

DISTRICT I  
1625 N. French Dr., Hobbs, NM 88240  
DISTRICT II  
1301 W. Grand Avenue, Artesia, NM 88210  
DISTRICT III  
1000 Rio Brazos Rd., Aztec, NM 87410  
DISTRICT IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

RECEIVED

JAN 12 2012

State of New Mexico  
Energy, Minerals and Natural Resources Department

Form C-102  
Revised July 10, 2010

Submit one copy to appropriate  
District Office

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.  
Santa Fe, New Mexico 87505

ARTESIA

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

|                           |                                                 |                                  |
|---------------------------|-------------------------------------------------|----------------------------------|
| API Number<br>30015-38659 | Pool Code<br>96403                              | Pool Name<br>Bone Spring Wildcat |
| Property Code<br>21500    | Property Name<br>EMPIRE "A" FEDERAL COM         | Well Number<br>3                 |
| OGRID No.<br>162683       | Operator Name<br>CIMAREX ENERGY CO. OF COLORADO | Elevation<br>3448'               |

Surface Location

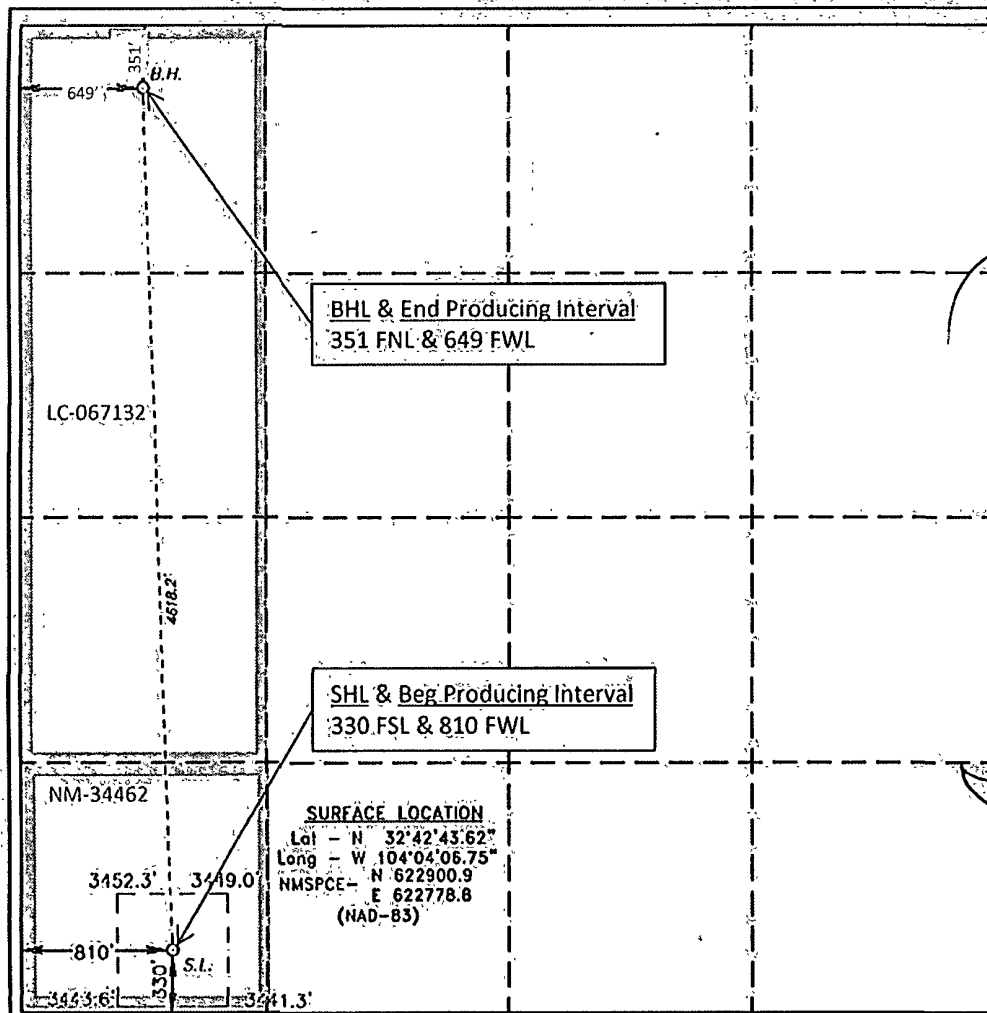
|                    |               |                  |               |         |                      |                           |                      |                        |                |
|--------------------|---------------|------------------|---------------|---------|----------------------|---------------------------|----------------------|------------------------|----------------|
| UL or lot No.<br>M | Section<br>27 | Township<br>18 S | Range<br>29 E | Lot Idn | Feet from the<br>330 | North/South line<br>SOUTH | Feet from the<br>810 | East/West line<br>WEST | County<br>EDDY |
|--------------------|---------------|------------------|---------------|---------|----------------------|---------------------------|----------------------|------------------------|----------------|

Bottom Hole Location If Different From Surface

|                    |               |                  |               |         |                      |                           |                      |                        |                |
|--------------------|---------------|------------------|---------------|---------|----------------------|---------------------------|----------------------|------------------------|----------------|
| UL or lot No.<br>D | Section<br>27 | Township<br>18 S | Range<br>29 E | Lot Idn | Feet from the<br>351 | North/South line<br>NORTH | Feet from the<br>649 | East/West line<br>WEST | County<br>EDDY |
|--------------------|---------------|------------------|---------------|---------|----------------------|---------------------------|----------------------|------------------------|----------------|

|                        |                 |                         |           |
|------------------------|-----------------|-------------------------|-----------|
| Dedicated Acres<br>160 | Joint or Infill | Consolidation Code<br>P | Order No. |
|------------------------|-----------------|-------------------------|-----------|

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED  
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature: *Terri Stathem* Date: 1/11/2012

Printed Name: Terri Stathem  
Email Address: tstathem@cimarex.com

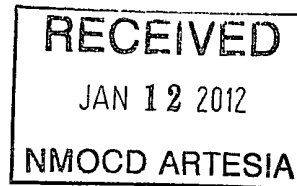
SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision and that the same is true and correct to the best of my belief.

Date Surveyed: JULY 27, 2010  
Signature & Seal of Professional Surveyor: *GARY L. JONES*  
Certificate No. 23205

Certificate No. Gary L. Jones 7977

BASIN SURVEYS 23205



1538659

## CIMAREX ENERGY

Bone Spring Wildcat  
Eddy County, NM  
Empire "A" Federal Com #3H  
VH - Job #32K0711645

Survey: Actual

## SDI Standard Survey Report

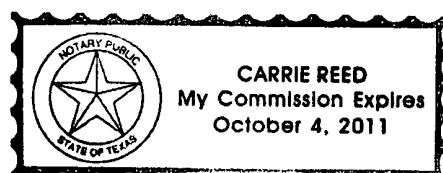
This survey is correct to the best of my knowledge and is supported by actual field data.

*Richard*

Notarized this date 1st of August, 2011.

*Carrie Reed*

Notary Signature  
County of Midland  
State of Texas



**Scientific Drilling International, Inc.**  
SDI Standard Survey Report



|                  |                            |                                     |                                     |
|------------------|----------------------------|-------------------------------------|-------------------------------------|
| <b>Company:</b>  | CIMAREX ENERGY             | <b>Local Co-ordinate Reference:</b> | Well Empire "A" Federal Com #3H     |
| <b>Project:</b>  | Bone Spring Wildcat        | <b>TVD Reference:</b>               | WELL @ 0 0usft (Original Well Elev) |
| <b>Site:</b>     | Eddy County, NM            | <b>MD Reference:</b>                | WELL @ 0 0usft (Original Well Elev) |
| <b>Well:</b>     | Empire "A" Federal Com #3H | <b>North Reference:</b>             | Grid                                |
| <b>Wellbore:</b> | VH - Job #32K0711645       | <b>Survey Calculation Method:</b>   | Minimum Curvature                   |
| <b>Design:</b>   | VH - Job #32K0711645       | <b>Database:</b>                    | EDM-Regulatory                      |

|                    |                                      |                      |                |
|--------------------|--------------------------------------|----------------------|----------------|
| <b>Project</b>     | Bone Spring Wildcat                  |                      |                |
| <b>Map System:</b> | US State Plane 1927 (Exact solution) | <b>System Datum:</b> | Mean Sea Level |
| <b>Geo Datum:</b>  | NAD 1927 (NADCON CONUS)              |                      |                |
| <b>Map Zone:</b>   | New Mexico East 3001                 |                      |                |

