



**CHISHOLM  
ENERGY**

**NM OIL CONSERVATION**  
ARTESIA DISTRICT

**NOV 06 2017**

**RECEIVED**

## **Chisholm Energy Holdings, LLC**

**Eddy County, NM (NAD83)**

**Sec. 29, T26 S, 26 E**

**Cottonwood 29-32 Fed Com 1H**

**Wellbore #1**

*30-015-43702*

**Survey: MWD Surveys**

## **Standard Survey Report**

**11 August, 2017**

**Please provide signature  
page for directional survey**





# Integrity Directional Services, LLC

## Survey Report



|                  |                               |                                     |                                  |
|------------------|-------------------------------|-------------------------------------|----------------------------------|
| <b>Company:</b>  | Chisholm Energy Holdings, LLC | <b>Local Co-ordinate Reference:</b> | Well Cottonwood 29-32 Fed Com 1H |
| <b>Project:</b>  | Eddy County, NM (NAD83)       | <b>TVD Reference:</b>               | KB=22' @ 3455.00ft (Nabors M55)  |
| <b>Site:</b>     | Sec. 29, T26 S, 26 E          | <b>MD Reference:</b>                | KB=22' @ 3455.00ft (Nabors M55)  |
| <b>Well:</b>     | Cottonwood 29-32 Fed Com 1H   | <b>North Reference:</b>             | Grid                             |
| <b>Wellbore:</b> | Wellbore #1                   | <b>Survey Calculation Method:</b>   | Minimum Curvature                |
| <b>Design:</b>   | Wellbore #1                   | <b>Database:</b>                    | EDM 5000.1 Multi User Db         |

|                    |                           |                      |                |
|--------------------|---------------------------|----------------------|----------------|
| <b>Project:</b>    | Eddy County, NM (NAD83)   |                      |                |
| <b>Map System:</b> | US State Plane 1983       | <b>System Datum:</b> | Mean Sea Level |
| <b>Geo Datum:</b>  | North American Datum 1983 |                      |                |
| <b>Map Zone:</b>   | New Mexico Eastern Zone   |                      |                |

|                       |     |                      |                   |            |                   |        |
|-----------------------|-----|----------------------|-------------------|------------|-------------------|--------|
| Site                  |     | Sec. 29, T26 S, 26 E |                   |            |                   |        |
| Site Position:        |     | Northing:            | 370,999.0000 usft | Latitude:  | 32.0199556        |        |
| From:                 | Map | Easting:             | 545,508.9000 usft | Longitude: | -104.3198738      |        |
| Position Uncertainty: |     | 0.00 ft              | Slot Radius:      | 13-3/16 "  | Grid Convergence: | 0.01 ° |

|                             |                             |         |                            |                   |                      |              |
|-----------------------------|-----------------------------|---------|----------------------------|-------------------|----------------------|--------------|
| <b>Well</b>                 | Cottonwood 29-32 Fed Com 1H |         |                            |                   |                      |              |
| <b>Well Position</b>        | <b>+N/-S</b>                | 0.00 ft | <b>Northing:</b>           | 370,999.0000 usft | <b>Latitude:</b>     | 32.0199556   |
|                             | <b>+E/-W</b>                | 0.00 ft | <b>Easting:</b>            | 545,508.9000 usft | <b>Longitude:</b>    | -104.3198738 |
| <b>Position Uncertainty</b> |                             | 0.00 ft | <b>Wellhead Elevation:</b> | 0.00 ft           | <b>Ground Level:</b> | 3,433.00 ft  |

|                  |             |
|------------------|-------------|
| <b>Wellbore:</b> | Wellbore #1 |
|------------------|-------------|

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|-----------|------------|-------------|-----------------|---------------|---------------------|
|           | HDGM       | 7/23/2017   | 7.48            | 59.65         | 47,899              |

|                |             |
|----------------|-------------|
| <b>Design:</b> | Wellbore #1 |
|----------------|-------------|

|                     |     |               |        |                           |
|---------------------|-----|---------------|--------|---------------------------|
| <b>Audit Notes:</b> |     |               |        |                           |
| <b>Version:</b>     | 1.0 | <b>Phase:</b> | ACTUAL | <b>Tie On Depth:</b> 0.00 |

| Vertical Section: | Depth From (TVD)<br>(ft) | +N/-S<br>(ft) | +E/-W<br>(ft) | Direction<br>(°) |
|-------------------|--------------------------|---------------|---------------|------------------|
|                   | 0.00                     | 0.00          | 0.00          | 180.00           |

|                |           |                           |           |                |
|----------------|-----------|---------------------------|-----------|----------------|
| Survey Program |           | Date 8/11/2017            |           |                |
| From (ft)      | To (ft)   | Survey (Wellbore)         | Tool Name | Description    |
| 119.00         | 13,710.00 | MWD Surveys (Wellbore #1) | MWD       | MWD - Standard |

