eog resources

**Lea County, NM (NAD 27 NME)**

**Thor 21 Fed Com #703H**

**H&P 651**

**Plan #0.2**

| PROJECT DETAILS: Lea County, NM (NAD 27 NME) |
|---|
| Geodetic System: US State Plane 1927 (Exact solution)<br>Datum: NAD 1927 (NADCON CONUS)<br>Ellipsoid: Clarke 1866<br>Zone: New Mexico East 3001<br>System Datum: Mean Sea Level |

Azimuths to Grid North
True North: -0.40°
Magnetic North: 6.76°

Magnetic Field
Strength: 48031.6snT
Dip Angle: 59.90°
Date: 5/21/2015
Model: IGRF2015

To convert a Magnetic Direction to a Grid Direction, Add 6.76°
To convert a Magnetic Direction to a True Direction, Add 7.16° East
To convert a True Direction to a Grid Direction, Subtract 0.40°

| WELL DETAILS: #703H | | | |
|---|---|---|---|
| Ground Level: 3256.0<br>KB = 25 @ 3281.0usft (H&P 651) | | | |
| Northing | Easting | Latitude | Longitude |
| 372581.00 | 735478.00 | 32° 1' 19.428 N | 103° 34' 24.750 W |

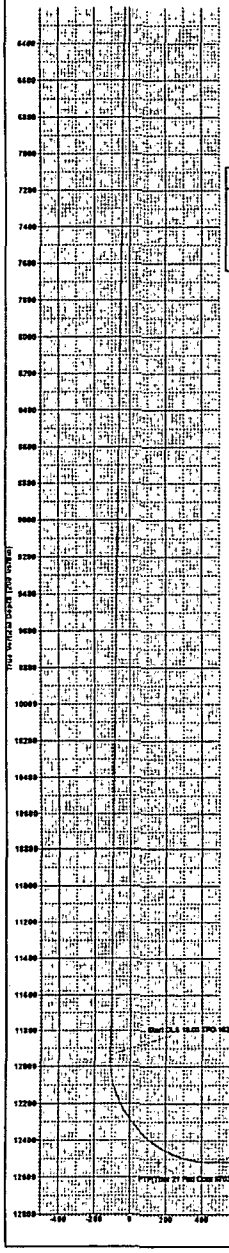
**SECTION DETAILS**

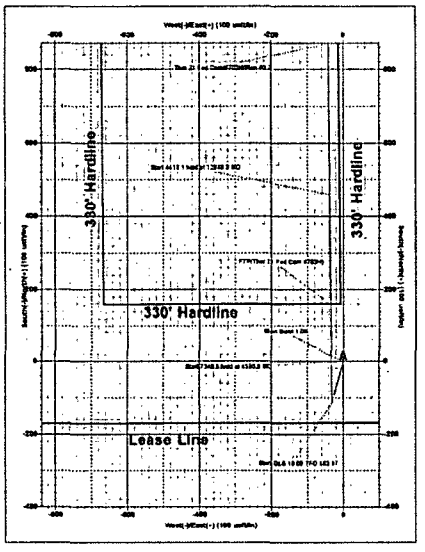
| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target | Annotation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | | |
| 2 | 4500.0 | 0.00 | 0.00 | 4500.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | | |
| 3 | 4590.8 | 0.91 | 195.62 | 4590.8 | -0.7 | -0.2 | 1.00 | 195.62 | -0.7 | | |
| 4 | 11939.2 | 0.91 | 195.62 | 11938.3 | -112.8 | -31.5 | 0.00 | 0.00 | -112.3 | | |
| 5 | 12848.0 | 90.00 | 359.60 | 12520.0 | 460.1 | -38.1 | 10.00 | 163.97 | 480.5 | | |
| 6 | 17268.0 | 90.00 | 359.60 | 12520.0 | 4878.0 | -69.0 | 0.00 | 0.00 | 4878.5 | PBHL(Thor 21 Fed Com #703H | |

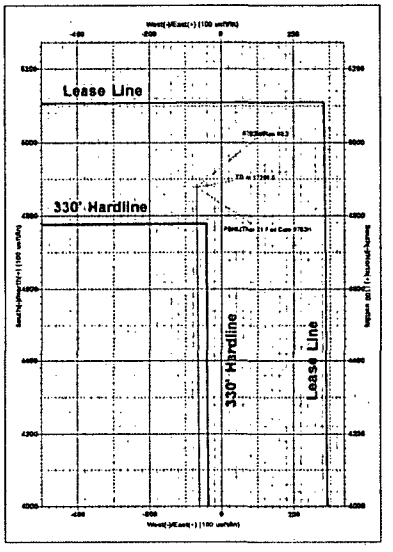
| CASING DETAILS |
|---|
| No casing data is available |