|                       |          |                 |                 |                   |                  |
|-----------------------|----------|-----------------|-----------------|-------------------|------------------|
| Site                  |          | Eddy County, NM |                 |                   |                  |
| Site Position:        |          | Northing:       | 622,880 73 usft | Latitude:         | 32° 42' 43 620 N |
| From:                 | Lat/Long | Easting:        | 581,443 41 usft | Longitude:        | 104° 4' 6 750 W  |
| Position Uncertainty: | 0 0 usft | Slot Radius:    | 0"              | Grid Convergence: | 0 14 °           |

|                      |                                                       |          |                     |                 |               |                  |
|----------------------|-------------------------------------------------------|----------|---------------------|-----------------|---------------|------------------|
| Well                 | Empire "A" Federal Com #3H, Directional (Great White) |          |                     |                 |               |                  |
| Well Position        | +N/-S                                                 | 0 0 usft | Northing:           | 622,880 73 usft | Latitude:     | 32° 42' 43 620 N |
|                      | +E/-W                                                 | 0 0 usft | Easting:            | 581,443 41 usft | Longitude:    | 104° 4' 6 750 W  |
| Position Uncertainty |                                                       | 0 0 usft | Wellhead Elevation: | usft            | Ground Level: | 0 0 usft         |

|                  |                      |                    |                            |                          |                                |
|------------------|----------------------|--------------------|----------------------------|--------------------------|--------------------------------|
| <b>Wellbore</b>  | VH - Job #32K0711645 |                    |                            |                          |                                |
| <b>Magnetics</b> | <b>Model Name</b>    | <b>Sample Date</b> | <b>Declination<br/>(°)</b> | <b>Dip Angle<br/>(°)</b> | <b>Field Strength<br/>(nT)</b> |
|                  | IGRF2010             | 7/8/2011           | 7 85                       | 60 55                    | 48,875                         |

|                   |                            |                      |                 |                   |
|-------------------|----------------------------|----------------------|-----------------|-------------------|
| Design            |                            | VH - Job #32K0711645 |                 |                   |
| Audit Notes:      |                            |                      |                 |                   |
| Version:          | 1 0                        | Phase:               | ACTUAL          | Tie On Depth: 0 0 |
| Vertical Section: | Depth From (TVD)<br>(usft) | +N/-S<br>(usft)      | +E/-W<br>(usft) | Direction<br>(°)  |
|                   | 0 0                        | 0 0                  | 0 0             | 287 79            |

|                        |                      |                               |                  |                    |
|------------------------|----------------------|-------------------------------|------------------|--------------------|
| <b>Survey Program</b>  | Date 8/25/2011       |                               |                  |                    |
| <b>From<br/>(usft)</b> | <b>To<br/>(usft)</b> | <b>Survey (Wellbore)</b>      | <b>Tool Name</b> | <b>Description</b> |
| 116 5                  | 8,050 4              | Actual (VH - Job #32K0711645) | Keeper           | Keeper Gyro        |

|                                  |                            |                        |                                |                               |                             |                                |                                    |     |
|----------------------------------|----------------------------|------------------------|--------------------------------|-------------------------------|-----------------------------|--------------------------------|------------------------------------|-----|
| <b>Survey</b>                    |                            |                        |                                |                               |                             |                                |                                    |     |
| <b>Measured Depth<br/>(usft)</b> | <b>Inclination<br/>(°)</b> | <b>Azimuth<br/>(°)</b> | <b>True Vertical<br/>Depth</b> | <b>North/South<br/>(usft)</b> | <b>East/West<br/>(usft)</b> | <b>Closure Azimuth<br/>(°)</b> | <b>Closure Distance<br/>(usft)</b> |     |
| 0 0                              | 0 00                       | 0 00                   | 0 0                            | 0 0                           | 0 0                         | 0 00                           | 0 0                                | 0 0 |
| 116 5                            | 0 64                       | 304 12                 | 116 5                          | 0 4                           | -0 5                        | 304 12                         | 0 7                                |     |
| 179 6                            | 0 35                       | 228 89                 | 179 6                          | 0 4                           | -1 0                        | 294 08                         | 1 1                                |     |
| 242 7                            | 0 68                       | 179 82                 | 242 7                          | -0 1                          | -1 1                        | 266 67                         | 1 1                                |     |
| 305 8                            | 0 67                       | 205 32                 | 305 8                          | -0 8                          | -1 3                        | 238 79                         | 1 5                                |     |
| 368 9                            | 0 78                       | 227 95                 | 368 9                          | -1 4                          | -1 8                        | 231 50                         | 2 2                                |     |
| 431 9                            | 0 69                       | 239 20                 | 431 9                          | -1 9                          | -2 4                        | 231 96                         | 3 0                                |     |
| 495 0                            | 0 67                       | 242 63                 | 495 0                          | -2 2                          | -3 1                        | 233 72                         | 3 8                                |     |
| 558 1                            | 0 56                       | 237 99                 | 558 1                          | -2 6                          | -3 6                        | 234 75                         | 4 5                                |     |
| 621 2                            | 0 38                       | 227 34                 | 621 2                          | -2 9                          | -4 1                        | 234.64                         | 5 0                                |     |
| 684 3                            | 0 17                       | 235 61                 | 684 3                          | -3 1                          | -4 3                        | 234 37                         | 5 3                                |     |
| 747 3                            | 0 39                       | 63 30                  | 747 3                          | -3 0                          | -4 2                        | 234 02                         | 5 2                                |     |

# Scientific Drilling International, Inc.

## SDI Standard Survey Report



|                  |                            |                                     |                                     |
|------------------|----------------------------|-------------------------------------|-------------------------------------|
| <b>Company:</b>  | CIMAREX ENERGY             | <b>Local Co-ordinate Reference:</b> | Well Empire "A" Federal Com #3H     |
| <b>Project:</b>  | Bone Spring Wildcat        | <b>TVD Reference:</b>               | WELL @ 0 0usft (Original Well Elev) |
| <b>Site:</b>     | Eddy County, NM            | <b>MD Reference:</b>                | WELL @ 0 0usft (Original Well Elev) |
| <b>Well:</b>     | Empire "A" Federal Com #3H | <b>North Reference:</b>             | Grid                                |
| <b>Wellbore:</b> | VH - Job #32K0711645       | <b>Survey Calculation Method:</b>   | Minimum Curvature                   |
| <b>Design:</b>   | VH - Job #32K0711645       | <b>Database:</b>                    | EDM-Regulatory                      |

