

WIDLAND, TEXAS

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1324687049

SOUTH HOBBS UNIT #222

LEA CO., NEW MEXICO

06/20/87

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# THE RADIUS OF CURVATURE

CALCULATED USING PROPOSAL OF S 20-35 W

0-1569- MULTISHOT D, RODGERS

COMPANY REPRESENTATIVE

SCIENTIFIC DRILLING INT'L.  
MIDLAND, TEXAS

PAGE 1

JOB NUMBER: 132M687049

DATE: 06/20/87

INRUN SURVEY

BY

THE RADIUS OF CURVATURE

| MEAS.<br>DEPTH | VERT.<br>DEPTH | VERT.<br>SECT. | COURSE<br>DEV. | INC<br>D M | BEARING<br>D M | COORDINATES<br>LATITUDE DEPARTURE | D-LEG<br>PER 100 |
|----------------|----------------|----------------|----------------|------------|----------------|-----------------------------------|------------------|
| 81.00          | 81.00          | .28            | .35            | 0-30 S     | 59- 0 W        | .18 S .30 W                       | .62              |
| 143.00         | 143.00         | .63            | .40            | 0-15 S     | 39- 0 W        | .45 S .61 W                       | .45              |
| 205.00         | 205.00         | .78            | .54            | 0-45 N     | 34- 0 W        | .43 S 1.07 W                      | 1.38             |
| 267.00         | 266.99         | .11            | .95            | 1- 0 N     | 14- 0 W        | .44 N 1.46 W                      | .63              |
| 329.00         | 328.98         | -.66           | .81            | 0-30 N     | 39- 0 E        | 1.20 N 1.29 W                     | 1.30             |
| 391.00         | 390.98         | -1.46          | .81            | 1- 0 N     | 11- 0 E        | 1.93 N .95 W                      | .98              |
| 453.00         | 452.97         | -2.25          | .81            | 0-30 N     | 1- 0 E         | 2.74 N .86 W                      | .83              |
| 515.00         | 514.97         | -2.47          | .40            | 0-15 N     | 68- 0 W        | 3.05 N 1.07 W                     | .76              |
| 577.00         | 576.97         | -2.75          | .68            | 1- 0 N     | 19- 0 W        | 3.53 N 1.52 W                     | 1.38             |
| 639.00         | 638.96         | -3.56          | 1.08           | 1- 0 N     | 22- 0 W        | 4.54 N 1.90 W                     | .08              |
| 701.00         | 700.95         | -3.83          | .81            | 0-30 N     | 76- 0 W        | 5.06 N 2.49 W                     | 1.31             |
| 763.00         | 762.95         | -3.57          | .54            | 0-30 S     | 57- 0 W        | 4.97 N 3.01 W                     | .64              |
| 825.00         | 824.95         | -3.61          | .54            | 0-30 N     | 4- 0 W         | 5.17 N 3.41 W                     | 1.39             |
| 887.00         | 886.95         | -4.01          | .46            | 0-15 N     | 40- 0 E        | 5.54 N 3.29 W                     | .59              |
| 949.00         | 948.94         | -4.13          | .14            | 0- 0       | N / A          | 5.65 N 3.20 W                     | .40              |