| Measured Depth (ft)              | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|----------------------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| 0.00                             | 0.00            | 0.00        | 0.00                | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 119.00                           | 0.50            | 125.80      | 119.00              | -0.30      | 0.42       | 0.30                  | 0.42                    | 0.42                   | 0.00                  |
| <b>First MWD Survey @ 119'MD</b> |                 |             |                     |            |            |                       |                         |                        |                       |
| 179.00                           | 0.60            | 118.30      | 179.00              | -0.61      | 0.91       | 0.61                  | 0.21                    | 0.17                   | -12.50                |
| 240.00                           | 0.60            | 137.40      | 239.99              | -0.99      | 1.41       | 0.99                  | 0.33                    | 0.00                   | 31.31                 |
| 300.00                           | 0.50            | 142.40      | 299.99              | -1.43      | 1.78       | 1.43                  | 0.18                    | -0.17                  | 8.33                  |
| 405.00                           | 0.50            | 179.00      | 404.99              | -2.25      | 2.07       | 2.25                  | 0.30                    | 0.00                   | 34.86                 |
| 515.00                           | 0.80            | 260.60      | 514.98              | -2.86      | 1.32       | 2.86                  | 0.80                    | 0.27                   | 74.18                 |
| 603.00                           | 1.00            | 275.50      | 602.97              | -2.88      | -0.05      | 2.88                  | 0.35                    | 0.23                   | 16.93                 |
| 730.00                           | 0.90            | 232.90      | 729.95              | -3.38      | -1.95      | 3.38                  | 0.55                    | -0.08                  | -33.54                |
| 824.00                           | 0.20            | 299.80      | 823.95              | -3.74      | -2.68      | 3.74                  | 0.90                    | -0.74                  | 71.17                 |



# Integrity Directional Services, LLC

## Survey Report



|                  |                               |                                     |                                  |
|------------------|-------------------------------|-------------------------------------|----------------------------------|
| <b>Company:</b>  | Chisholm Energy Holdings, LLC | <b>Local Co-ordinate Reference:</b> | Well Cottonwood 29-32 Fed Com 1H |
| <b>Project:</b>  | Eddy County, NM (NAD83)       | <b>TVD Reference:</b>               | KB=22' @ 3455.00ft (Nabors M55)  |
| <b>Site:</b>     | Sec. 29, T26 S, 26 E          | <b>MD Reference:</b>                | KB=22' @ 3455.00ft (Nabors M55)  |
| <b>Well:</b>     | Cottonwood 29-32 Fed Com 1H   | <b>North Reference:</b>             | Grid                             |
| <b>Wellbore:</b> | Wellbore #1                   | <b>Survey Calculation Method:</b>   | Minimum Curvature                |
| <b>Design:</b>   | Wellbore #1                   | <b>Database:</b>                    | EDM 5000.1 Multi User Db         |