| Survey                   |                    |                |                        |                       |                     |                        |                            |
|--------------------------|--------------------|----------------|------------------------|-----------------------|---------------------|------------------------|----------------------------|
| Measured Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | True Vertical<br>Depth | North/South<br>(usft) | East/West<br>(usft) | Closure Azimuth<br>(°) | Closure Distance<br>(usft) |
| 808 2                    | 1 42               | 78 04          | 808 2                  | -2 8                  | -3 2                | 229 45                 | 4 3                        |
| 869 1                    | 1 71               | 82 23          | 869 0                  | -2 5                  | -1 6                | 212 78                 | 3 0                        |
| 930 0                    | 1 81               | 79 51          | 929 9                  | -2 2                  | 0 2                 | 173 90                 | 2 2                        |
| 990 9                    | 1 67               | 71 55          | 990 8                  | -1 7                  | 2 0                 | 130 81                 | 2 7                        |
| 1,051 8                  | 1 50               | 70 89          | 1,051 7                | -1 2                  | 3 6                 | 108 42                 | 3 8                        |
| 1,112 8                  | 1 21               | 68 77          | 1,112 6                | -0 7                  | 5 0                 | 98 13                  | 5 0                        |
| 1,173 7                  | 0 91               | 60 35          | 1,173 5                | -0 2                  | 6 0                 | 92 28                  | 6 0                        |
| 1,232 8                  | 0 78               | 62 70          | 1,232 6                | 0 2                   | 6 8                 | 88 49                  | 6 8                        |
| 1,295 8                  | 0 66               | 50 04          | 1,295 6                | 0 6                   | 7 4                 | 85 31                  | 7 4                        |
| 1,358 9                  | 0 50               | 32 17          | 1,358 7                | 1 1                   | 7 8                 | 82 20                  | 7 9                        |
| 1,422 0                  | 0 37               | 13 08          | 1,421 8                | 1 5                   | 8 0                 | 79 38                  | 8 2                        |
| 1,485 0                  | 0 66               | 338 91         | 1,484 8                | 2 0                   | 8 0                 | 75 59                  | 8 2                        |
| 1,548 1                  | 0 66               | 338 72         | 1,547 9                | 2 7                   | 7 7                 | 70 51                  | 8 2                        |
| 1,611 1                  | 0 77               | 335 83         | 1,610 9                | 3 4                   | 7 4                 | 64 99                  | 8 1                        |
| 1,674 1                  | 0 82               | 332 62         | 1,673 9                | 4 2                   | 7 0                 | 58 85                  | 8 2                        |
| 1,737 2                  | 0 89               | 322 59         | 1,737 0                | 5 0                   | 6 5                 | 52 30                  | 8 2                        |
| 1,800 3                  | 0 92               | 268 03         | 1,800 1                | 5 4                   | 5 7                 | 46 55                  | 7 8                        |
| 1,863 3                  | 1 05               | 311 07         | 1,863 1                | 5 8                   | 4 8                 | 39 54                  | 7 5                        |
| 1,926 3                  | 1 01               | 307 00         | 1,926 1                | 6 5                   | 3 9                 | 30 91                  | 7 5                        |
| 1,989 4                  | 1 06               | 290 62         | 1,989 2                | 7 0                   | 2 9                 | 22 36                  | 7 6                        |
| 2,052 4                  | 0 90               | 283 16         | 2,052 1                | 7 3                   | 1 9                 | 14 21                  | 7 6                        |
| 2,115 5                  | 0 64               | 285 01         | 2,115 2                | 7 5                   | 1 0                 | 7 81                   | 7 6                        |
| 2,178 6                  | 0 44               | 285 52         | 2,178 3                | 7 7                   | 0 5                 | 3 42                   | 7 7                        |
| 2,241 6                  | 0 34               | 284 52         | 2,241 3                | 7 8                   | 0 0                 | 0 33                   | 7 8                        |
| 2,304 7                  | 0 38               | 269 66         | 2,304 4                | 7 8                   | -0 3                | 357 48                 | 7 9                        |
| 2,367 7                  | 0 41               | 275 24         | 2,367 4                | 7 9                   | -0 8                | 354 34                 | 7 9                        |
| 2,430 8                  | 0 47               | 264 03         | 2,430 5                | 7 9                   | -1 3                | 350 88                 | 8 0                        |
| 2,493 8                  | 0 43               | 276 06         | 2,493 5                | 7 9                   | -1 8                | 347 42                 | 8 0                        |
| 2,556 8                  | 0 44               | 260 69         | 2,556 5                | 7 8                   | -2 2                | 344 14                 | 8 2                        |
| 2,619 9                  | 0 50               | 259 57         | 2,619 6                | 7 8                   | -2 7                | 340 55                 | 8 2                        |
| 2,682 9                  | 0 53               | 278 26         | 2,682 6                | 7 7                   | -3 3                | 336 95                 | 8 4                        |
| 2,746 0                  | 0 54               | 263 34         | 2,745 7                | 7 8                   | -3 9                | 333 41                 | 8 7                        |
| 2,809 1                  | 0 57               | 263 02         | 2,808 8                | 7 7                   | -4 5                | 329 70                 | 8 9                        |
| 2,872 1                  | 0 61               | 264 77         | 2,871 8                | 7 6                   | -5 1                | 326 01                 | 9 2                        |
| 2,935 1                  | 0 69               | 269 55         | 2,934 8                | 7 6                   | -5 8                | 322 35                 | 9 6                        |
| 2,998 2                  | 0 81               | 270 72         | 2,997 9                | 7 6                   | -6 7                | 318 65                 | 10 1                       |
| 3,061 6                  | 0 81               | 270 81         | 3,061 3                | 7 6                   | -7 6                | 315 09                 | 10 7                       |
| 3,124 4                  | 1 04               | 286 62         | 3,124 1                | 7 8                   | -8 6                | 312 21                 | 11 6                       |
| 3,187 2                  | 0 98               | 281 16         | 3,186 9                | 8 0                   | -9 6                | 309 81                 | 12 5                       |
| 3,250 1                  | 0 93               | 283 76         | 3,249 8                | 8 3                   | -10 7               | 307 76                 | 13 5                       |
| 3,312 9                  | 0 97               | 267 46         | 3,312 6                | 8 4                   | -11 7               | 305 56                 | 14 4                       |
| 3,375 7                  | 1 05               | 264 83         | 3,375 4                | 8 3                   | -12 8               | 302 92                 | 15 2                       |
| 3,438 6                  | 1 16               | 267 34         | 3,438 2                | 8 2                   | -14 0               | 300 35                 | 16 2                       |
| 3,501 4                  | 1 24               | 266 22         | 3,501 0                | 8 1                   | -15 3               | 297 94                 | 17 3                       |

# Scientific Drilling International, Inc.

SDI Standard Survey Report



|                  |                            |                                     |                                     |
|------------------|----------------------------|-------------------------------------|-------------------------------------|
| <b>Company:</b>  | CIMAREX ENERGY             | <b>Local Co-ordinate Reference:</b> | Well Empire "A" Federal Com #3H     |
| <b>Project:</b>  | Bone Sprng Wildcat         | <b>TVD Reference:</b>               | WELL @ 0 0usft (Original Well Elev) |
| <b>Site:</b>     | Eddy County, NM            | <b>MD Reference:</b>                | WELL @ 0 0usft (Original Well Elev) |
| <b>Well:</b>     | Empire "A" Federal Com #3H | <b>North Reference:</b>             | Grid                                |
| <b>Wellbore:</b> | VH - Job #32K0711645       | <b>Survey Calculation Method:</b>   | Minimum Curvature                   |
| <b>Design:</b>   | VH - Job #32K0711645       | <b>Database:</b>                    | EDM-Regulatory                      |

