                                                  | 0.385                       | 16.20                                     | 1.025                             | 1.025            | 1.410    | 0.385      | 16.20  | 1.076                                   | 4.32                               | 3.750  | 0.249 | C <sub>3</sub> POLY TAR                                    | 12.5   | 0.73          | 0.097           |       |      |
| C <sub>3</sub> H <sub>6</sub><br>44.094  |        |                        |                     | 0.231                                                                                  | 0.037                       | 1.63                                      | 0.098                             | 0.098            | 0.135    | 0.037      | 1.63   | 0.108                                   | 4.24                               | 0.384  | 0.026 |                                                            |        |               |                 |       |      |
| C <sub>4</sub> H <sub>10</sub><br>56.104 |        |                        |                     | 1.709                                                                                  | 0.271                       | 15.20                                     | 0.721                             | 0.721            | 0.992    | 0.271      | 15.20  | 1.010                                   | 5.00                               | 3.040  | 0.202 |                                                            |        |               |                 |       |      |
| C <sub>4</sub> H <sub>8</sub><br>58.120  |        |                        |                     | 0.699                                                                                  | 0.111                       | 6.45                                      | 0.295                             | 0.295            | 0.406    | 0.111      | 6.45   | 0.429                                   | 4.86                               | 1.327  | 0.088 | C <sub>4</sub> H <sub>8</sub>                              | 5.00   | --            | --              | 68.0  |      |
| C <sub>5</sub> H <sub>12</sub><br>70.130 |        |                        |                     | 0.925                                                                                  | 0.146                       | 10.24                                     | 0.390                             | 0.390            | 0.536    | 0.146      | 10.24  | 0.680                                   | 5.45                               | 1.879  | 0.125 | C <sub>5</sub> POLY GASO.                                  | 5.98   | 13.30         | 2.224           | 1.5   |      |
| C <sub>5</sub> H <sub>10</sub><br>72.146 |        |                        |                     | 0.263                                                                                  | 0.042                       | 3.03                                      | 0.111                             | 0.111            | 0.153    | 0.042      | 3.03   | 0.201                                   | 5.25                               | 0.577  | 0.038 | C <sub>6</sub> H <sub>10</sub>                             | 4.86   | (6.45<br>4.77 | (1.327<br>0.932 | 68.0  |      |
| C <sub>6</sub> H <sub>14</sub><br>84.156 |        |                        |                     | 0.286                                                                                  | 0.045                       | 3.79                                      | 0.121                             | 0.121            | 0.166    | 0.045      | 3.79   | 0.252                                   | 5.54                               | 0.684  | 0.045 | C <sub>4</sub> FREE GASO.                                  |        |               | 9.061           | 5.8   |      |
| C <sub>3</sub> - C <sub>6</sub>          |        |                        |                     |                                                                                        |                             |                                           |                                   |                  |          |            | 56.54  | 3.756                                   |                                    | 11.641 | 0.773 | C <sub>4</sub> POLY TAR                                    | 7.53   | 1.90          | 0.252           |       |      |
| TOTAL                                    |        | 40.698                 | 515.22              |                                                                                        | 15.838                      | 352.76                                    | 42.214                            | 82.912           | 58.052   |            |        |                                         |                                    |        |       |                                                            |        |               |                 |       |      |
| H <sub>2</sub> + CO                      | 97.449 | 39.659                 | 15.051              | SCFH                                                                                   |                             |                                           | 22.149                            | 61.808           | 30.458   | -31.350    |        |                                         |                                    |        |       |                                                            |        |               |                 |       |      |
| H <sub>2</sub> /CO                       |        | 1.62                   | Factor 664407       |                                                                                        |                             |                                           | 3.84                              | 2.14             | 3.84     | 1.34       |        |                                         |                                    |        |       | 10 # BPP 400 EP<br>GASOLINE                                | 12.267 | 0.8150        | 4419            |       |      |
| Weight Recovery, %                       | 79.66  | Catalyst Age, hrs.     | 279                 | Space Velocity, vhr                                                                    | 1222                        | RECOVERED OIL                             | **0.296                           | 41.47            | 2.755    |            | 6.400  | 0.425                                   |                                    |        |       | GAS OIL                                                    | 0.623  | 0.0414        | 224             |       |      |
| Pressure, psig                           | 410    | Inlet Velocity, Ft/sec | 1.00                | Catalyst Vol, CF                                                                       | 12.32                       | TOTAL OIL                                 |                                   | 98.01            | 6.511    |            | 18.041 | 1.198                                   |                                    |        |       | FUEL OIL                                                   | 0.630  | 0.0419        | 227             |       |      |
| Temperature, °F                          | 667    | Bed Depth, Ft          | 18.67               | Weight, #                                                                              | 1725                        | WATER SOLUBLE<br>CHEMICALS                | **0.365                           | 19.38            | 1.288    | 7.982      | 2.428  | 0.161                                   |                                    |        |       | POLY TAR                                                   | 0.349  | 0.0232        | 126             |       |      |
| Recycle Ratio                            | 1.04   | Bed Density, #/CF      | 140                 | Effluent (H <sub>2</sub> )/(CO <sub>2</sub> )<br>Shift Ratio (H <sub>2</sub> O)/(CO) = | 10.7                        | TOTAL LIQUID<br>PRODUCTS C <sub>3</sub> + |                                   | 117.39           | 7.799    |            | 20.469 | 1.360                                   |                                    |        |       | TOTAL                                                      | 13.869 | 0.9215        | 4996            |       |      |
| FRESH FEED CONVERSION — %                |        |                        |                     | TOTAL FEED CONVERSION — %                                                              |                             |                                           |                                   | SELECTIVITY      |          |            |        | NET WATER                               |                                    |        |       | *9488 MCFH H <sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF |        |               |                 |       |      |
| Conversion                               | CO     | H <sub>2</sub>         | H <sub>2</sub> + CO | CO                                                                                     | H <sub>2</sub>              | CO + H <sub>2</sub>                       | C <sub>3</sub> + C <sub>4</sub> + | GROSS WATER      |          |            |        | HYDROCARBON<br>TOTAL — C <sub>1</sub> + |                                    |        |       |                                                            |        |               |                 |       |      |
| 61.08                                    | 88.64  | 73.14                  | 79.05               | 68.04                                                                                  | 42.62                       | 50.72                                     | 75.68                             |                  |          |            |        | 155.1110.306                            |                                    |        |       |                                                            |        |               |                 |       |      |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. 65-A  
HOURS 0-16  
CATALYST Bethlehem Mill  
Scale Red. 800<sup>OP</sup>

| FRESH FEED                                |        |                |                        | WET GAS                   |                                                                              |                   | RECYCLE                           | COMBINED FEED                          | EFFLUENT | NET CHANGE |         | YIELD BASIS H <sub>2</sub> + CO FED |        |        |                         |                                            |                          |                |                      |         |  |
|-------------------------------------------|--------|----------------|------------------------|---------------------------|------------------------------------------------------------------------------|-------------------|-----------------------------------|----------------------------------------|----------|------------|---------|-------------------------------------|--------|--------|-------------------------|--------------------------------------------|--------------------------|----------------|----------------------|---------|--|
|                                           | %      | m/hr           | #/hr                   | %                         | At Wt. Balance                                                               |                   | m/hr                              | m/hr                                   | m/hr     | m/hr       | #/hr    | CONDENSATE                          |        |        |                         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                          |                |                      |         |  |
|                                           |        |                |                        |                           | m/hr                                                                         | #/hr              |                                   |                                        |          |            |         | #/MCF                               | #/gal  | gal/hr | gal/MCF                 |                                            | CORRECTED HEMPEL, %      | gal/hr         | TREATING RECOVERY, % | gal/hr  |  |
| CO<br>28.010                              | 37.280 | 15.667         | 438.83                 | 5.210                     | 0.644                                                                        | 18.04             | 2.218                             | 17.885                                 | 2.862    | -15.023    | -420.79 |                                     |        |        |                         |                                            |                          |                |                      |         |  |
| H <sub>2</sub><br>5.018                   | 60.307 | 25.345         | 51.10                  | 37.416                    | 4.623                                                                        | 9.32              | 15.927                            | 41.272                                 | 20.550   | -20.722    | -41.78  |                                     |        |        |                         | 400 EP                                     | 81.9                     | 9.281          | 98.0                 | 9.095   |  |
| CO <sub>2</sub><br>44.010                 | 2.093  | 0.880          | 38.73                  | 32.177                    | 3.974                                                                        | 174.91            | 13.697                            | 14.577                                 | 17.671   | 3.094      | 136.18  | 8.750                               |        |        |                         | 400-550                                    | 12.8                     | 1.451          | 91.4                 | 1.326   |  |
| N <sub>2</sub><br>28.016                  | 0.107  | 0.045          | 1.26                   | 1.697                     | 0.210                                                                        | 5.88              | 0.722                             | 0.767                                  | 0.932    |            |         |                                     |        |        |                         | 550 +                                      | 5.3                      | 0.601          | 114.6                | 0.689   |  |
| CH <sub>4</sub><br>16.082                 | 0.213  | 0.090          | 1.44                   | 11.293                    | 1.395                                                                        | 22.38             | 4.807                             | 4.897                                  | 6.202    | 1.305      | 20.94   | 1.345                               |        |        |                         |                                            |                          |                |                      |         |  |
| C <sub>2</sub> H <sub>6</sub><br>28.038   |        |                |                        | 2.570                     | 0.318                                                                        | 8.92              | 1.094                             | 1.094                                  | 1.412    | 0.318      | 8.92    | 0.573                               |        |        |                         |                                            |                          |                |                      |         |  |
| C <sub>3</sub> H <sub>8</sub><br>30.068   |        |                |                        | 1.803                     | 0.223                                                                        | 6.71              | 0.768                             | 0.768                                  | 0.991    | 0.223      | 6.71    | 0.431                               |        |        |                         | PROPYLENE                                  | 48.6                     | 7.12           |                      |         |  |
| C <sub>4</sub> +C <sub>5</sub>            |        |                |                        |                           |                                                                              |                   |                                   |                                        |          |            | 36.57   | 2.349                               |        |        |                         | C <sub>3</sub> POLY GASO.                  | 87.5                     | 6.23           | 1.042                |         |  |
| C <sub>6</sub> H <sub>14</sub><br>42.078  |        |                |                        | 2.817                     | 0.348                                                                        | 14.64             | 1.199                             | 1.199                                  | 1.547    | 0.348      | 14.64   | 0.941                               | 4.32   | 3.389  | 0.218                   | C <sub>3</sub> POLY TAR                    | 12.5                     | 0.89           | 0.118                |         |  |
| C <sub>7</sub> H <sub>16</sub><br>44.094  |        |                |                        | 0.283                     | 0.035                                                                        | 1.54              | 0.120                             | 0.120                                  | 0.155    | 0.035      | 1.54    | 0.099                               | 4.24   | 0.363  | 0.023                   |                                            |                          |                |                      |         |  |
| C <sub>8</sub> H <sub>18</sub><br>58.104  |        |                |                        | 2.147                     | 0.265                                                                        | 14.87             | 0.914                             | 0.914                                  | 1.179    | 0.265      | 14.87   | 0.955                               | 5.00   | 2.974  | 0.191                   |                                            | #/gal                    | #/hr           | gal/hr               | RVP     |  |
| C <sub>9</sub> H <sub>20</sub><br>58.120  |        |                |                        | 0.900                     | 0.111                                                                        | 6.45              | 0.383                             | 0.383                                  | 0.494    | 0.111      | 6.45    | 0.414                               | 4.86   | 1.327  | 0.085                   | C <sub>4</sub> H <sub>10</sub>             | 5.00                     |                |                      | 68.0    |  |
| C <sub>10</sub> H <sub>22</sub><br>70.130 |        |                |                        | 1.027                     | 0.127                                                                        | 8.91              | 0.437                             | 0.437                                  | 0.564    | 0.127      | 8.91    | 0.572                               | 5.48   | 1.635  | 0.105                   | C <sub>4</sub> POLY GASO.                  | 5.98                     | 13.01          | 2.176                | 1.5     |  |
| C <sub>11</sub> H <sub>24</sub><br>72.142 |        |                |                        | 0.297                     | 0.037                                                                        | 2.67              | 0.126                             | 0.126                                  | 0.163    | 0.037      | 2.67    | 0.172                               | 5.25   | 0.509  | 0.033                   | C <sub>4</sub> H <sub>10</sub>             | 4.86                     | (6.45)<br>6.11 | 1.327<br>1.258       | 68.0    |  |
| C <sub>12</sub> H <sub>26</sub><br>84.152 |        |                |                        | 0.363                     | 0.045                                                                        | 3.79              | 0.155                             | 0.155                                  | 0.200    | 0.045      | 3.79    | 0.244                               | 5.54   | 0.684  | 0.044                   | C <sub>4</sub> FREE GASO.                  |                          |                | 12.955               | 5.8     |  |
| C <sub>13</sub> -C <sub>14</sub>          |        |                |                        |                           |                                                                              |                   |                                   |                                        |          |            | 52.87   | 3.397                               | 10.981 | 0.699  | C <sub>4</sub> POLY TAR | 7.53                                       | 1.86                     | 0.247          |                      |         |  |
| TOTAL                                     |        | 42.026         |                        |                           | 12.355                                                                       | 299.03            | 42.568                            | 84.494                                 | 63.619   |            |         |                                     |        |        |                         |                                            |                          |                |                      |         |  |
| H <sub>2</sub> +CO                        | 97.587 | 41.012         | 15564                  | SCFH                      | 5.267                                                                        |                   | 18.145                            | 59.157                                 | 23.412   | -35.745    |         |                                     |        |        |                         |                                            | 10 # RVP 400 EP GASOLINE | gal/hr         | gal/MCF              | Bbl/Day |  |
| H <sub>2</sub> /CO                        |        | 1.62           | Factor                 | 642508                    | 7.18                                                                         |                   | 7.18                              | 2.31                                   | 7.18     | 1.38       |         |                                     |        |        |                         |                                            |                          |                |                      |         |  |
| Weight Recovery, %                        | 92.97  |                | Catalyst Age, hrs.     |                           | Space Velocity, vhr                                                          | 1335              |                                   | RECOVERED OIL **                       | 0.519    | 72.84      | 4.680   |                                     | 11.333 | 0.728  |                         | GAS OIL                                    | 1.326                    | 0.0852         | 462                  |         |  |
| Pressure, psig                            | 416    |                | Inlet Velocity, Ft/sec | 1.00                      | Catalyst Vol CF                                                              | 11.66             |                                   | TOTAL OIL                              |          | 125.71     | 8.077   |                                     | 22.214 | 1.427  |                         | FUEL OIL                                   | 0.689                    | 0.0443         | 240                  |         |  |
| Temperature, °F                           | 664    |                | Bed Depth, Ft          | 17.67                     | Weight, #                                                                    | 1877              |                                   | WATER SOLUBLE CHEMICALS **             | 0.347    | 18.41      | 1.183   |                                     | 2.309  | 0.148  |                         | POLY TAR                                   | 0.365                    | 0.0235         | 127                  |         |  |
| Recycle Ratio                             | 1.01   |                | Bed Density, #/CF      | 161                       | Effluent (H <sub>2</sub> /CO) <sub>2</sub> Shift Ratio (H <sub>2</sub> O/CO) | = 17.65           |                                   | TOTAL LIQUID PRODUCTS C <sub>4</sub> + |          | 144.12     | 9.260   |                                     | 24.523 | 1.575  |                         | TOTAL                                      | 18.779                   | 1.2066         | 6541                 |         |  |
| FRESH FEED CONVERSION — %                 |        |                |                        | TOTAL FEED CONVERSION — % |                                                                              |                   |                                   | SELECTIVITY                            |          |            |         |                                     |        |        |                         |                                            |                          |                |                      |         |  |
| Contraction                               | CO     | H <sub>2</sub> | H <sub>2</sub> +CO     | CO                        | H <sub>2</sub>                                                               | CO+H <sub>2</sub> | C <sub>3</sub> + C <sub>4</sub> + | NET WATER                              |          | 7.830      | 141.06  | 9.063                               | 16.934 | 1.088  |                         | W. S. CHEM.                                | 2.309                    | 0.1484         | 805                  |         |  |
| 69.00                                     | 95.87  | 80.77          | 86.46                  | 83.80                     | 49.60                                                                        | 59.94             | 78.44                             | HYDROCARBON TOTAL—C <sub>4</sub> +     |          |            | 159.47  | 10.246                              | 19.243 | 1.236  |                         | TOTAL                                      | 21.088                   | 1.3550         | 7346                 |         |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**DATA SUMMARY**

RUN NO. 65-A  
HOURS 0-16

| OPERATING CONDITIONS |        |                                 |       | PRODUCT TESTS                                  |      |       |  | CATALYST DATA                        |             |                                             |               |
|----------------------|--------|---------------------------------|-------|------------------------------------------------|------|-------|--|--------------------------------------|-------------|---------------------------------------------|---------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.                  |       | OIL                                            |      | WATER |  | INVENTORY DATA                       |             | PARTICLE SIZE                               |               |
| Oxygen               | 440    | Fresh Feed                      | 15949 | *API                                           | 51.8 | 10.7  |  | In Reactor at Start of Period        |             | Screen Analysis                             | Sedimentation |
| Natural Gas          | 436    | Recycle                         | 16155 | Reut. No.                                      | 47.9 | 33.1  |  | Fresh Catalyst Added                 |             | Mesh                                        | Microns       |
| Generator Outlet     | 420    | Combined Feed                   | 32104 | Sap. No.                                       | 61.4 | 35.9  |  | Total                                |             | On 40                                       | 419+          |
| Reactor Inlet        | 416    | Wet Gas—Measured                | 3936  | Hydrox. No.                                    |      |       |  | Catalyst Recovered                   | 70 1/2      | 100                                         | 150           |
| Condenser Inlet      |        | Adjusted                        | 4689  | Bromine No.                                    | 91   |       |  | In Reactor at End of Period          |             | 150                                         | 105           |
| Product Accumulator  | 387    | Loss                            | 753   | Pour °F.                                       |      |       |  |                                      |             | 200                                         | 74            |
|                      |        |                                 |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 12.0  |  | REACTOR d-p, Inches H <sub>2</sub> O |             | 250                                         | 62            |
|                      |        |                                 |       |                                                |      |       |  | No. Height                           |             | 325                                         | 44            |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed              | 1.01  |                                                |      |       |  | 0 0-21-36                            | add one ft. | <325                                        |               |
| Oxygen               | 483    | Inlet Velocity—ft./sec.         | 1.00  |                                                |      |       |  | 1 21-3/8-52-3/4                      | 79          | CATALYST                                    |               |
| Natural Gas          | 804    | Fresh Feed Rate—S.C.F.H.        | 15564 | HEMPEL, DIST. %                                |      | *API  |  | 2 52-3/4-84                          | 75          | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            | 2469   | per Cu. Ft. Dense Bed           | 1355  | 205 °F.                                        |      |       |  | 3 84-115 3/8                         | 87          | Aerated                                     |               |
| Quench Accumulator   | 112    | per Lb. Catalyst                | 8.29  | 400                                            | 80.9 | 54.9  |  | 4 115 3/8-353 1/8                    | 275         | Settled                                     |               |
| Reactor Inlet        | 279    | per Sq. Ft.                     | 23581 | 400-550                                        | 12.8 | 34.3  |  |                                      |             | Compacted                                   |               |
| Condenser Inlet      | 601    |                                 |       | 550+                                           | 6.3  |       |  |                                      |             | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 92     | Heat Transfer Calculations      |       |                                                |      |       |  | CALCULATED FROM dp                   |             | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height | Steam Rate = 386#/hr            |       | A. S. T. M. DIST. ON                           |      |       |  | Density, Lbs./Cu.Ft.                 | 161         | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1                    | 0'0"   | @ 707 psia & 505°F              |       | Naphtha °F.                                    |      |       |  | Inventory, Lbs.                      | 1877        |                                             |               |
| 2                    | 0'9"   | 1201 BTU/#                      |       | IBP                                            | 101  |       |  | Bed Depth, Ft.                       | 17.67       | CHEMICAL ANALYSIS                           |               |
| 3                    | 1'9"   | Water in @ 53°F = 21 BTU/#      |       | 10%                                            | 124  |       |  | Vol., Cu. Ft.                        | 11.66       | Fe                                          |               |
| 4                    | 4'5"   | Net Heat Transferred/# Steam    | 50%   |                                                | 216  |       |  |                                      |             | C                                           |               |
| 5                    | 7'0"   | = 1180 BTU                      |       | 90%                                            | 341  |       |  |                                      |             | O                                           |               |
| 6                    | 12'3"  | (1180)(386) = 455480 BTU/hr     |       | EP                                             | 391  |       |  |                                      |             | H                                           |               |
| 7                    | 17'5"  | Ave. Bed Temp.=664              |       | Rec.                                           | 97.5 |       |  |                                      |             | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 20'0"  | dt=664-505=159°F                |       |                                                |      |       |  |                                      |             | X-Ray Analysis—                             |               |
| 9                    | 22'7"  | Tube Area = 32.1 sq ft          |       |                                                |      |       |  |                                      |             | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 25'2"  | K= $\frac{455480}{(32.1)(159)}$ |       |                                                |      |       |  |                                      |             | Fe <sub>2</sub> O <sub>4</sub>              |               |
| 11                   | 26'11" | 89.2 BTU/°F/sq ft               |       |                                                |      |       |  |                                      |             | Fe                                          |               |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. 65-B  
HOURS 16-40  
Catalytic Bethlehem Mill  
Scale Reduced @ 8000

| FRESH FEED                       |        |                |                         | WET GAS |                                                                                 |                   |                                   | RECYCLE                                | COMBINED FEED | EFFLUENT | NET CHANGE |       | YIELD BASIS H <sub>2</sub> + CO FED |       |       |        |         |                                 |        |             |        |            |
|----------------------------------|--------|----------------|-------------------------|---------|---------------------------------------------------------------------------------|-------------------|-----------------------------------|----------------------------------------|---------------|----------|------------|-------|-------------------------------------|-------|-------|--------|---------|---------------------------------|--------|-------------|--------|------------|
|                                  | %      | m/hr           | #/hr                    | %       | At Wt. Balance                                                                  | m/hr              | #/hr                              | m/hr                                   | m/hr          | m/hr     | m/hr       | #/hr  | CONDENSATE                          | #/MCF | #/gal | gal/hr | gal/MCF | YIELDS                          | BASIS  | BROWNSVILLE | DESIGN | FEED RATE* |
| CO                               | 36.954 | 15.470         | 533.30                  | 6.435   | 0.794                                                                           | 22.24             | 2.726                             | 18.196                                 | 3.520         | -14.676  | -411.06    |       |                                     |       |       |        |         |                                 |        |             |        |            |
| H <sub>2</sub>                   | 60.510 | 25.331         | 51.07                   | 36.301  | 4.483                                                                           | 9.04              | 15.381                            | 40.712                                 | 19.864        | -20.848  | 42.03      |       |                                     |       |       |        |         | 400 EP                          | 80.6   | 8.664       | 98.0   | 8.491      |
| CO <sub>2</sub>                  | 2.090  | 0.975          | 38.51                   | 31.453  | 3.884                                                                           | 170.93            | 13.327                            | 14.202                                 | 17.211        | 3.009    | 132.42     | 8.552 |                                     |       |       |        |         | 400-550                         | 12.8   | 1.376       | 91.4   | 1.258      |
| N <sub>2</sub>                   | 0.133  | 0.056          | 1.57                    | 1.660   | 0.205                                                                           | 5.74              | 0.703                             | 0.759                                  | 0.908         |          |            |       |                                     |       |       |        |         | 550 +                           | 6.6    | 0.709       | 114.6  | 0.813      |
| CH <sub>4</sub>                  | 0.313  | 0.131          | 2.10                    | 12.040  | 1.487                                                                           | 23.85             | 5.102                             | 5.233                                  | 6.589         | 1.356    | 21.75      | 1.405 |                                     |       |       |        |         |                                 |        |             |        |            |
| C <sub>2</sub> H <sub>6</sub>    |        |                |                         | 2.463   | 0.304                                                                           | 8.53              | 1.044                             | 1.044                                  | 1.348         | 0.304    | 8.53       | 0.551 |                                     |       |       |        |         |                                 |        |             |        |            |
| C <sub>3</sub> H <sub>8</sub>    |        |                |                         | 1.930   | 0.238                                                                           | 7.16              | 0.818                             | 0.818                                  | 1.056         | 0.238    | 7.16       | 0.462 |                                     |       |       |        |         | PROPYLENE                       | 48.5   | 7.77        |        |            |
| C <sub>4</sub> +C <sub>5</sub>   |        |                |                         |         |                                                                                 |                   |                                   |                                        |               |          |            |       |                                     |       |       |        |         | C <sub>4</sub> POLY GASO.       | 87.5   | 6.80        | 1.137  |            |
| C <sub>6</sub> H <sub>14</sub>   |        |                |                         | 3.083   | 0.381                                                                           | 16.03             | 1.306                             | 1.306                                  | 1.687         | 0.381    | 16.03      | 1.035 | 4.32                                | 3.711 | 0.240 |        |         | C <sub>6</sub> POLY TAR         | 12.5   | 0.97        | 0.129  |            |
| C <sub>7</sub> H <sub>16</sub>   |        |                |                         | 0.283   | 0.035                                                                           | 1.54              | 0.120                             | 0.120                                  | 0.155         | 0.035    | 1.54       | 0.099 | 4.24                                | 0.363 | 0.023 |        |         |                                 |        |             |        |            |
| C <sub>8</sub> H <sub>18</sub>   |        |                |                         | 2.090   | 0.258                                                                           | 14.47             | 0.886                             | 0.886                                  | 1.144         | 0.258    | 14.47      | 0.935 | 5.00                                | 2.894 | 0.187 |        |         |                                 |        |             |        |            |
| C <sub>9</sub> H <sub>20</sub>   |        |                |                         | 0.800   | 0.099                                                                           | 5.75              | 0.339                             | 0.339                                  | 0.438         | 0.099    | 5.75       | 0.371 | 4.86                                | 1.183 | 0.076 |        |         | C <sub>9</sub> H <sub>10</sub>  | 5.00   |             |        | 68.0       |
| C <sub>10</sub> H <sub>22</sub>  |        |                |                         | 0.937   | 0.116                                                                           | 8.14              | 0.397                             | 0.397                                  | 0.513         | 0.116    | 8.14       | 0.526 | 5.48                                | 1.494 | 0.096 |        |         | C <sub>10</sub> POLY GASO.      | 5.98   | 12.66       | 2.117  | 1.5        |
| C <sub>11</sub> H <sub>24</sub>  |        |                |                         | 0.237   | 0.029                                                                           | 2.09              | 0.100                             | 0.100                                  | 0.129         | 0.029    | 2.09       | 0.135 | 5.28                                | 0.398 | 0.026 |        |         | C <sub>11</sub> H <sub>10</sub> | 4.86   | 5.75        | 1.183  | 68.0       |
| C <sub>12</sub> H <sub>26</sub>  |        |                |                         | 0.290   | 0.036                                                                           | 3.03              | 0.123                             | 0.123                                  | 0.159         | 0.036    | 3.03       | 0.196 | 5.54                                | 0.547 | 0.035 |        |         | C <sub>12</sub> -FREE GASO.     |        |             | 12.067 | 5.8        |
| C <sub>13</sub> -C <sub>14</sub> |        |                |                         |         |                                                                                 |                   |                                   |                                        |               |          |            |       |                                     |       |       |        |         | C <sub>13</sub> POLY TAR        | 7.53   | 1.81        | 0.240  |            |
| TOTAL                            |        | 41.863         | 526.55                  |         | 12.349                                                                          | 298.53            | 42.372                            | 84.235                                 | 53.472        |          |            |       |                                     |       |       |        |         |                                 |        |             |        |            |
| H <sub>2</sub> +CO               | 97.464 | 40.801         | 15484                   | SCFH    | 5.277                                                                           |                   | 18.107                            | 58.908                                 | 23.384        | -35.524  |            |       |                                     |       |       |        |         |                                 |        |             |        |            |
| H <sub>2</sub> /CO               |        | 1.64           | Factor                  | 645827  | 5.64                                                                            |                   | 5.64                              | 2.24                                   | 5.64          | 1.42     |            |       |                                     |       |       |        |         | 10 # RVF 400 EP GASOLINE        | 15.367 | 0.9924      | 5380   |            |
| Weight Recovery, %               | 90.39  |                | Catalyst Age, hrs.      |         | Space Velocity, vhr                                                             | 1292              |                                   | RECOVERED OIL #                        | 0.493         | 69.16    | 4.467      |       | 10.749                              | 0.694 |       |        |         | GAS OIL                         | 1.258  | 0.0812      | 440    |            |
| Pressure, psig                   | 416    |                | Inlet Velocity, Ft./sec | 0.96    | Catalyst Vol CF                                                                 | 11.98             |                                   | TOTAL OIL                              |               | 120.21   | 7.764      |       | 21.339                              | 1.377 |       |        |         | FUEL OIL                        | 0.813  | 0.0525      | 285    |            |
| Temperature, °F                  | 661    |                | Bed Depth, Ft           | 18.15   | Weight, #                                                                       | 1964              |                                   | WATER SOLUBLE CHEMICALS #              | 0.287         | 15.25    | 0.985      |       | 1.916                               | 0.124 |       |        |         | POLY TAR                        | 0.369  | 0.0238      | 129    |            |
| Recycle Ratio                    | 1.01   |                | Bed Density, #/CF       | 164     | Effluent (H <sub>2</sub> )(CO <sub>2</sub> ) Shift Ratio (H <sub>2</sub> O)(CO) | 12.18             |                                   | TOTAL LIQUID PRODUCTS C <sub>1</sub> + |               | 135.46   | 8.749      |       | 23.255                              | 1.501 |       |        |         | TOTAL                           | 17.807 | 1.1499      | 6234   |            |
| FRESH FEED CONVERSION — %        |        |                |                         |         | TOTAL FEED CONVERSION — %                                                       |                   |                                   | NET WATER #                            | 7.971         | 143.61   | 9.275      |       | 17.240                              | 1.113 |       |        |         | W. S. CHEM.                     | 1.916  | 0.1237      | 671    |            |
| Contraction                      | CO     | H <sub>2</sub> | H <sub>2</sub> +CO      | CO      | H <sub>2</sub>                                                                  | CO+H <sub>2</sub> | C <sub>3</sub> + C <sub>4</sub> + | GROSS WATER                            |               | 158.86   | 10.260     |       | 19.156                              | 1.237 |       |        |         | TOTAL                           | 19.723 | 1.2736      | 6905   |            |
| 70.50                            | 94.87  | 82.30          | 87.07                   | 80.66   | 51.21                                                                           | 60.30             | 78.35                             | HYDROCARBON TOTAL—C <sub>1</sub> +     |               | 172.90   | 11.166     |       |                                     |       |       |        |         |                                 |        |             |        |            |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**DATA SUMMARY**