| Survey              |                 |             |                     |           |           |                       |                         |                        |                       |
|---------------------|-----------------|-------------|---------------------|-----------|-----------|-----------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N-S (ft) | +E-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 919.00              | 0.50            | 285.90      | 918.95              | -3.55     | -3.22     | 3.55                  | 0.33                    | 0.32                   | -14.63                |
| 1,014.00            | 0.40            | 309.60      | 1,013.94            | -3.22     | -3.88     | 3.22                  | 0.22                    | -0.11                  | 24.95                 |
| 1,110.00            | 1.10            | 269.10      | 1,109.94            | -3.02     | -5.06     | 3.02                  | 0.87                    | 0.73                   | -42.19                |
| 1,205.00            | 0.20            | 136.80      | 1,204.93            | -3.16     | -5.86     | 3.16                  | 1.31                    | -0.95                  | -139.26               |
| 1,300.00            | 1.10            | 87.10       | 1,299.92            | -3.23     | -4.83     | 3.23                  | 1.03                    | 0.95                   | -52.32                |
| 1,395.00            | 1.20            | 78.30       | 1,394.91            | -2.99     | -2.95     | 2.99                  | 0.21                    | 0.11                   | -9.26                 |
| 1,490.00            | 0.90            | 108.70      | 1,489.89            | -3.02     | -1.27     | 3.02                  | 0.65                    | -0.32                  | 32.00                 |
| 1,585.00            | 0.60            | 99.90       | 1,584.88            | -3.35     | -0.07     | 3.35                  | 0.34                    | -0.32                  | -9.26                 |
| 1,647.00            | 1.00            | 102.10      | 1,646.88            | -3.52     | 0.78      | 3.52                  | 0.65                    | 0.65                   | 3.55                  |
| 1,742.00            | 0.80            | 116.10      | 1,741.86            | -3.98     | 2.18      | 3.98                  | 0.31                    | -0.21                  | 14.74                 |
| 1,837.00            | 0.60            | 171.60      | 1,836.86            | -4.77     | 2.85      | 4.77                  | 0.71                    | -0.21                  | 58.42                 |
| 1,933.00            | 0.80            | 153.90      | 1,932.85            | -5.87     | 3.22      | 5.87                  | 0.30                    | 0.21                   | -18.44                |
| 2,027.00            | 1.00            | 183.00      | 2,026.84            | -7.27     | 3.47      | 7.27                  | 0.52                    | 0.21                   | 30.96                 |
| 2,122.00            | 1.00            | 187.10      | 2,121.83            | -8.92     | 3.32      | 8.92                  | 0.08                    | 0.00                   | 4.32                  |
| 2,217.00            | 0.60            | 168.50      | 2,216.82            | -10.23    | 3.32      | 10.23                 | 0.50                    | -0.42                  | -19.58                |
| 2,312.00            | 0.60            | 195.10      | 2,311.81            | -11.20    | 3.29      | 11.20                 | 0.29                    | 0.00                   | 28.00                 |
| 2,407.00            | 1.10            | 197.90      | 2,406.80            | -12.55    | 2.88      | 12.55                 | 0.53                    | 0.53                   | 2.95                  |
| 2,503.00            | 0.70            | 203.90      | 2,502.79            | -13.96    | 2.36      | 13.96                 | 0.43                    | -0.42                  | 6.25                  |
| 2,598.00            | 1.00            | 170.20      | 2,597.78            | -15.31    | 2.26      | 15.31                 | 0.60                    | 0.32                   | -35.47                |
| 2,693.00            | 0.90            | 165.20      | 2,692.77            | -16.85    | 2.59      | 16.85                 | 0.14                    | -0.11                  | -5.26                 |
| 2,788.00            | 1.00            | 188.70      | 2,787.75            | -18.39    | 2.66      | 18.39                 | 0.42                    | 0.11                   | 24.74                 |
| 2,883.00            | 0.90            | 345.60      | 2,882.75            | -18.49    | 2.35      | 18.49                 | 1.96                    | -0.11                  | 165.16                |
| 2,977.00            | 0.80            | 315.80      | 2,976.74            | -17.30    | 1.71      | 17.30                 | 0.48                    | -0.11                  | -31.70                |
| 3,072.00            | 0.60            | 314.70      | 3,071.73            | -16.48    | 0.89      | 16.48                 | 0.21                    | -0.21                  | -1.16                 |
| 3,167.00            | 0.90            | 278.00      | 3,166.72            | -16.02    | -0.20     | 16.02                 | 0.58                    | 0.32                   | -38.63                |
| 3,262.00            | 1.10            | 276.70      | 3,261.71            | -15.81    | -1.85     | 15.81                 | 0.21                    | 0.21                   | -1.37                 |
| 3,357.00            | 1.20            | 306.30      | 3,356.69            | -15.12    | -3.55     | 15.12                 | 0.63                    | 0.11                   | 31.16                 |
| 3,452.00            | 1.20            | 303.50      | 3,451.67            | -13.98    | -5.18     | 13.98                 | 0.06                    | 0.00                   | -2.95                 |
| 3,547.00            | 0.40            | 257.40      | 3,546.66            | -13.50    | -6.34     | 13.50                 | 1.02                    | -0.84                  | -48.53                |
| 3,642.00            | 0.70            | 247.70      | 3,641.66            | -13.79    | -7.20     | 13.79                 | 0.33                    | 0.32                   | -10.21                |
| 3,737.00            | 0.50            | 246.10      | 3,736.65            | -14.18    | -8.11     | 14.18                 | 0.21                    | -0.21                  | -1.68                 |
| 3,832.00            | 0.80            | 261.10      | 3,831.64            | -14.45    | -9.15     | 14.45                 | 0.36                    | 0.32                   | 15.79                 |
| 3,927.00            | 1.10            | 243.70      | 3,926.63            | -14.96    | -10.62    | 14.96                 | 0.43                    | 0.32                   | -18.32                |
| 4,022.00            | 0.60            | 271.60      | 4,021.62            | -15.35    | -11.93    | 15.35                 | 0.67                    | -0.53                  | 29.37                 |
| 4,117.00            | 1.20            | 355.80      | 4,116.61            | -14.34    | -12.51    | 14.34                 | 1.35                    | 0.63                   | 88.63                 |
| 4,212.00            | 1.00            | 337.70      | 4,211.59            | -12.58    | -12.89    | 12.58                 | 0.42                    | -0.21                  | -19.05                |
| 4,307.00            | 0.60            | 343.90      | 4,306.58            | -11.34    | -13.34    | 11.34                 | 0.43                    | -0.42                  | 6.53                  |
| 4,402.00            | 0.50            | 340.40      | 4,401.58            | -10.47    | -13.62    | 10.47                 | 0.11                    | -0.11                  | -3.68                 |
| 4,497.00            | 1.40            | 334.30      | 4,496.57            | -9.03     | -14.26    | 9.03                  | 0.95                    | 0.95                   | -6.42                 |
| 4,592.00            | 1.10            | 326.20      | 4,591.54            | -7.23     | -15.27    | 7.23                  | 0.37                    | -0.32                  | -8.53                 |
| 4,686.00            | 1.70            | 35.60       | 4,685.52            | -5.35     | -14.97    | 5.35                  | 1.77                    | 0.64                   | 73.83                 |
| 4,781.00            | 1.50            | 39.90       | 4,780.48            | -3.25     | -13.35    | 3.25                  | 0.25                    | -0.21                  | 4.53                  |
| 4,876.00            | 1.10            | 27.30       | 4,875.46            | -1.48     | -12.13    | 1.48                  | 0.52                    | -0.42                  | -13.26                |



# Integrity Directional Services, LLC Survey Report



|                  |                               |                                     |                                  |
|------------------|-------------------------------|-------------------------------------|----------------------------------|
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| <b>Well:</b>     | Cottonwood 29-32 Fed Com 1H   | <b>North Reference:</b>             | Grid                             |
| <b>Wellbore:</b> | Wellbore #1                   | <b>Survey Calculation Method:</b>   | Minimum Curvature                |
| <b>Design:</b>   | Wellbore #1                   | <b>Database:</b>                    | EDM 5000.1 Multi User Db         |