## Survey

| Measured Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | True Vertical<br>Depth | North/South<br>(usft) | East/West<br>(usft) | Closure Azimuth<br>(°) | Closure Distance<br>(usft) |
|--------------------------|--------------------|----------------|------------------------|-----------------------|---------------------|------------------------|----------------------------|
| 3,564.2                  | 1.30               | 266.62         | 3,563.8                | 8.0                   | -16.7               | 295.69                 | 18.5                       |
| 3,622.3                  | 1.41               | 269.50         | 3,621.9                | 8.0                   | -18.1               | 293.85                 | 19.8                       |
| 3,685.6                  | 1.63               | 272.67         | 3,685.2                | 8.0                   | -19.7               | 292.11                 | 21.3                       |
| 3,748.9                  | 1.94               | 273.88         | 3,748.4                | 8.1                   | -21.7               | 290.54                 | 23.2                       |
| 3,812.1                  | 2.33               | 273.35         | 3,811.6                | 8.3                   | -24.1               | 289.00                 | 25.5                       |
| 3,875.4                  | 2.67               | 274.87         | 3,874.8                | 8.5                   | -26.8               | 287.56                 | 28.1                       |
| 3,938.7                  | 3.13               | 276.27         | 3,938.1                | 8.8                   | -30.0               | 286.34                 | 31.3                       |
| 4,001.9                  | 3.66               | 277.34         | 4,001.1                | 9.2                   | -33.7               | 285.33                 | 35.0                       |
| 4,065.2                  | 4.17               | 277.61         | 4,064.3                | 9.8                   | -38.0               | 284.47                 | 39.3                       |
| 4,128.5                  | 4.65               | 278.21         | 4,127.4                | 10.5                  | -42.8               | 283.75                 | 44.1                       |
| 4,191.8                  | 5.16               | 278.03         | 4,190.5                | 11.2                  | -48.2               | 283.13                 | 49.5                       |
| 4,255.0                  | 5.68               | 279.26         | 4,253.4                | 12.1                  | -54.1               | 282.65                 | 55.4                       |
| 4,318.3                  | 6.38               | 280.01         | 4,316.3                | 13.3                  | -60.6               | 282.33                 | 62.1                       |
| 4,381.6                  | 6.77               | 281.42         | 4,379.2                | 14.6                  | -67.8               | 282.17                 | 69.3                       |
| 4,444.8                  | 6.56               | 282.03         | 4,442.0                | 16.1                  | -74.9               | 282.12                 | 76.7                       |
| 4,508.1                  | 5.84               | 281.32         | 4,504.9                | 17.5                  | -81.6               | 282.09                 | 83.5                       |
| 4,571.4                  | 5.34               | 279.44         | 4,567.9                | 18.6                  | -87.7               | 281.97                 | 89.7                       |
| 4,634.6                  | 4.78               | 278.71         | 4,630.9                | 19.5                  | -93.2               | 281.81                 | 95.2                       |
| 4,697.9                  | 4.28               | 277.89         | 4,694.0                | 20.2                  | -98.2               | 281.63                 | 100.2                      |
| 4,761.2                  | 3.94               | 277.22         | 4,757.1                | 20.8                  | -102.6              | 281.46                 | 104.7                      |
| 4,824.4                  | 3.59               | 274.47         | 4,820.2                | 21.2                  | -106.8              | 281.25                 | 108.9                      |
| 4,887.7                  | 3.62               | 273.78         | 4,883.4                | 21.5                  | -110.7              | 280.99                 | 112.8                      |
| 4,951.0                  | 3.08               | 273.32         | 4,946.5                | 21.7                  | -114.4              | 280.76                 | 116.5                      |
| 5,014.3                  | 2.66               | 272.44         | 5,009.8                | 21.9                  | -117.6              | 280.55                 | 119.6                      |
| 5,077.5                  | 2.24               | 267.87         | 5,072.9                | 21.9                  | -120.3              | 280.33                 | 122.3                      |
| 5,140.8                  | 2.17               | 278.67         | 5,136.2                | 22.1                  | -122.7              | 280.19                 | 124.7                      |
| 5,204.1                  | 2.35               | 289.04         | 5,199.4                | 22.7                  | -125.1              | 280.27                 | 127.2                      |
| 5,267.3                  | 2.43               | 292.13         | 5,262.6                | 23.6                  | -127.6              | 280.47                 | 129.8                      |
| 5,330.6                  | 2.38               | 293.03         | 5,325.8                | 24.6                  | -130.1              | 280.72                 | 132.4                      |
| 5,393.9                  | 2.25               | 294.52         | 5,389.1                | 25.6                  | -132.4              | 280.96                 | 134.9                      |
| 5,457.1                  | 2.04               | 288.81         | 5,452.2                | 26.5                  | -134.6              | 281.15                 | 137.2                      |
| 5,520.4                  | 1.93               | 281.84         | 5,515.5                | 27.1                  | -136.7              | 281.21                 | 139.4                      |
| 5,583.7                  | 1.59               | 278.22         | 5,578.7                | 27.4                  | -138.6              | 281.20                 | 141.3                      |
| 5,647.0                  | 1.88               | 281.47         | 5,642.0                | 27.8                  | -140.5              | 281.18                 | 143.2                      |
| 5,710.2                  | 2.28               | 288.43         | 5,705.2                | 28.4                  | -142.7              | 281.25                 | 145.5                      |
| 5,773.5                  | 2.59               | 285.57         | 5,768.4                | 29.2                  | -145.3              | 281.35                 | 148.2                      |
| 5,836.8                  | 2.64               | 284.37         | 5,831.6                | 29.9                  | -148.1              | 281.42                 | 151.1                      |
| 5,900.0                  | 2.31               | 289.73         | 5,894.8                | 30.7                  | -150.7              | 281.52                 | 153.8                      |
| 5,963.3                  | 2.13               | 285.40         | 5,958.0                | 31.4                  | -153.0              | 281.61                 | 156.2                      |
| 6,026.6                  | 2.33               | 284.00         | 6,021.3                | 32.1                  | -155.4              | 281.66                 | 158.7                      |
| 6,089.8                  | 2.54               | 285.70         | 6,084.4                | 32.8                  | -158.0              | 281.71                 | 161.3                      |
| 6,153.1                  | 2.87               | 286.92         | 6,147.7                | 33.6                  | -160.9              | 281.80                 | 164.3                      |
| 6,216.4                  | 2.82               | 288.59         | 6,210.9                | 34.6                  | -163.8              | 281.91                 | 167.5                      |
| 6,279.7                  | 2.36               | 292.93         | 6,274.1                | 35.6                  | -166.5              | 282.05                 | 170.3                      |

# Scientific Drilling International, Inc.

SDI Standard Survey Report



|                  |                            |                                     |                                     |
|------------------|----------------------------|-------------------------------------|-------------------------------------|
| <b>Company:</b>  | CIMAREX ENERGY             | <b>Local Co-ordinate Reference:</b> | Well Empire "A" Federal Com #3H     |
| <b>Project:</b>  | Bone Spring Wildcat        | <b>TVD Reference:</b>               | WELL @ 0 0usft (Original Well Elev) |
| <b>Site:</b>     | Eddy County, NM            | <b>MD Reference:</b>                | WELL @ 0 0usft (Original Well Elev) |
| <b>Well:</b>     | Empire "A" Federal Com #3H | <b>North Reference:</b>             | Grid                                |
| <b>Wellbore:</b> | VH - Job #32K0711645       | <b>Survey Calculation Method:</b>   | Minimum Curvature                   |
| <b>Design:</b>   | VH - Job #32K0711645       | <b>Database:</b>                    | EDM-Regulatory                      |

| Survey                   |                    |                |                        |                       |                     |                        |                            |
|--------------------------|--------------------|----------------|------------------------|-----------------------|---------------------|------------------------|----------------------------|
| Measured Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | True Vertical<br>Depth | North/South<br>(usft) | East/West<br>(usft) | Closure Azimuth<br>(°) | Closure Distance<br>(usft) |
| 6,342.9                  | 1.99               | 297.11         | 6,337.3                | 36.6                  | -168.7              | 282.23                 | 172.6                      |
| 6,406.2                  | 1.65               | 300.03         | 6,400.5                | 37.5                  | -170.5              | 282.41                 | 174.5                      |
| 6,469.5                  | 1.21               | 311.06         | 6,463.8                | 38.4                  | -171.8              | 282.61                 | 176.0                      |
| 6,532.7                  | 1.00               | 339.24         | 6,527.0                | 39.4                  | -172.5              | 282.86                 | 176.9                      |
| 6,596.0                  | 0.47               | 35.44          | 6,590.3                | 40.1                  | -172.5              | 283.09                 | 177.1                      |
| 6,659.3                  | 0.61               | 8.03           | 6,653.6                | 40.6                  | -172.3              | 283.27                 | 177.0                      |
| 6,722.6                  | 0.57               | 336.99         | 6,716.9                | 41.3                  | -172.4              | 283.46                 | 177.3                      |
| 6,785.8                  | 0.51               | 349.72         | 6,780.1                | 41.8                  | -172.6              | 283.63                 | 177.6                      |
| 6,849.1                  | 0.69               | 347.84         | 6,843.4                | 42.5                  | -172.7              | 283.82                 | 177.8                      |
| 6,912.4                  | 0.68               | 344.45         | 6,906.7                | 43.2                  | -172.9              | 284.04                 | 178.2                      |
| 6,975.6                  | 0.61               | 338.90         | 6,969.9                | 43.9                  | -173.1              | 284.23                 | 178.6                      |
| 7,038.9                  | 0.67               | 358.15         | 7,033.2                | 44.6                  | -173.2              | 284.43                 | 178.9                      |
| 7,102.2                  | 0.86               | 354.84         | 7,096.5                | 45.4                  | -173.3              | 284.69                 | 179.1                      |
| 7,165.4                  | 0.73               | 359.93         | 7,159.7                | 46.3                  | -173.3              | 284.95                 | 179.4                      |
| 7,228.7                  | 0.73               | 341.36         | 7,223.0                | 47.1                  | -173.4              | 285.19                 | 179.7                      |
| 7,292.0                  | 0.90               | 4.10           | 7,286.3                | 48.0                  | -173.5              | 285.45                 | 180.0                      |
| 7,355.2                  | 0.92               | 1.98           | 7,349.5                | 49.0                  | -173.5              | 285.76                 | 180.3                      |
| 7,418.5                  | 0.95               | 8.07           | 7,412.7                | 50.0                  | -173.4              | 286.08                 | 180.5                      |
| 7,481.8                  | 0.98               | 5.03           | 7,476.0                | 51.0                  | -173.3              | 286.41                 | 180.6                      |
| 7,549.3                  | 1.08               | 1.58           | 7,543.5                | 52.3                  | -173.2              | 286.79                 | 180.9                      |
| 7,611.9                  | 1.16               | 354.71         | 7,606.1                | 53.5                  | -173.2              | 287.15                 | 181.3                      |
| 7,674.6                  | 1.19               | 338.80         | 7,668.8                | 54.7                  | -173.5              | 287.50                 | 182.0                      |
| 7,737.2                  | 0.88               | 349.86         | 7,731.4                | 55.8                  | -173.9              | 287.79                 | 182.6                      |
| 7,799.8                  | 0.40               | 6.13           | 7,794.0                | 56.5                  | -173.9              | 287.99                 | 182.9                      |
| 7,862.5                  | 0.41               | 22.65          | 7,856.7                | 56.9                  | -173.8              | 288.13                 | 182.9                      |
| 7,925.1                  | 0.11               | 309.85         | 7,919.3                | 57.2                  | -173.8              | 288.21                 | 182.9                      |
| 7,987.7                  | 0.77               | 216.62         | 7,981.9                | 56.9                  | -174.1              | 288.09                 | 183.1                      |
| 8,050.4                  | 1.02               | 210.93         | 8,044.6                | 56.0                  | -174.6              | 287.79                 | 183.4                      |



