

**Burnett Oil Co., Inc.**

**NM OIL CONSERVATION**

ARTESIA DISTRICT

SEP 18 2017

RECEIVED

# **Burnett Oil Company, INC**

Eddy County, NM

Sec.24, T.17 S., R. 31 E.

Partition 13 FED NC 5H

**Wellbore #1**

**Plan: Plan #3**

## **Standard Survey Report**

07 March, 2017

**INTEGRITY**  
*Directional Services*

# Integrity Directional Services, LLC

## Survey Report

Burnett Oil Co., Inc.



**Company:** Burnett Oil Company, INC  
**Project:** Eddy County, NM  
**Site:** Sec.24, T.17 S., R. 31 E.  
**Well:** Partition 13 FED NC 5H  
**Wellbore:** Wellbore #1  
**Design:** Plan #3

**Local Co-ordinate Reference:** Well Partition 13 FED NC 5H  
**TVD Reference:** RKB @ 3907.01ft  
**MD Reference:** RKB @ 3907.01ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Multi User Db

|                    |                                      |                      |                |
|--------------------|--------------------------------------|----------------------|----------------|
| <b>Project</b>     | Eddy County, NM                      |                      |                |
| <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** Sec.24, T.17 S., R. 31 E.

|                                      |                                    |                                     |
|--------------------------------------|------------------------------------|-------------------------------------|
| <b>Site Position:</b>                | <b>Northing:</b> 664,720.0000 usft | <b>Latitude:</b> 32° 49' 34.975 N   |
| <b>From:</b> Map                     | <b>Easting:</b> 655,241.7000 usft  | <b>Longitude:</b> 103° 49' 40.666 W |
| <b>Position Uncertainty:</b> 0.00 ft | <b>Slot Radius:</b> 13-3/16 "      | <b>Grid Convergence:</b> 0.27 °     |

**Well** Partition 13 FED NC 5H

|                             |                      |                                    |                                     |
|-----------------------------|----------------------|------------------------------------|-------------------------------------|
| <b>Well Position</b>        | <b>+N/-S</b> 0.00 ft | <b>Northing:</b> 664,806.1000 usft | <b>Latitude:</b> 32° 49' 35.751 N   |
|                             | <b>+E/-W</b> 0.00 ft | <b>Easting:</b> 656,840.9000 usft  | <b>Longitude:</b> 103° 49' 21.920 W |
| <b>Position Uncertainty</b> | 0.00 ft              | <b>Wellhead Elevation:</b> 0.00 ft | <b>Ground Level:</b> 3,887.01 ft    |

**Wellbore** Wellbore #1

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|-----------|------------|-------------|-----------------|---------------|---------------------|
|           | HDGM       | 2/17/2017   | 7.35            | 60.82         | 48,460              |

**Design** Plan #3

**Audit Notes:**

**Version:** Phase: PLAN Tie On Depth: 0.00

| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) |
|-------------------|-----------------------|------------|------------|---------------|
|                   | 0.00                  | 0.00       | 0.00       | 356.41        |

**Survey Tool Program** Date 3/7/2017

| From (ft) | To (ft)   | Survey (Wellbore)     | Tool Name | Description    |
|-----------|-----------|-----------------------|-----------|----------------|
| 0.00      | 10,567.60 | Plan #3 (Wellbore #1) | MWD       | MWD - Standard |

**Planned 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) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| 0.00                | 0.00            | 0.00        | 0.00                | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 100.00              | 0.00            | 0.00        | 100.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 200.00              | 0.00            | 0.00        | 200.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 300.00              | 0.00            | 0.00        | 300.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 400.00              | 0.00            | 0.00        | 400.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 500.00              | 0.00            | 0.00        | 500.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 600.00              | 0.00            | 0.00        | 600.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 700.00              | 0.00            | 0.00        | 700.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 800.00              | 0.00            | 0.00        | 800.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 900.00              | 0.00            | 0.00        | 900.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |

# Integrity Directional Services, LLC

## Survey Report



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**Project:** Eddy County, NM  
**Site:** Sec.24, T.17 S., R. 31 E  
**Well:** Partition 13 FED NC 5H  
**Wellbore:** Wellbore #1  
**Design:** Plan #3

**Local Co-ordinate Reference:** Well Partition 13 FED NC 5H  
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**MD Reference:** RKB @ 3907.01ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Multi User Db