| Survey              |                 |             |                     |            |            |                       |                         |                        |                       |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 4,970.00            | 0.70            | 29.80       | 4,969.45            | -0.18      | -11.43     | 0.18                  | 0.43                    | -0.43                  | 2.66                  |
| 5,066.00            | 0.40            | 351.00      | 5,065.44            | 0.66       | -11.19     | -0.66                 | 0.48                    | -0.31                  | -40.42                |
| 5,160.00            | 0.30            | 347.40      | 5,159.44            | 1.22       | -11.30     | -1.22                 | 0.11                    | -0.11                  | -3.83                 |
| 5,255.00            | 0.40            | 289.80      | 5,254.44            | 1.58       | -11.66     | -1.58                 | 0.37                    | 0.11                   | -60.63                |
| 5,350.00            | 0.60            | 314.00      | 5,349.44            | 2.03       | -12.33     | -2.03                 | 0.30                    | 0.21                   | 25.47                 |
| 5,444.00            | 0.30            | 298.40      | 5,443.43            | 2.49       | -12.90     | -2.49                 | 0.34                    | -0.32                  | -16.60                |
| 5,537.00            | 0.20            | 236.40      | 5,536.43            | 2.52       | -13.25     | -2.52                 | 0.29                    | -0.11                  | -66.67                |
| 5,633.00            | 0.80            | 205.20      | 5,632.43            | 1.82       | -13.68     | -1.82                 | 0.66                    | 0.63                   | -32.50                |
| 5,728.00            | 1.10            | 206.10      | 5,727.42            | 0.40       | -14.36     | -0.40                 | 0.32                    | 0.32                   | 0.95                  |
| 5,824.00            | 1.00            | 185.90      | 5,823.40            | -1.26      | -14.85     | 1.26                  | 0.40                    | -0.10                  | -21.04                |
| 5,918.00            | 0.80            | 182.90      | 5,917.39            | -2.73      | -14.97     | 2.73                  | 0.22                    | -0.21                  | -3.19                 |
| 5,931.00            | 0.60            | 186.30      | 5,930.39            | -2.89      | -14.98     | 2.89                  | 1.57                    | -1.54                  | 26.15                 |
| 5,963.00            | 0.70            | 195.10      | 5,962.39            | -3.25      | -15.05     | 3.25                  | 0.44                    | 0.31                   | 27.50                 |
| 5,995.00            | 1.20            | 238.80      | 5,994.38            | -3.61      | -15.39     | 3.61                  | 2.64                    | 1.56                   | 136.56                |
| 6,026.00            | 3.40            | 264.70      | 6,025.36            | -3.86      | -16.58     | 3.86                  | 7.67                    | 7.10                   | 83.55                 |
| 6,057.00            | 5.90            | 267.50      | 6,056.25            | -4.02      | -19.09     | 4.02                  | 8.10                    | 8.06                   | 9.03                  |
| 6,089.00            | 8.70            | 271.00      | 6,087.99            | -4.04      | -23.15     | 4.04                  | 8.86                    | 8.75                   | 10.94                 |
| 6,121.00            | 11.50           | 273.90      | 6,119.49            | -3.79      | -28.76     | 3.79                  | 8.89                    | 8.75                   | 9.06                  |
| 6,153.00            | 14.00           | 275.60      | 6,150.70            | -3.19      | -35.79     | 3.19                  | 7.90                    | 7.81                   | 5.31                  |
| 6,184.00            | 15.00           | 275.80      | 6,180.71            | -2.42      | -43.52     | 2.42                  | 3.23                    | 3.23                   | 0.65                  |
| 6,216.00            | 16.80           | 280.50      | 6,211.49            | -1.16      | -52.19     | 1.16                  | 6.91                    | 5.63                   | 14.69                 |
| 6,250.00            | 17.60           | 279.90      | 6,243.97            | 0.62       | -62.08     | -0.62                 | 2.41                    | 2.35                   | -1.76                 |
| 6,282.00            | 20.30           | 277.80      | 6,274.23            | 2.21       | -72.35     | -2.21                 | 8.70                    | 8.44                   | -6.56                 |
| 6,313.00            | 23.70           | 274.20      | 6,302.97            | 3.39       | -83.89     | -3.39                 | 11.79                   | 10.97                  | -11.61                |
| 6,344.00            | 26.10           | 268.30      | 6,331.09            | 3.65       | -96.93     | -3.65                 | 11.13                   | 7.74                   | -19.03                |
| 6,375.00            | 29.90           | 268.40      | 6,358.46            | 3.23       | -111.47    | -3.23                 | 12.26                   | 12.26                  | 0.32                  |
| 6,407.00            | 33.20           | 269.00      | 6,385.72            | 2.85       | -128.21    | -2.85                 | 10.36                   | 10.31                  | 1.88                  |
| 6,439.00            | 35.00           | 266.00      | 6,412.22            | 2.06       | -146.13    | -2.06                 | 7.70                    | 5.63                   | -9.38                 |
| 6,470.00            | 39.10           | 264.20      | 6,436.96            | 0.45       | -164.73    | -0.45                 | 13.68                   | 13.23                  | -5.81                 |
| 6,502.00            | 41.30           | 260.50      | 6,461.40            | -2.31      | -185.19    | 2.31                  | 10.14                   | 6.88                   | -11.56                |
| 6,533.00            | 42.00           | 256.20      | 6,484.57            | -6.48      | -205.36    | 6.48                  | 9.49                    | 2.26                   | -13.87                |
| 6,565.00            | 43.80           | 256.30      | 6,508.01            | -11.65     | -226.51    | 11.65                 | 5.63                    | 5.63                   | 0.31                  |
| 6,597.00            | 46.10           | 253.80      | 6,530.66            | -17.49     | -248.35    | 17.49                 | 9.06                    | 7.19                   | -7.81                 |
| 6,628.00            | 48.90           | 253.80      | 6,551.60            | -23.87     | -270.29    | 23.87                 | 9.03                    | 9.03                   | 0.00                  |
| 6,660.00            | 51.30           | 251.10      | 6,572.13            | -31.28     | -293.69    | 31.28                 | 9.91                    | 7.50                   | -8.44                 |
| 6,692.00            | 53.40           | 249.40      | 6,591.67            | -39.84     | -317.53    | 39.84                 | 7.79                    | 6.56                   | -5.31                 |
| 6,724.00            | 54.50           | 245.40      | 6,610.51            | -49.79     | -341.41    | 49.79                 | 10.67                   | 3.44                   | -12.50                |
| 6,755.00            | 56.90           | 242.20      | 6,627.98            | -61.10     | -364.37    | 61.10                 | 11.52                   | 7.74                   | -10.32                |
| 6,787.00            | 58.40           | 238.10      | 6,645.11            | -74.56     | -387.81    | 74.56                 | 11.79                   | 4.69                   | -12.81                |
| 6,818.00            | 60.30           | 234.60      | 6,660.91            | -89.34     | -410.00    | 89.34                 | 11.48                   | 6.13                   | -11.29                |
| 6,850.00            | 63.50           | 231.40      | 6,675.99            | -106.33    | -432.53    | 106.33                | 13.33                   | 10.00                  | -10.00                |
| 6,881.00            | 66.00           | 227.60      | 6,689.21            | -124.54    | -453.84    | 124.54                | 13.71                   | 8.06                   | -12.26                |
| 6,889.07            | 66.52           | 226.68      | 6,692.46            | -129.57    | -459.25    | 129.57                | 12.26                   | 6.47                   | -11.38                |