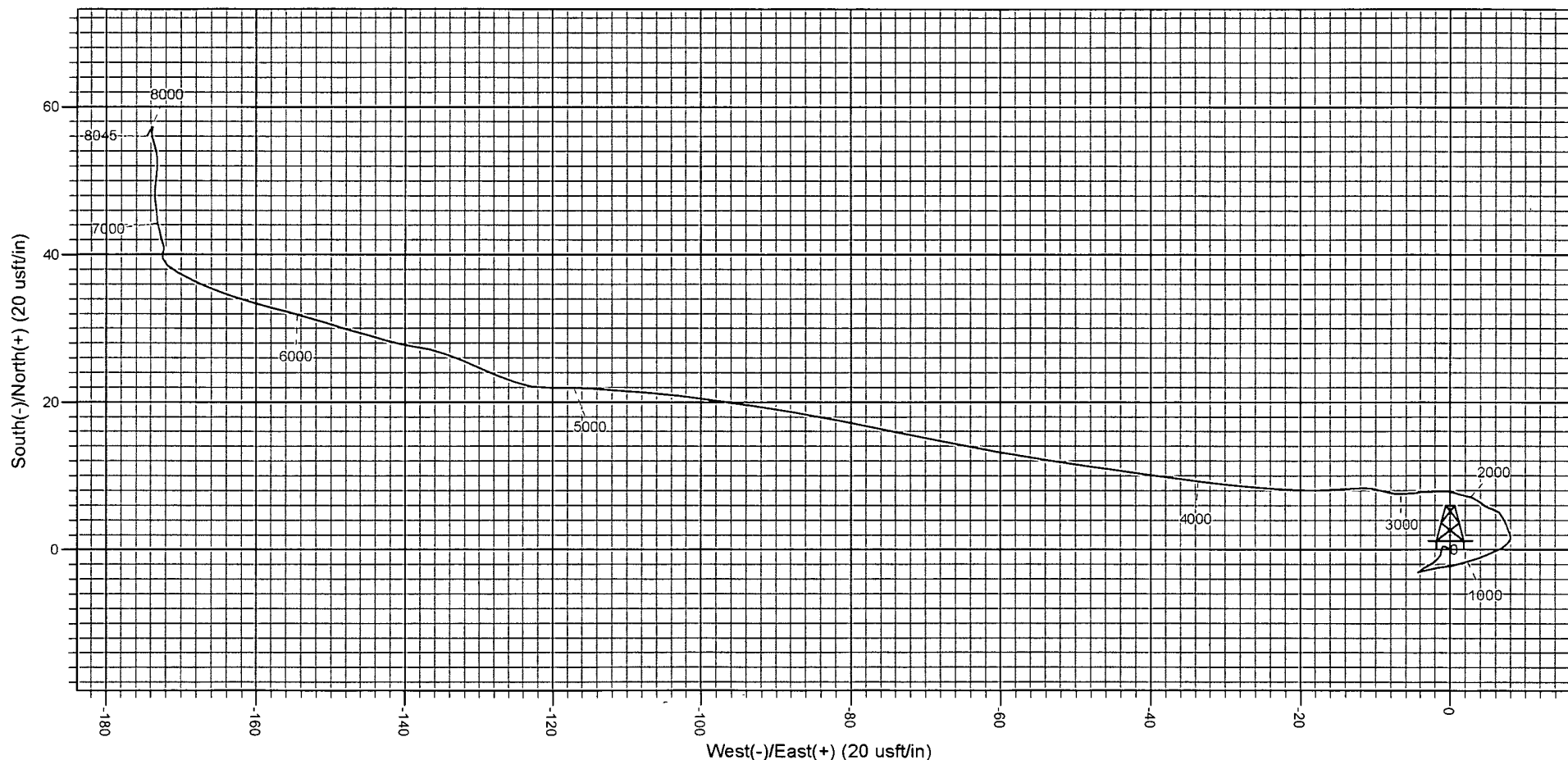
Project: Bone Spring Wildcat  
Eddy County, NM  
Well: Empire "A" Federal Com #3H  
Wellbore: VH - Job #32K0711645  
Design: VH - Job #32K0711645



Azimuths to Grid North  
True North -0°14'  
Magnetic North 7°70'  
Magnetic Field  
Strength 48874 GsnT  
Dip Angle 60°55'  
Date 7/8/2011  
Model IGRF2010

WELL DETAILS: Empire "A" Federal Com #3H  
WELL @ 0.0usft (Original Well Elev)

|       |       |           |           |                  |                 |      |
|-------|-------|-----------|-----------|------------------|-----------------|------|
| +N/-S | +E/-W | Northing  | Easting   | Latitude         | Longitude       | Slot |
| 0.0   | 0.0   | 622880 73 | 581443.41 | 32° 42' 43.620 N | 104° 4' 6.750 W |      |



PROJECT DETAILS: Bone Spring Wildcat  
Geodetic System: US State Plane 1927 (Exact solution)  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866  
Zone: New Mexico East 3001  
System Datum: Mean Sea Level

SITE DETAILS: Eddy County, NM  
Site Centre Latitude: 32° 42' 43.620 N  
Longitude: 104° 4' 6.750 W  
Positional Uncertainty: 0 0  
Convergence: 0 14  
Local North: Grid

# **Cimarex Energy Co. (Midland)**

**Eddy County (NM83E)**

**Sec 27-T18S-R29E**

**Empire A Fed Com #3H**

**Wellbore #1**

**Survey: Survey #2**

## **Standard Survey Report**

**02 August, 2011**



# Great White Directional Services

## Survey Report

|           |                              |                              |                                     |
|-----------|------------------------------|------------------------------|-------------------------------------|
| Company:  | Cimarex Energy Co. (Midland) | Local Co-ordinate Reference: | Well Empire A Fed Com #3H           |
| Project:  | Eddy County (NM83E)          | TVD Reference:               | WELL @ 0.0usft (Original Well Elev) |
| Site:     | Sec 27-T18S-R29E             | MD Reference:                | WELL @ 0.0usft (Original Well Elev) |
| Well:     | Empire A Fed Com #3H         | North Reference:             | Grid                                |
| Wellbore: | Wellbore #1                  | Survey Calculation Method:   | Minimum Curvature                   |
| Design:   | Wellbore #1                  | Database:                    | EDM 5000.1 Single User Db           |

|             |                           |               |                |
|-------------|---------------------------|---------------|----------------|
| Project:    | Eddy County (NM83E)       |               |                |
| Map System: | US State Plane 1983       | System Datum: | Mean Sea Level |
| Geo Datum:  | North American Datum 1983 |               |                |
| Map Zone:   | New Mexico Eastern Zone   |               |                |

|                       |  |  |           |  |  |                  |  |  |                 |  |  |                   |  |  |                 |  |  |
|-----------------------|--|--|-----------|--|--|------------------|--|--|-----------------|--|--|-------------------|--|--|-----------------|--|--|
| Site                  |  |  |           |  |  | Sec 27-T18S-R29E |  |  |                 |  |  |                   |  |  |                 |  |  |
| Site Position:        |  |  | Northing: |  |  | 622,900.90 usft  |  |  | Latitude:       |  |  | 32° 42' 43.618 N  |  |  |                 |  |  |
| From:                 |  |  | Map       |  |  | Easting:         |  |  | 622,778.80 usft |  |  | Longitude:        |  |  | 104° 4' 6.754 W |  |  |
| Position Uncertainty: |  |  | 0.0 usft  |  |  | Slot Radius:     |  |  | 13-3/16 "       |  |  | Grid Convergence: |  |  | 0.14 °          |  |  |

|                      |                      |          |                     |                 |               |                  |
|----------------------|----------------------|----------|---------------------|-----------------|---------------|------------------|
| Well:                | Empire A Fed Com #3H |          |                     |                 |               |                  |
| Well Position        | +N/-S                | 0.0 usft | Northing:           | 622,900.90 usft | Latitude:     | 32° 42' 43.618 N |
|                      | +E/-W                | 0.0 usft | Easting:            | 622,778.80 usft | Longitude:    | 104° 4' 6.754 W  |
| Position Uncertainty |                      | 0.0 usft | Wellhead Elevation: | usft            | Ground Level: | 0.0 usft         |