RUN NO. 65-B  
HOURS 16-40

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       |   | CATALYST DATA                        |              |                                             |               |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|---|--------------------------------------|--------------|---------------------------------------------|---------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       | OIL                                            |      | WATER |   | INVENTORY DATA                       |              | PARTICLE SIZE                               |               |
| Oxygen               | 442    | Fresh Feed               | 15687 | * API                                          | 51.6 | 10.6  |   | In Reactor at Start of Period        |              | Screen Analysis                             | Sedimentation |
| Natural Gas          | 436    | Recycle                  | 15159 | Neut. No.                                      | 45.4 | 32.0  |   | Fresh Catalyst Added                 |              | Mesh                                        | Microns       |
| Generator Outlet     | 421    | Combined Feed            | 31046 | Sap. No.                                       | 61.0 | 33.8  |   | Total                                |              | On 40                                       | 419+          |
| Reactor Inlet        | 416    | Wet Gas—Measured         | 3813  | Hydrox. No.                                    |      |       |   | Catalyst Recovered                   | 63.2         | 100                                         | 150           |
| Condenser Inlet      |        | Adjusted                 | 4686  | Bromine No.                                    | 98   |       |   | In Reactor at End of Period          |              | 150                                         | 105           |
| Product Accumulator  | 386    | Loss                     | 873   | Pour °F.                                       |      |       |   |                                      |              | 200                                         | 74            |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 10.0 |       |   | REACTOR d-p. Inches H <sub>2</sub> O |              | 250                                         | 62            |
|                      |        |                          |       |                                                |      |       |   | No. Height                           |              | 325                                         | 44            |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 1.01  |                                                |      |       |   | 0 See Period A                       | add 1 ft 335 |                                             |               |
| Oxygen               | 491    | Inlet Velocity—ft./sec.  | 0.96  |                                                |      |       |   | 1                                    | 80           | CATALYST                                    |               |
| Natural Gas          | 800    | Fresh Feed Rate—S.C.F.H. | 15484 | HEMPEL DIST. %                                 |      | °API  | 2 |                                      | 76           | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            |        | per Cu. Ft. Dense Bed    | 1292  | 205 °F.                                        |      |       | 3 |                                      | 90           | Aerated                                     |               |
| Quench Accumulator   | 115    | per Lb. Catalyst         | 7.88  | 400                                            | 79.6 | 55.2  | 4 |                                      | 295          | Settled                                     |               |
| Reactor Inlet        | 268    | per Sq. Ft.              | 23460 | 400-550                                        | 12.8 | 32.0  |   | Total                                | 541          | Compacted                                   |               |
| Condenser Inlet      | 604    |                          |       | 550+                                           | 7.6  |       |   |                                      |              | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 94     |                          |       |                                                |      |       |   | CALCULATED FROM dp                   |              | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       |   | Density, Lbs./Cu.Ft.                 | 164          | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1 See Per. A         |        |                          |       | Naphtha °F.                                    |      |       |   | Inventory, Lbs.                      | 1964         |                                             |               |
| 2                    | 655    |                          |       | IBP                                            | 96   |       |   | Bed Depth, Ft.                       | 18.15        | CHEMICAL ANALYSIS                           |               |
| 3                    | 653    |                          |       | 10%                                            | 130  |       |   | Vol., Cu. Ft.                        | 11.98        | Fe                                          |               |
| 4                    | 668    |                          |       | 50%                                            | 222  |       |   |                                      |              | C                                           |               |
| 5                    | 666    |                          |       | 90%                                            | 350  |       |   |                                      |              | O                                           |               |
| 6                    | 667    |                          |       | EP                                             | 396  |       |   |                                      |              | H                                           |               |
| 7                    | 659    |                          |       | Rec.                                           | 96.0 |       |   |                                      |              | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 645    |                          |       |                                                |      |       |   |                                      |              | X-Ray Analysis—                             |               |
| 9                    | 642    |                          |       |                                                |      |       |   |                                      |              | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 656    |                          |       |                                                |      |       |   |                                      |              | Fe <sub>3</sub> O <sub>4</sub>              |               |
| 11                   | 674    |                          |       |                                                |      |       |   |                                      |              | Fe                                          |               |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 65-C  
HOURS 40-64  
CATALYST Bethlehem Mill  
Scale Reduced @ 800°F

| Scale Reduced @ 800°F                    |        |                        |                    |                           |                                                                      |                     |                                   |                                        |                 |            |         |                                     |       |          |          |                                            |                     |                                |                     |         |         |      |
|------------------------------------------|--------|------------------------|--------------------|---------------------------|----------------------------------------------------------------------|---------------------|-----------------------------------|----------------------------------------|-----------------|------------|---------|-------------------------------------|-------|----------|----------|--------------------------------------------|---------------------|--------------------------------|---------------------|---------|---------|------|
| FRESH FEED                               |        |                        |                    | WET GAS                   |                                                                      |                     | RECYCLE                           | COMBINED FEED                          | EFFLUENT        | NET CHANGE |         | YIELD BASIS H <sub>2</sub> + CO FED |       |          |          |                                            |                     |                                |                     |         |         |      |
|                                          | %      | m/hr                   | #/hr               | %                         | At Wt. Balance                                                       |                     | m/hr                              | m/hr                                   | m/hr            | m/hr       | #/hr    | CONDENSATE                          |       |          |          | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                     |                                |                     |         |         |      |
|                                          |        |                        |                    |                           | m/hr                                                                 | #/hr                |                                   |                                        |                 |            |         | #/MCF                               | #/gal | gal/hr   | gal/MCF  |                                            | CORRECTED HEMFEL, % | gal/hr                         | TREATING RECOVER, % | gal/hr  |         |      |
| CO<br>26.010                             | 36.456 | 15.297                 | 428.47             | 8.320                     | 1.053                                                                | 29.49               | 3.581                             | 18.878                                 | 4.634           | -14.244    | -398.98 |                                     |       |          |          |                                            |                     |                                |                     |         |         |      |
| H <sub>2</sub><br>2.016                  | 60.903 | 25.555                 | 51.52              | 37.816                    | 4.786                                                                | 9.65                | 16.274                            | 41.829                                 | 21.060          | -20.769    | 41.87   |                                     |       |          |          |                                            | 400 EP              | 83.3                           | 9.053               | 98.0    | 9.872   |      |
| CO <sub>2</sub><br>1.100                 | 1.957  | 0.821                  | 36.13              | 30.057                    | 3.804                                                                | 167.44              | 12.935                            | 13.756                                 | 16.739          | 2.983      | 131.31  | 8.470                               |       |          |          |                                            | 400-550             | 12.4                           | 1.348               | 91.4    | 1.232   |      |
| N <sub>2</sub><br>28.016                 | 0.197  | 0.083                  | 2.33               | 1.620                     | 0.205                                                                | 5.74                | 0.697                             | 0.780                                  | 0.902           |            |         |                                     |       |          |          |                                            | 550 +               | 4.3                            | 0.467               | 114.6   | 0.535   |      |
| CH <sub>4</sub><br>16.042                | 0.487  | 0.204                  | 3.27               | 11.090                    | 1.404                                                                | 22.52               | 4.773                             | 4.977                                  | 6.177           | 1.200      | 19.25   | 1.242                               |       |          |          |                                            |                     |                                |                     |         |         |      |
| C <sub>2</sub> H <sub>6</sub><br>28.038  |        |                        |                    | 2.293                     | 0.290                                                                | 8.14                | 0.987                             | 0.987                                  | 1.277           | 0.290      | 8.14    | 0.525                               |       |          |          |                                            |                     | RECOVERY %                     | #/hr                | gal/hr  |         |      |
| C <sub>3</sub> H <sub>8</sub><br>30.068  |        |                        |                    | 1.730                     | 0.219                                                                | 6.58                | 0.745                             | 0.745                                  | 0.964           | 0.219      | 6.58    | 0.424                               |       |          |          |                                            |                     | PROPYLENE                      | 47.4                | 7.08    |         |      |
| C <sub>4</sub> +C <sub>5</sub>           |        |                        |                    |                           |                                                                      |                     |                                   |                                        |                 |            | 33.97   | 2.191                               |       |          |          |                                            |                     | C <sub>3</sub> POLY GASO.      | 87.5                | 6.19    | 1.035   |      |
| C <sub>2</sub> H <sub>2</sub><br>41.078  |        |                        |                    | 2.807                     | 0.355                                                                | 14.94               | 1.208                             | 1.208                                  | 1.563           | 0.355      | 14.94   | 0.964                               | 4.32  | 3.458    | 0.223    |                                            |                     | C <sub>3</sub> POLY TAR        | 12.5                | 0.89    | 0.118   |      |
| C <sub>2</sub> H <sub>4</sub><br>44.094  |        |                        |                    | 0.267                     | 0.034                                                                | 1.50                | 0.115                             | 0.115                                  | 0.149           | 0.034      | 1.50    | 0.097                               | 4.24  | 0.354    | 0.023    |                                            |                     |                                |                     |         |         |      |
| C <sub>2</sub> H <sub>6</sub><br>56.104  |        |                        |                    | 1.897                     | 0.240                                                                | 13.46               | 0.816                             | 0.816                                  | 1.056           | 0.240      | 13.46   | 0.868                               | 5.00  | 2.692    | 0.174    |                                            |                     | #/gal                          | #/hr                | gal/hr  | RVP     |      |
| C <sub>2</sub> H <sub>10</sub><br>58.132 |        |                        |                    | 0.750                     | 0.095                                                                | 5.52                | 0.323                             | 0.323                                  | 0.418           | 0.095      | 5.52    | 0.356                               | 4.86  | 1.136    | 0.073    |                                            |                     | C <sub>4</sub> H <sub>6</sub>  | 5.00                | 0.17    | 0.034   | 68.  |
| C <sub>2</sub> H <sub>12</sub><br>70.130 |        |                        |                    | 0.843                     | 0.107                                                                | 7.50                | 0.363                             | 0.363                                  | 0.470           | 0.107      | 7.50    | 0.484                               | 5.45  | 1.376    | 0.089    |                                            |                     | C <sub>4</sub> POLY GASO.      | 5.98                | 11.63   | 1.945   | 1.6  |
| C <sub>2</sub> H <sub>14</sub><br>72.146 |        |                        |                    | 0.247                     | 0.031                                                                | 2.24                | 0.106                             | 0.106                                  | 0.137           | 0.031      | 2.24    | 0.144                               | 5.25  | 0.427    | 0.028    |                                            |                     | C <sub>4</sub> H <sub>10</sub> | 4.86                | 5.52    | 1.136   | 68.0 |
| C <sub>2</sub> H <sub>16</sub><br>84.182 |        |                        |                    | 0.263                     | 0.033                                                                | 2.78                | 0.113                             | 0.113                                  | 0.146           | 0.033      | 2.78    | 0.179                               | 5.54  | 0.502    | 0.032    |                                            |                     | C <sub>4</sub> FREE GASO.      |                     |         | 12.212  | 5.8  |
| C <sub>3</sub> -C <sub>4</sub>           |        |                        |                    |                           |                                                                      |                     |                                   |                                        |                 |            | 47.94   | 3.092                               |       | 9.945    | 0.642    |                                            |                     | C <sub>4</sub> POLY TAR        | 7.53                | 1.66    | 0.220   |      |
| TOTAL                                    |        | 41.960                 | 521.72             |                           | 12.656                                                               | 297.51              | 43.035                            | 84.995                                 | 64.217          |            |         |                                     |       |          |          |                                            |                     |                                |                     |         |         |      |
| H <sub>2</sub> +CO                       | 97.359 | 40.852                 | 15503              | SCFH                      | 5.839                                                                |                     | 19.855                            | 60.707                                 | 25.694          | -35.013    |         |                                     |       |          |          |                                            |                     |                                | gal/hr              | gal/MCF | Bbl/Day |      |
| H <sub>2</sub> /CO                       |        | 1.67                   | Factor             | 645036                    | 4.54                                                                 |                     | 4.54                              | 2.22                                   | 4.54            | 1.46       |         |                                     |       |          |          |                                            |                     | 10 # RVP 480 EP GASOLINE       | 15.327              | 0.9886  | 5360    |      |
| Weight Recovery, %                       | 93.59  | Catalyst Age, hrs.     |                    |                           |                                                                      | Space Velocity, vhr |                                   | 1275                                   | RECOVERED OIL** |            | 0.498   | 69.85                               | 4.506 | 10.868   | 0.701    | GAS OIL                                    | 1.232               | 0.0795                         | 431                 |         |         |      |
| Pressure, psig                           | 416    | Inlet Velocity, Ft/sec |                    | 1.00                      | Catalyst Vol CF                                                      |                     | 12.16                             | TOTAL OIL                              |                 | 117.79     | 7.598   | 20.813                              | 1.343 | FUEL OIL | 0.535    | 0.0345                                     | 187                 |                                |                     |         |         |      |
| Temperature, °F                          | 659    | Bed Depth, Ft          |                    | 18.43                     | Weight, #                                                            |                     | 2006                              | WATER SOLUBLE CHEMICALS**              |                 | 0.277      | 14.72   | 0.949                               | 1.863 | 0.120    | POLY TAR | 0.338                                      | 0.0218              | 118                            |                     |         |         |      |
| Recycle Ratio                            | 1.03   | Bed Density, #/CF      |                    | 165                       | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) |                     | -9.81                             | TOTAL LIQUID PRODUCTS C <sub>6</sub> + |                 | 132.51     | 8.547   | 22.676                              | 1.463 | TOTAL    | 17.432   | 1.1244                                     | 6096                |                                |                     |         |         |      |
| FRESH FEED CONVERSION — %                |        |                        |                    | TOTAL FEED CONVERSION — % |                                                                      |                     |                                   | SELECTIVITY                            |                 |            |         | NET WATER **                        |       | 7.751    | 139.64   | 9.007                                      | 16.764              | 1.081                          | W. S. CHEM.         | 1.863   | 0.1202  | 651  |
| Contraction                              | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub>                                                       | CO+H <sub>2</sub>   | C <sub>3</sub> + C <sub>4</sub> + | GROSS WATER                            |                 | 154.36     | 9.957   | 18.627                              | 1.202 | TOTAL    | 19.295   | 1.2446                                     | 6747                |                                |                     |         |         |      |
| 69.94                                    | 93.12  | 81.27                  | 85.71              | 75.45                     | 49.65                                                                | 57.68               | 79.60                             | HYDROCARBON TOTAL — C <sub>1</sub> +   |                 | 166.48     | 10.739  |                                     |       |          |          |                                            |                     |                                |                     |         |         |      |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 × #/MCF

#0488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 × gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 65-C  
HOURS 40-64

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |      | CATALYST DATA                        |                    |                                             |         |               |         |   |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|------|--------------------------------------|--------------------|---------------------------------------------|---------|---------------|---------|---|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       |                                                |      |      | INVENTORY DATA                       |                    | PARTICLE SIZE                               |         |               |         |   |
| Oxygen               | 444    | Fresh Feed               | 15924 | * API                                          | 51.8 | 10.7 | In Reactor at Start of Period        |                    | Screen Analysis                             |         | Sedimentation |         |   |
| Natural Gas          | 436    | Recycle                  | 16332 | Neut. No.                                      | 46.8 | 35.5 | Fresh Catalyst Added                 |                    | Mesh                                        | Microns | %             | Microns | % |
| Generator Outlet     | 421    | Combined Feed            | 32256 | Sap. No.                                       | 58.7 | 38.3 | Total                                |                    | On 40                                       | 419+    |               | 80+     |   |
| Reactor Inlet        | 416    | Wet Gas—Measured         | 4072  | Hydrox. No.                                    |      |      | Catalyst Recovered                   | 62½                | 100                                         | 150     |               | 40—80   |   |
| Condenser Inlet      |        | Adjusted                 | 4803  | Bromine No.                                    | 101  |      | In Reactor at End of Period          |                    | 150                                         | 105     |               | 20—40   |   |
| Product Accumulator  | 386    | Loss                     | 731   | Pour °F.                                       |      |      |                                      |                    | 200                                         | 74      |               | 10—20   |   |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 10.0 | REACTOR d-p, Inches H <sub>2</sub> O |                    | 250                                         | 62      |               | 0—20    |   |
|                      |        |                          |       |                                                |      |      | No. Height                           |                    | 325                                         | 44      |               |         |   |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 1.03  |                                                |      |      | 0 See Period A                       |                    | <325                                        |         |               |         |   |
| Oxygen               | 466    | Inlet Velocity—ft./sec.  | 1.00  |                                                |      |      | 1                                    | 80                 | CATALYST                                    |         |               |         |   |
| Natural Gas          | 796    | Fresh Feed Rate—S.C.F.H. | 15503 | HEMPEL DIST. %                                 |      | *API | 2                                    | 76                 | Bulk Density, Lbs./Cu.Ft.                   |         |               |         |   |
| Generator            |        | per Cu. Ft. Dense Bed    | 1275  | 205 °F.                                        |      |      | 3                                    | 92                 | Aerated                                     |         |               |         |   |
| Quench Accumulator   | 141    | per Lb. Catalyst         | 7.73  | 400                                            | 82.3 | 54.6 | 4                                    | 305                | Settled                                     |         |               |         |   |
| Reactor Inlet        | 271    | per Sq. Ft.              | 23489 | 400-550                                        | 12.4 | 35.1 | Total                                | 553                | Compacted                                   |         |               |         |   |
| Condenser Inlet      | 594    |                          |       | 550+                                           | 5.3  |      |                                      |                    | Particle Density, gm./cc.                   |         |               |         |   |
| Product Accumulator  | 89     |                          |       |                                                |      |      |                                      | CALCULATED FROM dp | NH <sub>3</sub> Value, ml./gm.              |         |               |         |   |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |      | Density, Lbs./Cu.Ft.                 | 165                | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |               |         |   |
| 1 See Per. A         |        |                          |       | Naphtha °F.                                    |      |      | Inventory, Lbs.                      | 2006               |                                             |         |               |         |   |
| 2                    | 654    |                          |       | IBP                                            | 100  |      | Bed Depth, Ft.                       | 18.43              | CHEMICAL ANALYSIS                           |         |               |         |   |
| 3                    | 651    |                          |       | 10%                                            | 132  |      | Vol., Cu. Ft.                        | 12.16              | Fe                                          |         |               |         |   |
| 4                    | 664    |                          |       | 50%                                            | 212  |      |                                      |                    | C                                           |         |               |         |   |
| 5                    | 663    |                          |       | 90%                                            | 354  |      |                                      |                    | O                                           |         |               |         |   |
| 6                    | 664    |                          |       | EP                                             | 398  |      |                                      |                    | H                                           |         |               |         |   |
| 7                    | 656    |                          |       | Rec.                                           | 96.0 |      |                                      |                    | K <sub>2</sub> O, Wt. % basis Fe            |         |               |         |   |
| 8                    | 646    |                          |       |                                                |      |      |                                      |                    | X-Ray Analysis—                             |         |               |         |   |
| 9                    | 639    |                          |       |                                                |      |      |                                      |                    | Fe <sub>2</sub> O <sub>3</sub>              |         |               |         |   |
| 10                   | 641    |                          |       |                                                |      |      |                                      |                    | Fe <sub>3</sub> O <sub>4</sub>              |         |               |         |   |
| 11                   | 663    |                          |       |                                                |      |      |                                      |                    | Fe                                          |         |               |         |   |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. 65-D  
HOURS 64-88  
CATALYST Bethlehem Mill  
Scale Reduced @ 800°F

| FRESH FEED                               |        |                |                        | WET GAS                   |                                                                        |                   | RECYCLE                           | COMBINED FEED                             | EFFLUENT | NET CHANGE |        | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                            |        |                        |                  |                        |        |     |
|------------------------------------------|--------|----------------|------------------------|---------------------------|------------------------------------------------------------------------|-------------------|-----------------------------------|-------------------------------------------|----------|------------|--------|-------------------------------------|--------|--------|---------|--------------------------------------------|--------|------------------------|------------------|------------------------|--------|-----|
|                                          | %      | m/hr           | #/hr                   | %                         | At Wt. Balance                                                         |                   | m/hr                              | m/hr                                      | m/hr     | m/hr       | #/hr   | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |        |                        |                  |                        |        |     |
|                                          |        |                |                        |                           | m/hr                                                                   | #/hr              |                                   |                                           |          |            |        | #/MCF                               | #/gal  | gal/hr | gal/MCF |                                            |        |                        |                  |                        |        |     |
| CO<br>28.010                             | 37.330 | 15.454         | 432.86                 | 8.717                     | 1.134                                                                  | 31.76             | 3.722                             | 19.176                                    | 4.856    | -14.320    | 401.10 |                                     |        |        |         |                                            |        | CORRECTED<br>HEMPER. % | gal/hr           | TREATING<br>RECOVERY % | gal/hr |     |
| H <sub>2</sub><br>2.016                  | 60.063 | 24.864         | 50.13                  | 37.554                    | 4.887                                                                  | 9.85              | 16.036                            | 40.900                                    | 20.923   | -19.977    | -40.28 |                                     |        |        |         | 400 EP                                     | 83.4   | 8.342                  | 98.0             | 8.175                  |        |     |
| CO <sub>2</sub><br>44.010                | 1.957  | 0.810          | 35.65                  | 30.263                    | 3.939                                                                  | 173.38            | 12.923                            | 13.733                                    | 16.862   | 3.129      | 137.73 | 9.002                               |        |        |         | 400-550                                    | 12.8   | 1.280                  | 91.4             | 1.170                  |        |     |
| N <sub>2</sub><br>28.016                 | 0.163  | 0.067          | 1.88                   | 1.410                     | 0.183                                                                  | 5.13              | 0.602                             | 0.669                                     | 0.785    |            |        |                                     |        |        |         | 550 +                                      | 3.8    | 0.380                  | 114.6            | 0.435                  |        |     |
| CH <sub>4</sub><br>16.042                | 0.487  | 0.202          | 3.24                   | 10.893                    | 1.418                                                                  | 22.75             | 4.652                             | 4.854                                     | 6.070    | 1.216      | 19.15  | 1.275                               |        |        |         |                                            |        |                        |                  |                        |        |     |
| C <sub>2</sub> H <sub>6</sub><br>28.052  |        |                |                        | 2.363                     | 0.307                                                                  | 8.61              | 1.009                             | 1.009                                     | 1.316    | 0.307      | 8.61   | 0.563                               |        |        |         |                                            |        | RECOVERY<br>%          | #/hr             | gal/hr                 |        |     |
| C <sub>3</sub> H <sub>8</sub><br>30.068  |        |                |                        | 1.740                     | 0.226                                                                  | 6.80              | 0.743                             | 0.743                                     | 0.969    | 0.226      | 6.80   | 0.444                               |        |        |         | PROPYLENE                                  | 45.3   | 6.80                   |                  |                        |        |     |
| C <sub>4</sub> +C <sub>5</sub>           |        |                |                        |                           |                                                                        |                   |                                   |                                           |          |            | 34.92  | 2.282                               |        |        |         | C <sub>3</sub> POLY GASO.                  | 87.5   | 5.95                   | 0.995            |                        |        |     |
| C <sub>2</sub> H <sub>4</sub><br>42.078  |        |                |                        | 2.740                     | 0.357                                                                  | 15.02             | 1.170                             | 1.170                                     | 1.527    | 0.357      | 15.02  | 0.982                               | 4.32   | 3.477  | 0.227   | C <sub>3</sub> POLY TAR                    | 12.5   | 0.85                   | 0.113            |                        |        |     |
| C <sub>3</sub> H <sub>6</sub><br>44.094  |        |                |                        | 0.213                     | 0.028                                                                  | 1.23              | 0.091                             | 0.091                                     | 0.119    | 0.028      | 1.23   | 0.080                               | 4.24   | 0.290  | 0.019   |                                            |        |                        |                  |                        |        |     |
| C <sub>4</sub> H <sub>10</sub><br>56.104 |        |                |                        | 1.917                     | 0.249                                                                  | 13.97             | 0.819                             | 0.819                                     | 1.068    | 0.249      | 13.97  | 0.913                               | 5.00   | 2.794  | 0.183   |                                            |        | #/gal                  | #/hr             | gal/hr                 | RVP    |     |
| C <sub>5</sub> H <sub>12</sub><br>58.120 |        |                |                        | 0.760                     | 0.099                                                                  | 5.75              | 0.325                             | 0.325                                     | 0.424    | 0.099      | 5.75   | 0.376                               | 4.86   | 1.183  | 0.077   | C <sub>4</sub> H <sub>8</sub>              | 5.00   |                        |                  | 68.0                   |        |     |
| C <sub>6</sub> H <sub>14</sub><br>70.130 |        |                |                        | 0.883                     | 0.115                                                                  | 8.06              | 0.377                             | 0.377                                     | 0.492    | 0.115      | 8.06   | 0.527                               | 5.48   | 1.479  | 0.097   | C <sub>5</sub> POLY GASO.                  | 5.98   | 12.22                  | 2.044            | 1.5                    |        |     |
| C <sub>7</sub> H <sub>16</sub><br>72.146 |        |                |                        | 0.260                     | 0.034                                                                  | 2.45              | 0.111                             | 0.111                                     | 0.145    | 0.034      | 2.45   | 0.160                               | 5.25   | 0.467  | 0.031   | C <sub>6</sub> H <sub>10</sub>             | 4.86   | (5.75)<br>5.56         | (1.183)<br>1.145 | 68.0                   |        |     |
| C <sub>8</sub> H <sub>18</sub><br>84.156 |        |                |                        | 0.287                     | 0.037                                                                  | 3.11              | 0.123                             | 0.123                                     | 0.160    | 0.037      | 3.11   | 0.203                               | 5.54   | 0.561  | 0.037   | C <sub>7</sub> FREE GASO.                  |        |                        | 11.677           | 5.8                    |        |     |
| C <sub>9</sub> +C <sub>10</sub>          |        |                |                        |                           |                                                                        |                   |                                   |                                           |          |            | 49.59  | 3.241                               |        | 10.251 | 0.671   | C <sub>8</sub> POLY TAR                    | 7.53   | 1.75                   | 0.232            |                        |        |     |
| TOTAL                                    |        | 41.397         | 523.76                 |                           | 13.013                                                                 | 307.87            | 42.703                            | 84.100                                    | 64.064   |            |        |                                     |        |        |         |                                            |        |                        |                  |                        |        |     |
| H <sub>2</sub> +CO                       | 97.393 | 40.318         | 15300                  | SCFH                      | 6.021                                                                  |                   | 19.758                            | 60.076                                    | 25.779   | -34.297    |        |                                     |        |        |         |                                            |        | gal/hr                 | gal / MCF        | Bbl/Day                |        |     |
| H <sub>2</sub> /CO                       |        | 1.61           | Factor                 | 653594                    | 4.31                                                                   |                   | 4.31                              | 2.13                                      | 4.31     | 1.40       |        |                                     |        |        |         | 10 # RVP 400 EP<br>GASOLINE                | 14.966 | 0.9716                 | 5268             |                        |        |     |
| Weight Recovery, %                       | 93.46  |                | Catalyst Age, hrs.     |                           | Space Velocity, v/hv                                                   | 1248              |                                   | RECOVERED OIL**                           | 0.458    | 64.21      | 4.197  |                                     | 10.002 | 0.654  |         | GAS OIL                                    | 1.170  | 0.0765                 | 415              |                        |        |     |
| Pressure, psig                           | 417    |                | Inlet Velocity, Ft/sec | 0.99                      | Catalyst Vol CF                                                        | 12.26             |                                   | TOTAL OIL                                 |          | 113.80     | 7.438  |                                     | 20.253 | 1.325  |         | FUEL OIL                                   | 0.435  | 0.0284                 | 154              |                        |        |     |
| Temperature, °F                          | 661    |                | Bed Depth, Ft          | 18.58                     | Weight, #                                                              | 2023              |                                   | WATER SOLUBLE<br>CHEMICALS **             | 0.273    | 14.46      | 0.945  |                                     | 1.830  | 0.120  |         | POLY TAR                                   | 0.345  | 0.0225                 | 122              |                        |        |     |
| Recycle Ratio                            | 1.03   |                | Bed Density, #/CF      | 165                       | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) = | 9.54              |                                   | TOTAL LIQUID<br>PRODUCTS C <sub>3</sub> + |          | 128.26     | 8.383  |                                     | 22.083 | 1.445  |         | TOTAL                                      | 16.816 | 1.0990                 | 5959             |                        |        |     |
| FRESH FEED CONVERSION — %                |        |                |                        | TOTAL FEED CONVERSION — % |                                                                        |                   |                                   | SELECTIVITY                               |          |            |        | NET WATER **                        |        | 7.617  | 137.22  | 8.969                                      | 16.473 | 1.077                  | W. S. CHEM.      | 1.830                  | 0.1196 | 648 |
| Contraction                              | CO     | H <sub>2</sub> | H <sub>2</sub> +CO     | CO                        | H <sub>2</sub>                                                         | CO+H <sub>2</sub> | C <sub>3</sub> + C <sub>4</sub> + | GROSS WATER                               |          | 151.68     | 9.914  |                                     | 18.303 | 1.196  |         | TOTAL                                      | 18.646 | 1.2186                 | 6607             |                        |        |     |
| 68.57                                    | 92.66  | 80.35          | 85.07                  | 74.68                     | 48.84                                                                  | 57.09             | 78.60                             | HYDROCARBON<br>TOTAL—C <sub>3</sub> +     |          | 163.18     | 10.665 |                                     |        |        |         |                                            |        |                        |                  |                        |        |     |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF      9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**DATA SUMMARY**

RUN NO. 65-D  
HOURS 64-88

| OPERATING CONDITIONS |        |                                 |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |                                             |         |       |
|----------------------|--------|---------------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|--|---------------------------------------------|---------|-------|
| PRESSURES PSIG       |        | RATES S.C.F.H.                  |       |                                                | OIL  | WATER | INVENTORY DATA                       |  | PARTICLE SIZE                               |         |       |
| Oxygen               | 445    | Fresh Feed                      | 15710 | * API                                          | 52.0 | 10.7  | In Reactor at Start of Period        |  | Screen Analysis                             |         |       |
| Natural Gas          | 436    | Recycle                         | 16206 | Neut. No.                                      | 48.5 | 35.9  | Fresh Catalyst Added                 |  | Sedimentation                               |         |       |
| Generator Outlet     | 421    | Combined Feed                   | 31916 | Sap. No.                                       | 61.0 | 38.6  | Total                                |  | Mesh                                        | Microns | %     |
| Reactor Inlet        | 417    | Wet Gas—Measured                | 4192  | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | On 40                                       | 419+    |       |
| Condenser Inlet      |        | Adjusted                        | 4939  | Bromine No.                                    |      |       | In Reactor at End of Period          |  | 100                                         | 150     | 40—80 |
| Product Accumulator  | 386    | Loss                            | 747   | Pour °F.                                       |      |       |                                      |  | 150                                         | 105     | 20—40 |
|                      |        |                                 |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 10.0 |       | REACTOR d-p, Inches H <sub>2</sub> O |  | 200                                         | 74      | 10—20 |
|                      |        |                                 |       |                                                |      |       | No. Height                           |  | 250                                         | 62      | 0—20  |
|                      |        |                                 |       |                                                |      |       | O See Period A                       |  | 325                                         | 44      |       |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed              | 1.03  |                                                |      |       | 1                                    |  | CATALYST                                    |         |       |
| Oxygen               | 437    | Inlet Velocity—ft./sec.         | 0.99  |                                                |      |       | 2                                    |  | Bulk Density, Lbs./Cu.Ft.                   |         |       |
| Natural Gas          | 813    | Fresh Feed Rate—S.C.F.H.        | 15300 | HEMPEL, DIST. %                                |      | °API  | 3                                    |  | Aerated                                     |         |       |
| Generator            |        | per Cu. Ft. Dense Bed           | 1248  | 205 °F.                                        |      |       | 4                                    |  | Settled                                     |         |       |
| Quench Accumulator   | 126    | per Lb. Catalyst                | 7.56  | 400                                            | 82.4 | 55.1  | Total                                |  | Compacted                                   |         |       |
| Reactor Inlet        | 286    | per Sq. Ft.                     | 23182 | 400-550                                        | 12.8 | 34.2  |                                      |  | Particle Density, gm./cc.                   |         |       |
| Condenser Inlet      | 586    |                                 |       | 550+                                           | 4.8  |       |                                      |  | CALCULATED FROM dp                          |         |       |
| Product Accumulator  | 92     | Heat Transfer Calculations      |       |                                                |      |       | Density, Lbs./Cu.Ft.                 |  | NH <sub>3</sub> Value, ml./gm.              |         |       |
| Catalyst No.         | Height | Steam Rate = 379#/hr            |       | A. S. T. M. DIST. ON                           |      |       | 165                                  |  | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |       |
| 1 See Per. A         |        | @ 707 psia & 506°F              |       | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 2023                                        |         |       |
| 2                    | 658    | 1201 BTU/#                      |       | IBP                                            | 100  |       | Bed Depth, Ft.                       |  | 18.58                                       |         |       |
| 3                    | 656    | Water in @ 57°F=25 BTU/#        |       | 10%                                            | 130  |       | Vol., Cu. Ft.                        |  | 12.26                                       |         |       |
| 4                    | 668    | Net Heat Transferred/# Steam    |       | 50%                                            | 210  |       |                                      |  | Fe                                          |         |       |
| 5                    | 665    | = 1176 BTU                      |       | 90%                                            | 348  |       |                                      |  | O                                           |         |       |
| 6                    | 665    | (1176)(379)=445704              |       | EP                                             | 396  |       |                                      |  | H                                           |         |       |
| 7                    | 655    | Ave. Bed Temp=661°F             |       | Rec.                                           | 96.5 |       |                                      |  | K <sub>2</sub> O, W+, % basis Fe            |         |       |
| 8                    | 646    | dT=661-505=156°F                |       |                                                |      |       |                                      |  | X-Ray Analysis—                             |         |       |
| 9                    | 638    | Tube Area= 33.8 sq ft           |       |                                                |      |       |                                      |  | Fe <sub>2</sub> O <sub>3</sub>              |         |       |
| 10                   | 635    | K= $\frac{445704}{(33.8)(156)}$ |       |                                                |      |       |                                      |  | Fe <sub>2</sub> O <sub>4</sub>              |         |       |
| 11                   | 633    | 84.5 BTU/°F/sq ft               |       |                                                |      |       |                                      |  | Fe                                          |         |       |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. 65-E  
HOURS 88-112  
CATALYST Bethlehem Mill  
Scale Reduced @ 800°F

| FRESH FEED                                |        |                        |                    | WET GAS                   |                |                     |                                                                                    | RECYCLE                               | COMBINED<br>FEED | EFFLUENT | NET CHANGE       |                                           | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                           |                                 |                        |             |                         |         |     |
|-------------------------------------------|--------|------------------------|--------------------|---------------------------|----------------|---------------------|------------------------------------------------------------------------------------|---------------------------------------|------------------|----------|------------------|-------------------------------------------|-------------------------------------|--------|--------|---------|-------------------------------------------|---------------------------------|------------------------|-------------|-------------------------|---------|-----|
|                                           | %      | m/hr                   | #/hr               | %                         | At Wt. Balance |                     | m/hr                                                                               | m/hr                                  | m/hr             | m/hr     | #/hr             | #/hr                                      | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE |                                 |                        |             |                         |         |     |
|                                           |        |                        |                    |                           | m/hr           | #/hr                |                                                                                    |                                       |                  |          |                  |                                           | #/MCF                               | #/gal  | gal/hr | gal/MCF |                                           |                                 | CORRECTED<br>HEMPG., % | gal/hr      | TREATING<br>RECOVERY, % | gal/hr  |     |
| CO<br>26.010                              | 37.000 | 15.287                 | 428.19             | 9.487                     | 1.267          | 35.49               | 4.077                                                                              | 19.364                                | 5.344            | -14.020  | -392.70          |                                           |                                     |        |        |         |                                           |                                 |                        |             |                         |         |     |
| H <sub>2</sub><br>2.016                   | 60.413 | 24.960                 | 50.32              | 38.616                    | 5.158          | 10.40               | 16.593                                                                             | 41.553                                | 21.751           | -19.802  | -39.92           |                                           |                                     |        |        |         |                                           | 400 EP                          | 83.4                   | 7.636       | 98.0                    | 7.482   |     |
| CO <sub>2</sub><br>26.010                 | 1.917  | 0.792                  | 34.86              | 29.243                    | 3.908          | 171.97              | 12.566                                                                             | 13.358                                | 16.474           | 3.116    | 137.11           | 8.977                                     |                                     |        |        |         |                                           | 400-550                         | 12.8                   | 1.172       | 91.4                    | 1.071   |     |
| N <sub>2</sub><br>26.016                  | 0.197  | 0.081                  | 2.27               | 1.447                     | 0.193          | 5.41                | 0.622                                                                              | 0.703                                 | 0.815            |          |                  |                                           |                                     |        |        |         |                                           | 550 +                           | 3.8                    | 0.348       | 114.6                   | 0.399   |     |
| CH <sub>4</sub><br>16.042                 | 0.473  | 0.195                  | 3.13               | 10.136                    | 1.354          | 21.72               | 4.355                                                                              | 4.550                                 | 5.709            | 1.159    | 18.59            | 1.217                                     |                                     |        |        |         |                                           |                                 |                        |             |                         |         |     |
| C <sub>2</sub> H <sub>6</sub><br>26.032   |        |                        |                    | 2.197                     | 0.293          | 8.22                | 0.944                                                                              | 0.944                                 | 1.237            | 0.293    | 8.22             | 0.538                                     |                                     |        |        |         |                                           |                                 | RECOVERY<br>%          | #/hr        | gal/hr                  |         |     |
| C <sub>3</sub> H <sub>8</sub><br>30.048   |        |                        |                    | 1.693                     | 0.226          | 6.80                | 0.727                                                                              | 0.727                                 | 0.953            | 0.226    | 6.80             | 0.445                                     |                                     |        |        |         |                                           | PROPYLENE                       | 44.0                   | 7.22        |                         |         |     |
| C <sub>4</sub> +C <sub>5</sub>            |        |                        |                    |                           |                |                     |                                                                                    |                                       |                  |          |                  |                                           |                                     |        |        |         |                                           |                                 |                        |             |                         |         |     |
| C <sub>5</sub> H <sub>12</sub><br>42.078  |        |                        |                    | 2.920                     | 0.390          | 16.41               | 1.255                                                                              | 1.255                                 | 1.645            | 0.390    | 16.41            | 1.074                                     | 4.32                                | 3.799  | 0.249  |         |                                           | C <sub>5</sub> POLY GASE.       | 87.5                   | 6.32        | 1.067                   |         |     |
| C <sub>6</sub> H <sub>14</sub><br>44.094  |        |                        |                    | 0.297                     | 0.040          | 1.76                | 0.128                                                                              | 0.128                                 | 0.168            | 0.040    | 1.76             | 0.115                                     | 4.24                                | 0.415  | 0.027  |         |                                           | C <sub>6</sub> POLY TAR         | 12.5                   | 0.90        | 0.120                   |         |     |
| C <sub>7</sub> H <sub>16</sub><br>50.104  |        |                        |                    | 1.960                     | 0.262          | 14.70               | 0.842                                                                              | 0.842                                 | 1.104            | 0.262    | 14.70            | 0.962                                     | 5.00                                | 2.940  | 0.192  |         |                                           |                                 |                        |             |                         |         |     |
| C <sub>8</sub> H <sub>18</sub><br>58.120  |        |                        |                    | 0.677                     | 0.090          | 5.23                | 0.291                                                                              | 0.291                                 | 0.381            | 0.090    | 5.23             | 0.342                                     | 4.86                                | 1.076  | 0.070  |         |                                           | C <sub>8</sub> H <sub>18</sub>  | 5.00                   | 0.13        | 0.026                   | 68.0    |     |
| C <sub>9</sub> H <sub>20</sub><br>70.130  |        |                        |                    | 0.893                     | 0.119          | 8.35                | 0.384                                                                              | 0.384                                 | 0.503            | 0.119    | 8.35             | 0.547                                     | 5.45                                | 1.532  | 0.100  |         |                                           | C <sub>9</sub> POLY GASE.       | 5.98                   | 12.75       | 2.132                   | 1.5     |     |
| C <sub>10</sub> H <sub>22</sub><br>72.146 |        |                        |                    | 0.177                     | 0.024          | 1.73                | 0.076                                                                              | 0.076                                 | 0.100            | 0.024    | 1.73             | 0.113                                     | 5.25                                | 0.330  | 0.022  |         |                                           | C <sub>10</sub> H <sub>20</sub> | 4.86                   | 5.23        | 1.076                   | 68.0    |     |
| C <sub>12</sub> H <sub>26</sub><br>84.152 |        |                        |                    | 0.257                     | 0.034          | 2.86                | 0.110                                                                              | 0.110                                 | 0.144            | 0.034    | 2.86             | 0.187                                     | 5.54                                | 0.516  | 0.034  |         |                                           | C <sub>12</sub> -FREE GASE.     |                        |             | 10.918                  | 5.8     |     |
| C <sub>3</sub> -C <sub>6</sub>            |        |                        |                    |                           |                |                     |                                                                                    |                                       |                  |          |                  | 51.04                                     | 3.340                               | 10.608 | 0.694  |         |                                           | C <sub>4</sub> POLY TAR         | 7.53                   | 1.82        | 0.242                   |         |     |
| TOTAL                                     |        | 41.315                 | 518.77             |                           | 13.358         | 311.05              | 42.970                                                                             | 84.285                                | 64.482           |          |                  |                                           |                                     |        |        |         |                                           |                                 |                        |             |                         |         |     |
| H <sub>2</sub> +CO                        | 97.413 | 40.247                 | 15273              | SCFH                      | 6.425          |                     | 20.670                                                                             | 60.917                                | 27.095           | -33.822  |                  |                                           |                                     |        |        |         |                                           |                                 |                        | gal/hr      | gal / MCF               | Bbl/Day |     |
| H <sub>2</sub> /CO                        |        | 1.65                   | Factor             | 654750                    | 4.07           |                     | 4.07                                                                               | 2.15                                  | 4.07             | 1.41     |                  |                                           |                                     |        |        |         |                                           | 10 % RVP 400 EP<br>GASOLINE     | 14.152                 | 0.9266      | 5024                    |         |     |
| Weight Recovery, %                        | 95.88  | Catalyst Age, hrs.     |                    |                           |                | Space Velocity, vhr |                                                                                    |                                       |                  | 1253     | RECOVERED OIL ** |                                           | 0.421                               | 59.04  | 3.866  |         | 9.156                                     | 0.599                           | GAS OIL                | 1.071       | 0.0701                  | 380     |     |
| Pressure, psig                            | 416    | Inlet Velocity, Ft/sec |                    |                           |                | 1.00                | Catalyst Vol CF                                                                    |                                       |                  |          | 12.19            | TOTAL OIL                                 |                                     | 110.08 | 7.206  |         | 19.764                                    | 1.293                           | FUEL OIL               | 0.399       | 0.0261                  | 142     |     |
| Temperature, °F                           | 668    | Bed Depth, Ft          |                    |                           |                | 18.47               | Weight, #                                                                          |                                       |                  |          | 2035             | WATER SOLUBLE<br>CHEMICALS ***            |                                     | 0.267  | 14.18  | 0.928   |                                           | 1.794                           | 0.117                  | POLY TAR    | 0.362                   | 0.0237  | 128 |
| Recycle Ratio                             | 1.04   | Bed Density, #/CF      |                    |                           |                | 167                 | Effluent (H <sub>2</sub> )(CO <sub>2</sub> )<br>Shift Ratio (H <sub>2</sub> O)(CO) |                                       |                  |          | = 8.98           | TOTAL LIQUID<br>PRODUCTS C <sub>3</sub> + |                                     | 124.26 | 8.134  |         | 21.558                                    | 1.410                           | TOTAL                  | 15.984      | 1.0465                  | 5674    |     |
| FRESH FEED CONVERSION - %                 |        |                        |                    | TOTAL FEED CONVERSION - % |                |                     |                                                                                    | SELECTIVITY                           |                  |          |                  | NET WATER ***                             |                                     | 7.466  | 134.50 | 8.806   |                                           | 16.147                          | 1.057                  | W. S. CHEM. | 1.794                   | 0.1175  | 637 |
| Contraction                               | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub> | CO+H <sub>2</sub>   | C <sub>3</sub> + C <sub>4</sub> +                                                  | GROSS WATER                           |                  | 148.68   | 9.735            |                                           | 17.941                              | 1.175  |        |         |                                           | TOTAL                           | 17.778                 | 1.1640      | 6311                    |         |     |
| 67.67                                     | 91.71  | 79.33                  | 84.04              | 72.40                     | 47.65          | 55.52               | 78.71                                                                              | HYDROCARBON<br>TOTAL—C <sub>1</sub> + |                  | 157.87   | 10.337           |                                           |                                     |        |        |         |                                           |                                 |                        |             |                         |         |     |