### Planned Survey

| Measured Depth (ft)      | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ust) | Build Rate (°/100ust) | Turn Rate (°/100ust) |  |
|--------------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|------------------------|-----------------------|----------------------|--|
| 1,000.00                 | 0.00            | 0.00        | 1,000.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 1,100.00                 | 0.00            | 0.00        | 1,100.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 1,200.00                 | 0.00            | 0.00        | 1,200.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 1,300.00                 | 0.00            | 0.00        | 1,300.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 1,400.00                 | 0.00            | 0.00        | 1,400.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 1,500.00                 | 0.00            | 0.00        | 1,500.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 1,600.00                 | 0.00            | 0.00        | 1,600.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 1,700.00                 | 0.00            | 0.00        | 1,700.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 1,800.00                 | 0.00            | 0.00        | 1,800.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 1,900.00                 | 0.00            | 0.00        | 1,900.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 2,000.00                 | 0.00            | 0.00        | 2,000.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 2,100.00                 | 0.00            | 0.00        | 2,100.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 2,200.00                 | 0.00            | 0.00        | 2,200.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 2,300.00                 | 0.00            | 0.00        | 2,300.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 2,400.00                 | 0.00            | 0.00        | 2,400.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 2,500.00                 | 0.00            | 0.00        | 2,500.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 2,600.00                 | 0.00            | 0.00        | 2,600.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 2,700.00                 | 0.00            | 0.00        | 2,700.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 2,800.00                 | 0.00            | 0.00        | 2,800.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 2,900.00                 | 0.00            | 0.00        | 2,900.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 3,000.00                 | 0.00            | 0.00        | 3,000.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 3,100.00                 | 0.00            | 0.00        | 3,100.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 3,200.00                 | 0.00            | 0.00        | 3,200.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 3,300.00                 | 0.00            | 0.00        | 3,300.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 3,400.00                 | 0.00            | 0.00        | 3,400.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 3,500.00                 | 0.00            | 0.00        | 3,500.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 3,600.00                 | 0.00            | 0.00        | 3,600.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 3,700.00                 | 0.00            | 0.00        | 3,700.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 3,800.00                 | 0.00            | 0.00        | 3,800.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 3,900.00                 | 0.00            | 0.00        | 3,900.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,000.00                 | 0.00            | 0.00        | 4,000.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,100.00                 | 0.00            | 0.00        | 4,100.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,200.00                 | 0.00            | 0.00        | 4,200.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,300.00                 | 0.00            | 0.00        | 4,300.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,400.00                 | 0.00            | 0.00        | 4,400.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,500.00                 | 0.00            | 0.00        | 4,500.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,600.00                 | 0.00            | 0.00        | 4,600.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,700.00                 | 0.00            | 0.00        | 4,700.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,800.00                 | 0.00            | 0.00        | 4,800.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,900.00                 | 0.00            | 0.00        | 4,900.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| 4,930.00                 | 0.00            | 0.00        | 4,930.00            | 0.00       | 0.00       | 0.00                  | 0.00                   | 0.00                  | 0.00                 |  |
| <b>Start Build 12.00</b> |                 |             |                     |            |            |                       |                        |                       |                      |  |
| 5,000.00                 | 8.40            | 313.51      | 4,999.75            | 3.53       | -3.71      | 3.75                  | 12.00                  | 12.00                 | 0.00                 |  |
| 5,100.00                 | 20.40           | 313.51      | 5,096.43            | 20.62      | -21.72     | 21.94                 | 12.00                  | 12.00                 | 0.00                 |  |

