



**Scientific  
Drilling**

## Directional Survey Certification



RE: Williams Production Co. Operator  
N-26-31N-4W Rosa Unit #310 Well Name & No.  
30-039-24863 Rio Arriba County, NM Location  
41DEF0902215 SDI Job No.

I, Judi Moore, having personal knowledge of all the facts, hereby  
 certify that the attached directional survey run from a measured depth of 200 feet to a  
 measured depth of 5765 feet is true and correct as determined from all available records.

Judi Moore Well Planner SDI  
 Signature Title Company

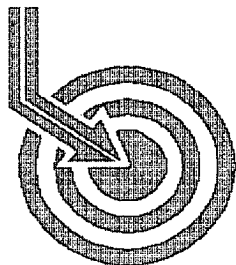
State of : Wyoming }  
 County of : Natrona } ss

On this 1st day of October, 2002, before me personally appeared  
Judi Moore to me known as the person described in and who executed the foregoing  
 instrument and acknowledged that (s)he executed the same as his/her free act and deed.

Seal

[Signature]  
 Notary Public

Aug 18, 2004  
 My Commission Expires



**Scientific  
Drilling**

**DIRECTIONAL SURVEY REPORT**

**Prepared For**

**WILLIAMS PRODUCTION CO.  
Rosa Unit #310  
Rio Arriba County, NM**

***Prepared By:  
Judi Moore - Well Planner  
Scientific Drilling International  
Rocky Mountain District***

Scientific Drilling International  
7237 W. Barton Rd., Casper, WY 82604  
P.O. Box 1600, Mills, WY 82644  
(307) 472-6621  
judimoore\_sdi@attbi.com



# Scientific Drilling Survey Completion Report

|                                         |  |                                   |  |                                     |  |                   |  |
|-----------------------------------------|--|-----------------------------------|--|-------------------------------------|--|-------------------|--|
| <b>Company:</b> Williams Production Co. |  | <b>Date:</b> 9/27/2002            |  | <b>Time:</b> 12:10:25               |  | <b>Page:</b> 1    |  |
| <b>Field:</b> Rio Arriba County, NM     |  | <b>Co-ordinate(NE) Reference:</b> |  | <b>Well:</b> #310, True North       |  |                   |  |
| <b>Site:</b> Rosa Unit #310             |  | <b>Vertical (TVD) Reference:</b>  |  | <b>SITE</b> 0.0                     |  |                   |  |
| <b>Well:</b> #310                       |  | <b>Section (VS) Reference:</b>    |  | <b>Well</b> (0.00N,0.00E,332.00Azi) |  |                   |  |
| <b>Wellpath:</b> OH                     |  | <b>Survey Calculation Method:</b> |  | <b>Minimum Curvature</b>            |  | <b>Db:</b> Sybase |  |

|                                     |  |                              |  |
|-------------------------------------|--|------------------------------|--|
| <b>Survey:</b> Survey #1            |  | <b>Start Date:</b> 9/18/2002 |  |
| <b>Company:</b> Scientific Drilling |  | <b>Engineer:</b> Sears       |  |
| <b>Tool:</b> MWD,                   |  | <b>Tied-to:</b> From Surface |  |

|                                                          |  |                                           |  |
|----------------------------------------------------------|--|-------------------------------------------|--|
| <b>Field:</b> Rio Arriba County, NM                      |  |                                           |  |
| <b>Map System:</b> US State Plane Coordinate System 1927 |  | <b>Map Zone:</b> New Mexico, Central Zone |  |
| <b>Geo Datum:</b> NAD27 (Clarke 1866)                    |  | <b>Coordinate System:</b> Well Centre     |  |
| <b>Sys Datum:</b> Mean Sea Level                         |  | <b>Geomagnetic Model:</b> igrf2000        |  |

|                                                                         |                  |           |                                    |
|-------------------------------------------------------------------------|------------------|-----------|------------------------------------|
| <b>Site:</b> Rosa Unit #310<br>SHL SEC.26,T31N,R4W 1245'FSL & 1850' FWL |                  |           |                                    |
| <b>Site Position:</b>                                                   | <b>Northing:</b> | <b>ft</b> | <b>Latitude:</b>                   |
| <b>From:</b> Lease Line                                                 | <b>Easting:</b>  | <b>ft</b> | <b>Longitude:</b>                  |
| <b>Position Uncertainty:</b> 0.00 ft                                    |                  |           | <b>North Reference:</b> True       |
| <b>Ground Level:</b> 0.00 ft                                            |                  |           | <b>Grid Convergence:</b> -0.15 deg |