# Integrity Directional Services, LLC

## Survey Report



|                  |                               |                                     |                                  |
|------------------|-------------------------------|-------------------------------------|----------------------------------|
| <b>Company:</b>  | Chisholm Energy Holdings, LLC | <b>Local Co-ordinate Reference:</b> | Well Cottonwood 29-32 Fed Com 1H |
| <b>Project:</b>  | Eddy County, NM (NAD83)       | <b>TVD Reference:</b>               | KB=22' @ 3455.00ft (Nabors M55)  |
| <b>Site:</b>     | Sec. 29, T26 S, 26 E          | <b>MD Reference:</b>                | KB=22' @ 3455.00ft (Nabors M55)  |
| <b>Well:</b>     | Cottonwood 29-32 Fed Com 1H   | <b>North Reference:</b>             | Grid                             |
| <b>Wellbore:</b> | Wellbore #1                   | <b>Survey Calculation Method:</b>   | Minimum Curvature                |
| <b>Design:</b>   | Wellbore #1                   | <b>Database:</b>                    | EDM 5000.1 Multi User Db         |

| Survey                                           |                 |             |                     |            |            |                       |                         |                        |                       |
|--------------------------------------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (ft)                              | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| <b>North 330' Hardline Crossing @ 6889.07'MD</b> |                 |             |                     |            |            |                       |                         |                        |                       |
| 6,913.00                                         | 68.10           | 224.00      | 6,701.69            | -145.09    | -474.95    | 145.09                | 12.26                   | 6.59                   | -11.21                |
| 6,945.00                                         | 70.40           | 219.70      | 6,713.04            | -167.37    | -494.90    | 167.37                | 14.47                   | 7.19                   | -13.44                |
| 6,977.00                                         | 72.40           | 215.30      | 6,723.25            | -191.43    | -513.35    | 191.43                | 14.45                   | 6.25                   | -13.75                |
| 7,008.00                                         | 74.20           | 210.90      | 6,732.16            | -216.30    | -529.56    | 216.30                | 14.78                   | 5.81                   | -14.19                |
| 7,040.00                                         | 75.10           | 205.90      | 6,740.63            | -243.44    | -544.23    | 243.44                | 15.33                   | 2.81                   | -15.63                |
| 7,072.00                                         | 75.80           | 202.90      | 6,748.67            | -271.64    | -557.02    | 271.64                | 9.33                    | 2.19                   | -9.38                 |
| 7,104.00                                         | 75.00           | 198.50      | 6,756.74            | -300.60    | -567.96    | 300.60                | 13.54                   | -2.50                  | -13.75                |
| 7,135.00                                         | 75.30           | 193.70      | 6,764.69            | -329.38    | -576.27    | 329.38                | 15.00                   | 0.97                   | -15.48                |
| 7,167.00                                         | 75.70           | 188.60      | 6,772.71            | -359.76    | -582.26    | 359.76                | 15.48                   | 1.25                   | -15.94                |
| 7,199.00                                         | 76.70           | 184.20      | 6,780.35            | -390.64    | -585.72    | 390.64                | 13.71                   | 3.13                   | -13.75                |
| 7,231.00                                         | 79.60           | 180.50      | 6,786.92            | -421.92    | -587.00    | 421.92                | 14.50                   | 9.06                   | -11.56                |
| 7,262.00                                         | 84.40           | 178.90      | 6,791.23            | -452.61    | -586.83    | 452.61                | 16.31                   | 15.48                  | -5.16                 |
| 7,290.00                                         | 88.50           | 178.00      | 6,792.97            | -480.54    | -586.08    | 480.54                | 14.99                   | 14.64                  | -3.21                 |
| 7,385.00                                         | 90.70           | 178.90      | 6,793.63            | -575.49    | -583.51    | 575.49                | 2.50                    | 2.32                   | 0.95                  |
| 7,480.00                                         | 90.10           | 179.00      | 6,792.97            | -670.47    | -581.77    | 670.47                | 0.64                    | -0.63                  | 0.11                  |
| 7,575.00                                         | 89.90           | 178.30      | 6,792.97            | -765.45    | -579.53    | 765.45                | 0.77                    | -0.21                  | -0.74                 |
| 7,670.00                                         | 90.10           | 177.50      | 6,792.97            | -860.38    | -576.05    | 860.38                | 0.87                    | 0.21                   | -0.84                 |
| 7,765.00                                         | 90.20           | 176.90      | 6,792.72            | -955.27    | -571.41    | 955.27                | 0.64                    | 0.11                   | -0.63                 |