Form ML-11

\*\* Included in Reactor Effluent Total

$$g/\text{NCM} = 16.91 \times g/\text{MCF}$$
$$\#9488 \text{ MCFH } \text{H}_2 + \text{CO: Bbl/D}_{\text{day}} = 5421.6 \times \text{gal/MCF}$$

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 65-E  
HOURS 88-112

| OPERATING CONDITIONS |            |                                   |                | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |       |                                             |         |   |               |   |
|----------------------|------------|-----------------------------------|----------------|------------------------------------------------|------|-------|--------------------------------------|--|-------|---------------------------------------------|---------|---|---------------|---|
| PRESSURES PSIG       |            |                                   | RATES S.C.F.H. |                                                | OIL  | WATER | INVENTORY DATA                       |  |       | PARTICLE SIZE                               |         |   |               |   |
| Oxygen               | 445        | Fresh Feed                        | 15679          | * API                                          | 51.2 | 10.7  | In Reactor at Start of Period        |  |       | Screen Analysis                             |         |   | Sedimentation |   |
| Natural Gas          | 436        | Recycle                           | 16307          | Neut. No.                                      | 46.6 | 33.3  | Fresh Catalyst Added                 |  |       | Mesh                                        | Microns | % | Microns       | % |
| Generator Outlet     | 420        | Combined Feed                     | 31986          | Sap. No.                                       | 61.6 | 37.1  | Total                                |  |       | On 40                                       | 419+    |   | 80+           |   |
| Reactor Inlet        | 416        | Wet Gas—Measured                  | 4438           | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  |       | 100                                         | 150     |   | 40—80         |   |
| Condenser Inlet      |            | Adjusted                          | 5070           | Bromine No.                                    | 91   |       | In Reactor at End of Period          |  |       | 150                                         | 105     |   | 20—40         |   |
| Product Accumulator  |            | Loss                              | 632            | Pour °F.                                       |      |       |                                      |  |       | 200                                         | 74      |   | 10—20         |   |
|                      |            |                                   |                | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 10.0  | REACTOR d-p, Inches H <sub>2</sub> O |  |       | 250                                         | 62      |   | 0—20          |   |
|                      |            |                                   |                |                                                |      |       | No. Height                           |  |       | 325                                         | 44      |   |               |   |
| TEMPERATURES—°F.     |            | Recycle/Fresh Feed                | 1.04           |                                                |      |       | 0 See Period A                       |  |       | <325                                        |         |   |               |   |
| Oxygen               | 484        | Inlet Velocity—ft./sec.           | 1.00           |                                                |      |       | 1                                    |  | 81    | CATALYST                                    |         |   |               |   |
| Natural Gas          | 804        | Fresh Feed Rate—S.C.F.H.<br>60742 | 15273          | HEMPEL, DIST. %                                |      | °API  | 2                                    |  | 77    | Bulk Density, Lbs./Cu.Ft.                   |         |   |               |   |
| Generator            |            | per Cu. Ft. Dense Bed             | 1253           | 205 °F.                                        |      |       | 3                                    |  | 93    | Aerated                                     |         |   |               |   |
| Quench Accumulator   | 127        | per Lb. Catalyst                  | 7.51           | 400                                            | 82.4 | 54.2  | 4                                    |  | 310   | Settled                                     |         |   |               |   |
| Reactor Inlet        | 288        | per Sq. Ft.                       | 23140          | 400-550                                        | 12.8 | 34.4  | Total                                |  | 561   | Compacted                                   |         |   |               |   |
| Condenser Inlet      | 586        |                                   |                | 550+                                           | 4.8  |       |                                      |  |       | Particle Density, gm./cc.                   |         |   |               |   |
| Product Accumulator  | 94         |                                   |                |                                                |      |       | CALCULATED FROM dp                   |  |       | NH <sub>3</sub> Value, ml./gm.              |         |   |               |   |
| Catalyst No.         | Height     |                                   |                | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 167   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |   |               |   |
| 1                    | See Per. A |                                   |                | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 2035  |                                             |         |   |               |   |
| 2                    | 668        |                                   |                | IBP                                            |      | 98    | Bed Depth, Ft.                       |  | 18.47 | CHEMICAL ANALYSIS                           |         |   |               |   |
| 3                    | 662        |                                   |                | 10%                                            |      | 130   | Vol., Cu. Ft.                        |  | 12.19 | Fe                                          |         |   |               |   |
| 4                    | 674        |                                   |                | 50%                                            |      | 210   |                                      |  |       | C                                           |         |   |               |   |
| 5                    | 672        |                                   |                | 90%                                            |      | 350   |                                      |  |       | O                                           |         |   |               |   |
| 6                    | 672        |                                   |                | EP                                             |      | 398   |                                      |  |       | H                                           |         |   |               |   |
| 7                    | 662        |                                   |                | Rec.                                           |      | 96.5  |                                      |  |       | K <sub>2</sub> O, W+, % basis Fe            |         |   |               |   |
| 8                    | 652        |                                   |                |                                                |      |       |                                      |  |       | X-Ray Analysis—                             |         |   |               |   |
| 9                    | 644        |                                   |                |                                                |      |       |                                      |  |       | Fe <sub>2</sub> O <sub>3</sub>              |         |   |               |   |
| 10                   | 640        |                                   |                |                                                |      |       |                                      |  |       | Fe <sub>2</sub> O <sub>3</sub>              |         |   |               |   |
| 11                   | 628        |                                   |                |                                                |      |       |                                      |  |       | Fe                                          |         |   |               |   |

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

## YIELD CALCULATIONS

Forced on Wet Gas, Oil and Water

 RUN NO. 65-P  
 HOURS 112-136  
 CATALYST Bethlehem Mill  
 Soot Reduced @ 800°F

| FRESH FEED                                |        |                        |                    | WET GAS                   |                |                     |                                                                                   | RECYCLE     | COMBINED<br>FEED                      | EFFLUENT                                  | NET CHANGE |              | YIELD BASIS H <sub>2</sub> + CO FED |         |                                            |                                |                             |                |                  |        |        |     |
|-------------------------------------------|--------|------------------------|--------------------|---------------------------|----------------|---------------------|-----------------------------------------------------------------------------------|-------------|---------------------------------------|-------------------------------------------|------------|--------------|-------------------------------------|---------|--------------------------------------------|--------------------------------|-----------------------------|----------------|------------------|--------|--------|-----|
|                                           | %      | m/hr                   | #/hr               | %                         | At Wt. Balance |                     | m/hr                                                                              | m/hr        | m/hr                                  | #/hr                                      | #/MCF      | #/gal        | gal/hr                              | gal/MCF | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                                |                             |                |                  |        |        |     |
| CONDENSATE                                |        |                        |                    |                           |                |                     |                                                                                   |             |                                       |                                           |            |              |                                     |         |                                            |                                |                             |                |                  |        |        |     |
| CO<br>28.010                              | 37.163 | 15.325                 | 429.25             | 8.793                     | 1.177          | 32.96               | 3.801                                                                             | 19.126      | 4.978                                 | -14.148                                   | -396.29    |              |                                     |         |                                            |                                |                             |                |                  |        |        |     |
| H <sub>2</sub><br>2.016                   | 60.534 | 24.962                 | 50.32              | 39.343                    | 5.266          | 10.62               | 17.005                                                                            | 41.967      | 22.271                                | -19.696                                   | -39.70     |              |                                     |         | 400 EP                                     | 84.2                           | 7.680                       | 98.0           | 7.526            |        |        |     |
| CO <sub>2</sub><br>44.010                 | 1.743  | 0.719                  | 31.64              | 28.860                    | 3.863          | 170.00              | 12.474                                                                            | 13.193      | 16.337                                | 3.144                                     | 138.36     | 9.064        |                                     |         | 400-550                                    | 11.6                           | 1.058                       | 91.4           | 0.967            |        |        |     |
| N <sub>2</sub><br>28.016                  | 0.183  | 0.075                  | 2.10               | 1.857                     | 0.248          | 6.95                | 0.803                                                                             | 0.879       | 1.051                                 |                                           |            |              |                                     |         | 550 +                                      | 4.2                            | 0.383                       | 114.6          | 0.439            |        |        |     |
| CH <sub>4</sub><br>16.042                 | 0.377  | 0.155                  | 2.49               | 10.230                    | 1.369          | 21.95               | 4.422                                                                             | 4.577       | 5.791                                 | 1.214                                     | 19.46      | 1.277        |                                     |         |                                            |                                |                             |                |                  |        |        |     |
| C <sub>2</sub> H <sub>6</sub><br>28.028   |        |                        |                    | 2.310                     | 0.309          | 8.67                | 0.998                                                                             | 0.998       | 1.307                                 | 0.309                                     | 8.67       | 0.569        |                                     |         |                                            |                                |                             |                |                  |        |        |     |
| C <sub>3</sub> H <sub>8</sub><br>30.048   |        |                        |                    | 1.693                     | 0.227          | 6.83                | 0.732                                                                             | 0.732       | 0.959                                 | 0.227                                     | 6.83       | 0.448        |                                     |         | PROPYLENE                                  | 43.8                           | 6.06                        |                |                  |        |        |     |
| C <sub>4</sub> +C <sub>5</sub>            |        |                        |                    |                           |                |                     |                                                                                   |             |                                       |                                           | 34.96      | 2.294        |                                     |         | C <sub>4</sub> POLY GASO.                  | 87.5                           | 5.30                        | 0.886          |                  |        |        |     |
| C <sub>6</sub> H <sub>14</sub><br>42.078  |        |                        |                    | 2.457                     | 0.329          | 13.84               | 1.062                                                                             | 1.062       | 1.391                                 | 0.329                                     | 13.84      | 0.908        | 4.32                                | 3.204   | 0.210                                      | C <sub>6</sub> POLY TAR        | 12.5                        | 0.76           | 0.101            |        |        |     |
| C <sub>7</sub> H <sub>16</sub><br>44.094  |        |                        |                    | 0.213                     | 0.029          | 1.28                | 0.092                                                                             | 0.092       | 0.121                                 | 0.029                                     | 1.28       | 0.084        | 4.24                                | 0.302   | 0.020                                      |                                |                             |                |                  |        |        |     |
| C <sub>8</sub> H <sub>18</sub><br>56.104  |        |                        |                    | 1.863                     | 0.249          | 13.97               | 0.805                                                                             | 0.805       | 1.054                                 | 0.249                                     | 13.97      | 0.917        | 5.00                                | 2.794   | 0.183                                      |                                |                             |                |                  |        |        |     |
| C <sub>9</sub> H <sub>20</sub><br>58.120  |        |                        |                    | 0.840                     | 0.113          | 6.57                | 0.363                                                                             | 0.363       | 0.476                                 | 0.113                                     | 6.57       | 0.431        | 4.86                                | 1.352   | 0.089                                      | C <sub>9</sub> H <sub>10</sub> | #/gal                       | #/hr           | gal/hr           | RVP    |        |     |
| C <sub>10</sub> H <sub>22</sub><br>70.130 |        |                        |                    | 0.927                     | 0.124          | 8.70                | 0.401                                                                             | 0.401       | 0.525                                 | 0.124                                     | 8.70       | 0.571        | 5.48                                | 1.596   | 0.105                                      | C <sub>4</sub> POLY GASO.      | 5.98                        | 12.22          | 2.044            | 1.5    |        |     |
| C <sub>11</sub> H <sub>24</sub><br>72.144 |        |                        |                    | 0.277                     | 0.037          | 2.67                | 0.120                                                                             | 0.120       | 0.157                                 | 0.037                                     | 2.67       | 0.175        | 3.25                                | 0.509   | 0.033                                      | C <sub>4</sub> H <sub>10</sub> | 4.86                        | (6.57)<br>5.40 | (1.352)<br>1.112 | 68.0   |        |     |
| C <sub>12</sub> H <sub>26</sub><br>84.156 |        |                        |                    | 0.337                     | 0.045          | 3.79                | 0.146                                                                             | 0.146       | 0.191                                 | 0.045                                     | 3.79       | 0.249        | 5.54                                | 0.684   | 0.045                                      | C <sub>4</sub> FREE GASO.      |                             |                | 11.201           | 5.8    |        |     |
| C <sub>13</sub> -C <sub>14</sub>          |        |                        |                    |                           |                |                     |                                                                                   |             |                                       |                                           | 50.82      | 3.334        |                                     | 10.441  | 0.685                                      | C <sub>4</sub> POLY TAR        | 7.53                        | 1.75           | 0.232            |        |        |     |
| TOTAL                                     |        | 41.236                 | 515.80             |                           | 13.385         | 308.80              | 43.223                                                                            | 84.459      | 64.728                                |                                           |            |              |                                     |         |                                            |                                |                             |                |                  |        |        |     |
| H <sub>2</sub> +CO                        | 97.697 | 40.287                 | 15242              | SCFH                      | 6.443          |                     | 20.806                                                                            | 61.093      | 27.249                                | -33.844                                   |            |              |                                     |         |                                            |                                | gal/hr                      | gal / MCF      | Bbl/Day          |        |        |     |
| H <sub>2</sub> /CO                        |        | 1.65                   | Factor             | 65608                     | 4.47           |                     | 4.47                                                                              | 2.19        | 4.47                                  | 1.39                                      |            |              |                                     |         |                                            |                                | 16 # RVP 400 EP<br>GASOLINE | 14.357         | 0.9419           | 51.07  |        |     |
| Weight Recovery, %                        | 94.14  | Catalyst Age, hrs.     |                    |                           |                | Space Velocity, vhr |                                                                                   | 1244        | RECOVERED OIL**                       |                                           | 0.416      | 58.34        | 3.828                               |         | 9.121                                      | 0.598                          | GAS OIL                     | 0.967          | 0.0634           | 344    |        |     |
| Pressure, psig                            | 415    | Inlet Velocity, Ft/sec |                    |                           |                | 1.00                | Catalyst Vol CF                                                                   |             | 12.25                                 | TOTAL OIL                                 |            | 109.16       | 7.162                               |         | 19.562                                     | 1.283                          | FUEL OIL                    | 0.439          | 0.0288           | 156    |        |     |
| Temperature, °F                           | 668    | Bed Depth, Ft          |                    |                           |                | 1856                | Weight, #                                                                         |             | 2021                                  | WATER SOLUBLE<br>CHEMICALS**              |            | 0.281        | 14.92                               | 0.979   |                                            | 1.884                          | 0.124                       | POLY TAR       | 0.333            | 0.0218 | 118    |     |
| Recycle Ratio                             | 1.05   | R-2 Density, #/CF      |                    |                           |                | 165                 | Effluent (H <sub>2</sub> )(CO) <sub>2</sub><br>Shift Ratio (H <sub>2</sub> O)(CO) |             | -9.85                                 | TOTAL LIQUID<br>PRODUCTS C <sub>3</sub> + |            | 124.08       | 8.141                               |         | 21.446                                     | 1.407                          | TOTAL                       | 16.096         | 1.0559           | 5725   |        |     |
| FRESH FEED CONVERSION — %                 |        |                        |                    | TOTAL FEED CONVERSION — % |                |                     |                                                                                   | SELECTIVITY |                                       |                                           |            | NET WATER ** |                                     | 7.423   | 133.74                                     | 8.774                          | 16.055                      | 1.053          | W. S. CHEM.      | 1.884  | 0.1236 | 670 |
| Contraction                               | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub> | CO+H <sub>2</sub>   | C <sub>3</sub> + C <sub>4</sub> +                                                 |             | GROSS WATER                           |                                           | 148.66     | 9.753        |                                     | 17.939  | 1.177                                      | TOTAL                          | 17.980                      | 1.1795         | 6395             |        |        |     |
| 67.54                                     | 92.32  | 78.90                  | 82.07              | 73.97                     | 46.93          | 55.40               | 78.02                                                                             |             | HYDROCARBON<br>TOTAL—C <sub>1</sub> + |                                           | 159.04     | 10.434       |                                     |         |                                            |                                |                             |                |                  |        |        |     |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF    \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 3421.6 X gal/MCF

## THE TEXAS COMPANY — MONTEBELLO LABORATORY

## DATA SUMMARY

 RUN NO. 65-P  
 HOURS 112-136

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |           |       | CATALYST DATA                        |  |                 |                                             |               |         |       |
|----------------------|--------|--------------------------|-------|------------------------------------------------|-----------|-------|--------------------------------------|--|-----------------|---------------------------------------------|---------------|---------|-------|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       |                                                | OIL       | WATER | INVENTORY DATA                       |  | PARTICLE SIZE   |                                             |               |         |       |
| Oxygen               | 445    | Fresh Feed               | 15649 | ° API                                          | 52.7      | 10.7  | In Reactor at Start of Period        |  | Screen Analysis |                                             | Sedimentation |         |       |
| Natural Gas          | 435    | Recycle                  | 16403 | Neut. No.                                      | 48.3      | 35.6  | Fresh Catalyst Added                 |  | Mesh            | Microns                                     | %             | Microns | %     |
| Generator Outlet     | 420    | Combined Feed            | 32052 | Sap. No.                                       | 60.8      | 37.4  | Total                                |  | On 40           | 419+                                        |               | 80+     |       |
| Reactor Inlet        | 415    | Wet Gas—Measured         | 4359  | Hydrox. No.                                    |           |       | Catalyst Recovered                   |  | 12              | 100                                         | 150           |         | 40—80 |
| Condenser Inlet      |        | Adjusted                 | 5080  | Bromine No.                                    |           |       | In Reactor at End of Period          |  |                 | 150                                         | 105           |         | 20—40 |
| Product Accumulator  | 385    | Loss                     | 721   | Pour °F.                                       | Below -30 |       |                                      |  |                 | 200                                         | 74            |         | 10—20 |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |           | 10.5  | REACTOR d-p, Inches H <sub>2</sub> O |  |                 | 250                                         | 62            |         | 0—20  |
|                      |        |                          |       |                                                |           |       | No. Height                           |  |                 | 325                                         | 44            |         |       |
| TEMPERATURES—°F      |        | Recycle/ Fresh Feed      | 1.05  |                                                |           |       | O See Period A                       |  |                 | <325                                        |               |         |       |
| Oxygen               | 470    | Inlet Velocity—ft./sec.  | 1.00  |                                                |           |       | 1                                    |  | 79              | CATALYST                                    |               |         |       |
| Natural Gas          | 786    | Fresh Feed Rate—S.C.F.H. | 15242 | HEMPEL, DIST. %                                |           | ° API | 2                                    |  | 76              | Bulk Density, Lbs./Cu.Ft.                   |               |         |       |
| Generator            |        | per Cu.Ft. Dense Bed     | 1244  | 205 °F.                                        |           |       | 3                                    |  | 92              | Aerated                                     |               |         |       |
| Quench Accumulator   | 110    | per Lb. Catalyst         | 7.54  | 400                                            | 83.2      | 53.8  | 4                                    |  | 310             | Settled                                     |               |         |       |
| Reactor Inlet        | 285    | per Sq. Ft.              | 23094 | 400-550                                        | 11.6      | 34.3  | Total                                |  | 557             | Compacted                                   |               |         |       |
| Condenser Inlet      | 589    |                          |       | 550+                                           | 5.2       |       |                                      |  |                 | Particle Density, gm./cc.                   |               |         |       |
| Product Accumulator  | 93     |                          |       |                                                |           |       | CALCULATED FROM dp                   |  |                 | NH <sub>3</sub> Value, ml./gm.              |               |         |       |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |           |       | Density, Lbs./Cu.Ft.                 |  | 165             | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |         |       |
| 1 See Per. A         |        |                          |       | Naphtha °F.                                    |           |       | Inventory, Lbs.                      |  | 2021            |                                             |               |         |       |
| 2                    | 669    |                          |       | IBP                                            |           | 96    | Bed Depth, Ft.                       |  | 18.56           | CHEMICAL ANALYSIS                           |               |         |       |
| 3                    | 663    |                          |       | 10%                                            |           | 128   | Vol., Cu. Ft.                        |  | 12.25           | Fe                                          |               |         |       |
| 4                    | 674    |                          |       | 50%                                            |           | 208   |                                      |  |                 | C                                           |               |         |       |
| 5                    | 675    |                          |       | 90%                                            |           | 346   |                                      |  |                 | O                                           |               |         |       |
| 6                    | 675    |                          |       | EP                                             |           | 390   |                                      |  |                 | H                                           |               |         |       |
| 7                    | 665    |                          |       | Rec.                                           |           | 96.5  |                                      |  |                 | K <sub>2</sub> O, W+, % basis Fe            |               |         |       |
| 8                    | 655    |                          |       |                                                |           |       |                                      |  |                 | X-Ray Analysis—                             |               |         |       |
| 9                    | 646    |                          |       |                                                |           |       |                                      |  |                 | Fe <sub>2</sub> O <sub>3</sub>              |               |         |       |
| 10                   | 643    |                          |       |                                                |           |       |                                      |  |                 | Fe <sub>2</sub> O <sub>4</sub>              |               |         |       |
| 11                   | 627    |                          |       |                                                |           |       |                                      |  |                 | Fe                                          |               |         |       |



**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. 65-G  
HOURS 136-160  
CATALYST Bethlehem Mill  
Scale Reduced @ 500°P

| Feed                                      |        |                             |                     |                           |                |                                                                                         |                                   |                                      |               |                                        |            |              |                                     |        |         | Scale Reduced @ 800°           |                                     |          |             |        |        |     |  |  |  |
|-------------------------------------------|--------|-----------------------------|---------------------|---------------------------|----------------|-----------------------------------------------------------------------------------------|-----------------------------------|--------------------------------------|---------------|----------------------------------------|------------|--------------|-------------------------------------|--------|---------|--------------------------------|-------------------------------------|----------|-------------|--------|--------|-----|--|--|--|
| FRESH FEED                                |        |                             |                     | WET GAS                   |                |                                                                                         |                                   | RECYCLE                              | COMBINED FEED | EFFLUENT                               | NET CHANGE |              | YIELD BASIS H <sub>2</sub> + CO FED |        |         |                                |                                     |          |             |        |        |     |  |  |  |
|                                           | %      | m/hr                        | #/hr                | %                         | At Wt. Balance |                                                                                         | m/hr                              | m/hr                                 | m/hr          | m/hr                                   | #/hr       | CONDENSATE   |                                     |        |         | YIELDS                         | BASIS BROWNSVILLE DESIGN FEED RATE* |          |             |        |        |     |  |  |  |
|                                           |        |                             |                     |                           | m/hr           | #/hr                                                                                    |                                   |                                      |               |                                        |            | #/MCF        | #/gal                               | gal/hr | gal/MCF |                                |                                     |          |             |        |        |     |  |  |  |
| CO<br>26.010                              | 37.470 | 15.289                      | 428.24              | 8.485                     | 1.132          | 31.70                                                                                   | 3.622                             | 18.911                               | 4.754         | -14.157                                | -396.54    |              |                                     |        |         |                                |                                     |          |             |        |        |     |  |  |  |
| H <sub>2</sub><br>2.016                   | 60.126 | 24.535                      | 49.46               | 38.272                    | 5.108          | 10.30                                                                                   | 16.342                            | 40.877                               | 21.450        | -19.427                                | -39.16     |              |                                     |        |         | 400 EP                         | 80.9                                | 7.431    | 98.0        | 7.282  |        |     |  |  |  |
| CO <sub>2</sub><br>11.010                 | 2.150  | 0.877                       | 38.60               | 30.663                    | 4.092          | 180.07                                                                                  | 13.094                            | 13.971                               | 17.186        | 3.215                                  | 141.47     | 9.361        |                                     |        |         | 400-550                        | 12.0                                | 1.102    | 91.4        | 1.007  |        |     |  |  |  |
| N <sub>2</sub><br>26.016                  | 0.177  | 0.072                       | 2.02                | 1.507                     | 0.201          | 5.63                                                                                    | 0.644                             | 0.716                                | 0.845         |                                        |            |              |                                     |        |         | 550 +                          | 7.1                                 | 0.652    | 114.6       | 0.747  |        |     |  |  |  |
| CH <sub>4</sub><br>16.042                 | 0.077  | 0.031                       | 0.50                | 9.793                     | 1.307          | 20.96                                                                                   | 4.182                             | 4.213                                | 5.489         | 1.276                                  | 20.46      | 1.354        |                                     |        |         |                                |                                     |          |             |        |        |     |  |  |  |
| C <sub>2</sub> H <sub>6</sub><br>26.038   |        |                             |                     | 2.350                     | 0.314          | 8.80                                                                                    | 1.004                             | 1.004                                | 1.318         | 0.314                                  | 8.80       | 0.582        |                                     |        |         |                                |                                     |          |             |        |        |     |  |  |  |
| C <sub>3</sub> H <sub>8</sub><br>30.048   |        |                             |                     | 1.747                     | 0.233          | 7.01                                                                                    | 0.746                             | 0.746                                | 0.979         | 0.233                                  | 7.01       | 0.464        |                                     |        |         | PROPYLENE                      | 43.3                                | 7.75     |             |        |        |     |  |  |  |
| C <sub>4</sub> + C <sub>5</sub>           |        |                             |                     |                           |                |                                                                                         |                                   |                                      |               |                                        | 36.27      | 2.400        |                                     |        |         | C <sub>3</sub> POLY GASO.      | 87.5                                | 6.78     | 1.134       |        |        |     |  |  |  |
| C <sub>6</sub> H <sub>14</sub><br>41.074  |        |                             |                     | 3.187                     | 0.425          | 17.90                                                                                   | 1.361                             | 1.361                                | 1.786         | 0.425                                  | 17.90      | 1.184        | 4.32                                | 4.144  | 0.274   | C <sub>3</sub> POLY TAR        | 12.5                                | 0.97     | 0.129       |        |        |     |  |  |  |
| C <sub>7</sub> H <sub>16</sub><br>44.094  |        |                             |                     | 0.287                     | 0.038          | 1.67                                                                                    | 0.123                             | 0.123                                | 0.161         | 0.038                                  | 1.67       | 0.111        | 4.24                                | 0.394  | 0.026   |                                |                                     |          |             |        |        |     |  |  |  |
| C <sub>8</sub> H <sub>18</sub><br>56.104  |        |                             |                     | 1.860                     | 0.249          | 13.95                                                                                   | 0.794                             | 0.794                                | 1.043         | 0.249                                  | 13.95      | 0.923        | 5.00                                | 2.790  | 0.185   |                                |                                     |          |             |        |        |     |  |  |  |
| C <sub>10</sub> H <sub>22</sub><br>59.130 |        |                             |                     | 0.640                     | 0.085          | 4.96                                                                                    | 0.273                             | 0.273                                | 0.358         | 0.085                                  | 4.96       | 0.328        | 4.86                                | 1.021  | 0.068   | C <sub>4</sub> H <sub>8</sub>  | 5.00                                | 0.20     | 0.040       | 68.0   |        |     |  |  |  |
| C <sub>12</sub> H <sub>26</sub><br>70.130 |        |                             |                     | 0.867                     | 0.116          | 8.11                                                                                    | 0.370                             | 0.370                                | 0.486         | 0.116                                  | 8.11       | 0.537        | 5.45                                | 1.488  | 0.098   | C <sub>4</sub> POLY GASO.      | 5.98                                | 12.03    | 2.012       | 1.5    |        |     |  |  |  |
| C <sub>14</sub> H <sub>30</sub><br>72.146 |        |                             |                     | 0.157                     | 0.021          | 1.54                                                                                    | 0.067                             | 0.067                                | 0.088         | 0.021                                  | 1.54       | 0.102        | 5.28                                | 0.293  | 0.019   | C <sub>4</sub> H <sub>10</sub> | 4.86                                | 4.96     | 1.021       | 68.0   |        |     |  |  |  |
| C <sub>16</sub> H <sub>34</sub><br>84.136 |        |                             |                     | 0.187                     | 0.025          | 2.13                                                                                    | 0.080                             | 0.080                                | 0.105         | 0.025                                  | 2.13       | 0.141        | 5.54                                | 0.384  | 0.025   | C <sub>4</sub> FREE GASO.      |                                     |          | 10.581      | 5.8    |        |     |  |  |  |
| C <sub>3</sub> -C <sub>6</sub>            |        |                             |                     |                           |                |                                                                                         |                                   |                                      |               |                                        |            |              | 10.514                              | 0.695  |         | C <sub>4</sub> POLY TAR        | 7.53                                | 1.72     | 0.228       |        |        |     |  |  |  |
| TOTAL                                     |        | 40.804                      |                     |                           | 13.346         | 314.71                                                                                  | 42.703                            | 83.507                               | 63.972        |                                        | 50.26      | 3.326        |                                     |        |         |                                |                                     |          |             |        |        |     |  |  |  |
| H <sub>2</sub> +CO                        | 97.596 | 39.824                      | 15113               | SCFH                      | 6.240          |                                                                                         | 19.964                            | 59.788                               | 26.204        | -33.584                                |            |              |                                     |        |         |                                |                                     |          |             |        |        |     |  |  |  |
| H <sub>2</sub> /CO                        | 1.60   | Factor                      | 661681              |                           | 4.51           |                                                                                         | 4.51                              | 2.16                                 | 4.51          |                                        |            |              |                                     |        |         | 10 # RVP 400 EP GASOLINE       | 13.654                              | 0.9035   | 4898        |        |        |     |  |  |  |
| Weight Recovery, %                        | 90.40  | Catalyst Age, hrs.          |                     |                           |                | Space Velocity, v/hv 1208                                                               |                                   |                                      |               | RECOVERED OIL **                       |            | 0.420        | 58.84                               | 3.893  |         | 9.185                          | 0.608                               | GAS OIL  | 1.007       | 0.0666 | 361    |     |  |  |  |
| Pressure, psig                            | 415    | Inlet Velocity, Ft/sec 0.99 |                     |                           |                | Catalyst Vol CP 12.52                                                                   |                                   |                                      |               | TOTAL OIL                              |            | 109.10       | 7.219                               |        | 19.699  | 1.303                          | FUEL OIL                            | 0.747    | 0.0494      | 268    |        |     |  |  |  |
| Temperature, °F                           | 665    | Bed Depth, Ft 18.97         |                     |                           |                | Weight, # 2003                                                                          |                                   |                                      |               | WATER SOLUBLE CHEMICALS **             |            | 0.289        | 15.32                               | 1.014  |         | 1.929                          | 0.128                               | POLY TAR | 0.357       | 0.0236 | 128    |     |  |  |  |
| Recycle Ratio                             | 1.05   | Bed Density, #/CF 160       |                     |                           |                | Effluent (H <sub>2</sub> )(CO <sub>2</sub> ) Shift Ratio (H <sub>2</sub> O)(CO) = 10.75 |                                   |                                      |               | TOTAL LIQUID PRODUCTS C <sub>3</sub> + |            | 124.42       | 8.233                               | 21.628 | 1.431   | TOTAL                          | 15.765                              | 1.0431   | 5655        |        |        |     |  |  |  |
| FRESH FEED CONVERSION — %                 |        |                             |                     | TOTAL FEED CONVERSION — % |                |                                                                                         |                                   | SELECTIVITY                          |               |                                        |            | NET WATER ** |                                     | 7.215  | 129.98  | 8.601                          | 15.604                              | 1.032    | W. S. CHEM. | 1.929  | 0.1276 | 692 |  |  |  |
| Contraction                               | CO     | H <sub>2</sub>              | H <sub>2</sub> + CO | CO                        | H <sub>2</sub> | CO + H <sub>2</sub>                                                                     | C <sub>3</sub> + C <sub>4</sub> + | GROSS WATER                          |               |                                        |            | 145.30       | 9.614                               | 17.533 | 1.160   | TOTAL                          | 17.694                              | 1.1707   | 6347        |        |        |     |  |  |  |
| 67.29                                     | 92.60  | 79.18                       | 84.33               | 74.86                     | 47.53          | 56.17                                                                                   | 77.44                             | HYDROCARBON TOTAL — C <sub>3</sub> + |               |                                        |            | 160.67       | 10.631                              |        |         |                                |                                     |          |             |        |        |     |  |  |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**DATA SUMMARY**