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SCIENTIFIC DRILLING INT'L.  
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|----------------|----------------|----------------|----------------|------------|----------------|-----------------------------------|------------------|
| 1011.00        | 1010.94        | -3.95          | .27            | 0-30 S     | 69- 0 W        | 5.55 N                            | 3.46 W           |
| 1073.00        | 1072.94        | -3.69          | .40            | 0-15 S     | 73- 0 W        | 5.42 N                            | 3.84 W           |
| 1135.00        | 1134.94        | -3.40          | .40            | 0-30 S     | 56- 0 W        | 5.25 N                            | 4.20 W           |
| 1197.00        | 1196.94        | -3.05          | .68            | 0-45 N     | 78- 0 W        | 5.12 N                            | 4.85 W           |
| 1259.00        | 1258.93        | -3.01          | .95            | 1- 0 N     | 66- 0 W        | 5.41 N                            | 5.75 W           |
| 1321.00        | 1320.93        | -2.94          | .68            | 0-15 N     | 83- 0 W        | 5.59 N                            | 6.40 W           |
| 1383.00        | 1382.93        | -2.78          | .27            | 0-15 S     | 51- 0 W        | 5.52 N                            | 6.65 W           |
| 1445.00        | 1444.92        | -2.44          | .40            | 0-30 S     | 46- 0 E        | 5.16 N                            | 6.67 W           |
| 1507.00        | 1506.92        | -2.20          | .54            | 0-30 S     | 39- 0 E        | 4.76 N                            | 6.30 W           |
| 1569.00        | 1568.92        | -2.08          | .54            | 0-30 S     | 73- 0 E        | 4.47 N                            | 5.86 W           |
| 1665.00        | 1664.92        | -2.10          | .63            | 0-15 S     | 68- 0 E        | 4.26 N                            | 5.27 W           |
| 1727.00        | 1726.92        | -2.08          | .27            | 0-15 S     | 63- 0 E        | 4.14 N                            | 5.02 W           |
| 1789.00        | 1788.91        | -1.53          | .81            | 1-15 S     | 20- 0 W        | 3.45 N                            | 4.75 W           |
| 1851.00        | 1850.85        | 1.17           | 2.70           | 3-45 S     | 21- 0 W        | .92 N                             | 5.70 W           |
| 1913.00        | 1912.57        | 6.98           | 5.81           | 7- 0 S     | 20- 0 W        | 4.52 S                            | 7.73 W           |

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|----------------|----------------|----------------|----------------|------------|----------------|-------------------------|-----------|------------------|
| 1975.00        | 1974.09        | 14.67          | 7.69           | 7-15       | S 20- 0 W      | 11.74 S                 | 10.36 W   | .40              |
| 2037.00        | 2035.57        | 22.63          | 7.96           | 7-30       | S 19- 0 W      | 19.25 S                 | 13.02 W   | .45              |
| 2099.00        | 2097.01        | 30.98          | 8.36           | 8- 0       | S 19- 0 W      | 27.15 S                 | 15.74 W   | .81              |
| 2161.00        | 2158.35        | 40.00          | 9.03           | 8-45       | S 17- 0 W      | 35.74 S                 | 18.53 W   | 1.30             |
| 2223.00        | 2219.60        | 49.55          | 9.57           | 9- 0       | S 18- 0 W      | 44.86 S                 | 21.41 W   | .47              |
| 2285.00        | 2280.73        | 59.90          | 10.37          | 10-15      | S 19- 0 W      | 54.69 S                 | 24.70 W   | 2.03             |
| 2347.00        | 2341.72        | 71.07          | 11.17          | 10-30      | S 20- 0 W      | 65.22 S                 | 28.42 W   | .50              |
| 2409.00        | 2402.60        | 82.75          | 11.70          | 11-15      | S 17- 0 W      | 76.31 S                 | 32.14 W   | 1.52             |
| 2471.00        | 2463.33        | 95.22          | 12.49          | 12- 0      | S 17- 0 W      | 88.26 S                 | 35.79 W   | 1.21             |
| 2533.00        | 2523.89        | 108.46         | 13.29          | 12-45      | S 16- 0 W      | 101.00 S                | 39.56 W   | 1.26             |
| 2595.00        | 2584.27        | 122.48         | 14.08          | 13-30      | S 15- 0 W      | 114.56 S                | 43.32 W   | 1.26             |
| 2657.00        | 2644.36        | 137.69         | 15.26          | 15- 0      | S 18- 0 W      | 129.19 S                | 47.66 W   | 2.70             |
| 2719.00        | 2704.21        | 153.84         | 16.18          | 15-15      | S 17- 0 W      | 144.62 S                | 52.52 W   | .58              |
| 2781.00        | 2763.92        | 170.51         | 16.70          | 16- 0      | S 18- 0 W      | 160.55 S                | 57.54 W   | 1.29             |
| 2843.00        | 2823.48        | 187.72         | 17.22          | 16-15      | S 19- 0 W      | 176.88 S                | 63.01 W   | .60              |