| 7,859.00                                         | 91.10           | 177.50      | 6,791.65            | -1,049.15  | -566.82    | 1,049.15              | 1.15                    | 0.96                   | 0.64                  |
| 7,955.00                                         | 91.70           | 177.70      | 6,789.31            | -1,145.04  | -562.80    | 1,145.04              | 0.66                    | 0.63                   | 0.21                  |
| 8,049.00                                         | 92.60           | 177.60      | 6,785.78            | -1,238.89  | -558.94    | 1,238.89              | 0.96                    | 0.96                   | -0.11                 |
| 8,144.00                                         | 92.50           | 178.70      | 6,781.55            | -1,333.74  | -555.88    | 1,333.74              | 1.16                    | -0.11                  | 1.16                  |
| 8,238.00                                         | 93.10           | 178.60      | 6,776.96            | -1,427.61  | -553.67    | 1,427.61              | 0.65                    | 0.64                   | -0.11                 |
| 8,333.00                                         | 94.60           | 179.30      | 6,770.58            | -1,522.37  | -551.93    | 1,522.37              | 1.74                    | 1.58                   | 0.74                  |
| 8,428.00                                         | 95.90           | 179.50      | 6,761.89            | -1,616.97  | -550.94    | 1,616.97              | 1.38                    | 1.37                   | 0.21                  |
| 8,523.00                                         | 95.10           | 179.20      | 6,752.78            | -1,711.52  | -549.87    | 1,711.52              | 0.90                    | -0.84                  | -0.32                 |
| 8,617.00                                         | 93.20           | 179.10      | 6,745.98            | -1,805.26  | -548.48    | 1,805.26              | 2.02                    | -2.02                  | -0.11                 |
| 8,712.00                                         | 93.30           | 179.00      | 6,740.60            | -1,900.10  | -546.90    | 1,900.10              | 0.15                    | 0.11                   | -0.11                 |
| 8,807.00                                         | 94.00           | 179.30      | 6,734.55            | -1,994.89  | -545.50    | 1,994.89              | 0.80                    | 0.74                   | 0.32                  |
| 8,902.00                                         | 92.40           | 179.70      | 6,729.25            | -2,089.74  | -544.67    | 2,089.74              | 1.74                    | -1.68                  | 0.42                  |
| 8,996.00                                         | 92.50           | 180.70      | 6,725.23            | -2,183.65  | -545.00    | 2,183.65              | 1.07                    | 0.11                   | 1.06                  |
| 9,091.00                                         | 93.20           | 181.30      | 6,720.50            | -2,278.52  | -546.65    | 2,278.52              | 0.97                    | 0.74                   | 0.63                  |
| 9,186.00                                         | 93.40           | 181.40      | 6,715.04            | -2,373.33  | -548.89    | 2,373.33              | 0.24                    | 0.21                   | 0.11                  |
| 9,281.00                                         | 90.60           | 180.10      | 6,711.72            | -2,468.25  | -550.13    | 2,468.25              | 3.25                    | -2.95                  | -1.37                 |
| 9,375.00                                         | 90.50           | 179.70      | 6,710.82            | -2,562.25  | -549.97    | 2,562.25              | 0.44                    | -0.11                  | -0.43                 |
| 9,470.00                                         | 90.50           | 179.40      | 6,709.99            | -2,657.24  | -549.22    | 2,657.24              | 0.32                    | 0.00                   | -0.32                 |
| 9,566.00                                         | 90.60           | 179.80      | 6,709.07            | -2,753.24  | -548.55    | 2,753.24              | 0.43                    | 0.10                   | 0.42                  |
| 9,660.00                                         | 90.60           | 180.30      | 6,708.08            | -2,847.23  | -548.63    | 2,847.23              | 0.53                    | 0.00                   | 0.53                  |
| 9,756.00                                         | 91.10           | 180.90      | 6,706.66            | -2,943.21  | -549.64    | 2,943.21              | 0.81                    | 0.52                   | 0.63                  |
| 9,851.00                                         | 90.80           | 180.20      | 6,705.08            | -3,038.20  | -550.55    | 3,038.20              | 0.80                    | -0.32                  | -0.74                 |
| 9,946.00                                         | 90.30           | 177.40      | 6,704.17            | -3,133.16  | -548.56    | 3,133.16              | 2.99                    | -0.53                  | -2.95                 |
| 10,041.00                                        | 89.10           | 177.40      | 6,704.67            | -3,228.06  | -544.25    | 3,228.06              | 1.26                    | -1.26                  | 0.00                  |
| 10,136.00                                        | 88.90           | 177.80      | 6,706.33            | -3,322.96  | -540.27    | 3,322.96              | 0.47                    | -0.21                  | 0.42                  |