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**Planned 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) |  |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|--|
| 5,200.00  | 32.40           | 313.51      | 5,185.84            | 51.18      | -53.90     | 54.45                 | 12.00                   | 12.00                  | 0.00                  |  |
| 5,300.00  | 44.40           | 313.51      | 5,264.06            | 93.87      | -98.87     | 99.88                 | 12.00                   | 12.00                  | 0.00                  |  |
| 5,366.63  | 52.40           | 313.51      | 5,308.27            | 128.15     | -134.97    | 136.35                | 12.00                   | 12.00                  | 0.00                  |  |
| <b>Start 25.53 hold at 5366.63 MD</b>                 |                 |             |                     |            |            |                       |                         |                        |                       |  |
| 5,392.17  | 52.40           | 313.51      | 5,323.85            | 142.07     | -149.64    | 151.17                | 0.00                    | 0.00                   | 0.00                  |  |
| <b>Start DLS 12.00 TFO 59.20</b>                      |                 |             |                     |            |            |                       |                         |                        |                       |  |
| 5,400.00  | 52.88           | 314.53      | 5,328.61            | 146.40     | -154.12    | 155.77                | 12.00                   | 6.20                   | 12.93                 |  |
| 5,500.00  | 59.74           | 326.38      | 5,384.18            | 210.56     | -206.64    | 223.09                | 12.00                   | 6.86                   | 11.85                 |  |
| 5,600.00  | 67.53           | 336.59      | 5,428.65            | 289.21     | -249.07    | 304.25                | 12.00                   | 7.78                   | 10.21                 |  |
| 5,700.00  | 75.88           | 345.68      | 5,460.07            | 378.92     | -279.53    | 395.69                | 12.00                   | 8.35                   | 9.08                  |  |
| 5,800.00  | 84.55           | 354.10      | 5,477.08            | 475.77     | -296.70    | 493.43                | 12.00                   | 8.67                   | 8.43                  |  |
| 5,867.72  | 90.50           | 359.65      | 5,480.00            | 543.27     | -300.38    | 561.03                | 12.00                   | 8.78                   | 8.19                  |  |
| <b>LP @ 5867.72' MD / 5480' TVD - 330' FSL Sec 13</b> |                 |             |                     |            |            |                       |                         |                        |                       |  |
| 5,900.00  | 90.50           | 359.65      | 5,479.72            | 575.55     | -300.58    | 593.25                | 0.00                    | 0.00                   | 0.00                  |  |
| 6,000.00  | 90.50           | 359.65      | 5,478.85            | 675.54     | -301.19    | 693.09                | 0.00                    | 0.00                   | 0.00                  |  |
| 6,100.00  | 90.50           | 359.65      | 5,477.97            | 775.54     | -301.80    | 792.92                | 0.00                    | 0.00                   | 0.00                  |  |
| 6,200.00  | 90.50           | 359.65      | 5,477.10            | 875.53     | -302.42    | 892.76                | 0.00                    | 0.00                   | 0.00                  |  |
| 6,300.00  | 90.50           | 359.65      | 5,476.23            | 975.52     | -303.03    | 992.60                | 0.00                    | 0.00                   | 0.00                  |  |
| 6,400.00  | 90.50           | 359.65      | 5,475.36            | 1,075.52   | -303.64    | 1,092.43              | 0.00                    | 0.00                   | 0.00                  |  |
| 6,500.00  | 90.50           | 359.65      | 5,474.48            | 1,175.51   | -304.26    | 1,192.27              | 0.00                    | 0.00                   | 0.00                  |  |
| 6,600.00  | 90.50           | 359.65      | 5,473.61            | 1,275.51   | -304.87    | 1,292.11              | 0.00                    | 0.00                   | 0.00                  |  |
| 6,700.00  | 90.50           | 359.65      | 5,472.74            | 1,375.50   | -305.48    | 1,391.94              | 0.00                    | 0.00                   | 0.00                  |  |
| 6,800.00  | 90.50           | 359.65      | 5,471.86            | 1,475.50   | -306.10    | 1,491.78              | 0.00                    | 0.00                   | 0.00                  |  |
| 6,900.00  | 90.50           | 359.65      | 5,470.99            | 1,575.49   | -306.71    | 1,591.61              | 0.00                    | 0.00                   | 0.00                  |  |
| 7,000.00  | 90.50           | 359.65      | 5,470.12            | 1,675.48   | -307.32    | 1,691.45              | 0.00                    | 0.00                   | 0.00                  |  |
| 7,100.00  | 90.50           | 359.65      | 5,469.25            | 1,775.48   | -307.94    | 1,791.29              | 0.00                    | 0.00                   | 0.00                  |  |
| 7,200.00  | 90.50           | 359.65      | 5,468.37            | 1,875.47   | -308.55    | 1,891.12              | 0.00                    | 0.00                   | 0.00                  |  |
| 7,300.00  | 90.50           | 359.65      | 5,467.50            | 1,975.47   | -309.16    | 1,990.96              | 0.00                    | 0.00                   | 0.00                  |  |
| 7,400.00  | 90.50           | 359.65      | 5,466.63            | 2,075.46   | -309.78    | 2,090.79              | 0.00                    | 0.00                   | 0.00                  |  |
| 7,500.00  | 90.50           | 359.65      | 5,465.76            | 2,175.46   | -310.39    | 2,190.63              | 0.00                    | 0.00                   | 0.00                  |  |
| 7,600.00  | 90.50           | 359.65      | 5,464.88            | 2,275.45   | -311.00    | 2,290.47              | 0.00                    | 0.00                   | 0.00                  |  |
| 7,700.00  | 90.50           | 359.65      | 5,464.01            | 2,375.44   | -311.62    | 2,390.30              | 0.00                    | 0.00                   | 0.00                  |  |
| 7,800.00  | 90.50           | 359.65      | 5,463.14            | 2,475.44   | -312.23    | 2,490.14              | 0.00                    | 0.00                   | 0.00                  |  |
| 7,900.00  | 90.50           | 359.65      | 5,462.27            | 2,575.43   | -312.84    | 2,589.98              | 0.00                    | 0.00                   | 0.00                  |  |
| 8,000.00  | 90.50           | 359.65      | 5,461.39            | 2,675.43   | -313.46    | 2,689.81              | 0.00                    | 0.00                   | 0.00                  |  |
| 8,100.00  | 90.50           | 359.65      | 5,460.52            | 2,775.42   | -314.07    | 2,789.65              | 0.00                    | 0.00                   | 0.00                  |  |
| 8,200.00  | 90.50           | 359.65      | 5,459.65            | 2,875.42   | -314.68    | 2,889.48              | 0.00                    | 0.00                   | 0.00                  |  |
| 8,300.00  | 90.50           | 359.65      | 5,458.77            | 2,975.41   | -315.30    | 2,989.32              | 0.00                    | 0.00                   | 0.00                  |  |
| 8,400.00  | 90.50           | 359.65      | 5,457.90            | 3,075.40   | -315.91    | 3,089.16              | 0.00                    | 0.00                   | 0.00                  |  |
| 8,500.00  | 90.50           | 359.65      | 5,457.03            | 3,175.40   | -316.52    | 3,188.99              | 0.00                    | 0.00                   | 0.00                  |  |
| 8,600.00  | 90.50           | 359.65      | 5,456.16            | 3,275.39   | -317.13    | 3,288.83              | 0.00                    | 0.00                   | 0.00                  |  |
| 8,700.00  | 90.50           | 359.65      | 5,455.28            | 3,375.39   | -317.75    | 3,388.67              | 0.00                    | 0.00                   | 0.00                  |  |
| 8,800.00  | 90.50           | 359.65      | 5,454.41            | 3,475.38   | -318.36    | 3,488.50              | 0.00                    | 0.00                   | 0.00                  |  |
| 8,900.00  | 90.50           | 359.65      | 5,453.54            | 3,575.38   | -318.97    | 3,588.34              | 0.00                    | 0.00                   | 0.00                  |  |