RUN NO. 65-G  
HOURS 136-160

| OPERATING CONDITIONS |        |                               |                | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |       |                                             |         |               |         |   |
|----------------------|--------|-------------------------------|----------------|------------------------------------------------|------|-------|--------------------------------------|--|-------|---------------------------------------------|---------|---------------|---------|---|
| PRESSURES PSIG       |        |                               | RATES S.C.F.H. |                                                | OIL  | WATER | INVENTORY DATA                       |  |       | PARTICLE SIZE                               |         |               |         |   |
| Oxygen               | 446    | Fresh Feed                    | 15485          | ° API                                          | 52.4 | 10.7  | In Reactor at Start of Period        |  |       | Screen Analysis                             |         | Sedimentation |         |   |
| Natural Gas          | 437    | Recycle                       | 16206          | Neut. No.                                      | 51.1 | 36.2  | Fresh Catalyst Added                 |  |       | Mesh                                        | Microns | %             | Microns | % |
| Generator Outlet     | 419    | Combined Feed                 | 31691          | Sap. No.                                       | 62.0 | 38.7  | Total                                |  |       | On 40                                       | 419+    | 80+           |         |   |
| Reactor Inlet        | 415    | Wet Gas—Measured              | 4412           | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 27    | 100                                         | 150     | 40—80         |         |   |
| Condenser Inlet      |        | Adjusted                      | 5065           | Bromine No.                                    | 96   |       | In Reactor at End of Period          |  |       | 150                                         | 105     | 20—40         |         |   |
| Product Accumulator  | 385    | Loss                          | 653            | Pour °F.                                       |      |       |                                      |  |       | 200                                         | 74      | 10—20         |         |   |
|                      |        |                               |                | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 11.0  | REACTOR d-p, Inches H <sub>2</sub> O |  |       | 250                                         | 62      | 0—20          |         |   |
|                      |        |                               |                |                                                |      |       | No. Height                           |  |       | 325                                         | 44      |               |         |   |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed            | 1.05           |                                                |      |       | 0 See Period A                       |  |       | <325                                        |         |               |         |   |
| Oxygen               | 485    | Inlet Velocity—ft./sec.       | 0.99           |                                                |      |       | 1                                    |  | 78    | CATALYST                                    |         |               |         |   |
| Natural Gas          | 792    | Fresh Feed Rate—S.C.F.H.      | 15113          | HEMPEL DIST. %                                 |      | °API  | 2                                    |  | 75    | Bulk Density, Lbs./Cu.Ft.                   |         |               |         |   |
| Generator            |        | per Cu.Ft. Dense Bed          | 1207           | 205 °F.                                        |      |       | 3                                    |  | 90    | Aerated                                     |         |               |         |   |
| Quench Accumulator   | 127    | per Lb. Catalyst              | 7.55           | 400                                            | 79.9 | 54.5  | 4                                    |  | 310   | Settled                                     |         |               |         |   |
| Reactor Inlet        | 261    | per Sq. Ft.                   | 22898          | 400-550                                        | 12.0 | 32.5  | Total                                |  | 553   | Compacted                                   |         |               |         |   |
| Condenser Inlet      | 587    |                               |                | 550+                                           | 8.1  |       |                                      |  |       | Particle Density, gm./cc.                   |         |               |         |   |
| Product Accumulator  | 90     | Heat Transfer Calculations    |                |                                                |      |       | CALCULATED FROM dp                   |  |       | NH <sub>3</sub> Value, ml./gm.              |         |               |         |   |
| Catalyst No.         | Height | Steam Rate = 363 #/hr         |                | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 160   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |               |         |   |
| 1 See Per. A         |        | @ 705 psia & 506°F            |                | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 2003  |                                             |         |               |         |   |
| 2                    | 663    | 1201 BTU/#                    |                | IBP                                            | 99   |       | Bed Depth, Ft.                       |  | 18.97 | CHEMICAL ANALYSIS                           |         |               |         |   |
| 3                    | 657    | Water in @ 61°F=29 BTU/#      |                | 10%                                            | 126  |       | Vol., Cu. Ft.                        |  | 12.52 | Fe                                          |         |               |         |   |
| 4                    | 669    | Net Heat Transferred/# Steam  |                | 50%                                            | 210  |       |                                      |  |       | C                                           |         |               |         |   |
| 5                    | 670    | = 1172 BTU                    |                | 90%                                            | 340  |       |                                      |  |       | O                                           |         |               |         |   |
| 6                    | 671    | (1172)(363)=425436 BTU/hr     |                | EP                                             |      |       |                                      |  |       | H                                           |         |               |         |   |
| 7                    | 661    | Ave. Bed Temp.= 663°F         |                | Rec.                                           | 96   |       |                                      |  |       | K <sub>2</sub> O, W+, % basis Fe            |         |               |         |   |
| 8                    | 653    | ΔT=663-506=157°F              |                |                                                |      |       |                                      |  |       | X-Ray Analysis—                             |         |               |         |   |
| 9                    | 645    | Tube Area=34.4 sq ft          |                |                                                |      |       |                                      |  |       | Fe <sub>2</sub> O <sub>3</sub>              |         |               |         |   |
| 10                   | 641    | K= 425436 / 78.8 BTU/°F/sq ft |                |                                                |      |       |                                      |  |       | Fe <sub>2</sub> O <sub>4</sub>              |         |               |         |   |
| 11                   | 623    | (34.4)(157)                   |                |                                                |      |       |                                      |  |       | Fe                                          |         |               |         |   |



**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. 65-I  
HOURS 184-208  
CATALYST Bethlehem Mill  
Scale Reduced @ 800°F

| FRESH FEED                               |        |                        |                    | WET GAS                                                              |                | RECYCLE           | COMBINED FEED                          | EFFLUENT                             | NET CHANGE | YIELD BASIS H <sub>2</sub> + CO FED |         |        |         |         |       |             |        |            |  |
|------------------------------------------|--------|------------------------|--------------------|----------------------------------------------------------------------|----------------|-------------------|----------------------------------------|--------------------------------------|------------|-------------------------------------|---------|--------|---------|---------|-------|-------------|--------|------------|--|
| %                                        | m/hr   | #/hr                   | %                  | At Wt. Balance                                                       | m/hr           | m/hr              | m/hr                                   | m/hr                                 | m/hr       | #/MCF                               | #/gal   | gal/hr | gal/MCF | YIELDS  | BASIS | BROWNSVILLE | DESIGN | FEED RATE* |  |
| CO<br>28.010                             | 37.014 | 15.113                 | 423.30             | 7.957                                                                | 1.063          | 29.76             | 3.387                                  | 18.480                               | 4.430      | -14.050                             | -393.54 |        |         |         |       |             |        |            |  |
| H <sub>2</sub><br>2.016                  | 60.150 | 24.559                 | 49.51              | 37.503                                                               | 5.008          | 10.10             | 15.871                                 | 40.430                               | 20.879     | -19.551                             | -39.41  |        |         | 400 EP  | 79.0  | 7.012       | 98.0   | 6.872      |  |
| CO <sub>2</sub><br>44.010                | 2.280  | 0.931                  | 40.97              | 30.513                                                               | 4.075          | 179.29            | 12.913                                 | 13.844                               | 16.988     | 3.144                               | 138.32  | 9.187  |         | 400-550 | 11.2  | 0.994       | 91.4   | 0.909      |  |
| N <sub>2</sub><br>22.016                 | 0.313  | 0.128                  | 3.59               | 1.480                                                                | 0.198          | 5.54              | 0.626                                  | 0.754                                | 0.824      |                                     |         |        |         | 550 +   | 9.8   | 0.870       | 114.6  | 0.997      |  |
| CH <sub>4</sub><br>16.042                | 0.243  | 0.099                  | 1.59               | 10.327                                                               | 1.379          | 22.12             | 4.370                                  | 4.469                                | 5.749      | 1.280                               | 20.53   | 6.364  |         |         |       |             |        |            |  |
| C <sub>2</sub> H <sub>6</sub><br>22.016  |        |                        |                    | 2.480                                                                | 0.331          | 9.29              | 1.049                                  | 1.049                                | 1.380      | 0.331                               | 9.29    | 0.617  |         |         |       |             |        |            |  |
| C <sub>2</sub> H <sub>4</sub><br>20.018  |        |                        |                    | 1.943                                                                | 0.246          | 7.40              | 0.780                                  | 0.780                                | 1.026      | 0.246                               | 7.40    | 0.491  |         |         |       |             |        |            |  |
| C <sub>3</sub> +C <sub>4</sub>           |        |                        |                    |                                                                      |                |                   |                                        |                                      |            | 37.22                               | 2.472   |        |         |         |       |             |        |            |  |
| C <sub>2</sub> H <sub>2</sub><br>42.078  |        |                        |                    | 3.210                                                                | 0.429          | 18.05             | 1.358                                  | 1.358                                | 1.787      | 0.429                               | 18.05   | 1.199  | 4.32    | 4.178   | 0.277 |             |        |            |  |
| C <sub>3</sub> H <sub>8</sub><br>44.014  |        |                        |                    | 0.280                                                                | 0.038          | 1.67              | 0.118                                  | 0.118                                | 0.156      | 0.038                               | 1.67    | 0.111  | 4.24    | 0.394   | 0.026 |             |        |            |  |
| C <sub>4</sub> H <sub>10</sub><br>52.016 |        |                        |                    | 2.057                                                                | 0.275          | 15.43             | 0.870                                  | 0.870                                | 1.145      | 0.275                               | 15.43   | 1.025  | 5.00    | 3.086   | 0.205 |             |        |            |  |
| C <sub>5</sub> H <sub>12</sub><br>58.010 |        |                        |                    | 0.837                                                                | 0.111          | 6.47              | 0.354                                  | 0.354                                | 0.465      | 0.111                               | 6.47    | 0.430  | 4.86    | 1.331   | 0.088 |             |        |            |  |
| C <sub>6</sub> H <sub>14</sub><br>70.010 |        |                        |                    | 1.027                                                                | 0.138          | 9.65              | 0.435                                  | 0.435                                | 0.573      | 0.138                               | 9.65    | 0.641  | 5.48    | 1.771   | 0.118 |             |        |            |  |
| C <sub>7</sub> H <sub>16</sub><br>74.016 |        |                        |                    | 0.213                                                                | 0.028          | 2.02              | 0.090                                  | 0.090                                | 0.118      | 0.028                               | 2.02    | 0.134  | 5.85    | 0.386   | 0.026 |             |        |            |  |
| C <sub>8</sub> H <sub>18</sub><br>84.016 |        |                        |                    | 0.273                                                                | 0.037          | 3.10              | 0.116                                  | 0.116                                | 0.153      | 0.037                               | 3.10    | 0.206  | 5.84    | 0.560   | 0.037 |             |        |            |  |
| C <sub>9</sub> +C <sub>10</sub>          |        |                        |                    |                                                                      |                |                   |                                        |                                      |            | 56.39                               | 3.746   |        | 11.705  | 0.777   |       |             |        |            |  |
| TOTAL                                    | 40.830 | 518.96                 |                    | 13.355                                                               | 319.90         | 42.517            | 83.147                                 | 63.453                               |            |                                     |         |        |         |         |       |             |        |            |  |
| H <sub>2</sub> +CO                       | 97.164 | 39.672                 | 15056              | SCFH                                                                 | 6.071          |                   | 19.238                                 | 58.910                               | 25.309     | -33.601                             |         |        |         |         |       |             |        |            |  |
| H <sub>2</sub> /CO                       | 1.63   | Factor                 | 664187             | 4.71                                                                 |                |                   | 4.71                                   | 2.19                                 | 1.39       |                                     |         |        |         |         |       |             |        |            |  |
| Weight Recovery, %                       | 94.79  | Catalyst Age, hrs.     |                    | Space Velocity, vhr                                                  | 1182           |                   | RECOVERED OIL **                       | 0.405                                | 56.86      | 3.777                               |         | 8.876  | 0.590   |         |       |             |        |            |  |
| Pressure, psig                           | 414    | Inlet Velocity, Ft/sec | 0.99               | Catalyst Vol CF                                                      | 12.74          |                   | TOTAL OIL                              |                                      | 113.25     | 7.523                               |         | 20.581 | 1.367   |         |       |             |        |            |  |
| Temperature, °F                          | 667    | Bed Depth, Ft          | 19.30              | Weight, #                                                            | 1936           |                   | WATER SOLUBLE CHEMICALS **             | 0.281                                | 14.91      | 0.990                               |         | 1.889  | 0.125   |         |       |             |        |            |  |
| Recycle Ratio                            | 1.04   | Bed Density, #/CF      | 152                | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) | 11.33          |                   | TOTAL LIQUID PRODUCTS C <sub>2</sub> + |                                      | 128.18     | 8.513                               |         | 22.470 | 1.492   |         |       |             |        |            |  |
| FRESH FEED CONVERSION — %                |        |                        |                    | TOTAL FEED CONVERSION — %                                            |                |                   |                                        | SELECTIVITY                          |            | NET WATER **                        | 7.065   | 127.28 | 8.454   | 15.280  | 1.015 |             |        |            |  |
| Contraction                              | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                                                                   | H <sub>2</sub> | CO+H <sub>2</sub> | C <sub>3</sub> + C <sub>4</sub> +      | GROSS WATER                          |            | 142.19                              | 9.444   | 17.169 | 1.140   |         |       |             |        |            |  |
| 67.29                                    | 92.97  | 79.61                  | 84.70              | 76.03                                                                | 48.36          | 57.04             | 77.49                                  | HYDROCARBON TOTAL — C <sub>1</sub> + |            | 165.38                              | 10.984  |        |         |         |       |             |        |            |  |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF

\*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**

**DATA SUMMARY**

RUN NO. 65-I  
HOURS 184-208

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |       |                                             |         |   |               |   |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|-------|---------------------------------------------|---------|---|---------------|---|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       | OIL                                            |      | WATER | INVENTORY DATA                       |       | PARTICLE SIZE                               |         |   |               |   |
| Oxygen               | 444    | Fresh Feed               | 15495 | * API                                          | 52.4 | 10.8  | In Reactor at Start of Period        |       | Screen Analysis                             |         |   | Sedimentation |   |
| Natural Gas          | 436    | Recycle                  | 16059 | Neut. No.                                      | 48.8 | 36.0  | Fresh Catalyst Added                 |       | Mesh                                        | Microns | % | Microns       | % |
| Generator Outlet     | 418    | Combined Feed            | 31554 | Sap. No.                                       | 63.6 | 38.4  | Total                                |       | On 40                                       | 419+    |   | 80+           |   |
| Reactor Inlet        | 414    | Wet Gas—Measured         | 4381  | Hydrox. No.                                    |      |       | Catalyst Recovered                   | 14    | 100                                         | 150     |   | 40—80         |   |
| Condenser Inlet      |        | Adjusted                 | 5068  | Bromine No.                                    | 96   |       | In Reactor at End of Period          |       | 150                                         | 105     |   | 20—40         |   |
| Product Accumulator  | 383    | Loss                     | 687   | Pour °F.                                       |      |       |                                      |       | 200                                         | 72      |   | 10—20         |   |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 11.0  | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62      |   | 0—20          |   |
|                      |        |                          |       |                                                |      |       | No. Height                           |       | 325                                         | 44      |   |               |   |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 1.04  |                                                |      |       | 0 See Period A                       |       | <325                                        |         |   |               |   |
| Oxygen               | 478    | Inlet Velocity—ft./sec.  | 0.99  |                                                |      |       | 1                                    | 73    | CATALYST                                    |         |   |               |   |
| Natural Gas          | 784    | Fresh Feed Rate—S.C.F.H. | 15056 | HEMPEL, DIST. %                                |      | °API  | 2                                    | 72    | Bulk Density, Lbs./Cu.Ft.                   |         |   |               |   |
| Generator            |        | per Cu.Ft. Dense Bed     | 1182  | 205 °F.                                        |      |       | 3                                    | 85    | Aerated                                     |         |   |               |   |
| Quench Accumulator   | 128    | per Lb. Catalyst         | 7.78  | 400                                            | 78.0 | 52.6  | 4                                    | 305   | Settled                                     |         |   |               |   |
| Reactor Inlet        | 267    | per Sq. Ft.              | 22812 | 400-550                                        | 11.2 | 33.5  | Total                                | 535   | Compacted                                   |         |   |               |   |
| Condenser Inlet      | 589    |                          |       | 550+                                           | 10.8 |       |                                      |       | Particle Density, gm./cc.                   |         |   |               |   |
| Product Accumulator  | 89     |                          |       |                                                |      |       |                                      |       | CALCULATED FROM dp                          |         |   |               |   |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 | 152   | NH <sub>3</sub> Value, ml./gm.              |         |   |               |   |
| 1 See Per. A         |        |                          |       | Naphtha °F.                                    |      |       | Inventory, Lbs.                      | 1936  | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |   |               |   |
| 2                    | 669    |                          |       | IBP                                            | 112  |       | Bed Depth, Ft.                       | 19.30 | CHEMICAL ANALYSIS                           |         |   |               |   |
| 3                    | 659    |                          |       | 10%                                            | 140  |       | Vol., Cu. Ft.                        | 12.74 | Fe                                          |         |   |               |   |
| 4                    | 671    |                          |       | 50%                                            | 224  |       |                                      |       | C                                           |         |   |               |   |
| 5                    | 674    |                          |       | 90%                                            | 348  |       |                                      |       | O                                           |         |   |               |   |
| 6                    | 675    |                          |       | EP                                             | 392  |       |                                      |       | H                                           |         |   |               |   |
| 7                    | 667    |                          |       | Rec.                                           | 96.5 |       |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |         |   |               |   |
| 8                    | 657    |                          |       |                                                |      |       |                                      |       | X-Ray Analysis—                             |         |   |               |   |
| 9                    | 649    |                          |       |                                                |      |       |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |         |   |               |   |
| 10                   | 644    |                          |       |                                                |      |       |                                      |       | Fe <sub>2</sub> O <sub>4</sub>              |         |   |               |   |
| 11                   | 624    |                          |       |                                                |      |       |                                      |       | Fe                                          |         |   |               |   |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. **65-J**  
HOURS **208-232**  
Catalyst **Bethlehem Mill**  
Scale **Reduced @ 800°F**

| FRESH FEED                                |        |                        |                    | WET GAS |                           |                     | RECYCLE                                                    | COMBINED FEED                      | EFFLUENT | NET CHANGE       |                                        | YIELD BASIS H <sub>2</sub> + CO FED |        |        |              |                                            |                                |                          |                     |                  |        |       |  |        |       |             |       |        |     |
|-------------------------------------------|--------|------------------------|--------------------|---------|---------------------------|---------------------|------------------------------------------------------------|------------------------------------|----------|------------------|----------------------------------------|-------------------------------------|--------|--------|--------------|--------------------------------------------|--------------------------------|--------------------------|---------------------|------------------|--------|-------|--|--------|-------|-------------|-------|--------|-----|
|                                           | %      | m/hr                   | #/hr               | %       | At Wt. Balance            |                     | m/hr                                                       | m/hr                               | m/hr     | m/hr             | #/hr                                   | CONDENSATE                          |        |        |              | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                                |                          |                     |                  |        |       |  |        |       |             |       |        |     |
|                                           |        |                        |                    |         | m/hr                      | #/hr                |                                                            |                                    |          |                  |                                        | #/MCF                               | #/gal  | gal/hr | gal/MCF      |                                            | CORRECTED HEMPH. %             | gal/hr                   | TREATING RECOVERY % | gal/hr           |        |       |  |        |       |             |       |        |     |
| CO<br>28.010                              | 37.413 | 15.055                 | 421.69             | 12.380  | 1.800                     | 50.41               | 5.348                                                      | 20.403                             | 7.148    | -13.255          | -371.28                                |                                     |        |        |              |                                            |                                |                          |                     |                  |        |       |  |        |       |             |       |        |     |
| H <sub>2</sub><br>28.016                  | 59.984 | 24.137                 | 48.66              | 40.427  | 5.876                     | 11.85               | 17.464                                                     | 41.611                             | 23.340   | -18.261          | -36.81                                 |                                     |        |        |              |                                            | 400 EP                         | 80.7                     | 6.003               | 98.0             | 5.883  |       |  |        |       |             |       |        |     |
| CO <sub>2</sub><br>44.010                 | 2.253  | 0.907                  | 39.92              | 26.203  | 3.809                     | 167.63              | 11.319                                                     | 12.226                             | 15.128   | 2.902            | 127.71                                 | 8.587                               |        |        |              |                                            | 400-550                        | 11.2                     | 0.833               | 91.4             | 0.761  |       |  |        |       |             |       |        |     |
| N <sub>2</sub><br>28.016                  | 0.117  | 0.047                  | 1.32               | 1.370   | 0.199                     | 5.58                | 0.592                                                      | 0.639                              | 0.791    |                  |                                        |                                     |        |        |              |                                            | 550 +                          | 8.1                      | 0.603               | 114.6            | 0.691  |       |  |        |       |             |       |        |     |
| CH <sub>4</sub><br>16.082                 | 0.233  | 0.094                  | 1.51               | 8.837   | 1.284                     | 20.60               | 3.817                                                      | 3.911                              | 5.101    | 1.190            | 19.09                                  | 1.284                               |        |        |              |                                            |                                |                          |                     |                  |        |       |  |        |       |             |       |        |     |
| C <sub>2</sub> H <sub>6</sub><br>28.088   |        |                        |                    | 2.107   | 0.306                     | 8.58                | 0.910                                                      | 0.910                              | 1.216    | 0.306            | 8.58                                   | 0.577                               |        |        |              |                                            |                                |                          |                     |                  |        |       |  |        |       |             |       |        |     |
| C <sub>3</sub> H <sub>8</sub><br>30.068   |        |                        |                    | 1.673   | 0.243                     | 7.32                | 0.723                                                      | 0.723                              | 0.966    | 0.243            | 7.32                                   | 0.492                               |        |        |              |                                            | PROPYLENE                      | 39.0                     | 6.33                |                  |        |       |  |        |       |             |       |        |     |
| C <sub>4</sub> +C <sub>5</sub>            |        |                        |                    |         |                           |                     |                                                            |                                    |          |                  | 34.99                                  | 2.553                               |        |        |              |                                            | C <sub>4</sub> POLY GASO.      | 87.5                     | 5.54                | 0.926            |        |       |  |        |       |             |       |        |     |
| C <sub>6</sub> H <sub>14</sub><br>42.078  |        |                        |                    | 2.657   | 0.386                     | 16.23               | 1.148                                                      | 1.148                              | 1.534    | 0.386            | 16.23                                  | 1.091                               | 4.32   | 3.757  | 0.253        |                                            | C <sub>3</sub> POLY TAR        | 12.5                     | 0.79                | 0.105            |        |       |  |        |       |             |       |        |     |
| C <sub>8</sub> H <sub>18</sub><br>44.094  |        |                        |                    | 0.283   | 0.041                     | 1.83                | 0.122                                                      | 0.122                              | 0.163    | 0.041            | 1.83                                   | 0.123                               | 4.24   | 0.432  | 0.029        |                                            |                                |                          |                     |                  |        |       |  |        |       |             |       |        |     |
| C <sub>10</sub> H <sub>22</sub><br>56.104 |        |                        |                    | 1.897   | 0.276                     | 15.49               | 0.819                                                      | 0.819                              | 1.095    | 0.276            | 15.49                                  | 1.041                               | 5.00   | 3.098  | 0.208        |                                            |                                | #/gal                    | #/hr                | gal/hr           | RVP    |       |  |        |       |             |       |        |     |
| C <sub>12</sub> H <sub>26</sub><br>58.120 |        |                        |                    | 0.623   | 0.090                     | 5.25                | 0.269                                                      | 0.269                              | 0.359    | 0.090            | 5.25                                   | 0.353                               | 4.86   | 1.080  | 0.073        |                                            | C <sub>4</sub> H <sub>6</sub>  | 5.00                     |                     |                  | 68.0   |       |  |        |       |             |       |        |     |
| C <sub>14</sub> H <sub>30</sub><br>70.130 |        |                        |                    | 1.007   | 0.146                     | 10.25               | 0.435                                                      | 0.435                              | 0.581    | 0.146            | 10.25                                  | 0.689                               | 5.45   | 1.881  | 0.126        |                                            | C <sub>4</sub> POLY GASO.      | 5.98                     | 13.55               | 2.267            | 1.5    |       |  |        |       |             |       |        |     |
| C <sub>16</sub> H <sub>34</sub><br>72.142 |        |                        |                    | 0.253   | 0.037                     | 2.64                | 0.109                                                      | 0.109                              | 0.146    | 0.037            | 2.64                                   | 0.178                               | 5.25   | 0.503  | 0.034        |                                            | C <sub>4</sub> H <sub>10</sub> | 4.86                     | (5.25)<br>5.07      | (1.080)<br>1.043 | 68.0   |       |  |        |       |             |       |        |     |
| C <sub>18</sub> H <sub>38</sub><br>84.152 |        |                        |                    | 0.283   | 0.041                     | 3.48                | 0.122                                                      | 0.122                              | 0.163    | 0.041            | 3.48                                   | 0.234                               | 5.54   | 0.628  | 0.042        |                                            | C <sub>4</sub> -FREE GASO.     |                          |                     | 9.821            | 5.8    |       |  |        |       |             |       |        |     |
| C <sub>20</sub> -C <sub>24</sub>          |        |                        |                    |         |                           | 340.09              |                                                            |                                    |          |                  | 55.17                                  | 3.709                               |        | 11.379 | 0.765        |                                            | C <sub>4</sub> POLY TAR        | 7.53                     | 1.94                | 0.258            |        |       |  |        |       |             |       |        |     |
| TOTAL                                     |        | 40.240                 | 513.07             |         | 14.535                    | 327.12              | 43.199                                                     | 83.439                             | 65.167   |                  |                                        |                                     |        |        |              |                                            |                                |                          |                     |                  |        |       |  |        |       |             |       |        |     |
| H <sub>2</sub> +CO                        | 97.397 | 39.192                 | 14873              | SCFH    | 7.676                     |                     | 22.812                                                     | 62.014                             | 30.488   | -31.516          |                                        |                                     |        |        |              |                                            |                                | gal/hr                   | gal / MCF           | Bbl/Day          |        |       |  |        |       |             |       |        |     |
| H <sub>2</sub> /CO                        |        | 1.60                   | Factor             | 672359  | 3.27                      |                     | 3.27                                                       | 2.04                               | 3.27     | 1.38             |                                        |                                     |        |        |              |                                            |                                | 10 # RVP 400 PP GASOLINE | 13.131              | 0.8829           | 4787   |       |  |        |       |             |       |        |     |
| Weight Recovery, %                        | 93.02  | Catalyst Age, hrs.     |                    |         |                           | Space Velocity, vhr |                                                            |                                    | 1195     | RECOVERED OIL ** |                                        | 0.343                               | 46.05  | 3.231  | 7.439        | 0.500                                      | GAS OIL                        | 0.761                    | 0.0512              | 278              |        |       |  |        |       |             |       |        |     |
| Pressure, psig                            | 413    | Inlet Velocity, Ft/sec |                    |         |                           | 0.99                | Catalyst Vol CF                                            |                                    |          | 12.45            | TOTAL OIL                              |                                     | 103.22 | 6.940  | 18.818       | 1.265                                      | FUEL OIL                       | 0.691                    | 0.0465              | 252              |        |       |  |        |       |             |       |        |     |
| Temperature, °F                           | 663    | Bed Depth, Ft          |                    |         |                           | 18.97               | Weight, #                                                  |                                    |          | 1880             | WATER SOLUBLE CHEMICALS **             |                                     | 0.289  | 15.32  | 1.030        | 1.912                                      | 0.129                          | POLY TAR                 | 0.363               | 0.0244           | 132    |       |  |        |       |             |       |        |     |
| Recycle Ratio                             | 1.07   | Bed Density, #/CF      |                    |         |                           | 151                 | Effluent Shift Ratio (H <sub>2</sub> O)/(CO <sub>2</sub> ) |                                    |          | = 7.26           | TOTAL LIQUID PRODUCTS C <sub>4</sub> + |                                     | 118.54 | 7.970  | 20.730       | 1.394                                      | TOTAL                          | 14.946                   | 1.0050              | 5449             |        |       |  |        |       |             |       |        |     |
| FRESH FEED CONVERSION — %                 |        |                        |                    |         | TOTAL FEED CONVERSION — % |                     |                                                            |                                    |          | SELECTIVITY      |                                        |                                     |        |        | NET WATER ** |                                            |                                |                          |                     | 6.804            | 122.58 | 8.242 |  | 14.716 | 0.989 | W. S. CHEM. | 1.912 | 0.1286 | 697 |
| Contraction                               | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO      | H <sub>2</sub>            | CO+H <sub>2</sub>   | C <sub>3</sub> + C <sub>4</sub> +                          | GROSS WATER                        |          | 137.90           | 9.272                                  |                                     | 16.628 | 1.118  |              |                                            | TOTAL                          | 16.858                   | 1.1336              | 6146             |        |       |  |        |       |             |       |        |     |
| 63.88                                     | 88.04  | 75.66                  | 80.41              | 64.97   | 43.89                     | 50.82               | 77.21                                                      | HYDROCARBON TOTAL—C <sub>4</sub> + |          | 153.53           | 10.323                                 |                                     |        |        |              |                                            |                                |                          |                     |                  |        |       |  |        |       |             |       |        |     |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X #/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 3421.6 X gal/MCF

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**DATA SUMMARY**

RUN NO. **65-J**  
HOURS **208-232**

| OPERATING CONDITIONS |            |                          |       | PRODUCT TESTS                                  |           |       |  | CATALYST DATA                        |       |                                             |               |
|----------------------|------------|--------------------------|-------|------------------------------------------------|-----------|-------|--|--------------------------------------|-------|---------------------------------------------|---------------|
| PRESSURES PSIG       |            | RATES S.C.F.H.           |       | OIL                                            |           | WATER |  | INVENTORY DATA                       |       | PARTICLE SIZE                               |               |
| Oxygen               | 442        | Fresh Feed               | 15271 | * API                                          | 50.9      | 10.6  |  | In Reactor at Start of Period        |       | Screen Analysis                             | Sedimentation |
| Natural Gas          | 433        | Recycle                  | 16394 | Neut. No.                                      | 54.0      | 37.4  |  | K <sub>2</sub> CO <sub>3</sub> Added | 20    | Mesh                                        | Microns %     |
| Generator Outlet     | 416        | Combined Feed            | 31665 | Sap. No.                                       | 69.1      | 40.4  |  | Total                                |       | On 40                                       | 419+          |
| Reactor Inlet        | 413        | Wet Gas—Measured         | 4708  | Hydrox. No.                                    |           |       |  | Catalyst Recovered                   | 123   | 100                                         | 150           |
| Condenser Inlet      |            | Adjusted                 | 5516  | Bromine No.                                    | 91        |       |  | In Reactor at End of Period          |       | 150                                         | 105           |
| Product Accumulator  | 383        | Loss                     | 808   | Pour °F.                                       | Below -30 |       |  |                                      |       | 200                                         | 74            |
|                      |            |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |           | 11.5  |  | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62            |
|                      |            |                          |       |                                                |           |       |  | No. Height                           |       | 325                                         | 44            |
|                      |            |                          |       |                                                |           |       |  | 0 See Period A                       |       | <325                                        |               |
| TEMPERATURES—°F.     |            |                          |       | Recycle/Fresh Feed                             | 1.07      |       |  |                                      |       |                                             |               |
| Oxygen               | 498        | Inlet Velocity—ft./sec.  | 0.99  |                                                |           |       |  | 1                                    | 72    | CATALYST                                    |               |
| Natural Gas          | 791        | Fresh Feed Rate—S.C.F.H. | 14873 | HEMPEL, DIST. %                                |           | °API  |  | 2                                    | 72    | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            |            | per Cu. Ft. Dense Bed    | 1195  | 205 °F.                                        |           |       |  | 3                                    | 85    | Aerated                                     |               |
| Quench Accumulator   | 125        | per Lb. Catalyst         | 7.91  | 400                                            | 79.7      | 54.4  |  | 4                                    | 290   | Settled                                     |               |
| Reactor Inlet        | 285        | per Sq. Ft.              | 22535 | 400-550                                        | 11.2      | 33.1  |  | Total                                | 519   | Compacted                                   |               |
| Condenser Inlet      | 591        |                          |       | 550+                                           | 9.1       |       |  |                                      |       | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 93         |                          |       |                                                |           |       |  | CALCULATED FROM dp                   |       | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height     |                          |       | A. S. T. M. DIST. ON                           |           |       |  | Density, Lbs./Cu.Ft.                 | 151   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1                    | See Per. A |                          |       | Naphtha °F.                                    |           |       |  | Inventory, Lbs.                      | 1880  | CHEMICAL ANALYSIS                           |               |
| 2                    | 661        |                          |       | IBP                                            | 100       |       |  | Bed Depth, Ft.                       | 18.87 |                                             |               |
| 3                    | 653        |                          |       | 10%                                            | 130       |       |  | Vol., Cu. Ft.                        | 12.45 | Fe                                          |               |
| 4                    | 666        |                          |       | 50%                                            | 222       |       |  |                                      |       | C                                           |               |
| 5                    | 666        |                          |       | 90%                                            | 340       |       |  |                                      |       | O                                           |               |
| 6                    | 669        |                          |       | EP                                             | 386       |       |  |                                      |       | H                                           |               |
| 7                    | 663        |                          |       | Rec.                                           | 96.0      |       |  |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 654        |                          |       |                                                |           |       |  |                                      |       | X-Ray Analysis—                             |               |
| 9                    | 647        |                          |       |                                                |           |       |  |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 643        |                          |       |                                                |           |       |  |                                      |       | Fe <sub>2</sub> O <sub>4</sub>              |               |
| 11                   | 625        |                          |       |                                                |           |       |  |                                      |       | Fe                                          |               |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 65-K  
HOURS 232-256  
CATALYST Bethlehem Mill  
Scale Reduced @ 500°F