|           |            |             |             |           |                |
|-----------|------------|-------------|-------------|-----------|----------------|
| Wellbore  |            | Wellbore #1 |             |           |                |
| Magnetics | Model Name | Sample Date | Declination | Dip Angle | Field Strength |
|           |            |             | (°)         | (°)       | (nT)           |
|           | IGRF2010   | 06/14/11    | 7.85        | 60.55     | 48,881         |

|                   |                            |                 |                 |                  |     |
|-------------------|----------------------------|-----------------|-----------------|------------------|-----|
| Design:           | Wellbore #1                |                 |                 |                  |     |
| Audit Notes:      |                            |                 |                 |                  |     |
| Version:          | 1.0                        | Phase:          | ACTUAL          | Tie On Depth:    | 0.0 |
| Vertical Section: | Depth From (TVD)<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Direction<br>(°) |     |
|                   | 0.0                        | 0.0             | 0.0             | 357.95           |     |

| Survey Program |              | Date                    | 08/01/11  |                |  |
|----------------|--------------|-------------------------|-----------|----------------|--|
| From<br>(usft) | To<br>(usft) | Survey (Wellbore)       | Tool Name | Description    |  |
| 116.5          | 7,481.0      | Gyro (Wellbore #1)      | MWD       | MWD - Standard |  |
| 7,481.0        | 12,275.0     | Survey #2 (Wellbore #1) | MWD       | MWD - Standard |  |

| Survey                      |                    |                |                             |                 |                 |                               |                               |                              |                             |
|-----------------------------|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| Measured<br>Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | Vertical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vertical<br>Section<br>(usft) | Dogleg<br>Rate<br>(°/100usft) | Build<br>Rate<br>(°/100usft) | Turn<br>Rate<br>(°/100usft) |
| 7,481.0                     | 0.98               | 5.03           | 7,476.0                     | 51.1            | -173.2          | 57.2                          | 0.00                          | 0.00                         | 0.00                        |
| 7,529.0                     | 1.10               | 351.40         | 7,524.0                     | 52.0            | -173.3          | 58.1                          | 0.57                          | 0.25                         | -28.40                      |
| 7,563.0                     | 1.50               | 4.80           | 7,558.0                     | 52.7            | -173.3          | 58.9                          | 1.47                          | 1.18                         | 39.41                       |
| 7,594.0                     | 7.10               | 354.40         | 7,588.9                     | 55.0            | -173.4          | 61.2                          | 18.16                         | 18.06                        | -33.55                      |
| 7,626.0                     | 13.10              | 357.00         | 7,620.4                     | 60.6            | -173.8          | 66.8                          | 18.80                         | 18.75                        | 8.13                        |
| 7,658.0                     | 19.20              | 359.00         | 7,651.1                     | 69.5            | -174.1          | 75.7                          | 19.14                         | 19.06                        | 6.25                        |
| 7,689.0                     | 25.00              | 0.20           | 7,679.8                     | 81.2            | -174.2          | 87.3                          | 18.77                         | 18.71                        | 3.87                        |
| 7,721.0                     | 30.90              | 0.20           | 7,708.1                     | 96.2            | -174.1          | 102.3                         | 18.44                         | 18.44                        | 0.00                        |
| 7,752.0                     | 37.00              | 0.00           | 7,733.8                     | 113.5           | -174.1          | 119.6                         | 19.68                         | 19.68                        | -0.65                       |
| 7,784.0                     | 43.20              | 1.30           | 7,758.3                     | 134.1           | -173.8          | 140.2                         | 19.55                         | 19.38                        | 4.06                        |

## Great White Directional Services

## Survey Report

|           |                              |                              |                                     |
|-----------|------------------------------|------------------------------|-------------------------------------|
| Company:  | Cimarex Energy Co. (Midland) | Local Co-ordinate Reference: | Well Empire A Fed Com #3H           |
| Project:  | Eddy County (NM83E)          | TVD Reference:               | WELL @ 0.0usft (Original Well Elev) |
| Site:     | Sec 27-T18S-R29E             | MD Reference:                | WELL @ 0.0usft (Original Well Elev) |
| Well:     | Empire A Fed Com #3H         | North Reference:             | Grid                                |
| Wellbore: | Wellbore #1                  | Survey Calculation Method:   | Minimum Curvature                   |
| Design:   | Wellbore #1                  | Database:                    | EDM 5000.1 Single User Db           |

| Survey                |                 |             |                       |              |              |                         |                         |                        |                       |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 7,815.0               | 49.30           | 1.90        | 7,779.7               | 156.4        | -173.2       | 162.5                   | 19.73                   | 19.68                  | 1.94                  |
| 7,847.0               | 55.20           | 1.90        | 7,799.3               | 181.7        | -172.4       | 187.8                   | 18.44                   | 18.44                  | 0.00                  |
| 7,879.0               | 61.20           | 2.10        | 7,816.1               | 208.9        | -171.4       | 214.9                   | 18.76                   | 18.75                  | 0.63                  |
| 7,910.0               | 67.30           | 2.50        | 7,829.6               | 236.8        | -170.3       | 242.7                   | 19.71                   | 19.68                  | 1.29                  |
| 7,942.0               | 73.80           | 2.90        | 7,840.2               | 266.9        | -168.9       | 272.8                   | 20.35                   | 20.31                  | 1.25                  |
| 7,974.0               | 80.00           | 2.90        | 7,847.5               | 298.0        | -167.3       | 303.8                   | 19.38                   | 19.38                  | 0.00                  |
| 7,986.0               | 82.70           | 2.90        | 7,849.3               | 309.9        | -166.7       | 315.6                   | 22.50                   | 22.50                  | 0.00                  |
| 8,003.0               | 86.40           | 3.00        | 7,850.9               | 326.8        | -165.8       | 332.5                   | 21.77                   | 21.76                  | 0.59                  |
| 8,035.0               | 90.60           | 2.40        | 7,851.7               | 358.7        | -164.3       | 364.3                   | 13.26                   | 13.13                  | -1.88                 |
| 8,066.0               | 91.00           | 2.90        | 7,851.3               | 389.7        | -162.9       | 395.2                   | 2.07                    | 1.29                   | 1.61                  |
| 8,098.0               | 91.60           | 3.00        | 7,850.6               | 421.6        | -161.2       | 427.1                   | 1.90                    | 1.88                   | 0.31                  |
| 8,129.0               | 91.60           | 3.50        | 7,849.7               | 452.6        | -159.5       | 458.0                   | 1.61                    | 0.00                   | 1.61                  |
| 8,192.0               | 91.00           | 3.20        | 7,848.3               | 515.4        | -155.8       | 520.7                   | 1.06                    | -0.95                  | -0.48                 |
| 8,256.0               | 91.10           | 3.90        | 7,847.1               | 579.3        | -151.8       | 584.3                   | 1.10                    | 0.16                   | 1.09                  |
| 8,319.0               | 90.00           | 2.50        | 7,846.5               | 642.2        | -148.3       | 647.1                   | 2.83                    | -1.75                  | -2.22                 |
| 8,382.0               | 90.10           | 3.80        | 7,846.5               | 705.1        | -144.9       | 709.8                   | 2.07                    | 0.16                   | 2.06                  |
| 8,446.0               | 89.60           | 2.10        | 7,846.6               | 769.0        | -141.6       | 773.6                   | 2.77                    | -0.78                  | -2.66                 |
| 8,509.0               | 89.30           | 1.10        | 7,847.2               | 832.0        | -139.8       | 836.4                   | 1.66                    | -0.48                  | -1.59                 |
| 8,572.0               | 89.10           | 0.00        | 7,848.1               | 895.0        | -139.2       | 899.4                   | 1.77                    | -0.32                  | -1.75                 |
| 8,635.0               | 89.30           | 359.30      | 7,849.0               | 958.0        | -139.6       | 962.3                   | 1.16                    | 0.32                   | -1.11                 |
| 8,699.0               | 89.40           | 358.80      | 7,849.7               | 1,021.9      | -140.6       | 1,026.3                 | 0.80                    | 0.16                   | -0.78                 |
| 8,763.0               | 89.40           | 359.60      | 7,850.4               | 1,085.9      | -141.5       | 1,090.3                 | 1.25                    | 0.00                   | 1.25                  |
| 8,826.0               | 89.50           | 359.80      | 7,851.0               | 1,148.9      | -141.9       | 1,153.3                 | 0.35                    | 0.16                   | 0.32                  |
| 8,888.0               | 89.40           | 359.20      | 7,851.6               | 1,210.9      | -142.4       | 1,215.2                 | 0.98                    | -0.16                  | -0.97                 |
| 8,952.0               | 89.30           | 359.40      | 7,852.3               | 1,274.9      | -143.2       | 1,279.2                 | 0.35                    | -0.16                  | 0.31                  |
| 9,015.0               | 89.70           | 0.60        | 7,852.9               | 1,337.9      | -143.2       | 1,342.2                 | 2.01                    | 0.63                   | 1.90                  |
| 9,078.0               | 90.70           | 0.60        | 7,852.6               | 1,400.9      | -142.5       | 1,405.1                 | 1.59                    | 1.59                   | 0.00                  |
| 9,142.0               | 91.00           | 0.60        | 7,851.7               | 1,464.9      | -141.9       | 1,469.0                 | 0.47                    | 0.47                   | 0.00                  |
| 9,205.0               | 91.30           | 0.60        | 7,850.4               | 1,527.9      | -141.2       | 1,532.0                 | 0.48                    | 0.48                   | 0.00                  |
| 9,269.0               | 92.10           | 1.50        | 7,848.5               | 1,591.8      | -140.0       | 1,595.8                 | 1.88                    | 1.25                   | 1.41                  |
| 9,333.0               | 91.80           | 0.20        | 7,846.3               | 1,655.8      | -139.1       | 1,659.7                 | 2.08                    | -0.47                  | -2.03                 |
| 9,395.0               | 91.00           | 359.30      | 7,844.8               | 1,717.8      | -139.3       | 1,721.7                 | 1.94                    | -1.29                  | -1.45                 |
| 9,459.0               | 89.50           | 358.40      | 7,844.6               | 1,781.8      | -140.6       | 1,785.6                 | 2.73                    | -2.34                  | -1.41                 |
| 9,522.0               | 89.60           | 358.60      | 7,845.1               | 1,844.7      | -142.3       | 1,848.6                 | 0.35                    | 0.16                   | 0.32                  |
| 9,586.0               | 89.90           | 358.10      | 7,845.3               | 1,908.7      | -144.1       | 1,912.6                 | 0.91                    | 0.47                   | -0.78                 |
| 9,649.0               | 90.20           | 358.10      | 7,845.3               | 1,971.7      | -146.2       | 1,975.6                 | 0.48                    | 0.48                   | 0.00                  |
| 9,712.0               | 90.30           | 357.80      | 7,845.0               | 2,034.6      | -148.5       | 2,038.6                 | 0.50                    | 0.16                   | -0.48                 |
| 9,776.0               | 90.50           | 358.50      | 7,844.6               | 2,098.6      | -150.5       | 2,102.6                 | 1.14                    | 0.31                   | 1.09                  |
| 9,840.0               | 91.10           | 358.70      | 7,843.7               | 2,162.6      | -152.1       | 2,166.6                 | 0.99                    | 0.94                   | 0.31                  |
| 9,904.0               | 91.00           | 359.00      | 7,842.5               | 2,226.6      | -153.4       | 2,230.6                 | 0.49                    | -0.16                  | 0.47                  |
| 9,966.0               | 90.70           | 358.60      | 7,841.6               | 2,288.5      | -154.7       | 2,292.6                 | 0.81                    | -0.48                  | -0.65                 |
| 10,030.0              | 91.00           | 358.50      | 7,840.6               | 2,352.5      | -156.3       | 2,356.6                 | 0.49                    | 0.47                   | -0.16                 |
| 10,093.0              | 92.10           | 358.00      | 7,838.9               | 2,415.4      | -158.2       | 2,419.6                 | 1.92                    | 1.75                   | -0.79                 |