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**Planned Survey**

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|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|--|
| 9,000.00            | 90.50           | 359.65      | 5,452.67            | 3,675.37   | -319.59    | 3,688.17              | 0.00                    | 0.00                   | 0.00                  |  |
| 9,100.00            | 90.50           | 359.65      | 5,451.79            | 3,775.36   | -320.20    | 3,788.01              | 0.00                    | 0.00                   | 0.00                  |  |
| 9,200.00            | 90.50           | 359.65      | 5,450.92            | 3,875.36   | -320.81    | 3,887.85              | 0.00                    | 0.00                   | 0.00                  |  |
| 9,300.00            | 90.50           | 359.65      | 5,450.05            | 3,975.35   | -321.43    | 3,987.68              | 0.00                    | 0.00                   | 0.00                  |  |
| 9,400.00            | 90.50           | 359.65      | 5,449.18            | 4,075.35   | -322.04    | 4,087.52              | 0.00                    | 0.00                   | 0.00                  |  |
| 9,500.00            | 90.50           | 359.65      | 5,448.30            | 4,175.34   | -322.65    | 4,187.36              | 0.00                    | 0.00                   | 0.00                  |  |
| 9,600.00            | 90.50           | 359.65      | 5,447.43            | 4,275.34   | -323.27    | 4,287.19              | 0.00                    | 0.00                   | 0.00                  |  |
| 9,700.00            | 90.50           | 359.65      | 5,446.56            | 4,375.33   | -323.88    | 4,387.03              | 0.00                    | 0.00                   | 0.00                  |  |
| 9,800.00            | 90.50           | 359.65      | 5,445.68            | 4,475.33   | -324.49    | 4,486.86              | 0.00                    | 0.00                   | 0.00                  |  |
| 9,900.00            | 90.50           | 359.65      | 5,444.81            | 4,575.32   | -325.11    | 4,586.70              | 0.00                    | 0.00                   | 0.00                  |  |
| 10,000.00           | 90.50           | 359.65      | 5,443.94            | 4,675.31   | -325.72    | 4,686.54              | 0.00                    | 0.00                   | 0.00                  |  |
| 10,100.00           | 90.50           | 359.65      | 5,443.07            | 4,775.31   | -326.33    | 4,786.37              | 0.00                    | 0.00                   | 0.00                  |  |
| 10,200.00           | 90.50           | 359.65      | 5,442.19            | 4,875.30   | -326.95    | 4,886.21              | 0.00                    | 0.00                   | 0.00                  |  |
| 10,300.00           | 90.50           | 359.65      | 5,441.32            | 4,975.30   | -327.56    | 4,986.04              | 0.00                    | 0.00                   | 0.00                  |  |
| 10,400.00           | 90.50           | 359.65      | 5,440.45            | 5,075.29   | -328.17    | 5,085.88              | 0.00                    | 0.00                   | 0.00                  |  |
| 10,500.00           | 90.50           | 359.65      | 5,439.58            | 5,175.29   | -328.79    | 5,185.72              | 0.00                    | 0.00                   | 0.00                  |  |
| 10,567.63           | 90.50           | 359.65      | 5,438.99            | 5,242.91   | -329.20    | 5,253.24              | 0.00                    | 0.00                   | 0.00                  |  |
| TD at 10567.63      |                 |             |                     |            |            |                       |                         |                        |                       |  |

**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         |
|------------------------|---------------------------|---------------|--------------|----------|------------|------------|-----------------|----------------|------------------|-------------------|
| Partition 13 FED NC 5H | - plan hits target center | 0.00          | 0.01         | 5,438.99 | 5,242.91   | -329.20    | 670,049.0000    | 656,511.7000   | 32° 50' 27.645 N | 103° 49' 25.482 W |
|                        | - Point                   |               |              |          |            |            |                 |                |                  |                   |
| Partition 13 FED NC 5H | - plan hits target center | 0.00          | 0.00         | 5,480.00 | 543.27     | -300.38    | 665,349.3689    | 656,540.5206   | 32° 49' 41.141 N | 103° 49' 25.410 W |
|                        | - Point                   |               |              |          |            |            |                 |                |                  |                   |