# Integrity Directional Services, LLC

## Survey Report



**Company:** Chisholm Energy Holdings, LLC  
**Project:** Eddy County, NM (NAD83)  
**Site:** Sec. 29, T26 S, 26 E  
**Well:** Cottonwood 29-32 Fed Com 1H  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Cottonwood 29-32 Fed Com 1H  
**TVD Reference:** KB=22' @ 3455.00ft (Nabors M55)  
**MD Reference:** KB=22' @ 3455.00ft (Nabors M55)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Multi User Db

### Survey

| Measured Depth (ft)                                                         | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------------------------------------------------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| 10,231.00                                                                   | 89.80           | 177.20      | 6,707.40            | -3,417.86  | -536.13    | 3,417.86              | 1.14                    | 0.95                   | -0.63                 |
| 10,325.00                                                                   | 90.50           | 177.60      | 6,707.16            | -3,511.77  | -531.87    | 3,511.77              | 0.86                    | 0.74                   | 0.43                  |
| 10,420.00                                                                   | 91.20           | 178.20      | 6,705.75            | -3,606.69  | -528.38    | 3,606.69              | 0.97                    | 0.74                   | 0.63                  |
| 10,514.00                                                                   | 91.40           | 178.20      | 6,703.62            | -3,700.62  | -525.43    | 3,700.62              | 0.21                    | 0.21                   | 0.00                  |
| 10,609.00                                                                   | 91.90           | 178.20      | 6,700.88            | -3,795.53  | -522.45    | 3,795.53              | 0.53                    | 0.53                   | 0.00                  |
| 10,704.00                                                                   | 92.70           | 178.30      | 6,697.07            | -3,890.41  | -519.55    | 3,890.41              | 0.85                    | 0.84                   | 0.11                  |
| 10,799.00                                                                   | 91.20           | 178.30      | 6,693.84            | -3,985.31  | -516.73    | 3,985.31              | 1.58                    | -1.58                  | 0.00                  |
| 10,894.00                                                                   | 91.40           | 178.20      | 6,691.68            | -4,080.24  | -513.83    | 4,080.24              | 0.24                    | 0.21                   | -0.11                 |
| 10,989.00                                                                   | 91.80           | 178.30      | 6,689.03            | -4,175.16  | -510.93    | 4,175.16              | 0.43                    | 0.42                   | 0.11                  |
| 11,084.00                                                                   | 90.60           | 179.00      | 6,687.04            | -4,270.11  | -508.70    | 4,270.11              | 1.46                    | -1.26                  | 0.74                  |
| 11,179.00                                                                   | 88.50           | 179.40      | 6,687.78            | -4,365.10  | -507.37    | 4,365.10              | 2.25                    | -2.21                  | 0.42                  |
| 11,274.00                                                                   | 88.30           | 179.60      | 6,690.44            | -4,460.05  | -506.54    | 4,460.05              | 0.30                    | -0.21                  | 0.21                  |
| 11,369.00                                                                   | 89.10           | 179.40      | 6,692.59            | -4,555.03  | -505.71    | 4,555.03              | 0.87                    | 0.84                   | -0.21                 |
| 11,463.00                                                                   | 89.40           | 179.70      | 6,693.82            | -4,649.01  | -504.97    | 4,649.01              | 0.45                    | 0.32                   | 0.32                  |
| 11,558.00                                                                   | 89.80           | 180.00      | 6,694.49            | -4,744.01  | -504.73    | 4,744.01              | 0.53                    | 0.42                   | 0.32                  |
| 11,653.00                                                                   | 90.00           | 180.40      | 6,694.65            | -4,839.01  | -505.06    | 4,839.01              | 0.47                    | 0.21                   | 0.42                  |
| 11,748.00                                                                   | 90.20           | 180.60      | 6,694.49            | -4,934.01  | -505.89    | 4,934.01              | 0.30                    | 0.21                   | 0.21                  |
| 11,843.00                                                                   | 90.70           | 180.70      | 6,693.74            | -5,029.00  | -506.96    | 5,029.00              | 0.54                    | 0.53                   | 0.11                  |
| 11,937.63                                                                   | 91.20           | 180.50      | 6,692.17            | -5,123.61  | -507.96    | 5,123.61              | 0.57                    | 0.53                   | -0.21                 |
| <b>Sec 29/32 Crossing @ 11937.63'MD</b>                                     |                 |             |                     |            |            |                       |                         |                        |                       |
| 11,938.00                                                                   | 91.20           | 180.50      | 6,692.17            | -5,123.98  | -507.96    | 5,123.98              | 0.57                    | 0.53                   | -0.21                 |
| 12,033.00                                                                   | 91.00           | 178.80      | 6,690.34            | -5,218.96  | -507.38    | 5,218.96              | 1.80                    | -0.21                  | -1.79                 |
| 12,128.00                                                                   | 90.30           | 177.70      | 6,689.26            | -5,313.90  | -504.48    | 5,313.90              | 1.37                    | -0.74                  | -1.16                 |
| 12,223.00                                                                   | 90.70           | 177.70      | 6,688.43            | -5,408.82  | -500.66    | 5,408.82              | 0.42                    | 0.42                   | 0.00                  |
| 12,318.00                                                                   | 89.80           | 178.80      | 6,688.02            | -5,503.78  | -497.76    | 5,503.78              | 1.50                    | -0.95                  | 1.16                  |
| 12,413.00                                                                   | 89.50           | 179.00      | 6,688.60            | -5,598.76  | -495.94    | 5,598.76              | 0.38                    | -0.32                  | 0.21                  |
| 12,507.00                                                                   | 89.80           | 179.40      | 6,689.17            | -5,692.74  | -494.63    | 5,692.74              | 0.53                    | 0.32                   | 0.43                  |
| 12,602.00                                                                   | 89.60           | 179.90      | 6,689.67            | -5,787.74  | -494.05    | 5,787.74              | 0.57                    | -0.21                  | 0.53                  |
| 12,697.00                                                                   | 90.00           | 180.50      | 6,690.00            | -5,882.74  | -494.38    | 5,882.74              | 0.76                    | 0.42                   | 0.63                  |
| 12,791.00                                                                   | 90.60           | 181.10      | 6,689.51            | -5,976.73  | -495.69    | 5,976.73              | 0.90                    | 0.64                   | 0.64                  |
| 12,886.00                                                                   | 90.30           | 180.00      | 6,688.77            | -6,071.72  | -496.60    | 6,071.72              | 1.20                    | -0.32                  | -1.16                 |
| 12,980.00                                                                   | 90.50           | 179.30      | 6,688.11            | -6,165.71  | -496.03    | 6,165.71              | 0.77                    | 0.21                   | -0.74                 |
| 13,075.00                                                                   | 90.00           | 178.70      | 6,687.69            | -6,260.70  | -494.37    | 6,260.70              | 0.82                    | -0.53                  | -0.63                 |
| 13,169.00                                                                   | 89.70           | 178.60      | 6,687.94            | -6,354.67  | -492.16    | 6,354.67              | 0.34                    | -0.32                  | -0.11                 |
| 13,264.00                                                                   | 89.80           | 178.60      | 6,688.35            | -6,449.64  | -489.84    | 6,449.64              | 0.11                    | 0.11                   | 0.00                  |
| 13,359.00                                                                   | 90.00           | 177.90      | 6,688.52            | -6,544.60  | -486.93    | 6,544.60              | 0.77                    | 0.21                   | -0.74                 |
| 13,452.00                                                                   | 90.70           | 177.80      | 6,687.95            | -6,637.53  | -483.45    | 6,637.53              | 0.76                    | 0.75                   | -0.11                 |
| 13,547.00                                                                   | 90.50           | 177.80      | 6,686.96            | -6,732.45  | -479.80    | 6,732.45              | 0.21                    | -0.21                  | 0.00                  |
| 13,626.00                                                                   | 90.70           | 178.10      | 6,686.13            | -6,811.40  | -476.97    | 6,811.40              | 0.46                    | 0.25                   | 0.38                  |
| <b>Final MWD Survey @ 13626'MD</b>                                          |                 |             |                     |            |            |                       |                         |                        |                       |
| 13,704.06                                                                   | 90.70           | 178.10      | 6,685.18            | -6,889.41  | -474.39    | 6,889.41              | 0.00                    | 0.00                   | 0.00                  |
| <b>South 330' Hardline Crossing @ 13704.06'MD - CW 29-32 Fed Com 1H BHL</b> |                 |             |                     |            |            |                       |                         |                        |                       |
| 13,710.00                                                                   | 90.70           | 178.10      | 6,685.10            | -6,895.35  | -474.19    | 6,895.35              | 0.00                    | 0.00                   | 0.00                  |
| <b>Projection to TD @ 13710'MD</b>                                          |                 |             |                     |            |            |                       |                         |                        |                       |