## Great White Directional Services

## Survey Report

|           |                              |                              |                                     |
|-----------|------------------------------|------------------------------|-------------------------------------|
| Company:  | Cimarex Energy Co. (Midland) | Local Co-ordinate Reference: | Well Empire A Fed Com #3H           |
| Project:  | Eddy County (NM83E)          | TVD Reference:               | WELL @ 0.0usft (Original Well Elev) |
| Site:     | Sec 27-T18S-R29E             | MD Reference:                | WELL @ 0.0usft (Original Well Elev) |
| Well:     | Empire A Fed Com #3H         | North Reference:             | Grid                                |
| Wellbore: | Wellbore #1                  | Survey Calculation Method:   | Minimum Curvature                   |
| Design:   | Wellbore #1                  | Database:                    | EDM 5000.1 Single User Db           |

| Survey                                                                   |                 |             |                       |              |              |                         |                         |                        |                       |  |
|--------------------------------------------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|--|
| Measured Depth (usft)                                                    | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |  |
| 10,156.0                                                                 | 92.50           | 357.90      | 7,836.4               | 2,478.4      | -160.5       | 2,482.5                 | 0.65                    | 0.63                   | -0.16                 |  |
| 10,220.0                                                                 | 91.80           | 358.00      | 7,834.0               | 2,542.3      | -162.8       | 2,546.5                 | 1.10                    | -1.09                  | 0.16                  |  |
| 10,283.0                                                                 | 90.30           | 358.80      | 7,832.8               | 2,605.2      | -164.5       | 2,609.4                 | 2.70                    | -2.38                  | 1.27                  |  |
| 10,347.0                                                                 | 90.40           | 359.00      | 7,832.4               | 2,669.2      | -165.7       | 2,673.4                 | 0.35                    | 0.16                   | 0.31                  |  |
| 10,410.0                                                                 | 90.90           | 358.90      | 7,831.7               | 2,732.2      | -166.9       | 2,736.4                 | 0.81                    | 0.79                   | -0.16                 |  |
| 10,473.0                                                                 | 91.60           | 359.10      | 7,830.3               | 2,795.2      | -168.0       | 2,799.4                 | 1.16                    | 1.11                   | 0.32                  |  |
| 10,537.0                                                                 | 92.50           | 358.90      | 7,828.1               | 2,859.1      | -169.1       | 2,863.3                 | 1.44                    | 1.41                   | -0.31                 |  |
| 10,598.0                                                                 | 91.70           | 358.60      | 7,825.8               | 2,920.1      | -170.4       | 2,924.3                 | 1.40                    | -1.31                  | -0.49                 |  |
| 10,661.0                                                                 | 90.20           | 358.90      | 7,824.8               | 2,983.0      | -171.8       | 2,987.3                 | 2.43                    | -2.38                  | 0.48                  |  |
| 10,724.0                                                                 | 90.20           | 359.10      | 7,824.6               | 3,046.0      | -172.9       | 3,050.3                 | 0.32                    | 0.00                   | 0.32                  |  |
| 10,787.0                                                                 | 90.80           | 358.90      | 7,824.0               | 3,109.0      | -174.0       | 3,113.3                 | 1.00                    | 0.95                   | -0.32                 |  |
| 10,851.0                                                                 | 91.10           | 359.80      | 7,822.9               | 3,173.0      | -174.7       | 3,177.2                 | 1.48                    | 0.47                   | 1.41                  |  |
| 10,915.0                                                                 | 90.70           | 1.10        | 7,821.9               | 3,237.0      | -174.2       | 3,241.2                 | 2.12                    | -0.63                  | 2.03                  |  |
| 10,978.0                                                                 | 90.40           | 1.20        | 7,821.3               | 3,300.0      | -173.0       | 3,304.1                 | 0.50                    | -0.48                  | 0.16                  |  |
| 11,041.0                                                                 | 91.20           | 0.90        | 7,820.5               | 3,363.0      | -171.8       | 3,367.0                 | 1.36                    | 1.27                   | -0.48                 |  |
| 11,104.0                                                                 | 91.70           | 0.80        | 7,818.9               | 3,425.9      | -170.9       | 3,429.9                 | 0.81                    | 0.79                   | -0.16                 |  |
| 11,167.0                                                                 | 92.00           | 0.80        | 7,816.8               | 3,488.9      | -170.0       | 3,492.7                 | 0.48                    | 0.48                   | 0.00                  |  |
| 11,230.0                                                                 | 92.20           | 0.60        | 7,814.5               | 3,551.9      | -169.2       | 3,555.6                 | 0.45                    | 0.32                   | -0.32                 |  |
| 11,291.0                                                                 | 93.10           | 0.90        | 7,811.7               | 3,612.8      | -168.4       | 3,616.5                 | 1.56                    | 1.48                   | 0.49                  |  |
| 11,354.0                                                                 | 91.50           | 1.10        | 7,809.2               | 3,675.7      | -167.3       | 3,679.4                 | 2.56                    | -2.54                  | 0.32                  |  |
| 11,417.0                                                                 | 92.20           | 0.60        | 7,807.1               | 3,738.7      | -166.4       | 3,742.2                 | 1.37                    | 1.11                   | -0.79                 |  |
| 11,481.0                                                                 | 91.60           | 0.00        | 7,805.0               | 3,802.6      | -166.1       | 3,806.1                 | 1.33                    | -0.94                  | -0.94                 |  |
| 11,544.0                                                                 | 91.70           | 359.90      | 7,803.2               | 3,865.6      | -166.1       | 3,869.1                 | 0.22                    | 0.16                   | -0.16                 |  |
| 11,607.0                                                                 | 90.90           | 0.00        | 7,801.8               | 3,928.6      | -166.2       | 3,932.0                 | 1.28                    | -1.27                  | 0.16                  |  |
| 11,670.0                                                                 | 90.60           | 0.50        | 7,801.0               | 3,991.6      | -165.9       | 3,995.0                 | 0.93                    | -0.48                  | 0.79                  |  |
| 11,734.0                                                                 | 91.60           | 359.90      | 7,799.7               | 4,055.6      | -165.7       | 4,058.9                 | 1.82                    | 1.56                   | -0.94                 |  |
| 11,797.0                                                                 | 92.70           | 359.90      | 7,797.4               | 4,118.5      | -165.8       | 4,121.8                 | 1.75                    | 1.75                   | 0.00                  |  |
| 11,860.0                                                                 | 93.50           | 0.00        | 7,794.0               | 4,181.4      | -165.9       | 4,184.7                 | 1.28                    | 1.27                   | 0.16                  |  |
| 11,923.0                                                                 | 91.50           | 0.60        | 7,791.2               | 4,244.4      | -165.5       | 4,247.6                 | 3.31                    | -3.17                  | 0.95                  |  |
| 11,987.0                                                                 | 92.00           | 0.70        | 7,789.2               | 4,308.3      | -164.8       | 4,311.5                 | 0.80                    | 0.78                   | 0.16                  |  |
| 12,050.0                                                                 | 93.10           | 359.90      | 7,786.4               | 4,371.3      | -164.5       | 4,374.4                 | 2.16                    | 1.75                   | -1.27                 |  |
| 12,114.0                                                                 | 93.20           | 1.00        | 7,782.9               | 4,435.2      | -164.0       | 4,438.2                 | 1.72                    | 0.16                   | 1.72                  |  |
| 12,177.0                                                                 | 91.80           | 1.00        | 7,780.2               | 4,498.1      | -162.9       | 4,501.1                 | 2.22                    | -2.22                  | 0.00                  |  |
| 12,226.0                                                                 | 91.50           | 0.90        | 7,778.8               | 4,547.1      | -162.1       | 4,550.0                 | 0.65                    | -0.61                  | -0.20                 |  |
| Last MWD Survey                                                          |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 12,275.0                                                                 | 91.20           | 0.80        | 7,777.6               | 4,596.1      | -161.3       | 4,598.9                 | 0.65                    | -0.61                  | -0.20                 |  |
| Projection to Bit - PBHL 7796' - 7840' - Empire #3H PBHL - 7840' Landing |                 |             |                       |              |              |                         |                         |                        |                       |  |