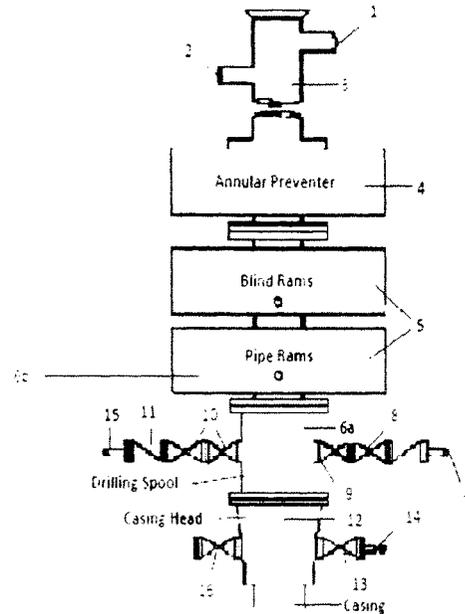
**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates |            | Comment                                  |
|---------------------|---------------------|-------------------|------------|--|
|                     |                     | +N/-S (ft)        | +E/-W (ft) |  |
| 4930                | 4930                | 0                 | 0          | Start Build 12.00                        |
| 5367                | 5308                | 128               | -135       | Start 25.53 hold at 5366.63 MD           |
| 5392                | 5324                | 142               | -150       | Start DLS 12.00 TFO 59.20                |
| 5868                | 5480                | 543               | -300       | LP @ 5867.72 MD/5480 TVD-330' FSL Sec 13 |
| 10,568              | 5439                | 5243              | -329       | TD at 10567.63                           |

**Mack Energy Corporation**  
**Minimum Blowout Preventer Requirements**  
**3000 psi Working Pressure**  
**13 5/8 inch- 5 MWP**  
**11 Inch - 5 MWP**  
**EXHIBIT #10**

**Stack Requirements**

| NO. | Items  | Min. I.D. | Min. Nominal |
|-----|--|-----------|--------------|
| 1   | Flowline   |           | 2"           |
| 2   | Fill up line   |           | 2"           |
| 3   | Drilling nipple  |           |              |
| 4   | Annular preventer  |           |              |
| 5   | Two single or one dual hydraulically operated rams                               |           |              |
| 6a  | Drilling spool with 2" min. kill line and 3" min choke line outlets              |           | 2" Choke     |
| 6b  | 2" min. kill line and 3" min. choke line outlets in ram. (Alternate to 6a above) |           |              |
| 7   | Valve Gate Plug  | 3 1/8     |              |
| 8   | Gate valve-power operated  | 3 1/8     |              |
| 9   | Line to choke manifold   |           | 3"           |
| 10  | Valve Gate Plug  | 2 1/16    |              |
| 11  | Check valve  | 2 1/16    |              |
| 12  | Casing head  |           |              |
| 13  | Valve Gate Plug  | 1 13/16   |              |
| 14  | Pressure gauge with needle valve   |           |              |
| 15  | Kill line to rig mud pump manifold   |           | 2"           |



**OPTIONAL**

|    |               |         |  |
|----|---------------|---------|--|
| 16 | Flanged Valve | 1 13/16 |  |
|----|---------------|---------|--|

**CONTRACTOR'S OPTION TO FURNISH:**

1. All equipment and connections above bradenhead or casinghead. Working pressure of preventers to be 2000 psi minimum.
2. Automatic accumulator (80 gallons, minimum) capable of closing BOP in 30 seconds or less and, holding them closed against full rated working pressure.
3. BOP controls, to be located near drillers' position.
4. Kelly equipped with Kelly cock.
5. Inside blowout preventer or its equivalent on derrick floor at all times with proper threads to fit pipe being used.
6. Kelly saver-sub equipped with rubber casing protector at all times.
7. Plug type blowout preventer tester.
8. Extra set pipe rams to fit drill pipe in use on location at all times.
9. Type RX ring gaskets in place of Type R.

**MEC TO FURNISH:**

1. Bradenhead or casing head and side valves.
2. Wear bushing. If required.

**GENERAL NOTES:**

1. Deviations from this drawing may be made only with the express permission of MEC's Drilling Manager.
2. All connections, valves, fittings, piping, etc., subject to well or pump pressure must be flanged (suitable clamp connections acceptable) and have minimum working pressure equal to rated working pressure of preventers up through choke valves must be full opening and suitable for high pressure mud service.
3. Controls to be of standard design and each marked, showing opening and closing position.
4. Chokes will be positioned so as not to hamper or delay changing of choke beans.

5. Replaceable parts for adjustable choke, or bean sizes, retainers, and choke wrenches to be conveniently located for immediate use.
6. All valves to be equipped with hand-wheels or handles ready for immediate use.
7. Choke lines must be suitably anchored.
8. Handwheels and extensions to be connected and ready for use.
9. Valves adjacent to drilling spool to be kept open. Use outside valves except for emergency.
10. All seamless steel control piping (2000 psi working pressure) to have flexible joints to avoid stress. Hoses will be permitted.
11. Casinghead connections shall not be used except in case of emergency.
12. Does not use kill line for routine fill up operations.

INFORMATION CONTAINED HEREIN IS THE PROPERTY OF CACTUS WELLHEAD, LLC. REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PERMISSIBLE ONLY AS PROVIDED BY CONTRACT OR AS EXPRESSLY AUTHORIZED BY CACTUS WELLHEAD, LLC

As shown in Figure 2, the wellhead holds the BOP equipment in position for well control during drilling operation. The wellhead (both A and B Sections) provide a vital link between the BOP and the casing strings required to drill and produce the well. The wellhead assembly is very important and provides several purposes such as:

- To support the weight of the casing string;
- To provide a pressure seal between the casing strings and the environment;
- To provide an outlet for any built up pressure to be bleed off.