| Scale Reduced @ 800°                             |        |                        |                    |                           |                                                                             |                      |                                  |                                    |                                        |              |                                     |            |        |        |         |                                           |                          |                |                      |        |  |
|--------------------------------------------------|--------|------------------------|--------------------|---------------------------|-----------------------------------------------------------------------------|----------------------|----------------------------------|------------------------------------|----------------------------------------|--------------|-------------------------------------|------------|--------|--------|---------|-------------------------------------------|--------------------------|----------------|----------------------|--------|--|
| FRESH FEED                                       |        |                        |                    | WET GAS                   |                                                                             | RECYCLE              | COMBINED FEED                    | EFFLUENT                           | NET CHANGE                             |              | YIELD BASIS H <sub>2</sub> + CO FED |            |        |        |         |                                           |                          |                |                      |        |  |
|                                                  | %      | m/hr                   | #/hr               | %                         | At Wt. Balance                                                              |                      |                                  |                                    |                                        |              |                                     | CONDENSATE |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE |                          |                |                      |        |  |
|                                                  |        |                        |                    |                           | m/hr                                                                        | #/hr                 | m/hr                             | m/hr                               | m/hr                                   | m/hr         | #/hr                                | #/MCF      | #/gal  | gal/hr | gal/MCF |                                           | CORRECTED HEMPEL, %      | gal/hr         | TREATING RECOVERY, % | gal/hr |  |
| CO <sub>28.010</sub>                             | 37.517 | 15.240                 | 426.88             | 11.453                    | 1.691                                                                       | 47.35                | 4.904                            | 20.144                             | 6.595                                  | -13.549      | -379.53                             |            |        |        |         |                                           |                          |                |                      |        |  |
| H <sub>2</sub> <sub>42.018</sub>                 | 59.813 | 24.297                 | 48.98              | 40.560                    | 5.990                                                                       | 12.08                | 17.369                           | 41.666                             | 23.359                                 | -18.307      | -36.90                              |            |        |        |         | 400 EP                                    | 80.3                     | 5.929          | 98.0                 | 5.810  |  |
| CO <sub>44.010</sub>                             | 2.213  | 0.899                  | 39.56              | 27.090                    | 3.999                                                                       | 176.03               | 11.601                           | 12.500                             | 15.600                                 | 3.100        | 136.47                              | 9.096      |        |        |         | 400-550                                   | 11.2                     | 0.827          | 91.4                 | 0.756  |  |
| N <sub>2</sub> <sub>28.016</sub>                 | 0.187  | 0.076                  | 2.13               | 1.320                     | 0.195                                                                       | 5.46                 | 0.565                            | 0.641                              | 0.760                                  |              |                                     |            |        |        |         | 550 +                                     | 8.5                      | 0.628          | 114.6                | 0.720  |  |
| CH <sub>4</sub> <sub>16.042</sub>                | 0.270  | 0.110                  | 1.76               | 8.950                     | 1.321                                                                       | 21.20                | 3.833                            | 3.943                              | 5.154                                  | 1.211        | 19.44                               | 1.296      |        |        |         |                                           |                          |                |                      |        |  |
| C <sub>2</sub> H <sub>6</sub> <sub>28.028</sub>  |        |                        |                    | 1.990                     | 0.294                                                                       | 8.24                 | 0.852                            | 0.852                              | 1.146                                  | 0.294        | 8.24                                | 0.549      |        |        |         |                                           | RECOVERY %               | #/hr           | gal/hr               |        |  |
| C <sub>3</sub> H <sub>8</sub> <sub>30.045</sub>  |        |                        |                    | 1.653                     | 0.244                                                                       | 7.35                 | 0.708                            | 0.708                              | 0.952                                  | 0.244        | 7.35                                | 0.490      |        |        |         | PROPYLENE                                 | 38.8                     | 6.08           |                      |        |  |
| C <sub>4</sub> +C <sub>5</sub>                   |        |                        |                    |                           |                                                                             |                      |                                  |                                    |                                        |              | 35.03                               | 2.335      |        |        |         | C <sub>4</sub> POLY GASO.                 | 87.5                     | 5.32           | 0.890                |        |  |
| C <sub>6</sub> H <sub>14</sub> <sub>42.078</sub> |        |                        |                    | 2.517                     | 0.372                                                                       | 15.66                | 1.078                            | 1.078                              | 1.450                                  | 0.372        | 15.66                               | 1.044      | 4.32   | 3.625  | 0.242   | C <sub>5</sub> POLY TAR                   | 12.5                     | 0.76           | 0.101                |        |  |
| C <sub>6</sub> H <sub>12</sub> <sub>44.094</sub> |        |                        |                    | 0.247                     | 0.036                                                                       | 1.60                 | 0.106                            | 0.106                              | 0.142                                  | 0.036        | 1.60                                | 0.107      | 4.24   | 0.377  | 0.025   |                                           |                          |                |                      |        |  |
| C <sub>6</sub> H <sub>10</sub> <sub>56.104</sub> |        |                        |                    | 1.827                     | 0.270                                                                       | 15.15                | 0.782                            | 0.782                              | 1.059                                  | 0.270        | 15.15                               | 1.010      | 5.00   | 3.030  | 0.202   |                                           | #/gal                    | #/hr           | gal/hr               | RVP    |  |
| C <sub>6</sub> H <sub>8</sub> <sub>58.120</sub>  |        |                        |                    | 0.783                     | 0.115                                                                       | 6.71                 | 0.335                            | 0.335                              | 0.450                                  | 0.115        | 6.71                                | 0.447      | 4.86   | 1.381  | 0.092   | C <sub>6</sub> H <sub>8</sub>             | 5.00                     |                |                      | 68.0   |  |
| C <sub>6</sub> H <sub>6</sub> <sub>70.130</sub>  |        |                        |                    | 0.983                     | 0.145                                                                       | 10.17                | 0.421                            | 0.421                              | 0.566                                  | 0.145        | 10.17                               | 0.678      | 5.48   | 1.866  | 0.124   | C <sub>6</sub> POLY GASO.                 | 5.98                     | 13.26          | 2.217                | 1.5    |  |
| C <sub>6</sub> H <sub>4</sub> <sub>72.148</sub>  |        |                        |                    | 0.330                     | 0.049                                                                       | 3.51                 | 0.141                            | 0.141                              | 0.190                                  | 0.049        | 3.51                                | 0.234      | 5.28   | 0.669  | 0.045   | C <sub>6</sub> H <sub>10</sub>            | 4.86                     | (6.71)<br>5.08 | (1.381)<br>1.041     | 68.0   |  |
| C <sub>6</sub> H <sub>2</sub> <sub>84.150</sub>  |        |                        |                    | 0.297                     | 0.044                                                                       | 3.69                 | 0.127                            | 0.127                              | 0.171                                  | 0.044        | 3.69                                | 0.246      | 5.54   | 0.666  | 0.044   | C <sub>6</sub> -FREE GASO.                |                          |                | 9.901                | 5.8    |  |
| C <sub>8</sub> +C <sub>9</sub>                   |        |                        |                    |                           |                                                                             |                      |                                  |                                    |                                        |              | 56.49                               | 3.766      |        | 11.614 | 0.774   | C <sub>8</sub> POLY TAR                   | 7.53                     | 1.89           | 0.251                |        |  |
| TOTAL                                            |        | 40.622                 | 51.931             |                           | 14.765                                                                      | 334.20               | 42.822                           | 83.444                             | 64.963                                 |              |                                     |            |        |        |         |                                           |                          |                |                      |        |  |
| H <sub>2</sub> +CO                               | 97.330 | 39.537                 | 15004              | SCFH                      | 7.681                                                                       |                      | 22.273                           | 61.810                             | 29.954                                 | -31.856      |                                     |            |        |        |         |                                           | gal/hr                   | gal/MCF        | Bbl/Day              |        |  |
| H <sub>2</sub> /CO                               |        | 1.59                   | Factor             | 666488                    | 3.54                                                                        |                      | 3.54                             | 2.07                               | 3.54                                   | 1.35         |                                     |            |        |        |         |                                           | 10 # RVP 400 EP GASOLINE | 13.159         | 0.8770               | 4755   |  |
| Weight Recovery, %                               | 91.31  | Catalyst Age, hrs.     |                    |                           |                                                                             | Space Velocity, v/hv |                                  | 1198                               | RECOVERED OIL **                       |              | 0.341                               | 47.85      | 3.189  |        | 7.384   | 0.492                                     | GAS OIL                  | 0.756          | 0.0504               | 273    |  |
| Pressure, psig                                   | 412    | Inlet Velocity, Ft/sec |                    | 0.99                      | Catalyst VolCF                                                              |                      | 12.52                            | TOTAL OIL                          |                                        |              | 104.34                              | 6.955      |        | 18.998 | 1.266   | FUEL OIL                                  | 0.720                    | 0.0480         | 260                  |        |  |
| Temperature, °F                                  | 664    | Bed Depth, Ft          |                    | 18.97                     | Weight, #                                                                   |                      | 1840                             | WATER SOLUBLE CHEMICALS **         |                                        | 0.300        | 15.93                               | 1.062      |        | 1.986  | 0.132   | POLY TAR                                  | 0.352                    | 0.0235         | 127                  |        |  |
| Recycle Ratio                                    | 1.05   | Bed Density, #/CF      |                    | 147                       | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) = 8.20 |                      |                                  |                                    | TOTAL LIQUID PRODUCTS C <sub>6</sub> + |              |                                     | 120.27     | 8.017  |        | 20.984  | 1.398                                     | TOTAL                    | 14.987         | 0.9989               | 5415   |  |
| FRESH FEED CONVERSION — %                        |        |                        |                    | TOTAL FEED CONVERSION — % |                                                                             |                      |                                  | SELECTIVITY                        |                                        | NET WATER ** |                                     | 6.735      | 121.33 | 8.086  | 14.565  | 0.971                                     | W. S. CHEM.              | 1.986          | 0.1324               | 718    |  |
| Contraction                                      | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                        | H <sub>2</sub>                                                              | CO+H <sub>2</sub>    | C <sub>3</sub> +C <sub>4</sub> + | GROSS WATER                        |                                        | 137.26       | 9.148                               |            | 16.551 | 1.103  |         | TOTAL                                     | 16.973                   | 1.1313         | 6133                 |        |  |
| 63.65                                            | 88.90  | 75.35                  | 80.57              | 67.26                     | 43.94                                                                       | 51.54                | 77.44                            | HYDROCARBON TOTAL—C <sub>6</sub> + |                                        | 155.30       | 10.353                              |            |        |        |         |                                           |                          |                |                      |        |  |

Form ML-11

\*\* Included in Reactor Effluent Total

R/NCM = 16.91 X #/MCF #9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 65-K  
HOURS 232-256

| OPERATING CONDITIONS |     |                          |       | PRODUCT TESTS                                  |         |       | CATALYST DATA                        |       |                                             |               |
|----------------------|-----|--------------------------|-------|------------------------------------------------|---------|-------|--------------------------------------|-------|---------------------------------------------|---------------|
| PRESSURES PSIG       |     | RATES S.C.F.H.           |       |                                                | OIL     | WATER | INVENTORY DATA                       |       | PARTICLE SIZE                               |               |
| Oxygen               | 441 | Fresh Feed               | 15416 | * API                                          | 50.3    | 10.6  | In Reactor at Start of Period        |       | Screen Analysis                             |               |
| Natural Gas          | 434 | Recycle                  | 16251 | Neut. No.                                      | 54.3    | 38.4  | Fresh Catalyst Added                 |       | Mesh                                        | Sedimentation |
| Generator Outlet     | 415 | Combined Feed            | 31667 | Sap. No.                                       | 70.1    | 40.4  | Total                                |       | On 40                                       | 419+          |
| Reactor Inlet        | 412 | Wet Gas—Measured         | 4693  | Hydrox. No.                                    |         |       | Catalyst Recovered                   |       | 100                                         | 150           |
| Condenser Inlet      |     | Adjusted                 | 5603  | Bromine No.                                    | 91      |       | In Reactor at End of Period          |       | 150                                         | 105           |
| Product Accumulator  | 382 | Loss                     | 910   | Pour °F.                                       |         |       |                                      |       | 200                                         | 74            |
|                      |     |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 12.0    |       | REACTOR d-p, Inches H <sub>2</sub> O |       | 250                                         | 62            |
|                      |     |                          |       |                                                |         |       | No. Height                           |       | 325                                         | 44            |
| TEMPERATURES — °F.   |     | Recycle/Fresh Feed       | 1.05  |                                                |         |       | 0 See Period A                       |       | <325                                        |               |
| Oxygen               | 503 | Inlet Velocity—ft./sec.  | 0.99  |                                                |         |       | 1                                    | 70    | CATALYST                                    |               |
| Natural Gas          | 805 | Fresh Feed Rate—S.C.F.H. | 15004 | HEMPEL DIST. %                                 |         | °API  | 2                                    | 71    | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            |     | per Cu.Ft. Dense Bed     | 1198  | 205 °F.                                        |         |       | 3                                    | 82    | Aerated                                     |               |
| Quench Accumulator   | 134 | per Lb. Catalyst         | 8.15  | 400                                            | 79.3    | 51.6  | 4                                    | 285   | Settled                                     |               |
| Reactor Inlet        | 278 | per Sq. Ft.              | 22733 | 400-550                                        | 11.2    | 34.0  | Total                                |       | 508                                         | Compacted     |
| Condenser Inlet      | 589 |                          |       | 550+                                           | 9.5     |       |                                      |       | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 93  |                          |       |                                                |         |       | CALCULATED FROM dp                   |       | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No. Height  |     |                          |       | A. S. T. M. DIST. ON                           | Naphtha |       | Density, Lbs./Cu.Ft.                 | 147   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1 See Per. A         |     |                          |       | Naphtha °F.                                    | °F      |       | Inventory, Lbs.                      | 1840  |                                             |               |
| 2                    | 663 |                          |       | IBP                                            | 112     |       | Bed Depth, Ft.                       | 18.97 | CHEMICAL ANALYSIS                           |               |
| 3                    | 658 |                          |       | 10%                                            | 142     |       | Vol., Cu. Ft.                        | 12.52 | Fe                                          |               |
| 4                    | 669 |                          |       | 50%                                            | 228     |       |                                      |       | C                                           |               |
| 5                    | 667 |                          |       | 90%                                            | 346     |       |                                      |       | O                                           |               |
| 6                    | 670 |                          |       | EP                                             | 396     |       |                                      |       | H                                           |               |
| 7                    | 664 |                          |       | Rec.                                           | 97.0    |       |                                      |       | K <sub>2</sub> O, W+, % basis Fe            |               |
| 8                    | 654 |                          |       |                                                |         |       |                                      |       | X-Ray Analysis—                             |               |
| 9                    | 646 |                          |       |                                                |         |       |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 642 |                          |       |                                                |         |       |                                      |       | Fe <sub>3</sub> O <sub>4</sub>              |               |
| 11                   | 625 |                          |       |                                                |         |       |                                      |       | Fe                                          |               |

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
YIELD CALCULATIONS

RUN NO. 65-L  
HOURS 256-280  
CATALYST Bethlehem Mill  
Scale Reduced @ 800°F

| FRESH FEED                       |        |                        |                    | WET GAS                                                        |                | RECYCLE           |                                        | COMBINED FEED                      |        | EFFLUENT |        | NET CHANGE   |      | YIELD BASIS H <sub>2</sub> + CO FED |        |                          |                                                              |
|----------------------------------|--------|------------------------|--------------------|----------------------------------------------------------------|----------------|-------------------|----------------------------------------|------------------------------------|--------|----------|--------|--------------|------|-------------------------------------|--------|--------------------------|--------------------------------------------------------------|
| %                                | m/hr   | #/hr                   | %                  | At Wt. Balance                                                 | m/hr           | m/hr              | m/hr                                   | m/hr                               | m/hr   | m/hr     | #/hr   | #/hr         | #/hr | \$/MCF                              | gal/hr | gal/MCF                  | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*                   |
| CO                               | 37.035 | 15.112                 | 483.27             | 11.167                                                         | 1.646          | 46.10             | 4.606                                  | 19.718                             | 6.252  | 13.466   | 377.17 |              |      |                                     |        |                          |                                                              |
| H <sub>2</sub>                   | 60.867 | 24.710                 | 49.81              | 49.044                                                         | 6.165          | 18.47             | 17.315                                 | 48.085                             | 23.498 | 18.828   | 37.34  |              |      |                                     |        |                          | 400 EP 80.7 8.739 99.0 3.684                                 |
| CO <sub>2</sub>                  | 8.010  | 0.880                  | 36.09              | 26.615                                                         | 3.914          | 178.26            | 10.958                                 | 11.778                             | 14.878 | 3.094    | 156.17 | 9.010        |      |                                     |        |                          | 400-550 10.8 0.768 91.4 0.708                                |
| N <sub>2</sub>                   | 0.185  | 0.076                  | 8.10               | 1.860                                                          | 0.186          | 8.18              | 0.619                                  | 0.594                              | 0.704  |          |        |              |      |                                     |        |                          | 550 + 8.5 0.604 114.6 0.699                                  |
| CH <sub>4</sub>                  | 0.817  | 0.089                  | 1.43               | 6.615                                                          | 1.867          | 80.33             | 3.646                                  | 3.635                              | 4.815  | 1.178    | 16.90  | 1.851        |      |                                     |        |                          |                                                              |
| C <sub>2</sub> H <sub>6</sub>    |        |                        |                    | 2.085                                                          | 0.298          | 8.36              | 0.835                                  | 0.835                              | 1.181  | 0.298    | 8.36   | 0.553        |      |                                     |        |                          | RECOVERY % #/hr gal/hr                                       |
| C <sub>3</sub> H <sub>8</sub>    |        |                        |                    | 1.630                                                          | 0.240          | 7.88              | 0.671                                  | 0.671                              | 0.911  | 0.240    | 7.88   | 0.478        |      |                                     |        |                          | PROPYLENE 39.1 8.54                                          |
| C <sub>4</sub> +C <sub>5</sub>   |        |                        |                    |                                                                |                |                   |                                        |                                    |        |          |        |              |      |                                     |        |                          | C <sub>4</sub> POLY SAO. 87.5 4.85 0.811                     |
| C <sub>6</sub> H <sub>12</sub>   |        |                        |                    | 2.893                                                          | 0.337          | 14.18             | 0.944                                  | 0.944                              | 1.281  | 0.337    | 14.18  | 0.938        | 4.38 | 3.288                               | 0.217  |                          | C <sub>6</sub> POLY TAR 12.5 0.69 0.092                      |
| C <sub>8</sub> H <sub>18</sub>   |        |                        |                    | 0.195                                                          | 0.088          | 1.83              | 0.079                                  | 0.079                              | 0.107  | 0.088    | 1.83   | 0.081        | 4.84 | 0.290                               | 0.018  |                          |                                                              |
| C <sub>10</sub> H <sub>16</sub>  |        |                        |                    | 1.787                                                          | 0.263          | 14.76             | 0.766                                  | 0.766                              | 0.999  | 0.263    | 14.76  | 0.977        | 8.00 | 3.959                               | 0.195  |                          | #/gal #/hr gal/hr RVP                                        |
| C <sub>12</sub> H <sub>22</sub>  |        |                        |                    | 0.780                                                          | 0.106          | 6.16              | 0.296                                  | 0.296                              | 0.408  | 0.106    | 6.16   | 0.408        | 4.88 | 1.867                               | 0.084  |                          | C <sub>12</sub> H <sub>22</sub> 5.00 88.0                    |
| C <sub>14</sub> H <sub>20</sub>  |        |                        |                    | 1.037                                                          | 0.153          | 10.73             | 0.427                                  | 0.427                              | 0.560  | 0.153    | 10.73  | 0.710        | 5.48 | 1.969                               | 0.130  |                          | C <sub>14</sub> POLY SAO. 5.98 19.98 8.160 1.5               |
| C <sub>16</sub> H <sub>18</sub>  |        |                        |                    | 0.275                                                          | 0.040          | 2.89              | 0.118                                  | 0.118                              | 0.158  | 0.040    | 2.89   | 0.191        | 8.88 | 0.550                               | 0.036  |                          | C <sub>16</sub> H <sub>18</sub> 4.88 (8.13) 1.867 1.017 88.0 |
| C <sub>18</sub> H <sub>16</sub>  |        |                        |                    | 0.327                                                          | 0.048          | 4.04              | 0.135                                  | 0.135                              | 0.185  | 0.048    | 4.04   | 0.287        | 8.84 | 0.789                               | 0.048  |                          | C <sub>18</sub> H <sub>2</sub> SAO. 9.685 5.8                |
| C <sub>20</sub> +C <sub>22</sub> |        |                        |                    |                                                                |                |                   |                                        |                                    |        |          |        |              |      |                                     |        |                          | C <sub>20</sub> POLY TAR 7.38 1.84 0.844                     |
| TOTAL                            | 40.806 | 612.70                 |                    | 14.710                                                         | 396.91         | 41.175            | 81.981                                 | 83.484                             |        |          |        |              |      |                                     |        |                          |                                                              |
| H <sub>2</sub> +CO               | 97.590 | 39.899                 | 16113              | SCFH                                                           | 7.831          |                   | 81.919                                 | 61.741                             | 80.750 | 31.991   |        |              |      |                                     |        |                          | gal/hr gal/MCF Bbl/Day                                       |
| H <sub>2</sub> /CO               | 1.04   | Factor                 | 661691             |                                                                | 3.76           |                   | 3.76                                   | 9.13                               | 3.76   | 1.38     |        |              |      |                                     |        |                          | 10 / BPP 400 PP GASOLINE 18.660 0.8809 4613                  |
| Weight Recovery, %               | 84.03  | Catalyst Age, hrs.     |                    | Space Velocity, v/v                                            | 1931           |                   | RECOVERED oil**                        | 0.399                              | 46.18  | 3.056    | 7.111  | 0.471        |      |                                     |        |                          | GAS OIL 0.708 0.0468 888                                     |
| Pressure, psig                   | 410    | Inlet Velocity, Ft/sec | 0.98               | Catalyst Vol CF                                                | 19.98          |                   | TOTAL OIL                              | 100.17                             | 6.688  | 18.150   | 1.800  |              |      |                                     |        |                          | FUEL OIL 0.692 0.0468 848                                    |
| Temperature, °F                  | 667    | Bed Depth, Ft          | 18.60              | Weight, #                                                      | 1756           |                   | WATER SOLUBLE CHEMICALS**              | 0.306                              | 16.23  | 1.074    | 8.036  | 0.135        |      |                                     |        |                          | POLY TAR 0.336 0.0888 180                                    |
| Recycle Ratio                    | 1.01   | Bed Density, #/CF      | 143                | Effluent (H <sub>2</sub> /CO) Shift Ratio (H <sub>2</sub> /CO) | 8.10           |                   | TOTAL LIQUID PRODUCTS C <sub>6</sub> + | 116.40                             | 7.708  | 20.186   | 1.335  |              |      |                                     |        |                          | TOTAL 14.690 0.9664 5833                                     |
| FRESH FEED CONVERSION = %        |        |                        |                    | TOTAL FEED CONVERSION = %                                      |                |                   |                                        | SELECTIVITY                        |        |          |        | NET WATER ** |      |                                     |        | W. S. CHEM.              |                                                              |
| Conversion                       | CO     | H <sub>2</sub>         | H <sub>2</sub> +CO | CO                                                             | H <sub>2</sub> | CO+H <sub>2</sub> | C <sub>3</sub> +C <sub>4</sub> +       | OXID. WATER                        |        |          |        |              |      |                                     |        |                          | 2.036 0.1347 730                                             |
| 63.95                            | 89.11  | 74.97                  | 80.33              | 68.29                                                          | 44.08          | 51.81             | 77.15                                  | HYDROCARBON TOTAL=C <sub>1</sub> + | 140.61 | 9.304    | 16.968 | 1.123        |      |                                     |        | TOTAL 16.686 1.1001 5963 |                                                              |

Form ML-11

\*\* Included in Reactor Effluent Total

g/NCM = 16.91 X g/MCF \*9488 MCFH H<sub>2</sub> + CO, Bbl/Day = 5431.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 65-L  
HOURS 256-280

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       |       | CATALYST DATA                        |       |                                             |               |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|-------|--------------------------------------|-------|---------------------------------------------|---------------|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       | OIL                                            |      | WATER |       | INVENTORY DATA                       |       | PARTICLE SIZE                               |               |
| Oxygen               | 439    | Fresh Feed               | 15486 | * API                                          | 49.9 | 10.7  |       | In Reactor at Start of Period        |       | Screen Analysis                             | Sedimentation |
| Natural Gas          | 438    | Recycle                  | 15686 | Neut. No.                                      | 54.6 | 38.4  |       | Fresh Catalyst Added                 |       | Mesh                                        | Microns       |
| Generator Outlet     | 414    | Combined Feed            | 31118 | Sap. No.                                       | 70.0 | 40.7  |       | Total                                |       | On 40                                       | 418+          |
| Reactor Inlet        | 410    | Wet Gas—Measured         |       | Hydrox. No.                                    |      |       |       | Catalyst Recovered                   | 18    | 100                                         | 150           |
| Condenser Inlet      |        | Adjusted                 |       | Bromine No.                                    | 91   |       |       | In Reactor at End of Period          |       | 150                                         | 105           |
| Product Accumulator  | 388    | Loss                     | 1314  | Pour °F.                                       |      |       |       |                                      |       | 200                                         | 74            |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> | 18.0 |       |       | REACTOR d.p. Inches H <sub>2</sub> O |       | 250                                         | 68            |
|                      |        |                          |       |                                                |      |       |       | No. Height                           |       | 325                                         | 44            |
|                      |        |                          |       |                                                |      |       |       | 0 See Period A                       |       | 4385                                        |               |
| TEMPERATURES—°F.     |        |                          |       | Recycle/Fresh Feed                             | 1.01 |       |       |                                      |       |                                             |               |
| Oxygen               | 479    | Inlet Velocity—Ft./sec.  | 0.98  |                                                |      |       |       | 1                                    | 68    | CATALYST                                    |               |
| Natural Gas          | 504    | Fresh Feed Rate—S.C.F.H. | 16113 | HEMPEL DIST. %                                 |      | °API  | 8     | 69                                   |       | Bulk Density, Lbs./Cu.Ft.                   |               |
| Generator            |        | per Cu. Ft. Dense Bed    | 1881  | 905 °F.                                        |      |       | 3     | 79                                   |       | Aerated                                     |               |
| Quench Accumulator   | 184    | per Lb. Catalyst         | 8.61  | 400                                            | 79.7 | 50.4  | 4     | 268                                  |       | Settled                                     |               |
| Reactor Inlet        | 281    | per Sq. Ft.              | 22898 | 400-550                                        | 10.8 | 35.1  | Total | 484                                  |       | Compacted                                   |               |
| Condenser Inlet      | 589    |                          |       | 550+                                           |      |       |       |                                      |       | Particle Density, gm./cc.                   |               |
| Product Accumulator  | 96     |                          |       |                                                |      |       |       |                                      |       | NH <sub>3</sub> Value, ml./gm.              |               |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       |       | CALCULATED FROM dp                   |       | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |               |
| 1 See Per. A         |        |                          |       | Naphtha °F.                                    |      |       |       | Density, Lbs./Cu. Ft.                | 143   |                                             |               |
| 2                    | 666    |                          |       | IBP                                            | 116  |       |       | Inventory, Lbs.                      | 1766  |                                             |               |
| 3                    | 661    |                          |       | 10%                                            | 146  |       |       | Bed Depth, Ft.                       | 18.60 | CHEMICAL ANALYSIS                           |               |
| 4                    | 678    |                          |       | 50%                                            | 226  |       |       | Vol., Cu. Ft.                        | 18.88 | Fe                                          |               |
| 5                    | 671    |                          |       | 90%                                            | 346  |       |       |                                      |       | C                                           |               |
| 6                    | 674    |                          |       | EP                                             | 398  |       |       |                                      |       | H                                           |               |
| 7                    | 668    |                          |       | Rec.                                           | 97.6 |       |       |                                      |       | K <sub>2</sub> O, Wt., % basis Fe           |               |
| 8                    | 665    |                          |       |                                                |      |       |       |                                      |       | X-Ray Analysis                              |               |
| 9                    | 647    |                          |       |                                                |      |       |       |                                      |       | Fe <sub>2</sub> O <sub>3</sub>              |               |
| 10                   | 644    |                          |       |                                                |      |       |       |                                      |       | Fe <sub>3</sub> O <sub>4</sub>              |               |
| 11                   | 685    |                          |       |                                                |      |       |       |                                      |       | Fe                                          |               |

**THE TEXAS COMPANY — MONTEBELLO LABORATORY**  
**YIELD CALCULATIONS**

RUN NO. 65-M  
HOURS 280-304  
CATALYST Bethlehem Mill  
Scale Reduced @ 800°F

| FRESH FEED                                |        |                    |                | WET GAS                   |                |                                                                        | RECYCLE        | COMBINED FEED     | EFFLUENT | NET CHANGE                              |         | YIELD BASIS H <sub>2</sub> + CO FED |        |        |         |                                            |                     |                |                      |        |  |
|-------------------------------------------|--------|--------------------|----------------|---------------------------|----------------|------------------------------------------------------------------------|----------------|-------------------|----------|-----------------------------------------|---------|-------------------------------------|--------|--------|---------|--------------------------------------------|---------------------|----------------|----------------------|--------|--|
|                                           | %      | m/hr               | #/hr           | %                         | At Wt. Balance |                                                                        | m/hr           | m/hr              | m/hr     | m/hr                                    | #/hr    | CONDENSATE                          |        |        |         | YIELDS BASIS BROWNSVILLE DESIGN FEED RATE* |                     |                |                      |        |  |
|                                           |        |                    |                |                           | m/hr           | #/hr                                                                   |                |                   |          |                                         |         | #/MCF                               | #/gal  | gal/hr | gal/MCF |                                            | CORRECTED HEMPEL, % | gal/hr         | TREATING RECOVERY, % | gal/hr |  |
| CO<br>26.010                              | 37.100 | 15.042             | 421.32         | 10.757                    | 1.568          | 43.92                                                                  | 4.709          | 19.751            | 6.277    | -13.474                                 | -377.40 |                                     |        |        |         |                                            |                     |                |                      |        |  |
| H <sub>2</sub><br>23.024                  | 60.257 | 24.431             | 49.25          | 41.897                    | 6.106          | 12.31                                                                  | 18.342         | 42.773            | 24.448   | -18.325                                 | 36.94   |                                     |        |        |         | 400 EP                                     | 81.0                | 6.293          | 98.0                 | 6.167  |  |
| CO <sub>2</sub><br>24.010                 | 2.200  | 0.892              | 39.26          | 27.333                    | 3.984          | 175.34                                                                 | 11.966         | 12.858            | 15.950   | 3.092                                   | 136.08  | 9.084                               |        |        |         | 400-550                                    | 9.0                 | 0.699          | 91.4                 | 0.639  |  |
| N <sub>2</sub><br>26.016                  | 0.290  | 0.118              | 3.31           | 1.400                     | 0.204          | 5.72                                                                   | 0.613          | 0.731             | 0.817    |                                         |         |                                     |        |        |         | 550 +                                      | 10.0                | 0.777          | 114.6                | 0.890  |  |
| CH <sub>4</sub><br>14.042                 | 0.153  | 0.062              | 0.99           | 8.757                     | 1.276          | 20.47                                                                  | 3.833          | 3.895             | 5.109    | 1.214                                   | 19.48   | 1.300                               |        |        |         |                                            |                     |                |                      |        |  |
| C <sub>2</sub> H <sub>6</sub><br>26.028   |        |                    |                | 2.013                     | 0.293          | 8.22                                                                   | 0.881          | 0.881             | 1.174    | 0.293                                   | 8.22    | 0.549                               |        |        |         |                                            | RECOVERY %          | #/hr           | gal/hr               |        |  |
| C <sub>3</sub> H <sub>8</sub><br>30.068   |        |                    |                | 1.643                     | 0.239          | 7.19                                                                   | 0.719          | 0.719             | 0.958    | 0.239                                   | 7.19    | 0.480                               |        |        |         | PROPYLENE                                  | 39.2                | 5.89           |                      |        |  |
| C <sub>4</sub> +C <sub>5</sub>            |        |                    |                |                           |                |                                                                        |                |                   |          |                                         |         | 34.89                               | 2.329  |        |         | C <sub>3</sub> POLY GASO.                  | 87.5                | 5.15           | 0.861                |        |  |
| C <sub>6</sub> +C <sub>7</sub>            |        |                    |                | 2.447                     | 0.357          | 15.02                                                                  | 1.071          | 1.071             | 1.428    | 0.357                                   | 15.02   | 1.003                               | 4.32   | 3.477  | 0.232   | C <sub>3</sub> POLY TAR                    | 12.5                | 0.74           | 0.098                |        |  |
| C <sub>8</sub> H <sub>18</sub><br>44.094  |        |                    |                | 0.253                     | 0.037          | 1.63                                                                   | 0.111          | 0.111             | 0.148    | 0.037                                   | 1.63    | 0.109                               | 4.24   | 0.384  | 0.026   |                                            |                     |                |                      |        |  |
| C <sub>10</sub> H <sub>22</sub><br>56.104 |        |                    |                | 1.600                     | 0.233          | 13.07                                                                  | 0.700          | 0.700             | 0.935    | 0.233                                   | 13.07   | 0.872                               | 5.00   | 2.614  | 0.174   |                                            | #/gal               | #/hr           | gal/hr               | RVP    |  |
| C <sub>10</sub> H <sub>10</sub><br>58.120 |        |                    |                | 0.620                     | 0.090          | 5.23                                                                   | 0.271          | 0.271             | 0.361    | 0.090                                   | 5.23    | 0.349                               | 4.86   | 1.076  | 0.074   | C <sub>4</sub> H <sub>6</sub>              | 5.00                |                |                      | 68.0   |  |
| C <sub>10</sub> H <sub>10</sub><br>70.130 |        |                    |                | 0.843                     | 0.123          | 8.63                                                                   | 0.369          | 0.369             | 0.492    | 0.123                                   | 8.63    | 0.576                               | 5.45   | 1.583  | 0.106   | C <sub>4</sub> POLY GASO.                  | 5.98                | 11.44          | 1.912                | 1.5    |  |
| C <sub>12</sub> H <sub>22</sub><br>72.146 |        |                    |                | 0.190                     | 0.028          | 2.02                                                                   | 0.083          | 0.083             | 0.111    | 0.028                                   | 2.02    | 0.135                               | 5.25   | 0.385  | 0.026   | C <sub>4</sub> H <sub>10</sub>             | 4.86                | (5.23)<br>4.72 | (1.076)<br>0.972     | 68.0   |  |
| C <sub>12</sub> H <sub>12</sub><br>84.124 |        |                    |                | 0.247                     | 0.036          | 3.03                                                                   | 0.108          | 0.108             | 0.144    | 0.036                                   | 3.03    | 0.202                               | 5.54   | 0.547  | 0.037   | C <sub>4</sub> TREE GASO.                  |                     |                | 9.543                | 5.8    |  |
| C <sub>3</sub> -C <sub>4</sub>            |        |                    |                |                           |                |                                                                        |                |                   |          |                                         | 48.63   | 3.246                               |        | 10.066 | 0.673   | C <sub>4</sub> POLY TAR                    | 7.53                | 1.63           | 0.216                |        |  |
| TOTAL                                     |        | 40.545             | 514.13         |                           | 14.574         | 321.75                                                                 | 43.776         | 84.321            | 65.988   |                                         |         |                                     |        |        |         |                                            |                     |                |                      |        |  |
| H <sub>2</sub> +CO                        | 97.357 | 39.473             | 14980          | SCFH                      | 7.674          |                                                                        | 23.051         | 62.524            | 30.725   | -31.799                                 |         |                                     |        |        |         |                                            | gal/hr              | gal / MCF      | Bbl/Day              |        |  |
| H <sub>2</sub> /CO                        |        | 1.62               | Factor         | 667556                    | 3.89           |                                                                        | 3.90           | 2.17              | 3.89     | 1.36                                    |         |                                     |        |        |         | 10 # RVP 400 EP GASOLINE                   | 12.427              | 0.8296         | 44.99                |        |  |
| Weight Recovery, %                        | 81.20  | Catalyst Age, hrs. |                |                           |                | Space Velocity, whv                                                    |                |                   | 1220     | RECOVERED OIL **                        |         | 0.359                               | 50.42  | 3.366  | 7.769   | 0.519                                      | GAS OIL             | 0.639          | 0.0427               | 232    |  |
| Pressure, psig                            | 408    |                    |                | Inlet Velocity, Ft/sec    | 1.02           | Catalyst Vol CF                                                        |                |                   | 12.28    | TOTAL OIL                               |         | 99.05                               | 6.612  | 17.835 | 1.192   | FUEL OIL                                   | 0.890               | 0.0594         | 322                  |        |  |
| Temperature, °F                           | 667    |                    |                | Bed Depth, Ft             | 18.61          | Weight, #                                                              |                |                   | 1682     | WATER SOLUBLE CHEMICALS **              |         | 0.309                               | 16.39  | 1.094  | 2.056   | 0.137                                      | POLY TAR            | 0.314          | 0.0210               | 114    |  |
| Recycle Ratio                             | 1.08   |                    |                | Bed Density, #/CF         | 137            | Effluent (H <sub>2</sub> )(CO)<br>Shift Ratio (H <sub>2</sub> O)(CO) = |                |                   | 8.91     | TOTAL LIQUID PRODUCTS, C <sub>4</sub> + |         | 115.44                              | 7.706  | 19.891 | 1.329   | TOTAL                                      | 14.270              | 0.9527         | 5166                 |        |  |
| FRESH FEED CONVERSION - %                 |        |                    |                | TOTAL FEED CONVERSION - % |                |                                                                        |                | SELECTIVITY       |          | NET WATER **                            |         | 6.970                               | 125.57 | 6.383  | 15.074  | 1.006                                      | W. S. CHEM.         | 2.056          | 0.1372               | 744    |  |
| Contraction                               |        | CO                 | H <sub>2</sub> | H <sub>2</sub> +CO        |                | CO                                                                     | H <sub>2</sub> | CO+H <sub>2</sub> |          | C <sub>3</sub> + C <sub>4</sub> +       |         | 141.96                              | 9.477  | 17.130 | 1.144   | TOTAL                                      | 16.326              | 1.0899         | 5910                 |        |  |
| 64.05                                     |        | 89.58              | 75.01          | 80.56                     |                | 68.22                                                                  | 42.94          | 50.86             |          | 76.79                                   |         |                                     |        | 150.33 | 10.035  |                                            |                     |                |                      |        |  |

Form ML-11

\*\* Included in Reactor Effluent Total

$$g/NCM = 16.91 \times \# / MCF \quad \#9488 \text{ MCFH } H_2 + CO, \text{ Bbl/Day} = 5421.6 \times \text{gal} / \text{MCF}$$