|                                      |                      |                                |                                  |
|--------------------------------------|----------------------|--------------------------------|----------------------------------|
| <b>Well:</b> #310                    |                      | <b>Slot Name:</b>              |                                  |
| <b>Well Position:</b>                | <b>+N/-S</b> 0.00 ft | <b>Northing:</b> 2183329.13 ft | <b>Latitude:</b> 36 59 59.999 N  |
|                                      | <b>+E/-W</b> 0.00 ft | <b>Easting :</b> 426997.34 ft  | <b>Longitude:</b> 106 30 0.000 W |
| <b>Position Uncertainty:</b> 0.00 ft |                      |                                |                                  |

|                                           |                       |                                           |        |
|-------------------------------------------|-----------------------|-------------------------------------------|--------|
| <b>Wellpath:</b> OH                       |                       | <b>Drilled From:</b> Surface              |        |
| <b>Current Datum:</b> SITE                | <b>Height</b> 0.00 ft | <b>Tie-on Depth:</b> 0.00 ft              |        |
| <b>Magnetic Data:</b> 8/28/2002           |                       | <b>Above System Datum:</b> Mean Sea Level |        |
| <b>Field Strength:</b> 52093 nT           |                       | <b>Declination:</b> 10.58 deg             |        |
| <b>Vertical Section:</b> Depth From (TVD) | <b>+N/-S</b> ft       | <b>Mag Dip Angle:</b> 64.19 deg           |        |
|                                           |                       | <b>+E/-W</b> ft                           |        |
|                                           |                       | <b>Direction</b> deg                      |        |
| 0.00                                      | 0.00                  | 0.00                                      | 332.00 |

| Survey           |                    |                |           |                 |           |           |                  |            |            |             |
|------------------|--------------------|----------------|-----------|-----------------|-----------|-----------|------------------|------------|------------|-------------|
| Meas Depth<br>ft | Inclination<br>deg | Azimuth<br>deg | TVD<br>ft | Vert Sect<br>ft | N/S<br>ft | E/W<br>ft | DLS<br>deg/100ft | CLen<br>ft | ClsD<br>ft | ClsA<br>deg |
| 0.00             | 0.00               | 0.00           | 0.00      | 0.00            | 0.00      | 0.00      | 0.00             | 0.00       | 0.00       | 0.00        |
| 200.00           | 0.05               | 184.37         | 200.00    | -0.07           | -0.09     | -0.01     | 0.02             | 200.00     | 0.09       | 184.37      |
| 400.00           | 0.15               | 212.77         | 400.00    | -0.28           | -0.39     | -0.16     | 0.05             | 200.00     | 0.42       | 201.47      |
| 600.00           | 0.27               | 165.27         | 600.00    | -0.86           | -1.07     | -0.18     | 0.10             | 200.00     | 1.08       | 189.39      |
| 800.00           | 0.48               | 165.99         | 799.99    | -2.13           | -2.34     | 0.15      | 0.11             | 200.00     | 2.34       | 176.43      |
| 1000.00          | 0.76               | 167.26         | 999.98    | -4.23           | -4.45     | 0.64      | 0.14             | 200.00     | 4.49       | 171.79      |
| 1200.00          | 0.57               | 136.11         | 1199.97   | -6.46           | -6.46     | 1.62      | 0.20             | 200.00     | 6.66       | 165.89      |
| 1400.00          | 0.64               | 119.30         | 1399.96   | -8.36           | -7.72     | 3.29      | 0.09             | 200.00     | 8.39       | 156.94      |
| 1600.00          | 0.69               | 110.75         | 1599.94   | -10.20          | -8.69     | 5.39      | 0.06             | 200.00     | 10.23      | 148.21      |
| 1800.00          | 0.72               | 119.57         | 1799.93   | -12.17          | -9.74     | 7.61      | 0.06             | 200.00     | 12.36      | 142.01      |
| 2000.00          | 0.76               | 71.54          | 1999.91   | -13.45          | -9.94     | 9.96      | 0.30             | 200.00     | 14.07      | 134.95      |
| 2200.00          | 1.14               | 72.73          | 2199.89   | -14.04          | -8.93     | 13.12     | 0.19             | 200.00     | 15.87      | 124.25      |
| 2400.00          | 1.29               | 87.63          | 2399.84   | -15.39          | -8.25     | 17.26     | 0.17             | 200.00     | 19.13      | 115.53      |
| 2600.00          | 1.70               | 85.05          | 2599.77   | -17.52          | -7.90     | 22.47     | 0.21             | 200.00     | 23.82      | 109.36      |
| 2800.00          | 2.08               | 87.10          | 2799.66   | -20.22          | -7.46     | 29.05     | 0.19             | 200.00     | 29.99      | 104.40      |
| 3000.00          | 2.34               | 84.90          | 2999.52   | -23.35          | -6.91     | 36.74     | 0.14             | 200.00     | 37.39      | 100.65      |
| 3173.00          | 2.18               | 25.80          | 3172.40   | -22.78          | -3.63     | 41.69     | 1.29             | 173.00     | 41.85      | 94.98       |
| 3203.00          | 6.40               | 346.90         | 3202.32   | -20.83          | -1.49     | 41.56     | 16.33            | 30.00      | 41.59      | 92.05       |
| 3234.00          | 9.30               | 327.00         | 3233.03   | -16.66          | 2.30      | 39.80     | 12.69            | 31.00      | 39.87      | 86.70       |
| 3265.00          | 12.30              | 320.40         | 3263.48   | -10.93          | 6.94      | 36.33     | 10.45            | 31.00      | 36.99      | 79.18       |
| 3297.00          | 16.30              | 316.20         | 3294.48   | -3.27           | 12.81     | 31.05     | 12.91            | 32.00      | 33.59      | 67.58       |
| 3328.00          | 20.60              | 314.40         | 3323.88   | 6.12            | 19.77     | 24.14     | 13.99            | 31.00      | 31.20      | 50.68       |
| 3359.00          | 24.70              | 316.20         | 3352.48   | 17.56           | 28.26     | 15.76     | 13.41            | 31.00      | 32.36      | 29.14       |
| 3390.00          | 28.20              | 321.60         | 3380.24   | 31.00           | 38.68     | 6.72      | 13.69            | 31.00      | 39.26      | 9.86        |