### Casing Head

The casing head is the lowermost section of the wellhead and may be attached by either a threaded or slip-on and weld connection to fit the casing. Threaded connections are simple to install and easy to remove, however it requires the casing to be run and set with the threaded connection precisely at the desired elevation. Since positioning the connection at the desired elevation is often a problem, a slip-on and weld connection (Figure 3) is commonly used. This requires welding services to complete the installation. When installing the casing head, great care needs to be taken to ensure the casing head is level and aligned with the rotary table. Additionally, the derrick should be level in order to prevent damage to the Kelly and the BOP/casing head system during subsequent drilling operations which could cause damage to the seal and support areas.

After installation, the casing head/casing connection needs to be hydrostatically tested based off of the equipment's rated pressure of the pipe and flanged fittings. The casing head usually provides one or more side openings that provides access to each casing annulus and can be used for bleeding off pressure or pumping into the well. Caution should be taken when pumping mud continuously through these outlets as it

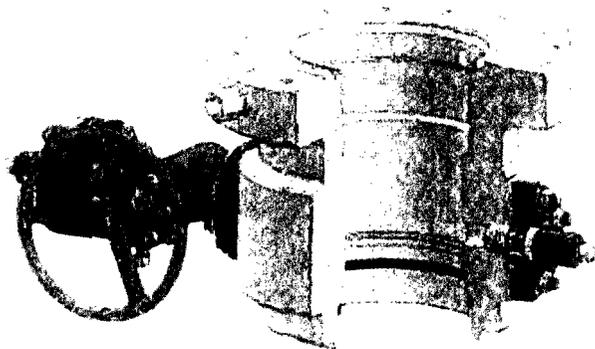


Figure 3 - Slip-On Weld (SOW) Casing Head

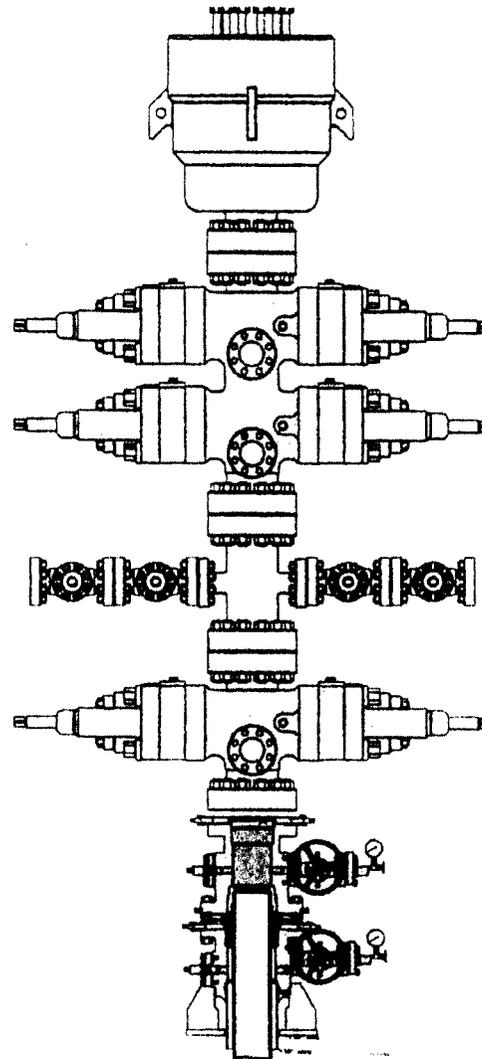


Figure 2 - BOP Stack Made Up to Wellhead

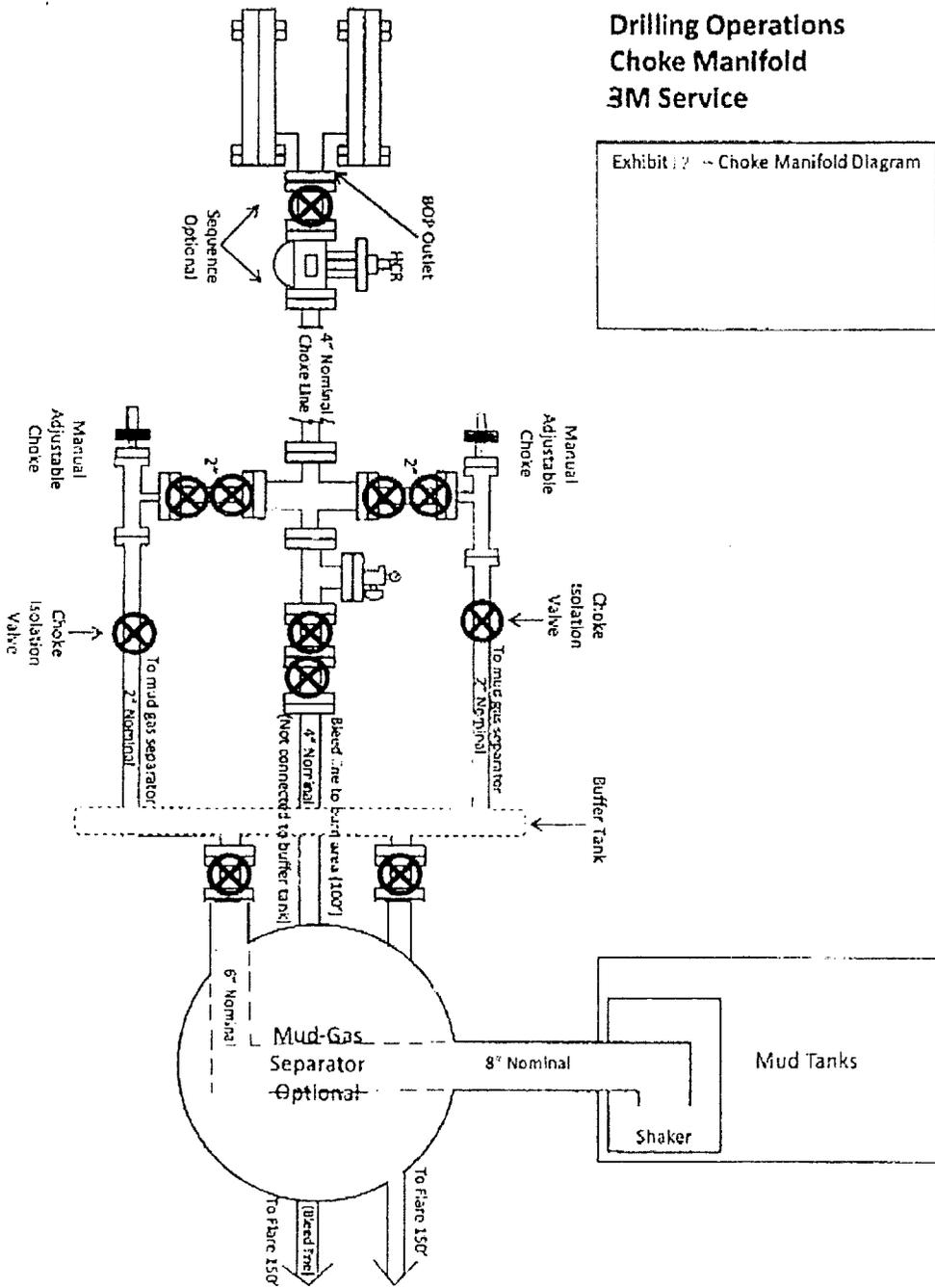
may erode the wellhead, weakening the system. Pressure should be monitored and checked periodically. Casing head side outlets may be attached by thread, studded, clamp hub, and flanged connections. Casing heads with threaded outlets are acceptable for services up to and including 5,000 PSI working pressure provided that the casing head working pressure is rated the same. Some companies require flanged or studded connections for all 5,000 PSI and higher working pressure systems.

In sizing casing heads, the top flange must be sized to permit drilling the desired hole size and subsequent running and hanging of the casing strings. Usually the flange opening is sized to equal or exceeding the casing inside diameter of the casing string that is to be installed.

Adapter spools or flanges to connect BOP's of different sizes or pressure ratings to the casing head are not