THE TEXAS COMPANY — MONTEBELLO LABORATORY  
DATA SUMMARY

RUN NO. 65-M  
HOURS 280-304

| OPERATING CONDITIONS |        |                          |       | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |                 |                                             |     |               |       |
|----------------------|--------|--------------------------|-------|------------------------------------------------|------|-------|--------------------------------------|--|-----------------|---------------------------------------------|-----|---------------|-------|
| PRESSURES PSIG       |        | RATES S.C.F.H.           |       | OIL                                            |      | WATER | INVENTORY DATA                       |  | PARTICLE SIZE   |                                             |     |               |       |
| Oxygen               | 440    | Fresh Feed               | 15387 | ° API                                          | 50.0 | 10.7  | In Reactor at Start of Period        |  | Screen Analysis |                                             |     | Sedimentation |       |
| Natural Gas          | 431    | Recycle                  | 16613 | Neut. No.                                      | 53.7 | 36.9  | Fresh Catalyst Added                 |  | Mesh            | Microns                                     | %   | Microns       | %     |
| Generator Outlet     | 413    | Combined Feed            | 32000 | Sap. No.                                       | 69.5 | 40.7  | Total                                |  | On 40           | 419+                                        |     | 80+           |       |
| Reactor Inlet        | 408    | Wet Gas—Measured         | 4068  | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 33              | 100                                         | 150 |               | 40—80 |
| Condenser Inlet      |        | Adjusted                 | 5531  | Bromine No.                                    | 93   |       | In Reactor at End of Period          |  |                 | 150                                         | 105 |               | 20—40 |
| Product Accumulator  | 381    | Loss                     | 1463  | Pour °F.                                       |      |       |                                      |  |                 | 200                                         | 74  |               | 10—20 |
|                      |        |                          |       | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 12.0  | REACTOR d-p, Inches H <sub>2</sub> O |  |                 | 250                                         | 62  |               | 0—20  |
|                      |        |                          |       |                                                |      |       | No. Height                           |  |                 | 325                                         | 44  |               |       |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 1.08  |                                                |      |       | 0 See Period A                       |  |                 | <325                                        |     |               |       |
| Oxygen               | 484    | Inlet Velocity—ft./sec.  | 1.02  |                                                |      |       | 1                                    |  | 66              | CATALYST                                    |     |               |       |
| Natural Gas          | 806    | Fresh Feed Rate—S.C.F.H. | 14980 | HEMPFEL DIST. %                                |      | °API  | 2                                    |  | 66              | Bulk Density, Lbs./Cu.Ft.                   |     |               |       |
| Generator            |        | per Cu. Ft. Dense Bed    | 1220  | 205 °F.                                        |      |       | 3                                    |  | 75              | Aerated                                     |     |               |       |
| Quench Accumulator   | 128    | per Lb. Catalyst         | 8.91  | 400                                            | 80.0 | 50.8  | 4                                    |  | 257             | Settled                                     |     |               |       |
| Reactor Inlet        | 278    | per Sq. Ft.              | 22697 | 400-550                                        | 9.0  | 33.9  | Total                                |  | 464             | Compacted                                   |     |               |       |
| Condenser Inlet      | 589    |                          |       | 550+                                           | 11.0 |       |                                      |  |                 | Particle Density, gm./cc.                   |     |               |       |
| Product Accumulator  | 92     |                          |       |                                                |      |       | CALCULATED FROM dp                   |  |                 | NH <sub>3</sub> Value, ml./gm.              |     |               |       |
| Catalyst No.         | Height |                          |       | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 137             | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |     |               |       |
| 1 See Per. A         |        |                          |       | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 1682            |                                             |     |               |       |
| 2                    | 666    |                          |       | IBP                                            |      | 112   | Bed Depth, Ft.                       |  | 18.61           | CHEMICAL ANALYSIS                           |     |               |       |
| 3                    | 661    |                          |       | 10%                                            |      | 142   | Vol., Cu. Ft.                        |  | 12.28           | Fe                                          |     |               |       |
| 4                    | 673    |                          |       | 50%                                            |      | 226   |                                      |  |                 | C                                           |     |               |       |
| 5                    | 670    |                          |       | 90%                                            |      | 346   |                                      |  |                 | O                                           |     |               |       |
| 6                    | 674    |                          |       | EP                                             |      | 388   |                                      |  |                 | H                                           |     |               |       |
| 7                    | 668    |                          |       | Rec.                                           |      | 97.0  |                                      |  |                 | K <sub>2</sub> O, Wt. % basis Fe            |     |               |       |
| 8                    | 656    |                          |       |                                                |      |       |                                      |  |                 | X-Ray Analysis—                             |     |               |       |
| 9                    | 648    |                          |       |                                                |      |       |                                      |  |                 | Fe <sub>2</sub> O <sub>3</sub>              |     |               |       |
| 10                   | 646    |                          |       |                                                |      |       |                                      |  |                 | Fe <sub>2</sub> O <sub>4</sub>              |     |               |       |
| 11                   | 626    |                          |       |                                                |      |       |                                      |  |                 | Fe                                          |     |               |       |

## Overall Effluent Forced

CATALYST Bethlehem Mill  
 Scale Reduced @ 800°F

Form ML-11

\*\* Included in Reactor Effluent Total

$$g/\text{NCM} = 16.91 \times \#/\text{MCF}$$
$$*9488 \text{ MCFH H}_2 + \text{CO, Bbl/Day} = 5421.6 \times \text{gal/MCF}$$

RUN NO. 65-N  
HOURS 304-326

| OPERATING CONDITIONS |        |                          |                | PRODUCT TESTS                                  |      |       | CATALYST DATA                        |  |       |                                             |         |   |               |   |
|----------------------|--------|--------------------------|----------------|------------------------------------------------|------|-------|--------------------------------------|--|-------|---------------------------------------------|---------|---|---------------|---|
| PRESSURES PSIG       |        |                          | RATES S.C.F.H. |                                                | OIL  | WATER | INVENTORY DATA                       |  |       | PARTICLE SIZE                               |         |   |               |   |
| Oxygen               | 440    | Fresh Feed               | 15491          | ° API                                          | 51.0 | 10.7  | In Reactor at Start of Period        |  |       | Screen Analysis                             |         |   | Sedimentation |   |
| Natural Gas          | 432    | Recycle                  | 15590          | Neut. No.                                      | 54.5 | 36.0  | Fresh Catalyst Added                 |  |       | Mesh                                        | Microns | % | Microns       | % |
| Generator Outlet     | 412    | Combined Feed            | 31081          | Sap. No.                                       | 70.1 | 40.4  | Total                                |  |       | On 40                                       | 419+    |   | 80+           |   |
| Reactor Inlet        | 408    | Wet Gas—Measured         | 3862           | Hydrox. No.                                    |      |       | Catalyst Recovered                   |  | 64    | 100                                         | 150     |   | 40—80         |   |
| Condenser Inlet      |        | Adjusted                 | 5267           | Bromine No.                                    | 93   |       | In Reactor at End of Period          |  |       | 150                                         | 105     |   | 20—40         |   |
| Product Accumulator  | 381    | Loss                     | 1405           | Pour °F.                                       |      |       |                                      |  |       | 200                                         | 74      |   | 10—20         |   |
|                      |        |                          |                | Chemicals, % by K <sub>2</sub> CO <sub>3</sub> |      | 12.3  | REACTOR d-p, Inches H <sub>2</sub> O |  |       | 250                                         | 62      |   | 0—20          |   |
|                      |        |                          |                |                                                |      |       | No. Height                           |  |       | 325                                         | 44      |   |               |   |
| TEMPERATURES—°F.     |        | Recycle/Fresh Feed       | 1.01           |                                                |      |       | 0 See Period A                       |  |       | <325                                        |         |   |               |   |
| Oxygen               | 468    | Inlet Velocity—ft./sec.  | 0.99           |                                                |      |       | 1                                    |  | 65    | CATALYST                                    |         |   |               |   |
| Natural Gas          | 787    | Fresh Feed Rate—S.C.F.H. | 15107          | HEMPEL DIST. %                                 |      | °API  | 2                                    |  | 65    | Bulk Density, Lbs./Cu.Ft.                   |         |   |               |   |
| Generator            |        | per Cu.Ft. Dense Bed     | 1238           | 205 °F.                                        |      |       | 3                                    |  | 72    | Aerated                                     |         |   |               |   |
| Quench Accumulator   | 130    | per Lb. Catalyst         | 9.31           | 400                                            | 80.0 | 52.0  | 4                                    |  | 245   | Settled                                     |         |   |               |   |
| Reactor Inlet        | 275    | per Sq. Ft.              | 22889          | 400-550                                        | 11.6 | 32.8  | Total                                |  | 447   | Compacted                                   |         |   |               |   |
| Condenser Inlet      | 592    |                          |                | 550+                                           | 8.4  |       |                                      |  |       | Particle Density, gm./cc.                   |         |   |               |   |
| Product Accumulator  | 86     |                          |                |                                                |      |       | CALCULATED FROM dp                   |  |       | NH <sub>3</sub> Value, ml./gm.              |         |   |               |   |
| Catalyst No.         | Height |                          |                | A. S. T. M. DIST. ON                           |      |       | Density, Lbs./Cu.Ft.                 |  | 133   | N <sub>2</sub> Surface, m <sup>2</sup> /gm. |         |   |               |   |
| 1 See Per. A         |        |                          |                | Naphtha °F.                                    |      |       | Inventory, Lbs.                      |  | 1623  |                                             |         |   |               |   |
| 2                    | 666    |                          |                | IBP                                            |      | 102   | Bed Depth, Ft.                       |  | 18.48 | CHEMICAL ANALYSIS                           |         |   |               |   |
| 3                    | 662    |                          |                | 10%                                            |      | 136   | Vol., Cu. Ft.                        |  | 12.20 | Fe                                          |         |   |               |   |
| 4                    | 674    |                          |                | 50%                                            |      | 226   |                                      |  |       | C                                           |         |   |               |   |
| 5                    | 671    |                          |                | 90%                                            |      | 340   |                                      |  |       | O                                           |         |   |               |   |
| 6                    | 676    |                          |                | EP                                             |      | 386   |                                      |  |       | H                                           |         |   |               |   |
| 7                    | 671    |                          |                | Rec.                                           |      | 97.0  |                                      |  |       | K <sub>2</sub> O, W+. % basis Fe            |         |   |               |   |
| 8                    | 659    |                          |                |                                                |      |       |                                      |  |       | X-Ray Analysis—                             |         |   |               |   |
| 9                    | 651    |                          |                |                                                |      |       |                                      |  |       | Fe <sub>2</sub> O <sub>3</sub>              |         |   |               |   |
| 10                   | 648    |                          |                |                                                |      |       |                                      |  |       | Fe <sub>2</sub> O <sub>4</sub>              |         |   |               |   |
| 11                   | 629    |                          |                |                                                |      |       |                                      |  |       | Fe                                          |         |   |               |   |



| GAS ANALYSES                            |       |       |                            |         | GENERATOR BALANCE    |        |          |         |                                         |            |                 |        |        |           | WEIGHT BALANCE         |                  |                |  |  |  |  |
|-----------------------------------------|-------|-------|----------------------------|---------|----------------------|--------|----------|---------|-----------------------------------------|------------|-----------------|--------|--------|-----------|------------------------|------------------|----------------|--|--|--|--|
| HR                                      | 1800  | 2200  | 0600                       | AVERAGE | M/HR                 | C      | H        | O       |                                         | Mol %      | M/Hr            | C      | H      | O         |                        | #/hr<br>Measured | At Wt. Balance |  |  |  |  |
| FRESH FEED                              |       |       |                            |         |                      |        |          |         | O <sub>2</sub><br>38.000                | 0.23       | 10.569<br>0.031 |        |        | 21.200    | WET GAS                | 26.99<br>251.03  | 299.03         |  |  |  |  |
| CO<br>28.010                            | 37.04 | 37.54 | 37.28                      | 37.280  | 15.667               | 15.667 |          | 15.667  | CO <sub>2</sub><br>44.010               | 1.28       | 0.171           | 0.171  |        | 0.342     | OIL                    | 67.72            | 72.84          |  |  |  |  |
| H <sub>2</sub><br>2.016                 | 60.52 | 59.90 | 60.50                      | 60.307  | 25.345               |        | 50.690   |         | N <sub>2</sub><br>78.014                | 1.76       | 0.235           |        |        |           | WATER                  | 148.26           | 159.47         |  |  |  |  |
| CO <sub>2</sub><br>44.010               | 1.98  | 2.26  | 2.04                       | 2.093   | 0.880                | 0.880  |          | 1.760   | CH <sub>4</sub><br>16.042               | 82.60      | 11.033          | 11.033 | 44.132 |           | TOTAL                  | 494.00           | 531.34         |  |  |  |  |
| N <sub>2</sub><br>28.016                | 0.08  | 0.14  | 0.10                       | 0.107   | 0.045                |        |          |         | C <sub>2</sub> H <sub>6</sub><br>30.069 | 6.71       | 0.896           | 1.792  | 5.376  |           | FRESH FEED             | 531.34           |                |  |  |  |  |
| CH <sub>4</sub><br>16.042               | 0.38  | 0.16  | 0.10                       | 0.213   | 0.090                | 0.090  | 0.360    |         | C <sub>2</sub> H <sub>4</sub><br>28.054 | 5.22       | 0.697           | 2.091  | 5.576  |           | WEIGHT BALANCE         | 92.97            |                |  |  |  |  |
|                                         |       |       | M. W                       | 12.6432 |                      |        | 51.050   | 17.427  | C <sub>2</sub> H <sub>2</sub><br>26.040 | 1.61       | 0.215           | 0.860  | 2.150  |           | Forced Factor          | 1075587          |                |  |  |  |  |
|                                         |       |       | H <sub>2</sub> O<br>18.016 |         |                      |        | 7.682    | 3.841   | C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.59       | 0.079           | 0.395  | 0.948  |           | WET GAS FACTOR         | 1191212          |                |  |  |  |  |
|                                         |       |       |                            |         | 42.026               | 16.637 | 58.732   | 21.268  | MW                                      | 20.0614    |                 |        |        |           | INDICATED LOSS—S C F H | 1009             |                |  |  |  |  |
|                                         |       |       |                            |         |                      |        | 101.805  | 100.945 | 98.728                                  | TOTAL      |                 |        |        |           |                        |                  |                |  |  |  |  |
|                                         |       |       | BALANCE                    |         |                      |        |          |         |                                         |            |                 | 16.342 | 58.182 | 21.542    |                        |                  |                |  |  |  |  |
| GAS FLOW RATES                          |       |       |                            |         | LIQUID PRODUCT RATES |        |          |         |                                         |            |                 |        |        |           |                        |                  |                |  |  |  |  |
| CO<br>28.010                            | 6.23  | 5.69  | 3.71                       | 5.210   |                      | ✓      | PRESSURE | TEMP.   | M. W.                                   | S. C. F. H | M/HR            | HR     | GAGE   | GAL.      | °F                     | FACTOR           | GAL. AT 60     |  |  |  |  |
| H <sub>2</sub><br>2.016                 | 38.83 | 37.14 | 36.28                      | 37.416  |                      |        | 415.5    | 48      | 2.28976                                 |            |                 |        | OIL    | 4'8 1/4"  | 251.11                 | 36               | 1.0119         |  |  |  |  |
| CO <sub>2</sub><br>44.010               | 30.34 | 32.83 | 33.36                      | 32.177  | FRESH FEED           |        | 1.38     | 52      | 1.19615                                 |            |                 |        |        | 1'9 3/4"  | 93.76                  | 55               | 1.0025         |  |  |  |  |
| N <sub>2</sub><br>28.016                | 1.74  | 1.32  | 2.03                       | 1.697   | 79.31                | 6.333  | 20.7412  | 1.0117  | 1.51319                                 | 15949      | 42.026          |        |        |           |                        |                  | 93.99          |  |  |  |  |
| CH <sub>4</sub><br>16.042               | 11.19 | 10.82 | 11.87                      | 11.293  | 158.44               | 5.621  | 4.010    | 1.0078  | 1.09368                                 | 3936       | 10.372          |        |        |           |                        |                  | 6.427          |  |  |  |  |
| C <sub>2</sub> H <sub>6</sub><br>30.069 | 2.49  | 2.68  | 2.54                       | 2.570   | WET GAS              |        | 415.2    | 64      |                                         |            |                 |        | 16 hrs |           |                        |                  | 1083.53        |  |  |  |  |
| C <sub>2</sub> H <sub>4</sub><br>28.054 | 1.63  | 1.78  | 2.00                       | 1.803   | 79.31                | 8.513  | 20.734   | 0.9962  | 1.09368                                 | 15252      | 40.189          |        |        |           |                        |                  | 67.72          |  |  |  |  |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 2.70  | 3.23  | 2.52                       | 2.817   | RECYCLE              |        | 415.2    | 64      |                                         |            |                 |        |        |           |                        |                  | 10.537         |  |  |  |  |
| C <sub>2</sub> H <sub>2</sub><br>44.010 | 0.28  | 0.33  | 0.24                       | 0.283   | BLEED                | 5.02   | 7.960    | 20.734  | 0.9962                                  | 1.09368    | 903             | 2.379  | WATER  |           |                        |                  |                |  |  |  |  |
| C <sub>2</sub> H <sub>2</sub><br>56.104 | 2.10  | 2.10  | 2.24                       | 2.147   | NATURAL GAS          |        | 435.1    | 173     | 1.44306                                 |            | 42.668          |        |        | 6'11 1/4" | 367.86                 | 58               | 1.0010         |  |  |  |  |
| C <sub>2</sub> H <sub>2</sub><br>56.104 | 0.85  | 0.64  | 1.21                       | 0.900   | 28.43                | 7.713  | 21.232   | 0.9064  | 1.2013                                  | 5069       | 13.357          |        |        | 2'2 3/4"  | 117.17                 | 62               | 0.9990         |  |  |  |  |
| C <sub>2</sub> H <sub>2</sub><br>56.104 | 0.99  | 0.95  | 1.14                       | 1.027   |                      |        | 440.2    | 46      |                                         |            |                 |        |        | 2'4"      | 124.28                 | 52               | 1.0049         |  |  |  |  |
| C <sub>2</sub> H <sub>2</sub><br>72.146 | 0.29  | 0.18  | 0.42                       | 0.297   | OXYGEN               | 27.07  | 6.853    | 21.3283 | 1.0137                                  |            | 10.569          |        |        | 1'8 3/4"  | 89.24                  | 47               | 1.0064         |  |  |  |  |
| C <sub>2</sub> H <sub>2</sub><br>84.152 | 0.34  | 0.31  | 0.44                       | 0.363   |                      |        | 30.1     |         |                                         |            |                 |        |        |           |                        |                  |                |  |  |  |  |
|                                         |       |       | M. W.                      | 24.2026 | STEAM                | 215.7  | 6.129    | 0.2920  | 386#/hr                                 |            |                 | 15 hrs |        |           |                        |                  | 2372.24        |  |  |  |  |
|                                         |       |       |                            |         |                      |        |          |         |                                         |            |                 |        |        |           |                        |                  | 17.891         |  |  |  |  |

THE TEXAS COMPANY — MONTEBELLO LABORATORY

### RATE CALCULATIONS

RUN NO. 65-B  
HOURS 16-40

| GAS ANALYSES                            |       |       |                            |         | GENERATOR BALANCE |         |          |        |                                         |             |        |        |         |        | WEIGHT BALANCE         |                 |                 |            |         |              |
|-----------------------------------------|-------|-------|----------------------------|---------|-------------------|---------|----------|--------|-----------------------------------------|-------------|--------|--------|---------|--------|------------------------|-----------------|-----------------|------------|---------|--------------|
| Hour                                    | 1400  | 2200  | 0600                       | Average | M/HR              | C       | H        | O      |                                         | Mol %       | M/HR   | C      | H       | O      |                        | #/hr Measured   | At. Wt. Balance |            |         |              |
| FRESH FEED                              |       |       |                            |         |                   |         |          |        | O <sub>2</sub><br>32.000                | 0.21        | 10.445 |        |         | 20.946 | WET GAS                | 26.96<br>242.89 | 298.53          |            |         |              |
| CO<br>28.010                            | 36.87 | 37.22 | 36.77                      | 36.954  | 15.470            | 15.470  |          | 15.470 | CO <sub>2</sub><br>44.010               | 1.40        | 0.186  | 0.186  |         | 0.372  | OIL                    | 62.51           | 69.16           |            |         |              |
| H <sub>2</sub><br>2.016                 | 60.32 | 60.50 | 60.71                      | 60.510  | 25.331            |         | 50.662   |        | N <sub>2</sub><br>28.016                | 1.04        | 0.138  |        |         |        | WATER                  | 143.59          | 158.86          |            |         |              |
| CO <sub>2</sub><br>44.010               | 1.96  | 2.01  | 2.30                       | 2.090   | 0.875             | 0.875   |          |        | CH <sub>4</sub><br>16.042               | 83.15       | 11.021 | 11.021 | 44.084  |        | TOTAL                  | 475.95          | 526.55          |            |         |              |
| N <sub>2</sub><br>28.016                | 0.13  | 0.13  | 0.14                       | 0.133   | 0.056             |         |          |        | C <sub>2</sub> H <sub>6</sub><br>30.068 | 6.74        | 0.893  | 1.786  | 5.358   |        | FRESH FEED             | 526.55          |                 |            |         |              |
| CH <sub>4</sub><br>16.042               | 0.72  | 0.14  | 0.08                       | 0.313   | 0.131             | 0.524   |          |        | C <sub>2</sub> H <sub>4</sub><br>28.054 | 5.33        | 0.706  | 2.118  | 5.648   |        | WEIGHT BALANCE         | 90.39           |                 |            |         |              |
|                                         |       |       | M. W                       | 12.5780 |                   |         |          |        | C <sub>2</sub> H <sub>2</sub><br>26.040 | 1.60        | 0.212  | 0.848  | 2.120   |        | Forced Factor          | 1106313         |                 |            |         |              |
|                                         |       |       | H <sub>2</sub> O<br>18.016 |         |                   |         | 8.030    | 4.015  | C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.53        | 0.070  | 0.350  | 0.840   |        | WET GAS FACTOR         | 1229074         |                 |            |         |              |
|                                         |       |       |                            |         | 41.863            | 16.476  | 59.216   | 21.235 | MW                                      | 20.0027     |        |        |         |        | INDICATED LOSS—S C F H | 1218            |                 |            |         |              |
|                                         |       |       | BALANCE                    |         |                   | 101.023 | 102.008  | 99.610 | TOTAL                                   |             |        | 16.309 | 58.050  | 21.318 |                        |                 |                 |            |         |              |
| WET GAS                                 |       |       |                            |         | GAS FLOW RATES    |         |          |        |                                         |             |        |        |         |        | LIQUID PRODUCT RATES   |                 |                 |            |         |              |
| CO<br>28.010                            | 5.91  | 6.49  | 6.90                       | 6.433   |                   | ✓H      | PRESSURE | TEMP.  | M. W.                                   | S. C. F. H. | M/HR   | Hour   | GAGE    | GAL.   | °F                     | FACTOR          | GAL. AT 60      | APP. #/GAL | #       | # HR GAL. HR |
| H <sub>2</sub><br>2.016                 | 36.06 | 36.55 | 36.29                      | 36.301  | FRESH FEED        |         | 416.0    | 52     | 2.30163                                 |             |        |        | OIL     | 7'5½"  | 395.14                 | 46              | 1.0069          | 397.87     | 51.6    |              |
| CO <sub>2</sub><br>44.010               | 31.34 | 30.72 | 32.30                      | 31.453  | 79.31             | 6.313   | 20.7535  | 1.0078 | 1.61711                                 | 15887       | 41.863 |        | 4'8½"   | 251.11 | 35                     | 1.0124          | 254.22          | 6.434      |         |              |
| N <sub>2</sub><br>28.016                | 1.36  | 1.84  | 1.78                       | 1.660   | WET GAS           |         | 1.43     | 55     | 1.19748                                 |             |        |        |         |        |                        |                 |                 |            |         |              |
| CH <sub>4</sub><br>16.042               | 13.65 | 11.62 | 10.85                      | 12.040  | 158.44            | 5.450   | 4.0162   | 1.0048 | 1.09429                                 | 3813        | 10.047 |        | 2'1"    | 109.84 | 35                     | 1.0124          | 111.20          |            |         |              |
| C <sub>2</sub> H <sub>6</sub><br>30.068 | 2.46  | 2.48  | 2.45                       | 2.463   | RECYCLE           |         | 415.4    | 67     |                                         |             |        |        | 0'5½"   | 24.34  | 35                     | 1.0124          | 24.64           |            |         | 62.51        |
| C <sub>2</sub> H <sub>4</sub><br>28.054 | 1.88  | 2.01  | 1.90                       | 1.930   | 79.31             | 8.479   | 20.7388  | 0.9933 | 1.09429                                 | 15159       | 39.945 |        |         |        |                        |                 | 230.21          |            |         | 9.715        |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 2.89  | 3.48  | 2.88                       | 3.083   | BLEED             | 5.02    | 415.4    | 67     |                                         |             |        |        |         |        |                        |                 | 42.95           |            | 19.00   |              |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.23  | 0.30  | 0.32                       | 0.283   | 5.02              | 8.138   | 20.7388  | 0.9933 | 1.09429                                 | 921         | 2.427  | WATER  | 7'3"    | 384.23 | 67                     | 0.9993          | 383.96          | 10.6       | 1500.15 |              |
| C <sub>2</sub> H <sub>4</sub><br>28.054 | 2.04  | 2.22  | 2.01                       | 2.090   | NATURAL GAS       |         | 435.8    | 182    | 1.44730                                 |             |        |        | 2'4"    | 124.28 | 52                     | 1.0006          | 124.35          | 8.293      |         |              |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.70  | 0.92  | 0.78                       | 0.800   | 28.43             | 7.700   | 21.2249  | 0.9000 | 1.20303                                 | 5030        | 13.254 |        |         |        |                        |                 |                 |            |         |              |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.93  | 0.94  | 0.94                       | 0.937   | OXYGEN            |         | 442.6    | 51     |                                         |             |        | 7 AM   | 3'1-34" | 169.21 | 58                     | 1.0002          | 169.24          |            |         |              |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.27  | 0.18  | 0.26                       | 0.237   | 27.07             | 6.788   | 21.3845  | 1.0088 |                                         | 3964        | 10.445 |        | 0'3"    | 13.28  | 37                     | 1.0010          | 13.29           |            |         | 143.59       |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.28  | 0.25  | 0.34                       | 0.290   |                   |         |          |        |                                         |             |        |        |         |        |                        |                 | 415.56          |            |         | 17.315       |
|                                         |       |       | M. W.                      | 24.1757 | STEAM             | 215.7   | 6.017    |        |                                         |             |        |        |         |        |                        |                 |                 |            |         |              |

| GAS ANALYSES                             |       |       |                            |           | GENERATOR BALANCE |        |          |        |                                          |             |                 |        |        |           | WEIGHT BALANCE         |                 |                |  |  |
|------------------------------------------|-------|-------|----------------------------|-----------|-------------------|--------|----------|--------|------------------------------------------|-------------|-----------------|--------|--------|-----------|------------------------|-----------------|----------------|--|--|
| HR                                       | 1400  | 2200  | 0600                       | AVERAGE   | M/HR              | C      | H        | O      |                                          | Mol %       | M/Hr            | C      | H      | O         |                        | #/hr Measured   | At Wt. Balance |  |  |
| FRESH FEED                               |       |       |                            |           |                   |        |          |        | O <sub>2</sub><br>32.000                 | 0.22        | 10.427<br>0.029 |        |        | 20.912    | WET GAS                | 26.38<br>261.33 | 307.87         |  |  |
| CO<br>28.010                             | 37.38 | 37.25 | 37.36                      | 37.330    | 15.454            | 15.454 |          | 15.454 | CO <sub>2</sub><br>44.010                | 1.17        | 0.155           | 0.155  |        | 0.310     | OIL                    | 60.01           | 64.21          |  |  |
| H <sub>2</sub><br>2.016                  | 59.62 | 60.28 | 60.29                      | 60.063    | 24.864            |        | 49.728   |        | N <sub>2</sub><br>28.014                 | 0.43        | 0.057           |        |        |           | WATER                  | 141.76          | 151.68         |  |  |
| CO <sub>2</sub><br>44.010                | 1.84  | 2.14  | 1.89                       | 1.957     | 0.810             | 0.810  |          | 1.620  | CH <sub>4</sub><br>16.042                | 83.51       | 11.033          | 11.033 | 44.132 |           | TOTAL                  | 489.48          | 523.76         |  |  |
| N <sub>2</sub><br>28.016                 | 0.13  | 0.16  | 0.20                       | 0.163     | 0.067             |        |          |        | C <sub>2</sub> H <sub>6</sub><br>30.068  | 6.80        | 0.898           | 1.796  | 5.388  |           | FRESH FEED             | 523.76          |                |  |  |
| CH <sub>4</sub><br>16.042                | 1.03  | 0.17  | 0.26                       | 0.487     | 0.202             | 0.202  | 0.808    |        | C <sub>2</sub> H <sub>4</sub><br>28.052  | 5.51        | 0.728           | 2.184  | 5.824  |           | WEIGHT BALANCE         | 93.46           |                |  |  |
|                                          |       |       | M. W                       | 12.652069 |                   |        |          |        | C <sub>2</sub> H <sub>10</sub><br>58.120 | 1.67        | 0.221           | 0.884  | 2.210  |           | Forced Factor          | 1070033         |                |  |  |
|                                          |       |       | H <sub>2</sub> O<br>18.016 |           |                   |        | 8.203    | 4.102  | C <sub>2</sub> H <sub>2</sub><br>26.038  | 0.69        | 0.091           | 0.455  | 1.092  |           | WET GAS FACTOR         | 1178089         |                |  |  |
|                                          |       |       |                            |           |                   | 16.466 | 58.739   | 21.176 | MW                                       | 20.045075   |                 |        |        |           | INDICATED LOSS—S C F H | 973             |                |  |  |
|                                          |       |       |                            |           |                   |        |          |        |                                          |             |                 | 16.507 | 58.646 | 21.222    |                        | 5165            |                |  |  |
|                                          |       |       | BALANCE                    |           |                   | 99.75  | 100.16   | 99.78  | TOTAL                                    |             |                 |        |        |           |                        |                 |                |  |  |
| WET GAS                                  |       |       |                            |           | GAS FLOW RATES    |        |          |        |                                          |             |                 |        |        |           | LIQUID PRODUCT RATES   |                 |                |  |  |
| CO<br>28.010                             | 8.99  | 8.71  | 8.45                       | 8.717     |                   | VR     | PRESSURE | TEMP.  | M. W.                                    | S. C. F. H. | M/HR            | HR     | GAGE   | GAL       | °F                     | FACTOR          | GAL. AT 60     |  |  |
| H <sub>2</sub><br>2.016                  | 38.23 | 37.48 | 36.95                      | 37.554    | FRESH FEED        |        | 416.5    | 59     | 2288163                                  |             |                 |        | OIL    | 7'2 1/4"  | 380.96                 | 46              | 1.0069         |  |  |
| CO <sub>2</sub><br>44.010                | 28.93 | 30.99 | 30.87                      | 30.263    | 79.31             | 6.300  | 20.765   | 1.0010 | 1.5127                                   | 15710       | 41.397          |        |        | 6'4 3/8"  | 338.40                 | 38              | 1.0109         |  |  |
| N <sub>2</sub><br>28.016                 | 1.24  | 1.55  | 1.44                       | 1.410     |                   |        | 1.40     | 58     | 1223664                                  |             |                 |        |        | 4'11 1/2" | 263.11                 | 43              | 1.0084         |  |  |
| CH <sub>4</sub><br>16.042                | 11.91 | 10.16 | 10.61                      | 10.893    | 158.44            | 5.950  | 4.012    | 1.0019 | 1.1062                                   | 4192        | 11.046          |        |        | 1'8"      | 87.01                  | 42              | 1.0089         |  |  |
| C <sub>2</sub> H <sub>6</sub><br>30.068  | 2.29  | 2.36  | 2.44                       | 2.363     | WET GAS           |        | 415.8    | 72     |                                          |             |                 |        |        |           |                        |                 |                |  |  |
| C <sub>2</sub> H <sub>4</sub><br>28.052  | 1.62  | 1.79  | 1.81                       | 1.740     | 79.31             | 8.471  | 20.748   | 0.9897 | 1.1062                                   | 15245       | 40.171          |        |        |           |                        | +5.30           | 60.01          |  |  |
| C <sub>2</sub> H <sub>10</sub><br>58.120 | 2.57  | 2.71  | 2.94                       | 2.740     | RECYCLE           |        |          |        |                                          |             |                 |        |        |           | 224.34                 | 1440.26         | 9.348          |  |  |
| C <sub>2</sub> H <sub>2</sub><br>26.038  | 0.20  | 0.21  | 0.23                       | 0.213     | BLEED             | 5.02   | 8.342    | 20.748 | 1.0000                                   | 1.1062      | 961             | 2.532  | WATER  | 7'1 1/4"  | 376.59                 | 67              | 0.99932        |  |  |
| C <sub>2</sub> H <sub>12</sub><br>58.104 | 1.83  | 1.86  | 2.06                       | 1.917     |                   |        | 435.9    | 185    | 1444245                                  |             |                 |        |        | 4'9 3/8"  | 254.38                 | 58              | 1.00018        |  |  |
| C <sub>2</sub> H <sub>10</sub><br>58.120 | 0.75  | 0.75  | 0.78                       | 0.760     | NATURAL GAS       | 28.43  | 7.700    | 21.227 | 0.8979                                   | 1.2018      | 5014            | 13.212 |        | 6'7"      | 349.31                 | 61              | 0.99992        |  |  |
| C <sub>2</sub> H <sub>10</sub><br>58.120 | 0.90  | 0.85  | 0.90                       | 0.883     |                   |        | 444.6    | 60     |                                          |             |                 |        |        | 1'2"      | 60.66                  | 67              | 0.99932        |  |  |
| C <sub>2</sub> H <sub>2</sub><br>26.038  | 0.23  | 0.29  | 0.26                       | 0.260     | OXYGEN            | 27.07  | 6.821    | 21.431 | 1.0000                                   |             | 39.57           | 10.427 |        |           |                        |                 | 410.56         |  |  |
| C <sub>2</sub> H <sub>12</sub><br>58.104 | 0.31  | 0.29  | 0.26                       | 0.287     |                   |        | 29.4     |        |                                          |             |                 |        |        |           |                        |                 | 3402.31        |  |  |
|                                          |       |       | M. W.                      | 23.658438 | STEAM             | 215.7  | 6.071    | 0.2893 | 379#/hr                                  |             |                 |        |        |           |                        |                 |                |  |  |