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Company: Williams Production Co.  
Field: Rio Arriba County, NM  
Site: Rosa Unit #310  
Well: #310  
Wellpath: OH

Date: 9/27/2002 Time: 12:10:25 Page: 2  
Co-ordinate(NE) Reference: Well: #310, True North  
Vertical (TVD) Reference: SITE 0.0  
Section (VS) Reference: Well (0.00N,0.00E,332.00Azi)  
Survey Calculation Method: Minimum Curvature Db: Sybase

## Survey

| Meas Depth<br>ft | Inclination<br>deg | Azimuth<br>deg | TVD<br>ft | Vert Sect<br>ft | N/S<br>ft | E/W<br>ft | DLS<br>deg/100ft | CLen<br>ft | ClsD<br>ft | ClsA<br>deg |
|------------------|--------------------|----------------|-----------|-----------------|-----------|-----------|------------------|------------|------------|-------------|
| 3422.00          | 31.60              | 325.10         | 3407.98   | 46.77           | 51.49     | -2.78     | 11.94            | 32.00      | 51.57      | 356.91      |
| 3454.00          | 33.40              | 326.70         | 3434.97   | 63.86           | 65.73     | -12.41    | 6.23             | 32.00      | 66.89      | 349.31      |
| 3484.00          | 36.90              | 328.70         | 3459.49   | 81.08           | 80.33     | -21.62    | 12.28            | 30.00      | 83.19      | 344.93      |
| 3516.00          | 40.10              | 330.30         | 3484.53   | 100.98          | 97.50     | -31.72    | 10.47            | 32.00      | 102.53     | 341.98      |
| 3547.00          | 43.10              | 330.80         | 3507.71   | 121.55          | 115.42    | -41.84    | 9.74             | 31.00      | 122.77     | 340.07      |
| 3578.00          | 46.50              | 330.30         | 3529.71   | 143.38          | 134.44    | -52.58    | 11.03            | 31.00      | 144.35     | 338.64      |
| 3609.00          | 49.50              | 330.30         | 3550.45   | 166.41          | 154.44    | -63.99    | 9.68             | 31.00      | 167.18     | 337.49      |
| 3640.00          | 53.00              | 331.40         | 3569.85   | 190.58          | 175.56    | -75.76    | 11.62            | 31.00      | 191.21     | 336.66      |
| 3672.00          | 56.80              | 331.90         | 3588.24   | 216.75          | 198.59    | -88.19    | 11.94            | 32.00      | 217.30     | 336.06      |
| 3703.00          | 60.80              | 332.00         | 3604.30   | 243.26          | 221.99    | -100.66   | 12.91            | 31.00      | 243.75     | 335.61      |
| 3734.00          | 65.00              | 332.80         | 3618.42   | 270.85          | 246.44    | -113.44   | 13.74            | 31.00      | 271.30     | 335.28      |
| 3765.00          | 69.10              | 333.70         | 3630.50   | 299.38          | 271.93    | -126.28   | 13.49            | 31.00      | 299.82     | 335.09      |
| 3797.00          | 72.00              | 333.90         | 3641.16   | 329.54          | 299.00    | -139.60   | 9.08             | 32.00      | 329.98     | 334.97      |
| 3829.00          | 74.00              | 333.80         | 3650.51   | 360.12          | 326.47    | -153.08   | 6.26             | 32.00      | 360.58     | 334.88      |
| 3860.00          | 77.70              | 333.00         | 3658.09   | 390.17          | 353.34    | -166.54   | 12.19            | 31.00      | 390.62     | 334.76      |
| 3886.00          | 80.60              | 331.80         | 3662.98   | 415.70          | 375.97    | -178.37   | 12.04            | 26.00      | 416.14     | 334.62      |
| 3922.00          | 85.20              | 331.50         | 3667.43   | 451.41          | 407.40    | -195.33   | 12.80            | 36.00      | 451.81     | 334.38      |
| 3957.00          | 85.60              | 334.00         | 3670.24   | 486.30          | 438.41    | -211.30   | 7.21             | 35.00      | 486.68     | 334.27      |
| 3988.00          | 86.00              | 334.00         | 3672.51   | 517.19          | 466.20    | -224.86   | 1.29             | 31.00      | 517.59     | 334.25      |
| 4020.00          | 85.10              | 331.80         | 3674.99   | 549.09          | 494.60    | -239.39   | 7.41             | 32.00      | 549.49     | 334.17      |
| 4051.00          | 83.60              | 331.30         | 3678.05   | 579.94          | 521.72    | -254.09   | 5.10             | 31.00      | 580.30     | 334.03      |
| 4083.00          | 84.40              | 331.90         | 3681.39   | 611.76          | 549.72    | -269.22   | 3.12             | 32.00      | 612.10     | 333.91      |
| 4114.00          | 90.10              | 327.60         | 3682.88   | 642.68          | 576.44    | -284.81   | 23.02            | 31.00      | 642.97     | 333.71      |
| 4142.00          | 89.40              | 325.60         | 3683.00   | 670.56          | 599.82    | -300.23   | 7.57             | 28.00      | 670.76     | 333.41      |