# Drilling Operations Choke Manifold 3M Service

Exhibit 12 -- Choke Manifold Diagram









SEP 18 2017

RECEIVED

**PECOS DISTRICT  
CONDITIONS OF APPROVAL**

|                       |                                    |
|-----------------------|------------------------------------|
| OPERATOR'S NAME:      | Burnett Oil Co., Inc.              |
| LEASE NO.:            | NMLC029415B                        |
| WELL NAME & NO.:      | Partition 13 Fed NC 5H             |
| SURFACE HOLE FOOTAGE: | 255'/N & 2590'/W                   |
| BOTTOM HOLE FOOTAGE:  | 290'/N & 2290'/W SEC 13            |
| LOCATION:             | Section 24, T.17 S., R.31 E., NMPM |
| COUNTY:               | Eddy County, New Mexico            |

All previous COAs still apply except the following

**TABLE OF CONTENTS**

- Special Requirements**
  - Communitization Agreement
  - Lesser Prairie-Chicken Timing Stipulations
- Drilling**
  - H2S requirements-Onshore Order 6
  - Waste Material and Fluids

**I. SPECIAL REQUIREMENT(S)**

**Communitization Agreement**

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.
- **Well name shall be changed to include "Com" via Sundry Notice.**

**Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken:**

Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

## II. DRILLING

### A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

**Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,  
(575) 361-2822

1. A Hydrogen Sulfide (H<sub>2</sub>S) Drilling Plan shall be activated 500 feet prior to drilling into the **Grayburg** formation. **As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
3. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

## B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

### Wait on cement (WOC) for Water Basin:

After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Possibility for water flows in the Artesia Group and Salado.

Possibility of lost circulation in the Red Beds, Rustler, Artesia Group, and San Andres.

1. The 13-3/8 inch surface casing shall be set at approximately 720 feet (**in a competent bed below the Magenta Dolomite, which is a Member of the Rustler, and if salt is encountered, set casing at least 25 feet above the salt**) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
  - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

- d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is:
  - Cement to surface. If cement does not circulate see B.1.a, c-d above.