| GAS ANALYSES                               |       |       |                            |         | GENERATOR BALANCE    |        |          |        |         |                                          |        |                 |          |          | WEIGHT BALANCE       |                     |                 |                |                   |                 |
|--------------------------------------------|-------|-------|----------------------------|---------|----------------------|--------|----------|--------|---------|------------------------------------------|--------|-----------------|----------|----------|----------------------|---------------------|-----------------|----------------|-------------------|-----------------|
| Hour                                       | 1400  | 2200  | 0600                       | Average | M/Hr                 | C      | H        | O      |         | Mol %                                    | M/Hr   | C               | H        | O        |                      |                     | #/hr Measured   | At Wt. Balance |                   |                 |
| FRESH FEED                                 |       |       |                            |         |                      |        |          |        |         | O <sub>2</sub><br>32.000                 | 0.20   | 10.377<br>0.026 |          |          | 20.906               | WET GAS             | 264.99<br>25.72 | 308.80         |                   |                 |
| CO<br>28.010                               | 37.11 | 37.26 | 37.12                      | 37.163  | 15.325               | 15.235 |          | 15.235 |         | CO <sub>2</sub><br>44.010                | 1.30   | 0.171           | 0.171    |          | 0.342                | OIL                 | 54.92           | 58.34          |                   |                 |
| H <sub>2</sub><br>2.016                    | 60.29 | 60.58 | 60.73                      | 60.534  | 24.962               |        | 49.924   |        |         | N <sub>2</sub><br>28.016                 | 1.02   | 0.134           |          |          |                      | WATER               | 139.95          | 148.66         |                   |                 |
| CO <sub>2</sub><br>44.010                  | 1.59  | 1.79  | 1.85                       | 1.743   | 0.719                | 0.719  |          | 1.438  |         | CH <sub>4</sub><br>16.042                | 83.34  | 10.985          | 10.985   | 43.940   |                      | TOTAL               | 485.58          | 515.80         |                   |                 |
| N <sub>2</sub><br>28.016                   | 0.25  | 0.17  | 0.13                       | 0.183   | 0.075                |        |          |        |         | C <sub>2</sub> H <sub>6</sub><br>30.048  | 6.86   | 0.904           | 1.808    | 5.424    |                      | FRESH FEED          | 515.80          |                |                   |                 |
| CH <sub>4</sub><br>16.042                  | 0.76  | 0.20  | 0.17                       | 0.377   | 0.155                | 0.155  | 0.620    |        |         | C <sub>3</sub> H <sub>8</sub><br>44.096  | 5.21   | 0.687           | 2.061    | 5.496    |                      | WEIGHT BALANCE      | 94.14           |                |                   |                 |
|                                            |       |       | M. W                       | 12.5086 |                      |        |          |        |         | C <sub>4</sub> H <sub>10</sub><br>58.120 | 1.54   | 0.203           | 0.812    | 2.030    |                      | Force Factor        | 1062234         |                |                   |                 |
|                                            |       |       | H <sub>2</sub> O<br>18.016 |         |                      |        | 7.384    | 3.692  |         | C <sub>5</sub> H <sub>12</sub><br>72.146 | 0.53   | 0.070           | 0.350    | 0.840    |                      | WET GAS FACTOR      | 116533          |                |                   |                 |
|                                            |       |       |                            |         |                      | 16.109 | 57.928   | 20.365 | MM      | 19.9287                                  |        | 16.187          | 57.730   | 20.464   |                      | INDICATED LOSS—SCFH | 721             |                |                   |                 |
|                                            |       |       | BALANCE                    |         |                      | 99.52  | 100.34   | 99.52  | TOTAL   |                                          |        |                 |          |          |                      |                     |                 |                |                   |                 |
| WET GAS                                    |       |       |                            |         | GAS FLOW RATES       |        |          |        |         |                                          |        |                 |          |          | LIQUID PRODUCT RATES |                     |                 |                |                   |                 |
| CO<br>28.010                               | 8.64  | 8.86  | 8.88                       | 8.793   |                      | VR     | PRESSURE | TEMP.  | M. W.   | S. C. F. H.                              | M/Hr   | Hour            | GAGE     | GAL      | °F                   | FACTOR              | GAL. AT 60      | API*<br>#/GAL  | #                 | # HR<br>GAL. HR |
| H <sub>2</sub><br>2.016                    | 39.25 | 39.89 | 38.89                      | 39.343  | FRESH FEED           |        | 415.4    | 60     | 2.31440 |                                          |        |                 | OIL      | 6'7"     | 349.31               | 48                  | 1.0059          | 351.37         | 52.7              |                 |
| CO <sub>2</sub><br>44.010                  | 28.61 | 28.49 | 29.48                      | 28.860  | 79.31                | 6.254  | 20.739   | 1.0000 | 1.5213  | 15649                                    | 41.236 |                 | 2'9 3/4" | 149.62   | 51                   | 1.0044              | 150.28          | 6.396          |                   |                 |
| N <sub>2</sub><br>28.016                   | 1.64  | 1.86  | 2.07                       | 1.857   |                      |        | 1.5      | 61     | 1.25484 |                                          |        |                 |          |          |                      |                     | 201.09          |                | 1286.17<br>+32.00 | 54.92           |
| CH <sub>4</sub><br>16.042                  | 11.11 | 10.02 | 9.56                       | 10.230  | 158.44               | 6.108  | 4.0249   | 0.9990 | 1.12019 | 4359                                     | 11.486 |                 |          |          |                      |                     | 206.09          |                | 1318.17           | 8.587           |
| C <sub>2</sub> H <sub>6</sub><br>30.048    | 2.37  | 2.34  | 2.22                       | 2.310   |                      |        | 414.0    | 75     |         |                                          |        |                 |          |          |                      |                     |                 |                |                   |                 |
| C <sub>3</sub> H <sub>8</sub><br>44.096    | 1.60  | 1.69  | 1.79                       | 1.693   | 79.31                | 8.500  | 20.705   | 0.9859 | 1.12019 | 15414                                    | 40.617 |                 |          |          |                      |                     |                 |                |                   |                 |
| C <sub>4</sub> H <sub>10</sub><br>58.120   | 2.68  | 2.60  | 2.09                       | 2.457   |                      |        | 414.0    |        |         |                                          |        |                 |          |          |                      |                     |                 |                |                   |                 |
| C <sub>5</sub> H <sub>12</sub><br>72.146   | 0.24  | 0.23  | 0.17                       | 0.213   |                      | 5.02   | 8.496    | 20.705 | 1.0000  | 1.1209                                   | 989    | 2.606           | WATER    | 7'5 1/4" | 395.14               | 70                  | 0.99896         | 394.73         | 10.7              |                 |
| C <sub>6</sub> H <sub>14</sub><br>86.178   | 1.88  | 1.82  | 1.89                       | 1.863   |                      |        | 435.1    | 191    | 1.45267 |                                          | 43.223 |                 | 2'8"     | 142.71   | 63                   | 0.9997              | 142.67          | 8.287          |                   |                 |
| C <sub>7</sub> H <sub>16</sub><br>98.120   | 0.59  | 0.77  | 1.16                       | 0.840   | NATURAL GAS<br>28.43 | 7.700  | 21.208   | 0.8938 | 1.2053  | 5002                                     | 13.181 |                 | 3'11"    | 209.64   | 64                   | 0.99963             | 209.56          |                |                   |                 |
| C <sub>8</sub> H <sub>18</sub><br>100.120  | 0.88  | 0.89  | 1.01                       | 0.927   |                      |        | 444.7    | 62     |         |                                          |        |                 | 1'1"     | 56.30    | 56                   | 1.00033             | 56.32           |                |                   | 139.95          |
| C <sub>9</sub> H <sub>20</sub><br>114.120  | 0.22  | 0.23  | 0.38                       | 0.277   | OXYGEN<br>27.07      | 6.800  | 21.434   | 0.9981 |         | 3938                                     | 10.377 |                 |          |          |                      |                     | 405.30          |                |                   | 16.888          |
| C <sub>10</sub> H <sub>22</sub><br>128.120 | 0.29  | 0.31  | 0.41                       | 0.337   |                      |        |          |        |         |                                          |        |                 |          |          |                      |                     |                 |                |                   |                 |
|                                            |       |       | M. W.                      | 23.0705 | STEAM<br>215.7       | 6.096  |          |        |         |                                          |        |                 |          |          |                      |                     |                 |                |                   |                 |

RUN NO. 65-G  
HOURS 136-160

| Forced                             |              |       |                                    |         |                   |        |          |        |         |                                    |        |         |          |        |                      |                        |               |                |        |             |
|------------------------------------|--------------|-------|------------------------------------|---------|-------------------|--------|----------|--------|---------|------------------------------------|--------|---------|----------|--------|----------------------|------------------------|---------------|----------------|--------|-------------|
|                                    | GAS ANALYSES |       |                                    |         | GENERATOR BALANCE |        |          |        |         |                                    |        |         |          |        | WEIGHT BALANCE       |                        |               |                |        |             |
| HR                                 | 1800         | 2200  | 0600                               | AVERAGE | M/HR              | C      | H        | O      |         | Mol %                              | M/HR   | C       | H        | O      |                      |                        | #/hr Measured | At Wt. Balance |        |             |
| FRESH FEED                         |              |       |                                    |         |                   |        |          |        |         | CO <sub>28.010</sub>               | 0.23   | 10.540  | 0.031    |        | 21.142               | WET GAS                | 26.29         | 314.71         |        |             |
| CO <sub>28.010</sub>               | 37.42        | 37.57 | 37.42                              | 37.470  | 15.289            | 15.289 |          | 15.289 |         | CO <sub>28.010</sub>               | 1.30   | 0.173   | 0.173    |        | 0.346                | OIL                    | 56.17         | 58.84          |        |             |
| H <sub>20.016</sub>                | 60.30        | 60.02 | 60.06                              | 60.126  | 24.535            |        | 49.070   |        |         | N <sub>216.016</sub>               | 1.83   | 0.243   |          |        |                      | WATER                  | 138.72        | 145.30         |        |             |
| CO <sub>44.010</sub>               | 1.97         | 2.24  | 2.24                               | 2.150   | 0.877             | 0.877  |          | 1.754  |         | CH <sub>16.042</sub>               | 83.20  | 11.062  | 11.062   | 44.248 |                      | TOTAL                  | 495.34        |                |        |             |
| N <sub>28.016</sub>                | 0.21         | 0.10  | 0.22                               | 0.177   | 0.072             |        |          |        |         | C <sub>2</sub> H <sub>30.068</sub> | 6.65   | 0.884   | 1.768    | 5.304  |                      | FRESH FEED             | 518.85        |                |        |             |
| CH <sub>16.042</sub>               | 0.10         | 0.07  | 0.06                               | 0.077   | 0.031             | 0.031  | 0.124    |        |         | C <sub>2</sub> H <sub>14.074</sub> | 5.01   | 0.666   | 1.998    | 5.328  |                      | WEIGHT BALANCE         | 95.47         |                |        |             |
|                                    |              |       | M. W                               | 12.7156 |                   |        |          |        |         | C <sub>2</sub> H <sub>58.120</sub> | 1.34   | 0.178   | 0.712    | 1.780  |                      | Forced Factor          | 1047462       |                |        |             |
|                                    |              |       | H <sub>2</sub> O <sub>18.016</sub> |         |                   |        | 8.192    | 40.96  |         | C <sub>2</sub> H <sub>72.146</sub> | 0.44   | 0.059   | 0.295    | 0.708  |                      | WET GAS FACTOR         | 1147906       |                |        |             |
|                                    |              |       |                                    |         | 16.197            | 57.386 | 21.139   | MW     |         | 19.8102                            | 13.296 | 16.0082 | 57.368   | 21.448 |                      | INDICATED LOSS-S C F H | 801           |                |        |             |
|                                    |              |       | BALANCE                            |         | 98.94             | 100.03 | 98.56    | TOTAL  |         |                                    |        |         |          |        |                      |                        |               |                |        |             |
| WET GAS 1400                       |              |       |                                    |         | GAS FLOW RATES    |        |          |        |         |                                    |        |         |          |        | LIQUID PRODUCT RATES |                        |               |                |        |             |
| CO <sub>28.010</sub>               | 8.29         | 8.61  | 8.55                               | 8.483   |                   | ✓      | PRESSURE | TEMP.  | M. W.   | S. C. F. H.                        | M/HR   | HOUR    | GAGE     | GAL.   | °F                   | FACTOR                 | GAL AT 60     | API°/GAL       | #      | # HR GAL HR |
| H <sub>20.016</sub>                | 37.99        | 39.20 | 37.63                              | 38.272  | FRESH FEED        |        | 414.5    | 60     | 2.27673 |                                    |        |         | OIL      | 7'5"   | 392.96               | 53                     | 1.0035        | 394.34         | 52.4   |             |
| CO <sub>28.010</sub>               | 30.11        | 30.54 | 31.34                              | 30.663  | 79.31             | 6.246  | 20.7171  | 1.0000 | 1.50888 | 15485                              | 40.904 |         | 6'7"     | 349.31 | 48                   | 1.0059                 | 351.37        | 6.406          |        |             |
| N <sub>28.016</sub>                | 1.54         | 1.38  | 1.60                               | 1.507   | WET GAS           |        | 1.5      | 59     |         |                                    |        |         | 3'9 1/2" | 203.10 | 42                   | 1.0089                 | 204.91        |                |        |             |
| CH <sub>16.042</sub>               | 10.81        | 9.26  | 9.31                               | 9.793   | 158.44            | 6.238  | 4.0249   | 1.0010 | 1.10798 | 4412                               | 11.626 |         | 0'9 1/2" | 41.26  | 63                   | 0.9985                 | 41.20         |                |        |             |
| C <sub>2</sub> H <sub>28.032</sub> | 2.43         | 2.33  | 2.29                               | 2.350   | RECYCLE           |        | 412.6    | 74     |         |                                    |        |         |          |        |                      |                        | 3.75          |                | +24.00 | 56.17       |
| C <sub>2</sub> H <sub>28.032</sub> | 1.75         | 1.77  | 1.72                               | 1.747   | 79.31             | 8.496  | 20.6712  | 0.9868 | 1.10798 | 15229                              | 40.129 |         |          |        |                      |                        | 210.43        |                |        | 8.768       |
| C <sub>2</sub> H <sub>42.078</sub> | 3.31         | 3.10  | 3.15                               | 3.187   | BLEED             |        | 412.6    | 60     |         |                                    |        |         |          |        |                      |                        |               |                |        |             |
| C <sub>2</sub> H <sub>44.094</sub> | 0.30         | 0.29  | 0.27                               | 0.287   | 5.02              | 8.500  | 20.6712  | 1.0000 | 1.10798 | 977                                | 2.574  | WATER   | 7'6"     | 397.32 | 71                   | 0.99883                | 396.86        | 10.7           |        |             |
| C <sub>2</sub> H <sub>36.104</sub> | 1.84         | 1.75  | 1.99                               | 1.860   | NATURAL GAS       |        | 437.0    | 186    | 1.46136 |                                    |        |         | 3'11"    | 209.64 | 64                   | 0.99963                | 209.56        | 8.287          |        |             |
| C <sub>2</sub> H <sub>38.120</sub> | 0.53         | 0.60  | 0.79                               | 0.640   | 28.43             | 7.700  | 21.2532  | 0.8972 | 1.20886 | 5046                               | 13.296 |         | 5'6"     | 292.57 | 60                   | 1.00000                | 292.57        |                |        |             |
| C <sub>2</sub> H <sub>70.130</sub> | 0.83         | 0.79  | 0.98                               | 0.867   | OXYGEN            |        | 446.0    | 61     |         |                                    |        |         | 1'6"     | 78.16  | 64                   | 0.99963                | 78.13         |                |        | 138.72      |
| C <sub>2</sub> H <sub>72.146</sub> | 0.09         | 0.19  | 0.19                               | 0.157   | 27.07             | 6.892  | 20.14639 | 0.9990 |         | 4000                               | 10.540 |         |          |        |                      |                        | 401.74        |                |        | 16.739      |
| C <sub>2</sub> H <sub>74.156</sub> | 0.18         | 0.19  | 0.19                               | 0.187   |                   |        | 27.4     |        |         |                                    |        |         |          |        |                      |                        |               |                |        |             |
|                                    |              |       | M. W.                              | 23.5819 | STEAM             |        |          |        |         |                                    |        |         |          |        |                      |                        |               |                |        |             |
|                                    |              |       |                                    | 215.7   | 5.998             | 0.2811 |          |        | 363#/hr |                                    |        |         |          |        |                      |                        |               |                |        |             |

THE TEXAS COMPANY — MONTEBELLO LABORATORY

## RATE CALCULATIONS

RUN NO. 65-H  
HOURS 160-184

· Forced

| GAS ANALYSES                            |       |       |                            |           | GENERATOR BALANCE   |        |          |        |                                         |             |                 |        |          |        | WEIGHT BALANCE       |                     |                 |               |         |                |
|-----------------------------------------|-------|-------|----------------------------|-----------|---------------------|--------|----------|--------|-----------------------------------------|-------------|-----------------|--------|----------|--------|----------------------|---------------------|-----------------|---------------|---------|----------------|
| Hour                                    | 1400  | 2200  | 0600                       | Average   | M/HR                | C      | H        | O      |                                         | Mol %       | M/HR            | C      | H        | O      |                      | #/hr Measured       | At Wt. Balance  |               |         |                |
| FRESH FEED                              |       |       |                            |           |                     |        |          |        | O <sub>2</sub><br>32.000                | 0.29        | 10.551<br>0.038 |        |          |        | 21.178               | WET GAS             | 25.89<br>271.89 | 319.79        |         |                |
| CO<br>28.010                            | 37.76 | 37.85 | 37.60                      | 37.737    | 15.461              | 15.461 |          | 15.461 | CO <sub>2</sub><br>44.010               | 1.32        | 0.175           | 0.175  |          |        | 0.350                | OIL                 | 51.56           | 55.41         |         |                |
| H <sub>2</sub><br>2.016                 | 59.75 | 59.91 | 59.81                      | 59.823    | 24.508              |        | 49.016   |        | N <sub>2</sub><br>28.016                | 1.17        | 0.155           |        |          |        |                      | WATER               | 136.80          | 147.01        |         |                |
| CO <sub>2</sub><br>44.010               | 1.78  | 1.99  | 2.21                       | 1.993     | 0.817               | 0.817  |          | 1.634  | CH <sub>4</sub><br>16.042               | 83.76       | 11.116          | 11.116 | 44.464   |        |                      | TOTAL               | 485.94          | 522.21        |         |                |
| N <sub>2</sub><br>28.016                | 0.11  | 0.11  | 0.31                       | 0.177     | 0.073               |        |          |        | C <sub>2</sub> H <sub>6</sub><br>30.069 | 6.65        | 0.983           | 1.766  | 5.298    |        |                      | FRESH FEED          | 522.21          |               |         |                |
| CH <sub>4</sub><br>16.042               | 0.60  | 0.14  | 0.07                       | 0.270     | 0.111               | 0.111  | 0.444    |        | C <sub>2</sub> H <sub>4</sub><br>28.052 | 4.96        | 0.658           | 1.974  | 5.264    |        |                      | WEIGHT BALANCE      | 93.05           |               |         |                |
|                                         |       |       | M. W                       | 12.746186 |                     |        |          |        | C <sub>2</sub> H <sub>2</sub><br>26.038 | 1.41        | 0.187           | 0.748  | 1.870    |        |                      | Forced Factor       | 1074638         |               |         |                |
|                                         |       |       | H <sub>2</sub> O<br>18.016 |           |                     |        | 8.499    | 4.250  | C <sub>2</sub> H <sub>2</sub><br>26.038 | 0.44        | 0.058           | 0.290  | 0.696    |        |                      | WET GAS FACTOR      | 1176174         |               |         |                |
|                                         |       |       |                            |           | 16.389              | 57.959 | 21.345   | MW     | 19.761817                               |             |                 |        |          |        |                      | INDICATED LOSS—SCFH | 1021            |               |         |                |
|                                         |       |       | BALANCE                    |           | 101.99              | 100.64 | 99.15    | TOTAL  |                                         |             |                 | 16.069 | 57.592   | 21.528 |                      |                     | 5500            |               |         |                |
| WET GAS                                 |       |       |                            |           | GAS FLOW RATES      |        |          |        |                                         |             |                 |        |          |        | LIQUID PRODUCT RATES |                     |                 |               |         |                |
| CO<br>28.010                            | 8.20  | 8.95  | 6.87                       | 8.007     |                     | ✓H     | PRESSURE | TEMP.  | M. W.                                   | S. C. F. H. | M/HR            | HOUR   | GAGE     | GAL    | °F                   | FACTOR              | GAL AT 60       | API°<br>#/GAL | #       | # HR<br>GAL HR |
| H <sub>2</sub><br>2.016                 | 40.31 | 40.36 | 39.63                      | 40.100    | FRESH FEED<br>79.31 |        | 414.1    | 61     | 2271267                                 |             |                 |        | OIL      | 7'3"   | 384.23               | 46                  | 1.0069          | 386.88        | 52.6    |                |
| CO <sub>2</sub><br>44.010               | 28.25 | 29.96 | 31.19                      | 29.800    |                     | 6.288  | 20.707   | 0.9990 | 1.5071                                  | 15548       | 40.970          |        | 3'9½"    | 203.10 | 42                   | 1.0089              | 204.91          | 6.399         |         |                |
| N <sub>2</sub><br>28.016                | 0.97  | 1.35  | 1.68                       | 1.333     | WET GAS             |        | 1.50     | 61     | 1256653                                 |             |                 |        | 12"      | 60.66  | 44                   | 1.0079              | 61.14           |               |         |                |
| CH <sub>4</sub><br>16.042               | 11.03 | 8.79  | 9.14                       | 9.654     | 158.44              | 6.271  | 4.025    | 0.9990 | 1.1210                                  | 4479        | 11.802          |        | 0'11½"   | 49.82  | 41                   | 1.0094              | 50.29           |               |         |                |
| C <sub>2</sub> H <sub>6</sub><br>30.069 | 2.04  | 2.27  | 2.33                       | 2.213     | RECYCLE<br>79.31    | 8.504  | 20.666   | 0.9859 | 1.1210                                  | 15404       | 40.590          |        |          |        |                      |                     | +0.55           |               | 3.50    | 51.56          |
| C <sub>2</sub> H <sub>4</sub><br>28.052 | 1.56  | 1.69  | 1.76                       | 1.670     |                     |        |          |        |                                         |             |                 |        |          |        |                      |                     | 193.37          |               | 1237.37 | 8.057          |
| C <sub>2</sub> H <sub>2</sub><br>26.038 | 3.24  | 2.93  | 2.99                       | 3.053     | BLEED               |        |          |        |                                         |             |                 |        |          |        |                      |                     |                 |               |         |                |
| C <sub>2</sub> H <sub>2</sub><br>26.038 | 0.38  | 0.33  | 0.26                       | 0.323     | 5.02                | 8.558  | 20.666   | 1.0000 | 1.1210                                  | 995         | 2.622           | WATER  | 7'5½"    | 395.14 | 68                   | 0.99920             | 394.82          | 10.7          |         |                |
| C <sub>2</sub> H <sub>2</sub><br>26.038 | 1.76  | 1.69  | 1.92                       | 1.790     | NATURAL GAS         |        | 434.8    | 187    | 1464946                                 |             |                 |        | 5'6"     | 292.57 | 60                   | 1.00000             | 292.57          | 8.287         |         |                |
| C <sub>2</sub> H <sub>2</sub><br>26.038 | 0.85  | 0.46  | 0.78                       | 0.697     | 28.43               | 7.700  | 21.201   | 0.8965 | 1.2103                                  | 5036        | 13.270          |        | 7'12"    | 379.86 | 60                   | 1.00000             | 379.86          |               |         |                |
| C <sub>2</sub> H <sub>2</sub><br>26.038 | 0.69  | 0.84  | 0.95                       | 0.827     | OXYGEN<br>27.07     | 6.917  | 21.464   | 0.9962 |                                         | 4004        | 10.551          |        | 1'7-3/4" | 85.91  | 60                   | 1.00000             | 85.91           |               |         | 136.80         |
| C <sub>2</sub> H <sub>2</sub><br>26.038 | 0.56  | 0.14  | 0.26                       | 0.320     |                     |        |          |        |                                         |             |                 |        |          |        |                      |                     | 396.20          |               | 3283.31 | 16.508         |
| C <sub>2</sub> H <sub>2</sub><br>26.038 | 0.16  | 0.24  | 0.24                       | 0.213     | STEAM               |        | 26.8     |        |                                         |             |                 |        |          |        |                      |                     |                 |               |         |                |
|                                         |       |       | M. W.                      | 23.037749 | 215.7               | 5.942  |          |        |                                         |             |                 |        |          |        |                      |                     |                 |               |         |                |

| GAS ANALYSES                          |       |       |                         |           | GENERATOR BALANCE |        |          |        |                                       |          |        |        |          |           | WEIGHT BALANCE       |                        |                 |           |         |             |        |
|---------------------------------------|-------|-------|-------------------------|-----------|-------------------|--------|----------|--------|---------------------------------------|----------|--------|--------|----------|-----------|----------------------|------------------------|-----------------|-----------|---------|-------------|--------|
| HR                                    | 1400  | 2200  | 0600                    | AVERAGE   | M/HR              | C      | H        | O      |                                       | Mol %    | M/Hr   | C      | H        | O         |                      | #/hr<br>Measured       | At Wt. Balance  |           |         |             |        |
| FRESH FEED                            |       |       |                         |           |                   |        |          |        | O <sub>2</sub> 0.00                   | 0.23     | 10.535 | 0.030  |          |           | 21.130               | WET GAS                | 28.71<br>276.51 | 319.90    |         |             |        |
| CO <sub>2</sub> 0.10                  | 36.85 | 37.11 | 37.10                   | 37.014    | 15.113            | 15.113 |          | 15.113 | CO <sub>2</sub> 44.010                | 1.37     | 0.182  | 0.182  |          |           | 0.364                | OIL                    | 53.90           | 56.86     |         |             |        |
| H <sub>2</sub> 2.016                  | 60.38 | 60.19 | 59.88                   | 60.150    | 24.559            |        | 49.118   |        | N <sub>2</sub> 28.016                 | 2.25     | 0.298  |        |          |           |                      | WATER                  | 134.78          | 142.19    |         |             |        |
| CO <sub>2</sub> 44.010                | 2.04  | 2.37  | 2.43                    | 2.280     | 0.931             | 0.931  |          | 1.862  | CH <sub>4</sub> 16.042                | 83.05    | 11.007 | 11.007 | 44.028   |           |                      | TOTAL                  | 491.90          |           |         |             |        |
| N <sub>2</sub> 28.016                 | 0.18  | 0.26  | 0.50                    | 0.313     | 0.128             |        |          |        | C <sub>2</sub> H <sub>6</sub> 30.074  | 6.47     | 0.857  | 1.714  | 5.142    |           |                      | FRESH FEED             | 518.96          |           |         |             |        |
| CH <sub>4</sub> 16.042                | 0.57  | 0.07  | 0.09                    | 0.243     | 0.099             | 0.099  | 0.396    |        | C <sub>2</sub> H <sub>4</sub> 44.094  | 4.80     | 0.636  | 1.908  | 5.088    |           |                      | WEIGHT BALANCE         | 94.79           |           |         |             |        |
|                                       |       |       | M. W                    | 12.71035  |                   |        |          |        | C <sub>2</sub> H <sub>10</sub> 58.120 | 1.39     | 0.184  | 0.736  | 1.840    |           |                      | Forced Factor          | 105501          |           |         |             |        |
|                                       |       |       | H <sub>2</sub> O 18.016 |           |                   |        | 8.159    | 4.080  | C <sub>2</sub> H <sub>2</sub> 72.144  | 0.44     | 0.058  | 0.290  | 0.696    |           |                      | WET GAS FACTOR         | 1156920         |           |         |             |        |
|                                       |       |       |                         |           |                   | 16.143 | 57.673   | 21.055 | MW                                    | 19.81700 |        |        |          |           |                      | INDICATED LOSS—S C F H | 852             |           |         |             |        |
|                                       |       |       | BALANCE                 |           |                   | 101.93 | 101.55   | 97.96  | TOTAL                                 |          |        |        | 15.837   | 56.794    | 21.494               |                        | 5233            |           |         |             |        |
| WET GAS                               |       |       |                         |           | GAS FLOW RATES    |        |          |        |                                       |          |        |        |          |           | LIQUID PRODUCT RATES |                        |                 |           |         |             |        |
| CO <sub>2</sub> 0.10                  | 7.74  | 8.41  | 7.72                    | 7.957     |                   | V R    | PRESSURE | TEMP.  | M. W.                                 | S. C F H | M/HR   | HR     | GAGE     | GAL.      | °F                   | FACTOR                 | GAL AT 60       | API #/GAL | #       | # HR GAL HR |        |
| H <sub>2</sub> 2.016                  | 39.71 | 37.11 | 35.69                   | 37.503    | FRESH FEED        |        | 413.8    | 58     | 2277671                               |          |        |        | OIL      | 4'10 3/4" | 259.84               | 42                     | 1.0089          | 262.15    | 52.4    |             |        |
| CO <sub>2</sub> 44.010                | 27.35 | 31.74 | 32.45                   | 30.513    | 79.31             | 6.242  | 20.700   | 1.0019 | 1.5092                                | 15495    | 40.830 |        | 1'2"     | 60.66     | 44                   | 1.0079                 | 61.14           | 6.406     |         |             |        |
| N <sub>2</sub> 28.016                 | 1.29  | 1.50  | 1.65                    | 1.480     | WET GAS           |        | 1.50     | 59     | 1208613                               |          |        |        |          |           |                      |                        | +0.94           |           | +6.00   | 53.90       |        |
| CH <sub>4</sub> 16.042                | 11.92 | 9.16  | 9.90                    | 10.327    | 158.44            | 6.242  | 4.025    | 1.0010 | 1.0994                                | 4381     | 11.544 |        |          |           |                      |                        | 201.95          |           | 1293.69 | 8.415       |        |
| C <sub>2</sub> H <sub>6</sub> 30.074  | 2.56  | 2.39  | 2.49                    | 2.480     | RECYCLE           |        | 411.7    | 74     |                                       |          |        |        |          |           |                      |                        |                 |           |         |             |        |
| C <sub>2</sub> H <sub>4</sub> 44.094  | 1.84  | 1.82  | 1.87                    | 1.843     | 79.31             | 8.492  | 20.649   | 0.9868 | 1.0994                                | 15088    | 39.758 |        |          |           |                      |                        |                 |           |         |             |        |
| C <sub>2</sub> H <sub>2</sub> 72.144  | 3.54  | 3.02  | 3.07                    | 3.210     |                   |        |          |        |                                       |          |        |        |          |           |                      |                        |                 |           |         |             |        |
| C <sub>2</sub> H <sub>10</sub> 58.120 | 0.36  | 0.27  | 0.21                    | 0.280     | BLEED             | 5.02   | 8.517    | 20.649 | 1.0000                                | 1.0994   | 971    | 2.559  | WATER    | 7'6"      | 397.32               | 60                     | 1.00000         | 397.32    | 10.8    |             |        |
| C <sub>2</sub> H <sub>2</sub> 72.144  | 2.05  | 2.11  | 2.01                    | 2.057     | NATURAL GAS       |        | 435.5    | 188    | 1460866                               |          |        |        | 7'12"    | 379.86    | 60                   | 1.00000                | 379.86          | 8.282     |         |             |        |
| C <sub>2</sub> H <sub>10</sub> 58.120 | 0.55  | 0.78  | 1.18                    | 0.837     | 28.43             | 7.700  | 21.218   | 0.8558 | 1.2087                                | 5029     | 13.252 |        | 7'3 3/8" | 386.41    | 60                   | 1.00000                | 386.41          |           |         |             |        |
| C <sub>2</sub> H <sub>2</sub> 72.144  | 0.83  | 1.16  | 1.09                    | 1.027     | OXYGEN            | 27.07  | 6.908    | 21.422 | 0.9981                                |          | 3998   | 10.535 |          | 0'3"      | 13.28                | 44                     | 1.00106         | 13.29     |         |             | 134.78 |
| C <sub>2</sub> H <sub>10</sub> 58.120 | 0.13  | 0.23  | 0.28                    | 0.213     |                   |        |          |        |                                       |          |        |        |          |           |                      |                        | 390.58          |           | 3234.78 | 16.274      |        |
| C <sub>2</sub> H <sub>2</sub> 72.144  | 0.13  | 0.30  | 0.39                    | 0.273     | STEAM             |        | 27.1     |        |                                       |          |        |        |          |           |                      |                        |                 |           |         |             |        |
|                                       |       |       | M. W                    | 23.953067 | 215.7             | 5.917  |          |        |                                       |          |        |        |          |           |                      |                        |                 |           |         |             |        |