# Great White Directional Services

## Survey Report

|           |                              |                              |                                     |
|-----------|------------------------------|------------------------------|-------------------------------------|
| Company:  | Cimarex Energy Co. (Midland) | Local Co-ordinate Reference: | Well Empire A Fed Com #3H           |
| Project:  | Eddy County (NM83E)          | TVD Reference:               | WELL @ 0.0usft (Original Well Elev) |
| Site:     | Sec 27-T18S-R29E             | MD Reference:                | WELL @ 0.0usft (Original Well Elev) |
| Well:     | Empire A Fed Com #3H         | North Reference:             | Grid                                |
| Wellbore: | Wellbore #1                  | Survey Calculation Method:   | Minimum Curvature                   |
| Design:   | Wellbore #1                  | Database:                    | EDM 5000.1 Single User Db           |

| Survey Annotations    |                       |                   |              |                   |
|-----------------------|-----------------------|-------------------|--------------|-------------------|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              | Comment           |
|                       |                       | +N/-S (usft)      | +E/-W (usft) |                   |
| 12,226.0              | 7,778.8               | 4,547.1           | -162.1       | Last MWD Survey   |
| 12,275.0              | 7,777.6               | 4,596.1           | -161.3       | Projection to Bit |

|                   |                    |             |
|-------------------|--------------------|-------------|
| Checked By: _____ | Approved By: _____ | Date: _____ |
|-------------------|--------------------|-------------|



Company: Cimarex Energy Co. (Midland)  
Project: Eddy County (NM83E)  
Site: Sec 27-T18S-R29E  
Well: Empire A Fed Com #3H  
Wellbore: Wellbore #1  
Design: Plan #7  
Lat: 32° 42' 43.618 N  
Long: 104° 4' 6.754 W  
GL: 0.0  
KB: WELL @ 0.0usft (Original Well Elev)



T G M  
Azimuths to Grid North  
True North: -0.14°  
Magnetic North: 7.71°  
Magnetic Field  
Strength: 4881.1nT  
Dip Angle: 60.55°  
Date: 06/14/2011  
Model: IGRF2010

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Empire A Fed Com #3H, Grid North  
Vertical (TVD) Reference: WELL @ 0.0usft (Original Well Elev)  
Section (VS) Reference: Slot - (0.0N, 0.0E)  
Measured Depth Reference: WELL @ 0.0usft (Original Well Elev)  
Calculation Method: Minimum Curvature

#### WELL DETAILS: Empire A Fed Com #3H

| +N/-S | +E/-W | Northing  | Eastings  | Latitude         | Longitude       | Slot |
|-------|-------|-----------|-----------|------------------|-----------------|------|
| 0.0   | 0.0   | 622900.90 | 622778.80 | 32° 42' 43.618 N | 104° 4' 6.754 W |      |

#### WELLBORE TARGET DETAILS (LAT/LONG)

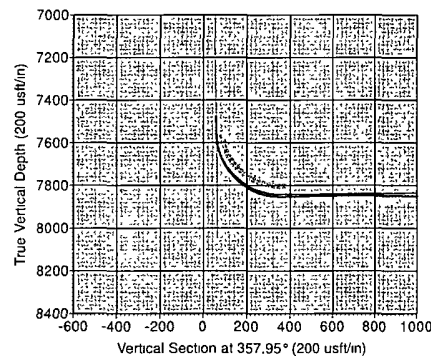
| Name          | TVD    | +N/-S  | +E/-W  | Latitude         | Longitude       | Shape |
|---------------|--------|--------|--------|------------------|-----------------|-------|
| PBHL 7796'    | 7796.0 | 4614.1 | -164.8 | 32° 43' 29.279 N | 104° 4' 8.548 W | Point |
| 7840' Landing | 7840.0 | 4614.1 | -164.8 | 32° 43' 29.279 N | 104° 4' 8.548 W | Point |

#### SECTION DETAILS

| MD      | Inc   | Azi  | TVD    | +N/-S  | +E/-W  | Dleg  | TFace | VSect  | Annotation           |
|---------|-------|------|--------|--------|--------|-------|-------|--------|----------------------|
| 7549.3  | 1.08  | 1.58 | 7543.5 | 52.3   | -173.2 | 0.00  | 0.00  | 58.4   | Tie In Gyro          |
| 7555.0  | 1.09  | 1.91 | 7549.2 | 52.4   | -173.2 | 0.21  | 32.17 | 58.6   | KOP - 19.33°/100 DLS |
| 8018.1  | 90.59 | 0.10 | 7840.0 | 351.9  | -172.5 | 19.33 | -1.81 | 357.8  | EOC - Hold to TD     |
| 12280.6 | 90.59 | 0.10 | 7796.0 | 4614.1 | -164.8 | 0.00  | 0.00  | 4617.1 | TD at 12280.6        |

#### FORMATION TOP DETAILS

No formation data is available



PROJECT DETAILS Eddy County (NM83E)  
Geodetic System US State Plane 1983  
Datum North American Datum 1983  
Ellipsoid GRS 1980  
Zone New Mexico Eastern Zone  
System Datum Mean Sea Level

SITE DETAILS Sec 27-T18S-R29E  
Site Centre Latitude: 32° 42' 43.618 N  
Longitude: 104° 4' 6.754 W  
Positional Uncertainty: 0.0  
Convergence: 0.14  
Local North: Grid