| 4174.00          | 88.00              | 327.10         | 3683.73   | 702.39          | 626.45    | -317.95   | 6.41             | 32.00      | 702.52     | 333.09      |
| 4236.00          | 87.10              | 330.80         | 3686.38   | 764.24          | 679.51    | -349.90   | 6.14             | 62.00      | 764.30     | 332.75      |
| 4299.00          | 92.70              | 334.10         | 3686.49   | 827.20          | 735.33    | -379.02   | 10.32            | 63.00      | 827.27     | 332.73      |
| 4330.00          | 92.20              | 333.60         | 3685.16   | 858.15          | 763.13    | -392.67   | 2.28             | 31.00      | 858.23     | 332.77      |
| 4393.00          | 90.60              | 334.00         | 3683.62   | 921.10          | 819.64    | -420.47   | 2.62             | 63.00      | 921.20     | 332.84      |
| 4456.00          | 87.90              | 333.70         | 3684.45   | 984.06          | 876.18    | -448.24   | 4.31             | 63.00      | 984.18     | 332.91      |
| 4487.00          | 88.00              | 336.50         | 3685.56   | 1014.99         | 904.28    | -461.28   | 9.03             | 31.00      | 1015.14    | 332.97      |
| 4542.00          | 91.24              | 335.54         | 3685.92   | 1069.85         | 954.53    | -483.63   | 6.14             | 55.00      | 1070.05    | 333.13      |
| 4572.00          | 90.48              | 337.97         | 3685.47   | 1099.74         | 982.09    | -495.46   | 8.49             | 30.00      | 1099.99    | 333.23      |
| 4635.00          | 89.86              | 336.32         | 3685.28   | 1162.48         | 1040.14   | -519.93   | 2.80             | 63.00      | 1162.85    | 333.44      |
| 4694.00          | 88.56              | 335.29         | 3686.10   | 1221.34         | 1093.95   | -544.11   | 2.81             | 59.00      | 1221.79    | 333.56      |
| 4758.00          | 86.87              | 338.14         | 3688.65   | 1285.07         | 1152.68   | -569.39   | 5.17             | 64.00      | 1285.64    | 333.71      |
| 4819.00          | 90.38              | 336.81         | 3690.11   | 1345.76         | 1209.00   | -592.74   | 6.15             | 61.00      | 1346.49    | 333.88      |
| 4882.00          | 91.82              | 334.32         | 3688.90   | 1408.62         | 1266.34   | -618.80   | 4.56             | 63.00      | 1409.44    | 333.96      |
| 4915.00          | 93.30              | 334.12         | 3687.43   | 1441.56         | 1296.02   | -633.14   | 4.53             | 33.00      | 1442.41    | 333.96      |
| 4947.00          | 89.59              | 332.47         | 3686.62   | 1473.54         | 1324.60   | -647.51   | 12.69            | 32.00      | 1474.39    | 333.95      |
| 4978.00          | 86.28              | 330.55         | 3687.74   | 1504.51         | 1351.82   | -662.28   | 12.34            | 31.00      | 1505.34    | 333.90      |
| 5041.00          | 89.52              | 331.30         | 3690.05   | 1567.45         | 1406.84   | -692.87   | 5.28             | 63.00      | 1568.20    | 333.78      |
| 5104.00          | 91.31              | 330.07         | 3689.59   | 1630.42         | 1461.76   | -723.72   | 3.45             | 63.00      | 1631.11    | 333.66      |
| 5199.00          | 89.14              | 326.93         | 3689.22   | 1725.23         | 1542.75   | -773.34   | 4.02             | 95.00      | 1725.73    | 333.38      |
| 5294.00          | 89.90              | 330.25         | 3690.01   | 1820.04         | 1623.81   | -822.84   | 3.58             | 95.00      | 1820.40    | 333.13      |
| 5388.00          | 88.31              | 329.04         | 3691.48   | 1913.95         | 1704.91   | -870.34   | 2.13             | 94.00      | 1914.21    | 332.96      |
| 5420.00          | 89.30              | 331.82         | 3692.15   | 1945.93         | 1732.74   | -886.13   | 9.22             | 32.00      | 1946.17    | 332.91      |
| 5483.00          | 89.45              | 331.97         | 3692.84   | 2008.92         | 1788.30   | -915.80   | 0.34             | 63.00      | 2009.16    | 332.88      |
| 5514.00          | 87.97              | 329.32         | 3693.54   | 2039.90         | 1815.31   | -930.99   | 9.79             | 31.00      | 2040.13    | 332.85      |
| 5577.00          | 90.28              | 331.44         | 3694.50   | 2102.86         | 1870.07   | -962.12   | 4.98             | 63.00      | 2103.05    | 332.77      |
| 5640.00          | 89.83              | 325.75         | 3694.44   | 2165.72         | 1923.82   | -994.94   | 9.06             | 63.00      | 2165.86    | 332.65      |
| 5702.00          | 89.90              | 322.07         | 3694.58   | 2227.10         | 1973.91   | -1031.45  | 5.94             | 62.00      | 2227.15    | 332.41      |