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|----------------|----------------|----------------|----------------|------------|----------------|-----------------------------------|------------------|
| 2905.00        | 2882.97        | 205.19         | 17.48          | 16-30 S    | 19- 0 W        | 193.41 S 68.70 W                  | .40              |
| 2967.00        | 2942.34        | 223.05         | 17.87          | 17- 0 S    | 22- 0 W        | 210.14 S 74.96 W                  | 1.61             |
| 3029.00        | 3001.63        | 241.18         | 18.13          | 17- 0 S    | 21- 0 W        | 227.01 S 81.60 W                  | .47              |
| 3091.00        | 3060.88        | 259.43         | 18.26          | 17-15 S    | 22- 0 W        | 243.99 S 88.29 W                  | .62              |
| 3153.00        | 3120.13        | 277.68         | 18.26          | 17- 0 S    | 24- 0 W        | 260.80 S 95.42 W                  | 1.03             |
| 3215.00        | 3179.42        | 295.78         | 18.13          | 17- 0 S    | 24- 0 W        | 277.36 S 102.79 W                 | .00              |
| 3277.00        | 3238.71        | 313.87         | 18.13          | 17- 0 S    | 25- 0 W        | 293.85 S 110.31 W                 | .47              |
| 3339.00        | 3298.16        | 331.38         | 17.61          | 16- 0 S    | 29- 0 W        | 309.54 S 118.30 W                 | 2.44             |
| 3401.00        | 3357.86        | 347.93         | 16.70          | 15-15 S    | 28- 0 W        | 324.21 S 126.27 W                 | 1.29             |
| 3432.00        | 3387.79        | 355.96         | 8.09           | 15- 0 S    | 27- 0 W        | 331.39 S 130.01 W                 | 1.17             |
| 3472.00        | 3426.43        | 366.26         | 10.35          | 15- 0 S    | 27- 0 W        | 340.61 S 134.71 W                 | .00              |
| 3479.00        | 3433.19        | 368.06         | 1.81           | 15- 0 S    | 26- 0 W        | 342.23 S 135.52 W                 | 3.70             |
| 3541.00        | 3493.08        | 384.04         | 16.05          | 15- 0 S    | 26- 0 W        | 356.66 S 142.55 W                 | .00              |
| 3603.00        | 3552.96        | 400.01         | 16.05          | 15- 0 S    | 27- 0 W        | 371.02 S 149.71 W                 | .42              |
| 3665.00        | 3612.85        | 415.98         | 16.05          | 15- 0 S    | 26- 0 W        | 385.38 S 156.87 W                 | .42              |

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|----------------|----------------|----------------|----------------|------------|----------------|-----------------------------------|------------------|
| 3727.00        | 3672.67        | 432.21         | 16.31          | 15-30 S    | 27- 0 W        | 399.97 S 164.15 W                 | .91              |
| 3789.00        | 3732.41        | 448.75         | 16.57          | 15-30 S    | 21- 0 W        | 415.10 S 170.88 W                 | 2.59             |
| 3851.00        | 3792.16        | 465.24         | 16.57          | 15-30 S    | 11- 0 W        | 431.01 S 175.44 W                 | 4.31             |
| 3913.00        | 3851.83        | 481.73         | 16.83          | 16- 0 S    | 8- 0 W         | 447.60 S 178.22 W                 | 1.54             |
| 3975.00        | 3911.35        | 498.61         | 17.35          | 16-30 S    | 7- 0 W         | 464.80 S 180.49 W                 | .92              |
| 4037.00        | 3970.64        | 516.21         | 18.13          | 17-30 S    | 7- 0 W         | 482.80 S 182.69 W                 | 1.61             |
| 4099.00        | 4029.52        | 535.05         | 19.42          | 19- 0 S    | 7- 0 W         | 502.07 S 185.06 W                 | 2.42             |
| 4161.00        | 4087.69        | 555.88         | 21.46          | 21-30 S    | 7- 0 W         | 523.36 S 187.68 W                 | 4.03             |
| 4223.00        | 4145.17        | 578.42         | 23.23          | 22-30 S    | 7- 0 W         | 546.42 S 190.51 W                 | 1.61             |
| 4285.00        | 4202.24        | 601.94         | 24.23          | 23-30 S    | 7- 0 W         | 570.46 S 193.46 W                 | 1.61             |
| 4347.00        | 4258.77        | 626.65         | 25.46          | 25- 0 S    | 7- 0 W         | 595.73 S 196.56 W                 | 2.42             |
| 4360.00        | 4270.53        | 632.03         | 5.55           | 25-30 S    | 6- 0 W         | 601.24 S 197.19 W                 | 5.06             |