# Integrity Directional Services, LLC

## Survey Report



**Company:** Chisholm Energy Holdings, LLC  
**Project:** Eddy County, NM (NAD83)  
**Site:** Sec. 29, T26 S, 26 E  
**Well:** Cottonwood 29-32 Fed Com 1H  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Cottonwood 29-32 Fed Com 1H  
**TVD Reference:** KB=22' @ 3455.00ft (Nabors M55)  
**MD Reference:** KB=22' @ 3455.00ft (Nabors M55)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Multi User Db

### Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|

### Design Targets

| Target Name                                                                                   | - hit/miss target | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude   | Longitude    |
|-----------------------------------------------------------------------------------------------|-------------------|---------------|--------------|----------|------------|------------|-----------------|----------------|------------|--------------|
| CW 29-32 Fed Com 1                                                                            |                   | 0.00          | 0.00         | 6,681.90 | -6,889.51  | -471.40    | 364,109.5000    | 545,037.5000   | 32.0010165 | -104.3213972 |
| - survey misses target center by 4.43ft at 13704.06ft MD (6685.18 TVD, -6889.41 N, -474.39 E) |                   |               |              |          |            |            |                 |                |            |              |
| - Point                                                                                       |                   |               |              |          |            |            |                 |                |            |              |

### Survey Annotations

| Measured Depth (ft) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Comment                                    |
|---------------------|---------------------|------------|------------|--------------------------------------------|
| 119.00              | 119.00              | -0.30      | 0.42       | First MWD Survey @ 119'MD                  |
| 6,889.07            | 6,692.46            | -129.57    | -459.25    | North 330' Hardline Crossing @ 6889.07'MD  |
| 11,937.63           | 6,692.17            | -5,123.61  | -507.96    | Sec 29/32 Crossing @ 11937.63'MD           |
| 13,626.00           | 6,686.13            | -6,811.40  | -476.97    | Final MWD Survey @ 13626'MD                |
| 13,704.06           | 6,685.18            | -6,889.41  | -474.39    | South 330' Hardline Crossing @ 13704.06'MD |
| 13,710.00           | 6,685.10            | -6,895.35  | -474.19    | Projection to TD @ 13710'MD                |

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_