**A double isolation packer is required a few feet inside the lease offset limit.**

3. The minimum required fill of cement behind the 7 X 5-1/2 inch production casing is:

**Operator has proposed DV tool at depth of 4700'. Operator is to submit sundry if DV tool depth varies by more than 100' from approved depth.**

- a. First stage to DV tool:
  - No cement required. A packer/port system will be utilized.
- b. Second stage above DV tool:
  - Cement to surface. If cement does not circulate see B.1.a, c-d above.
4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

## **C. PRESSURE CONTROL**

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API 53.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

**Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the**

**blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 3000 (3M) psi.**

- a. **Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.**
- b. **If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.**
- c. **Manufacturer representative shall install the test plug for the initial BOP test.**

**If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.**

3. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
  - a. The tests shall be done by an independent service company utilizing a test plug.
  - b. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
  - c. The results of the test shall be reported to the appropriate BLM office.
  - d. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
  - e. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

**D. DRILL STEM TEST**

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

**E. WASTE MATERIAL AND FLUIDS**

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

**ZS 090717**

| 13 3/8 Segment  | surface csg in a #/ft | 17 1/2 Grade | inch hole. Coupling | Joint | Design Factors |       |        | SURFACE |  |
|---|-----------------------|--------------|---------------------|-------|----------------|-------|--------|---------|--|
| "A"   | 48.00                 | J 55         | ST&C                | 12.53 | Collapse       | Burst | Length | Weight  |  |
| "B"   |                       |              |                     |       | 2.08           | 2.28  | 720    | 34,560  |  |
| w/8.4#/g mud, 30min Sfc Csg Test psig: 1,345 Tail Cmt does circ to sfc. Totals: |                       |              |                     |       |                |       | 720    | 34,560  |  |

Comparison of Proposed to Minimum Required Cement Volumes

| Hole Size | Annular Volume | 1 Stage Cmt Sx | 1 Stage CuFt Cmt | Min Cu Ft | 1 Stage % Excess | Drilling Mud Wt | Calc MASP | Req'd BOPE | Min Dist Hole-Cplg |
|-----------|----------------|----------------|------------------|-----------|------------------|-----------------|-----------|------------|--------------------|
| 17 1/2    | 0.6946         | 670            | 1037             | 555       | 87               | 9.50            | 599       | 2M         | 1.56               |

| 9 5/8 Segment                                  | casing inside the #/ft | 13 3/8 Grade | Coupling | Joint | Design Factors |       |        | INTERMEDIATE |  |
|--|------------------------|--------------|----------|-------|----------------|-------|--------|--------------|--|
| "A"  | 36.00                  | J 55         | LT&C     | 6.29  | Collapse       | Burst | Length | Weight       |  |
| "B"  |                        |              |          |       | 1.94           | 1.25  | 2,000  | 72,000       |  |
| w/8.4#/g mud, 30min Sfc Csg Test psig: Totals: |                        |              |          |       |                |       | 2,000  | 72,000       |  |

The cement volume(s) are intended to achieve a top of 0 ft from surface or a 720 overlap.

| Hole Size | Annular Volume | 1 Stage Cmt Sx | 1 Stage CuFt Cmt | Min Cu Ft | 1 Stage % Excess | Drilling Mud Wt | Calc MASP | Req'd BOPE | Min Dist Hole-Cplg |
|-----------|----------------|----------------|------------------|-----------|------------------|-----------------|-----------|------------|--------------------|
| 12 1/4    | 0.3132         | 680            | 1102             | 691       | 59               | 10.00           | 1629      | 2M         | 0.81               |

| 7 Segment  | casing inside the #/ft | 9 5/8 Grade | Coupling | Joint | Design Factors |       |        | PRODUCTION |  |
|--|------------------------|-------------|----------|-------|----------------|-------|--------|------------|--|
| "A"  | 26.00                  | L 80        | LT&C     | 3.77  | Collapse       | Burst | Length | Weight     |  |
| "B"  | 17.00                  | L 80        | LT&C     | 4.06  | 1.93           | 2.74  | 5,768  | 98,056     |  |
| w/8.4#/g mud, 30min Sfc Csg Test psig: 1,500 Totals: |                        |             |          |       |                |       | 10,568 | 222,856    |  |

B would be: 31.11 2 23 if it were a vertical wellbore.

No Pilot Hole Planned MTD Max VTD Csg VD Curve KOP Dogleg<sup>o</sup> Severity<sup>o</sup> MEOC  
10568 5439 5439 4930 91 10 5868

The cement volume(s) are intended to achieve a top of 1500 ft from surface or a 500 overlap.

| Hole Size | Annular Volume | 1 Stage Cmt Sx | 1 Stage CuFt Cmt | Min Cu Ft | 1 Stage % Excess | Drilling Mud Wt | Calc MASP | Req'd BOPE | Min Dist Hole-Cplg |
|-----------|----------------|----------------|------------------|-----------|------------------|-----------------|-----------|------------|--------------------|
| 8 1/2     | 0.1268         | look ↘         | 0                | 1176      |                  | 10.00           |           |            | 0.42               |

| Setting Depths for D V Tool(s): | 4700 | sum of sx | Σ CuFt | Σ% excess |
|---------------------------------|------|-----------|--------|-----------|
| % excess cmt by stage.          | 101  | 425       | 854    | -27       |

Collapse sf = 1.19 for segment B. Curve calc is conservative