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MIDLAND, TEXAS

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INRUN SURVEY

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| MEAS.<br>DEPTH | VERT.<br>DEPTH | VERT.<br>SECT. | COURSE<br>DEV. | INC<br>D M | BEARING<br>D M | COORDINATES<br>LATITUDE DEPARTURE | D-LEG<br>PER 100 |
|----------------|----------------|----------------|----------------|------------|----------------|-----------------------------------|------------------|
| 4390.00        | 4297.61        | 644.51         | 12.92          | 25-30 S    | 6- 0 W         | 614.09 S 198.54 W                 | .00              |

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THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF

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4390.00 FEET EQUALS 645.39 FEET AT S 17-55 W.

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SCIENTIFIC DRILLING CONTROLS

SURVEY CERTIFICATION

COMPANY Amoco Production Company WELL NAME & NO. South Hobbs Unit #222  
DATE of CERTIFICATION July 05, 1987 LOCATION Lea County, New Mexico  
TYPE of SURVEY Magnetic Multishot FROM 00' TO 3472'  
JOB NUMBER 132M687049 TICKET NUMBER \_\_\_\_\_

THE ABOVE SURVEY WAS PERFORMED BY ME ON June 20 & 24 1987  
THE RESULTS OBTAINED FROM ACTUAL FIELD DATA CONFORM TO ESTABLISHED  
STANDARDS AND ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE.

Deora Moody  
SURVEYOR

FILM TRANSFER RECEIPT

I HEREBY ACKNOWLEDGE RECEIPT OF ORIGINAL FILM OBTAINED ON THE ABOVE  
SURVEY.

DATE RECEIVED \_\_\_\_\_ 19\_\_\_\_

COMPANY REPRESENTATIVE \_\_\_\_\_

SURVEY CONFIRMATION

I HAVE EXAMINED THE ABOVE SURVEY AND FOUND THE DATA AND RESULTS  
ACCEPTABLE ACCORDING TO CURRENT SCIENTIFIC DRILLING CONTROLS STANDARDS.

Candlyn Sutter 8-28-87  
Notary for Ector Co.  
Com. Exp. 10-87

Deora Moody  
S.D.C. REPRESENTATIVE

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SMITH DRILLING SYSTEMS

SURVEY CERTIFICATION

COMPANY AMOCO PRODUCTION CO. WELL NAME & NO. SOUTH HOBBS UNIT # 222  
DATE of CERTIFICATION 06-29-87 LOCATION LEA COUNTY, NEW MEXICO  
TYPE of SURVEY MAGNETIC MULTISHOT FROM 3479' TO 4390'  
JOB NUMBER 08706115 TICKET NUMBER 0120

THE ABOVE SURVEY WAS PERFORMED BY ME ON JUNE - 28 19 87  
THE RESULTS OBTAINED FROM ACTUAL FIELD DATA CONFORM TO ESTABLISHED STANDARDS AND ARE  
TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE.

GARRY HENDRIX / [Signature]  
SURVEYOR / DIRECTIONAL DRILLER

FILM TRANSFER RECEIPT

I HEREBY ACKNOWLEDGE RECEIPT OF ORIGINAL FILM OBTAINED ON THE ABOVE SURVEY.

DATE RECEIVED 19

COMPANY REPRESENTATIVE

SURVEY CONFIRMATION

I HAVE EXAMINED THE ABOVE SURVEY AND FOUND THE DATA AND RESULTS ACCEPTABLE ACCORDING  
TO CURRENT SMITH DRILLING SYSTEMS STANDARDS.

[Signature]  
Notary Public  
June 30, 1987  
Date  
Ecator County  
8/88

JIM AGNEW / [Signature]  
S.D.S. REPRESENTATIVE