# Scientific Drilling Survey Completion Report

**Company:** Williams Production Co.  
**Field:** Rio Arriba County, NM  
**Site:** Rosa Unit #310  
**Well:** #310  
**Wellpath:** OH

**Date:** 9/27/2002 **Time:** 12:10:25 **Page:** 3  
**Co-ordinate(NE) Reference:** Well: #310, True North  
**Vertical (TVD) Reference:** SITE 0.0  
**Section (VS) Reference:** Well (0.00N,0.00E,332.00Azi)  
**Survey Calculation Method:** Minimum Curvature **Db:** Sybase

## Survey

| Meas Depth<br>ft | Inclination<br>deg | Azimuth<br>deg | TVD<br>ft | Vert Sect<br>ft | N/S<br>ft | E/W<br>ft | DLS<br>deg/100ft | CLen<br>ft | ClSD<br>ft | ClSA<br>deg |
|------------------|--------------------|----------------|-----------|-----------------|-----------|-----------|------------------|------------|------------|-------------|
| 5765.00          | 89.83              | 320.80         | 3694.73   | 2289.03         | 2023.17   | -1070.73  | 2.02             | 63.00      | 2289.03    | 332.11      |



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# Williams Production Co.

Field: Rio Arriba County, NM  
Site: Rosa Unit #310  
Well: #310  
Wellpath: OH  
Survey: Survey #1