THE TEXAS COMPANY — MONTEBELLO LABORATORY

## RATE CALCULATIONS

RUN NO. 65-J  
HOURS 208-232

| GAS ANALYSES                               |       |       |                            |          | GENERATOR BALANCE |        |          |        |                                          |             |                 |        |          |          | WEIGHT BALANCE       |                        |                 |                |                |                 |
|--------------------------------------------|-------|-------|----------------------------|----------|-------------------|--------|----------|--------|------------------------------------------|-------------|-----------------|--------|----------|----------|----------------------|------------------------|-----------------|----------------|----------------|-----------------|
| Hour                                       | 1400  | 2200  | 0600                       | Average  | M/HR              | C      | H        | O      |                                          | Mol %       | M/Hr            | C      | H        | O        |                      |                        | #/hr Measured   | At Wt. Balance |                |                 |
| FRESH FEED                                 |       |       |                            |          |                   |        |          |        | O <sub>2</sub><br>32.000                 | 0.19        | 10.472<br>0.025 |        |          |          | 20.994               | WET GAS                | 25.09<br>279.21 | 327.12         |                |                 |
| CO<br>28.010                               | 37.36 | 37.62 | 37.26                      | 37.413   | 15.055            | 15.055 |          | 15.055 | CO <sub>2</sub><br>44.010                | 1.49        | 0.197           | 0.197  |          |          | 0.394                | OIL                    | 44.70           | 48.05          |                |                 |
| H <sub>2</sub><br>2.016                    | 59.97 | 59.88 | 60.10                      | 59.984   | 24.137            |        | 48.274   |        | N <sub>2</sub><br>28.014                 | 0.21        | 0.028           |        |          |          |                      | WATER                  | 128.28          | 137.90         |                |                 |
| CO <sub>2</sub><br>44.010                  | 2.12  | 2.28  | 2.36                       | 2.253    | 0.907             | 0.907  |          | 1.814  | CH <sub>4</sub><br>16.042                | 84.70       | 11.211          | 11.211 | 44.844   |          |                      | TOTAL                  | 477.28          |                |                |                 |
| N <sub>2</sub><br>28.016                   | 0.06  | 0.11  | 0.18                       | 0.117    | 0.047             |        |          |        | C <sub>2</sub> H <sub>6</sub><br>30.068  | 6.45        | 0.854           | 1.708  | 5.124    |          |                      | FRESH FEED             | 513.07          |                |                |                 |
| CH <sub>4</sub><br>16.042                  | 0.49  | 0.11  | 0.10                       | 0.233    | 0.094             | 0.094  | 0.376    |        | C <sub>3</sub> H <sub>8</sub><br>44.099  | 4.95        | 0.655           | 1.965  | 5.240    |          |                      | WEIGHT BALANCE         | 93.02           |                |                |                 |
|                                            |       |       | M. W                       | 12.75036 |                   |        | 9.360    | 4.519  | C <sub>4</sub> H <sub>10</sub><br>58.120 | 1.47        | 0.195           | 0.780  | 1.950    |          |                      | Forced Factor          | 1074987         |                |                |                 |
|                                            |       |       | H <sub>2</sub> O<br>18.016 |          |                   |        | 9.199    | 4.600  | C <sub>5</sub> H <sub>12</sub><br>72.146 | 0.54        | 0.071           | 0.355  | 0.852    |          |                      | WET GAS FACTOR         | 1171591         |                |                |                 |
|                                            |       |       |                            |          | 16.056            |        |          |        | MW                                       | 19.728948   |                 |        |          |          |                      | INDICATED LOSS—S C F H | 808             |                |                |                 |
|                                            |       |       | BALANCE                    |          | 99.01             |        |          |        | TOTAL                                    |             |                 | 16.216 | 58.010   |          | 21.388               |                        | 5735            |                |                |                 |
| WET GAS                                    |       |       |                            |          | GAS FLOW RATES    |        |          |        |                                          |             |                 |        |          |          | LIQUID PRODUCT RATES |                        |                 |                | 21 hours basis |                 |
| CO<br>28.010                               | 12.03 | 12.68 | 12.43                      | 12.380   |                   | V R    | PRESSURE | TEMP.  | M. W.                                    | S. C. F. H. | M/HR            | Hour   | GAGE     | GAL.     | °F                   | FACTOR                 | GAL. AT 60°     | API°<br>#/GAL  | #              | # HR<br>GAL. HR |
| H <sub>2</sub><br>2.016                    | 41.15 | 39.38 | 40.75                      | 40.427   | FRESH FEED        |        | 412.6    | 61     | 2270524                                  |             |                 |        | OIL      | 4'7 1/2" | 246.74               | 49                     | 1.0054          | 248.07         | 50.9           |                 |
| CO <sub>2</sub><br>44.010                  | 24.71 | 27.17 | 26.73                      | 26.203   | 79.31             | 6.188  | 20.671   | 0.9990 | 1.5068                                   | 15271       | 40.240          |        | 2'0 1/2" | 106.35   | 43                   | 1.0084                 | 107.24          | 6.459          |                |                 |
| N <sub>2</sub><br>28.016                   | 1.33  | 1.23  | 1.55                       | 1.370    | WET GAS           |        | 1.50     | 62     | 1286311                                  |             |                 |        |          |          |                      |                        | 44.49           | 29.00          | 44.70          |                 |
| CH <sub>4</sub><br>16.042                  | 10.18 | 8.08  | 8.25                       | 8.837    | 158.44            | 6.521  | 4.025    | 0.9981 | 1.1342                                   | 4708        | 12.406          |        |          |          |                      |                        | 145.32          | 938.62         | 6.920          |                 |
| C <sub>2</sub> H <sub>6</sub><br>30.068    | 2.22  | 2.12  | 1.98                       | 2.107    | RECYCLE           |        | 411.9    | 77     |                                          |             |                 |        |          |          |                      |                        |                 |                |                |                 |
| C <sub>3</sub> H <sub>8</sub><br>44.099    | 1.72  | 1.70  | 1.60                       | 1.673    | 79.31             | 8.450  | 20.654   | 0.9840 | 1.1342                                   | 15448       | 40.706          |        |          |          |                      |                        |                 |                |                |                 |
| C <sub>4</sub> H <sub>10</sub><br>58.120   | 2.83  | 2.87  | 2.27                       | 2.657    |                   |        |          |        |                                          |             |                 |        |          |          |                      |                        |                 |                |                |                 |
| C <sub>5</sub> H <sub>12</sub><br>72.146   | 0.28  | 0.29  | 0.28                       | 0.283    | BLEED             | 5.02   | 8.046    | 20.654 | 1.0000                                   | 1.1342      | 946             | 2.493  | WATER    | 7'3-3/4" | 387.50               | 68                     | 0.99920         | 387.19         | 10.6           |                 |
| C <sub>6</sub> H <sub>14</sub><br>98.196   | 1.77  | 2.14  | 1.78                       | 1.897    |                   |        | 432.7    | 187    | 1467386                                  |             |                 |        |          | 1'9"     | 91.50                | 62                     | 0.99982         | 91.48          | 8.293          |                 |
| C <sub>7</sub> H <sub>16</sub><br>100.125  | 0.50  | 0.65  | 0.72                       | 0.623    | NATURAL GAS       | 28.43  | 7.692    | 21.152 | 0.8965                                   | 1.2114      | 5025            | 13.236 |          | 1'7"     | 82.59                | 61                     | 0.99992         | 82.58          |                |                 |
| C <sub>8</sub> H <sub>18</sub><br>114.216  | 0.81  | 1.15  | 1.06                       | 1.007    |                   |        | 441.6    | 63     |                                          |             |                 |        |          | 1'0 1/2" | 54.14                | 50                     | 1.00070         | 54.18          |                |                 |
| C <sub>9</sub> H <sub>20</sub><br>128.171  | 0.24  | 0.23  | 0.29                       | 0.253    | OXYGEN            | 27.07  | 6.892    | 21.361 | 0.9971                                   |             | 3974            | 10.472 |          |          |                      |                        | 40.72           |                | 46.00          | 128.28          |
| C <sub>10</sub> H <sub>22</sub><br>142.177 | 0.23  | 0.31  | 0.31                       | 0.283    |                   |        | 26.0     |        |                                          |             |                 |        |          |          |                      |                        | 324.83          |                | 2693.82        | 15.468          |
|                                            |       |       | M. W                       | 22.50621 | STEAM             | 215.7  | 5.750    |        |                                          |             |                 |        |          |          |                      |                        |                 |                |                |                 |

| Forced                                  |       |       |       |                |                   |        |          |                |                                         |             |                 |        |        |           |                        |                 |                |                |         |                |
|-----------------------------------------|-------|-------|-------|----------------|-------------------|--------|----------|----------------|-----------------------------------------|-------------|-----------------|--------|--------|-----------|------------------------|-----------------|----------------|----------------|---------|----------------|
| GAS ANALYSES                            |       |       |       |                | GENERATOR BALANCE |        |          |                |                                         |             |                 |        |        |           | WEIGHT BALANCE         |                 |                |                |         |                |
| Hour                                    | 1400  | 2200  | 0600  | Average        | M/HR              | C      | H        | O              |                                         | Mol %       | M/HR            | C      | H      | O         |                        | #/hr Measured   | At Wt. Balance |                |         |                |
| FRESH FEED                              |       |       |       |                |                   |        |          |                | O <sub>2</sub><br>32.000                | 0.26        | 10.440<br>0.035 |        |        | 20.950    | WET GAS                | 25.24<br>279.80 | 334.20         |                |         |                |
| CO<br>28.010                            | 37.11 | 38.12 | 37.32 | 37.517         | 15.240            | 15.240 |          | 15.240         | CO <sub>2</sub><br>44.010               | 1.34        | 0.178           | 0.178  |        | 0.356     | OIL                    | 43.69           | 47.85          |                |         |                |
| H <sub>2</sub><br>2.016                 | 60.39 | 58.93 | 60.12 | 59.813         | 24.297            |        | 48.594   |                | N <sub>2</sub><br>28.016                | 0.38        | 0.051           |        |        |           | WATER                  | 125.33          | 137.26         |                |         |                |
| CO <sub>2</sub><br>44.010               | 1.79  | 2.58  | 2.27  | 2.213          | 0.899             | 0.899  |          | 1.798          | CH <sub>4</sub><br>16.042               | 84.43       | 11.225          | 11.225 | 44.900 |           | TOTAL                  | 474.16          | 519.31         |                |         |                |
| N <sub>2</sub><br>28.016                | 0.13  | 0.26  | 0.17  | 0.187          | 0.076             |        |          |                | C <sub>2</sub> H <sub>6</sub><br>30.068 | 6.69        | 0.890           | 1.780  | 5.340  |           | FRESH FEED             | 519.31          |                |                |         |                |
| CH <sub>4</sub><br>16.042               | 0.09  | 0.11  | 0.12  | 0.270          | 0.110             | 0.110  | 0.440    |                | C <sub>2</sub> H <sub>4</sub><br>28.054 | 4.98        | 0.662           | 1.986  | 5.296  |           | WEIGHT BALANCE         | 91.31           |                |                |         |                |
|                                         |       |       |       | M. W<br>18.016 | 12.783986         |        |          |                | C <sub>2</sub> H <sub>2</sub><br>26.037 | 1.44        | 0.191           | 0.764  | 1.910  |           | Forced Factor          | 1095221         |                |                |         |                |
|                                         |       |       |       |                |                   |        | 8.858    | 4.268<br>4.429 | C <sub>2</sub> H <sub>2</sub><br>26.037 | 0.48        | 0.064           | 0.320  | 0.768  |           | WET GAS FACTOR         | 1193997         |                |                |         |                |
|                                         |       |       |       |                | 16.249            | 57.892 | 21.467   | MW             | 19.71431                                |             |                 |        |        |           | INDICATED LOSS-S C F H | 1180            |                |                |         |                |
|                                         |       |       |       | BALANCE        | 99.98             | 99.45  | 100.76   | TOTAL          |                                         |             |                 | 16.253 | 58.214 | 21.306    |                        | 5873            |                |                |         |                |
| WET GAS                                 |       |       |       |                | GAS FLOW RATES    |        |          |                |                                         |             |                 |        |        |           | LIQUID PRODUCT RATES   |                 |                |                |         |                |
| CO<br>28.010                            | 10.99 | 11.84 | 11.53 | 11.453         |                   | ✓      | PRESSURE | TEMP.          | M. W.                                   | S. C. F. H. | M/HR            | Hour   | GAGE   | GAL.      | °F                     | FACTOR          | GAL. AT 60     | API°<br>#/GAL. | #       | # HR<br>GAL HR |
| H <sub>2</sub><br>2.016                 | 39.85 | 41.34 | 40.49 | 40.560         | FRESH FEED        |        | 411.5    | 61             | 2264551                                 |             |                 |        | OIL    | 7'13 1/2" | 385.32                 | 48              | 1.0059         | 387.59         | 50.3    |                |
| CO <sub>2</sub><br>44.010               | 26.81 | 26.99 | 27.47 | 27.090         | 79.31             | 6.263  | 20.645   | 0.9990         | 1.5048                                  | 15416       | 40.622          |        |        | 4'17 1/2" | 246.74                 | 49              | 1.0054         | 248.07         | 6.480   |                |
| N <sub>2</sub><br>28.016                | 1.26  | 1.27  | 1.43  | 1.320          | WET GAS           |        | 1.65     | 63             | 1279030                                 |             |                 |        |        | 1'4 1/2"  | 70.49                  | 45              | 1.0074         | 71.01          |         |                |
| CH <sub>4</sub><br>16.042               | 9.66  | 8.61  | 8.58  | 8.950          | 158.44            | 6.496  | 4.044    | 0.9917         | 1.7309                                  | 4693        | 12.366          |        |        | 1'0 1/2"  | 53.06                  | 40              | 1.0099         | 53.59          |         |                |
| C <sub>2</sub> H <sub>6</sub><br>28.052 | 2.02  | 2.07  | 1.88  | 1.990          | RECYCLE           |        | 410.9    | 75             |                                         |             |                 |        |        |           |                        |                 |                | 44.86          | +31.50  | 43.69          |
| C <sub>2</sub> H <sub>4</sub><br>28.052 | 1.66  | 1.66  | 1.64  | 1.653          | 79.31             | 8.392  | 20.630   | 0.9859         | 1.1309                                  | 15309       | 40.340          |        |        |           |                        |                 |                | 161.80         | 1048.46 | 6.742          |
| C <sub>2</sub> H <sub>2</sub><br>26.037 | 2.58  | 2.55  | 2.42  | 2.517          | BLEED             |        |          |                |                                         |             |                 |        |        |           |                        |                 |                |                |         |                |
| C <sub>2</sub> H <sub>2</sub><br>26.037 | 0.28  | 0.27  | 0.19  | 0.247          | 5.02              | 8.046  | 20.530   | 1.0000         | 1.1309                                  | 942         | 2.482           |        | WATER  | 7'7-1/2"  | 402.23                 | 65              | 0.99953        | 402.04         | 10.6    |                |
| C <sub>2</sub> H <sub>2</sub><br>26.037 | 2.04  | 1.64  | 1.80  | 1.827          | NATURAL GAS       |        | 434.0    | 187            | 14694                                   | 76          |                 |        |        | 1'7"      | 82.59                  | 61              | 0.99992        | 82.58          | 8.293   |                |
| C <sub>2</sub> H <sub>2</sub><br>26.037 | 0.88  | 0.52  | 0.95  | 0.793          | 28.43             | 7.713  | 21.193   | 0.8965         | 1.2118                                  | 5046        | 13.296          |        |        | 1'7 1/2"  | 84.80                  | 59              | 1.00009        | 84.91          |         |                |
| C <sub>2</sub> H <sub>2</sub><br>26.037 | 1.16  | 0.84  | 0.95  | 0.983          |                   |        | 440.9    | 64             |                                         |             |                 |        |        | 0'9-3/4"  | 42.31                  | 44              | 1.00106        | 42.35          |         |                |
| C <sub>2</sub> H <sub>2</sub><br>26.037 | 0.41  | 0.18  | 0.40  | 0.330          | OXYGEN            | 27.07  | 6.883    | 21.345         | 0.9962                                  |             | 3962            | 10.440 |        |           |                        |                 |                | +0.78          |         | 125.33         |
| C <sub>2</sub> H <sub>2</sub><br>26.037 | 0.40  | 0.22  | 0.27  | 0.297          |                   |        | 26.5     |                |                                         |             |                 |        |        |           |                        |                 |                | 362.70         | 3007.87 | 15.113         |
|                                         |       |       |       | STEAM          | 215.7             | 5.696  |          |                |                                         |             |                 |        |        |           |                        |                 |                |                |         |                |
|                                         |       |       |       | M. W.          | 22.634321         |        |          |                |                                         |             |                 |        |        |           |                        |                 |                |                |         |                |

THE TEXAS COMPANY — MONTEBELLO LABORATORY

## RATE CALCULATIONS

RUN NO. 65-L  
HOURS 256-280

| Forced                                   |       |       |                            |           |                   |        |          |        |                                          |           |                 |        |           |          |                      |                        |                 |             |            |         |             |  |
|------------------------------------------|-------|-------|----------------------------|-----------|-------------------|--------|----------|--------|------------------------------------------|-----------|-----------------|--------|-----------|----------|----------------------|------------------------|-----------------|-------------|------------|---------|-------------|--|
| GAS ANALYSES                             |       |       |                            |           | GENERATOR BALANCE |        |          |        |                                          |           |                 |        |           |          | WEIGHT BALANCE       |                        |                 |             |            |         |             |  |
| Hour                                     | 1400  | 2200  | 0600                       | Average   | M/HR              | C      | H        | O      |                                          | Mol %     | M/HR            | C      | H         | O        |                      | #/hr Measured          | At Wt. Balance  |             |            |         |             |  |
| FRESH FEED                               |       |       |                            |           |                   |        |          |        |                                          | 0.22      | 10.451<br>0.029 |        |           |          | 20.960               | WET GAS                | 24.70<br>249.17 | 325.91      |            |         |             |  |
| CO<br>28.010                             | 37.35 | 36.93 | 36.82                      | 37.033    | 15.112            | 15.112 |          | 15.112 | CO<br>44.510                             | 1.29      | 0.170           | 0.170  |           |          | 0.340                | OIL                    | 38.81           | 46.18       |            |         |             |  |
| H <sub>2</sub><br>2.016                  | 60.45 | 60.53 | 60.59                      | 60.557    | 24.710            |        | 49.420   |        | N <sub>2</sub><br>28.016                 | 0.82      | 0.082           |        |           |          |                      | WATER                  | 118.16          | 140.91      |            |         |             |  |
| CO <sub>2</sub><br>4.010                 | 1.73  | 2.19  | 2.11                       | 2.010     | 0.820             | 0.820  |          | 1.640  | CH <sub>4</sub><br>16.042                | 83.77     | 11.039          | 11.039 | 44.156    |          |                      | TOTAL                  | 430.84          |             |            |         |             |  |
| N <sub>2</sub><br>28.016                 | 0.17  | 0.24  | 0.14                       | 0.133     | 0.075             |        |          |        | C <sub>2</sub> H <sub>6</sub><br>30.028  | 6.78      | 0.893           | 1.786  | 5.358     |          |                      | FRESH FEED             | 512.70          |             |            |         |             |  |
| CH <sub>4</sub><br>16.042                | 0.30  | 0.11  | 0.24                       | 0.217     | 0.089             | 0.089  | 0.356    |        | C <sub>2</sub> H <sub>8</sub><br>44.029  | 5.19      | 0.684           | 2.052  | 5.472     |          |                      | WEIGHT BALANCE         | 84.03           |             |            |         |             |  |
|                                          |       |       | M.W.                       | 12.56445  |                   |        |          |        | C <sub>2</sub> H <sub>10</sub><br>30.020 | 1.55      | 0.204           | 0.816  | 2.040     |          |                      | Forced Factor          | 11900           |             |            |         |             |  |
|                                          |       |       | H <sub>2</sub> O<br>18.016 |           |                   |        |          |        | C <sub>2</sub> H <sub>12</sub><br>72.146 | 0.58      | 0.077           | 0.385  | 0.924     |          |                      | WET GAS FACTOR         | 1307982         |             |            |         |             |  |
|                                          |       |       |                            |           |                   |        |          |        | MW                                       | 19.896607 |                 |        |           |          |                      | INDICATED LOSS—S C F H | 1825            |             |            |         |             |  |
|                                          |       |       | BALANCE                    |           |                   |        |          |        | TOTAL                                    |           |                 |        |           |          | 21.300               |                        | 6093            |             |            |         |             |  |
| WET GAS                                  |       |       |                            |           | GAS FLOW RATES    |        |          |        |                                          |           |                 |        |           |          | LIQUID PRODUCT RATES |                        |                 |             |            |         |             |  |
| CO<br>28.010                             | 10.26 | 11.50 | 11.90                      | 11.197    |                   | ✓      | PRESSURE | TEMP.  | M.W.                                     | S C F H   | M/HR            |        | Hour      | GAGE     | GAL.                 | °F                     | FACTOR          | GAL. AT 60° | API° #/GAL | #       | # HR GAL HR |  |
| H <sub>2</sub><br>2.016                  | 40.40 | 42.11 | 43.82                      | 42.044    | FRESH FEED        |        | 410.3    | 61     | 1304119                                  |           |                 |        |           | OIL      | 3'11 1/2"            | 211.83                 | 51              | 1.0044      | 212.76     | 49.9    |             |  |
| CO <sub>2</sub><br>4.010                 | 27.49 | 26.60 | 25.75                      | 26.613    | 79.31             | 6.246  | 20.616   | 0.9990 | 1.5179                                   | 15486     | 40.806          |        |           | 1'4 1/2" | 70.49                | 45                     | 1.0074          | 71.01       | 6.494      |         |             |  |
| N <sub>2</sub><br>28.016                 | 1.24  | 1.47  | 1.07                       | 1.260     | WET GAS           |        | 1.50     | 65     | 1306634                                  |           |                 |        |           |          |                      |                        |                 | 41.69       |            | 411.00  | 38.91       |  |
| CH <sub>4</sub><br>16.042                | 8.98  | 8.34  | 8.52                       | 8.613     | 158.44            | 5.883  | 4.025    | 0.9952 | 1.1431                                   | 4268      | 11.246          |        |           |          |                      |                        |                 | 143.44      |            | 931.50  | 5.977       |  |
| C <sub>2</sub> H <sub>6</sub><br>30.028  | 2.16  | 1.97  | 1.95                       | 2.023     | RECYCLE           |        | 410.1    | 79     |                                          |           |                 |        |           |          |                      |                        |                 |             |            |         |             |  |
| C <sub>2</sub> H <sub>8</sub><br>44.029  | 1.74  | 1.58  | 1.57                       | 1.630     | 79.31             | 7.992  | 20.611   | 0.9822 | 1.1431                                   | 14668     | 38.651          |        |           |          |                      |                        |                 |             |            |         |             |  |
| C <sub>2</sub> H <sub>10</sub><br>30.020 | 2.87  | 1.97  | 2.24                       | 2.293     | BLEED             |        |          |        |                                          |           |                 |        |           |          |                      |                        |                 |             |            |         |             |  |
| C <sub>2</sub> H <sub>12</sub><br>72.146 | 0.21  | 0.16  | 0.21                       | 0.193     | 5.02              | 8.096  | 20.611   | 1.0000 | 1.1431                                   | 958       | 2.524           | WATER  | 7'12 1/2" | 382.05   | 87                   | 0.99932                | 381.79          | 10.7        |            |         |             |  |
| C <sub>2</sub> H <sub>14</sub><br>58.120 | 2.13  | 1.77  | 1.46                       | 1.787     | NATURAL GAS       |        | 432.3    | 188    | 1455021                                  |           |                 |        |           | 1'7 1/2" | 84.80                | 59                     | 1.00009         | 84.81       | 8.287      |         |             |  |
| C <sub>2</sub> H <sub>16</sub><br>58.120 | 0.81  | 0.82  | 0.53                       | 0.720     | 28.43             | 7.700  | 21.142   | 0.8958 | 1.2062                                   | 5001      | 13.178          |        |           | 2'0"     | 105.19               | 62                     | 0.99982         | 105.17      |            |         |             |  |
| C <sub>2</sub> H <sub>18</sub><br>72.146 | 1.25  | 1.06  | 0.80                       | 1.037     | OXYGEN            |        | 438.8    | 63     |                                          |           |                 |        |           | 1'2"     | 60.66                | 58                     | 1.00018         | 60.67       |            |         |             |  |
| C <sub>2</sub> H <sub>20</sub><br>86.196 | 0.26  | 0.34  | 0.22                       | 0.273     | 27.07             | 6.900  | 21.296   | 0.9971 |                                          | 3966      | 10.451          |        |           |          |                      |                        |                 | 40.72       |            | 46.00   | 118.16      |  |
| C <sub>2</sub> H <sub>22</sub><br>86.196 | 0.41  | 0.31  | 0.26                       | 0.327     | 28.1              |        |          |        |                                          |           |                 |        |           |          |                      |                        |                 | 342.20      |            | 2835.81 | 14.258      |  |
|                                          |       |       | M.W.                       | 22.156156 | 215.7             | 5.521  |          |        |                                          |           |                 |        |           |          |                      |                        |                 |             |            |         |             |  |

| GAS ANALYSES         |       |       |                           |           | GENERATOR BALANCE |        |          |        |                      |             |        |        |           |          | WEIGHT BALANCE       |               |                |            |         |             |  |
|----------------------|-------|-------|---------------------------|-----------|-------------------|--------|----------|--------|----------------------|-------------|--------|--------|-----------|----------|----------------------|---------------|----------------|------------|---------|-------------|--|
| HR                   | 1400  | 2200  | 0600                      | AVERAGE   | M/HR              | C      | H        | O      |                      | Mol %       | M/Hr   | C      | H         | O        |                      | #/hr Measured | At Wt. Balance |            |         |             |  |
| FRESH FEED           |       |       |                           |           |                   |        |          |        | O <sub>28.000</sub>  | 0.26        | 10.543 | 0.034  |           | 21.154   | WET GAS              | 24.62         | 321.75         |            |         |             |  |
| CO <sub>26.010</sub> | 36.97 | 37.12 | 37.21                     | 37.100    | 15.042            | 15.042 |          | 15.042 | CO <sub>44.010</sub> | 1.62        | 0.214  | 0.214  |           | 0.428    | OIL                  | 40.94         | 50.42          |            |         |             |  |
| H <sub>2.016</sub>   | 60.47 | 60.33 | 59.97                     | 60.257    | 24.431            |        | 48.863   |        | N <sub>28.016</sub>  | 1.70        | 0.224  |        |           |          | WATER                | 115.28        | 141.96         |            |         |             |  |
| CO <sub>44.010</sub> | 2.02  | 2.15  | 2.43                      | 2.200     | 0.892             | 0.892  |          | 1.784  | CH <sub>16.042</sub> | 83.55       | 11.026 | 11.026 | 44.104    |          | TOTAL                | 417.49        |                |            |         |             |  |
| N <sub>28.016</sub>  | 0.22  | 0.33  | 0.32                      | 0.290     | 0.118             |        |          |        | C <sub>30.048</sub>  | 6.17        | 0.814  | 1.628  | 4.884     |          | FRESH FEED           | 514.13        |                |            |         |             |  |
| CH <sub>16.042</sub> | 0.32  | 0.07  | 0.07                      | 0.153     | 0.062             | 0.062  | 0.248    |        | C <sub>44.094</sub>  | 4.72        | 0.623  | 1.869  | 4.984     |          | WEIGHT BALANCE       | 81.20         |                |            |         |             |  |
|                      |       |       | M. W                      | 12.680502 |                   |        |          |        | C <sub>58.120</sub>  | 1.48        | 0.195  | 0.780  | 1.950     |          | Forced Factor        | 1231478       |                |            |         |             |  |
|                      |       |       | H <sub>2O</sub><br>18.016 |           |                   |        | 8.558    | 4.279  | C <sub>72.146</sub>  | 0.50        | 0.066  | 0.330  | 0.792     |          | WET GAS FACTOR       | 1359602       |                |            |         |             |  |
|                      |       |       |                           |           |                   | 15.996 | 57.668   | 21.105 | MW                   | 19.932865   |        |        |           |          | INDICATED LOSS—SCFH  | 2084          |                |            |         |             |  |
|                      |       |       | BALANCE                   |           |                   | 100.94 | 101.68   | 97.80  | TOTAL                |             |        | 15.847 | 56.714    | 21.582   |                      | 6152          |                |            |         |             |  |
| WET GAS              |       |       |                           |           | GAS FLOW RATES    |        |          |        |                      |             |        |        |           |          | LIQUID PRODUCT RATES |               |                |            |         |             |  |
| CO <sub>26.010</sub> | 10.32 | 11.35 | 10.60                     | 10.757    |                   | VR     | PRESSURE | TEMP.  | M. W.                | S. C. F. H. | M/HR   | HR     | GAGE      | GAL.     | °F                   | FACTOR        | GAL AT 60      | API° #/GAL | #       | # HR GAL HR |  |
| H <sub>2.016</sub>   | 42.34 | 41.98 | 41.37                     | 41.897    | FRESH FEED        |        | 408.3    | 57     | 2283032              |             |        |        | OIL       | 6'18"    | 355.86               | 43            | 1.0084         | 358.85     | 50.0    |             |  |
| CO <sub>44.010</sub> | 26.70 | 27.05 | 28.25                     | 27.333    | 79.31             | 6.225  | 20.567   | 1.0029 | 1.5110               | 15387       | 40.545 |        | 3'11 1/2" | 211.83   | 51                   | 1.0044        | 212.76         | 6.490      |         |             |  |
| N <sub>28.016</sub>  | 1.26  | 1.54  | 1.40                      | 1.400     | WET GAS           |        | 1.50     | 60     | 1311259              |             |        |        |           |          |                      |               | +5.32          |            | +34.50  | 40.94       |  |
| CH <sub>16.042</sub> | 9.49  | 8.28  | 8.50                      | 8.757     | 158.44            | 5.571  | 4.025    | 1.0000 | 1.1451               | 4068        | 10.719 |        |           |          |                      |               | 151.41         |            | 982.65  | 6.309       |  |
| C <sub>30.048</sub>  | 2.02  | 1.88  | 2.14                      | 2.013     | RECYCLE           |        | 407.9    | 74     |                      |             |        |        |           |          |                      |               |                |            |         |             |  |
| C <sub>30.048</sub>  | 1.67  | 1.59  | 1.67                      | 1.643     | 79.31             | 8.500  | 20.557   | 0.9868 | 1.1451               | 15660       | 41.265 |        |           |          |                      |               |                |            |         |             |  |
| C <sub>42.078</sub>  | 2.37  | 2.35  | 2.62                      | 2.447     | BLEED             |        |          |        |                      |             |        |        |           |          |                      |               |                |            |         |             |  |
| C <sub>44.094</sub>  | 0.23  | 0.24  | 0.29                      | 0.253     | 5.02              | 8.063  | 20.557   | 1.0000 | 1.1451               | 953         | 2.511  |        | WATER     | 7'2 1/2" | 382.05               | 63            | 0.99973        | 381.95     | 10.7    |             |  |
| C <sub>58.120</sub>  | 1.58  | 1.65  | 1.57                      | 1.600     | NATURAL GAS       |        | 431.3    | 187    | 1459698              |             |        |        | 2'10"     | 105.19   | 62                   | 0.99982       | 105.17         | 8.287      |         |             |  |
| C <sub>70.132</sub>  | 0.67  | 0.74  | 0.45                      | 0.620     | 28.43             | 7.700  | 21.119   | 0.9965 | 1.2082               | 5008        | 13.196 |        | 2'5-3/4"  | 132.34   | 56                   | 1.00033       | 132.38         |            |         |             |  |
| C <sub>70.132</sub>  | 0.89  | 0.85  | 0.79                      | 0.943     | 439.5             |        |          | 56     |                      |             |        |        | 1'5 1/2"  | 75.97    | 54                   | 1.00047       | 76.01          |            |         |             |  |
| C <sub>72.146</sub>  | 0.20  | 0.24  | 0.13                      | 0.190     | OXYGEN            |        | 27.07    | 1.0039 |                      | 4001        | 10.543 |        |           |          |                      |               | +0.72          |            | +6.00   | 115.28      |  |
| C <sub>72.146</sub>  | 0.26  | 0.26  | 0.22                      | 0.247     | 27.4              |        |          |        |                      |             |        |        |           |          |                      |               | 333.87         |            | 2766.78 | 13.911      |  |
|                      |       |       | M. W                      | 22.078012 | STEAM             |        | 215.7    | 5.450  |                      |             |        |        |           |          |                      |               |                |            |         |             |  |

THE TEXAS COMPANY — MONTEBELLO LABORATORY

RUN NO. 65-N  
HOURS 304-326

Forced

| GAS ANALYSES                            |       |       |                            |           | GENERATOR BALANCE   |        |          |        |                                         |          |                 |        |        |        | WEIGHT BALANCE                      |                 |                |            |        |             |  |
|-----------------------------------------|-------|-------|----------------------------|-----------|---------------------|--------|----------|--------|-----------------------------------------|----------|-----------------|--------|--------|--------|-------------------------------------|-----------------|----------------|------------|--------|-------------|--|
| HOUR                                    | 1400  | 2200  | 0200                       | AVERAGE   | M/HR                | C      | H        | O      |                                         | Mol %    | M/HR            | C      | H      | O      |                                     | #/hr Measured   | At Wt. Balance |            |        |             |  |
| FRESH FEED                              |       |       |                            |           |                     |        |          |        | O <sub>2</sub><br>32.000                | 0.23     | 0.522<br>10.030 |        |        | 21.104 | WET GAS                             | 226.13<br>24.77 | 308.40         |            |        |             |  |
| CO<br>28.010                            | 37.13 | 37.01 | 36.88                      | 37.007    | 15.106              | 15.106 |          | 15.106 | CO <sub>2</sub><br>44.010               | 1.24     | 0.162           | 0.162  |        | 0.324  | OIL                                 | 42.42           | 52.14          |            |        |             |  |
| H <sub>2</sub><br>2.016                 | 60.53 | 60.46 | 60.55                      | 60.513    | 24.700              |        | 49.400   |        | N <sub>2</sub><br>28.016                | 1.86     | 0.242           |        |        |        | WATER                               | 125.33          | 154.05         |            |        |             |  |
| CO <sub>2</sub><br>44.010               | 1.89  | 2.28  | 2.26                       | 2.143     | 0.975               | 0.975  |          | 1.750  | CH <sub>4</sub><br>16.042               | 82.28    | 10.747          | 10.747 | 42.988 |        | TOTAL                               | 418.65          | 514.59         |            |        |             |  |
| N <sub>2</sub><br>28.016                | 0.23  | 0.16  | 0.21                       | 0.200     | 0.082               |        |          |        | C <sub>2</sub> H <sub>6</sub><br>30.068 | 6.70     | 0.975           | 1.750  | 5.250  |        | FRESH FEED                          | 514.59          |                |            |        |             |  |
| CH <sub>4</sub><br>16.042               | 0.22  | 0.09  | 0.10                       | 0.137     | 0.056               | 0.056  | 0.224    |        | C <sub>2</sub> H <sub>4</sub><br>28.054 | 5.27     | 0.688           | 2.064  | 5.504  |        | WEIGHT BALANCE                      | 81.36           |                |            |        |             |  |
|                                         |       |       | M.W.                       | 12.60675  |                     |        |          |        | C <sub>2</sub> H <sub>2</sub><br>26.040 | 1.72     | 0.225           | 0.900  | 2.250  |        | Forced Factor                       | 1229165         |                |            |        |             |  |
|                                         |       |       | H <sub>2</sub> O<br>18.016 |           |                     |        | 8.314    | 4.157  | C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.71     | 0.093           | 0.465  | 1.116  |        | WET GAS FACTOR                      | 1363817         |                |            |        |             |  |
|                                         |       |       |                            |           | 16.037              | 57.938 | 21.013   | MW     | 20.187188                               |          |                 |        |        |        | INDICATED LOSS—S C F H              | 1405            |                |            |        |             |  |
|                                         |       |       | BALANCE                    |           |                     | 99.68  | 101.45   | 9.806  | TOTAL                                   |          |                 | 16.088 | 57.108 | 21.428 |                                     | 5924            |                |            |        |             |  |
| WET GAS                                 |       |       |                            |           | GAS FLOW RATES      |        |          |        |                                         |          |                 |        |        |        | LIQUID PRODUCT RATES Basis 21 hours |                 |                |            |        |             |  |
| CO<br>28.010                            | 9.96  | 10.57 | 9.47                       | 10.000    |                     | V.R.   | PRESSURE | TEMP.  | M.W.                                    | S.C.F.H. | M/HR            | HOUR   | GAGE   | GAL.   | "F                                  | FACTOR          | GAL AT 6"      | API #/GAL. | #      | # HR GAL HR |  |
| H <sub>2</sub><br>2.016                 | 42.33 | 41.68 | 41.91                      | 41.973    | FRESH FEED<br>79.31 |        | 408.4    | 57     | 2296388                                 |          |                 |        | OIL    | 7'5"   | 392.96                              | 52              | 1.0039         | 394.49     | 51.0   |             |  |
| CO <sub>2</sub><br>44.010               | 27.35 | 27.89 | 28.39                      | 27.877    |                     | 6.248  | 20.569   | 1.0029 | 1.5154                                  | 15491    | 40.819          |        | 6'8½"  | 355.86 | 43                                  | 1.0084          | 358.85         | 6.455      |        |             |  |
| N <sub>2</sub><br>28.016                | 1.47  | 1.52  | 1.42                       | 1.470     | WET GAS             |        | 1.50     | 59     | 1302916                                 |          |                 |        | 3'4"   | 179.09 | 40                                  | 1.0099          | 180.86         |            |        |             |  |
| CH <sub>4</sub><br>16.042               | 8.93  | 8.15  | 8.90                       | 8.660     |                     | 158.44 | 5.300    | 4.025  | 1.0010                                  | 1.1415   | 3862            | 10.177 | 1'6½"  | 80.37  | 50                                  | 1.0049          | 80.76          |            |        |             |  |
| C <sub>2</sub> H <sub>6</sub><br>30.068 | 1.99  | 1.85  | 2.21                       | 2.010     | RECYCLE             |        | 406.9    | 78     |                                         |          |                 |        |        |        |                                     |                 | +2.25          | +14.50     | 42.42  |             |  |
| C <sub>2</sub> H <sub>4</sub><br>28.054 | 1.63  | 1.64  | 1.70                       | 1.657     |                     | 79.31  | 8.010    | 20.533 | 0.9831                                  | 1.1415   | 14638           | 38.572 |        |        |                                     |                 | 137.99         | 890.73     | 6.571  |             |  |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 2.28  | 2.38  | 2.72                       | 2.460     | BLEED               |        |          |        |                                         |          |                 |        |        |        |                                     |                 |                |            |        |             |  |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.20  | 0.23  | 0.26                       | 0.230     |                     | 5.02   | 8.095    | 20.533 | 1.0000                                  | 1.1415   | 952             | 2.509  | WATER  | 7'2½"  | 382.05                              | 62              | 0.99982        | 381.98     | 10.7   |             |  |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 1.67  | 1.70  | 1.50                       | 1.623     | NATURAL GAS         |        |          | 432.2  | 190                                     | 1434077  |                 |        |        | 2'10"  | 105.19                              | 62              | 0.99982        | 105.17     | 8.287  |             |  |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.74  | 0.86  | 0.42                       | 0.673     |                     | 28.43  | 7.700    | 21.140 | 0.8944                                  | 1.1975   | 4957            | 13.082 |        | 1'6-¾" | 81.48                               | 55              | 1.0039         | 81.51      |        |             |  |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.91  | 0.89  | 0.71                       | 0.837     | OXYGEN              |        |          | 440.0  | 59                                      |          |                 |        |        | 0'9½"  | 41.26                               | 42              | 1.00116        | 41.31      |        |             |  |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.26  | 0.31  | 0.20                       | 0.257     |                     | 6.910  | 21.324   | 1.0010 |                                         | 3993     | 10.522          |        |        |        |                                     |                 | +0.60          | +5.00      | 125.33 |             |  |
| C <sub>2</sub> H <sub>2</sub><br>26.040 | 0.28  | 0.35  | 0.19                       | 0.273     |                     |        |          | 25.7   |                                         |          |                 |        |        |        |                                     |                 |                |            |        |             |  |
|                                         |       |       | M.W.                       | 22.219367 | STEAM               |        | 5.548    |        |                                         |          |                 |        |        |        |                                     |                 | 317.61         | 2632.03    | 15.124 |             |  |