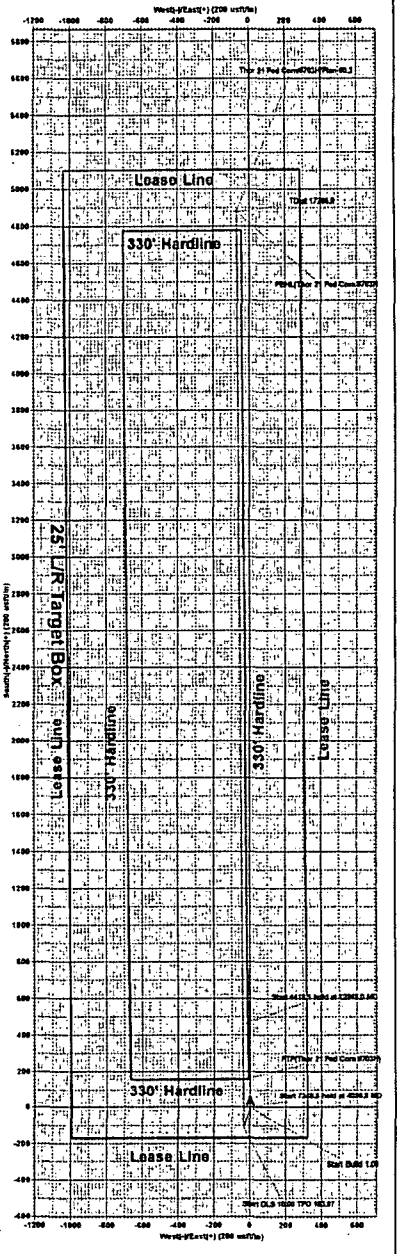
**WELLBORE TARGET DETAILS (MAP CO-ORDINATES)**

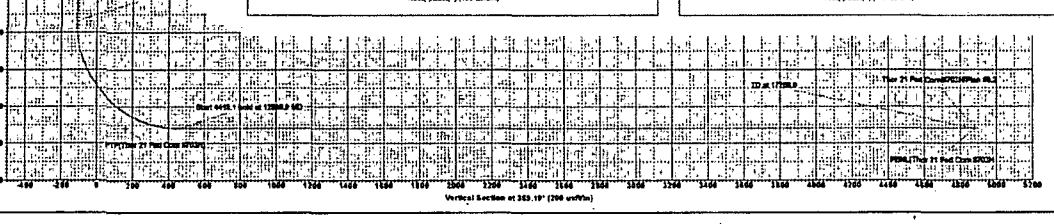
| Name | TVD | +N/-S | +E/-W | Northing | Easting |
|---|---|---|---|---|---|
| PBHL(Thor 21 Fed Com #703H | 12520.0 | 4878.0 | -69.0 | 377459.00 | 735409.00 |
| FTP(Thor 21 Fed Com #703H) | 12520.0 | 160.0 | -16.0 | 372741.00 | 735442.00 |

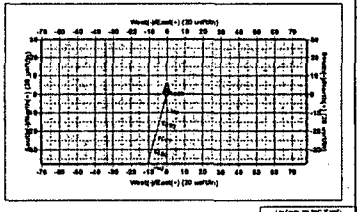






APR 18 2016

eog resources

# EOG Resources - Midland

Lea County, NM (NAD 27 NME)
Thor 21 Fed Com
#703H
OH

Plan: Plan #0.2

# EOG PVA

22 March, 2016

**EOG Resources, Inc.**
EOG PVA

| | | | |
|---|---|---|---|
| **Company:** | EOG Resources - Midland | **Local Co-ordinate Reference:** | Well #703H |
| **Project:** | Lea County, NM (NAD 27 NME) | **TVD Reference:** | KB = 25 @ 3281.0usft (H&P 651) |
| **Site:** | Thor 21 Fed Com | **MD Reference:** | KB = 25 @ 3281.0usft (H&P 651) |
| **Well:** | #703H | **North Reference:** | Grid |
| **Wellbore:** | OH | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Plan #0.2 | **Database:** | EDM 5000.1 Single User Db |

**Project** Lea County, NM (NAD 27 NME)

| | | | |
|---|---|---|---|
| **Map System:** | US State Plane 1927 (Exact solution) | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | NAD 1927 (NADCON CONUS) | | |
| **Map Zone:** | New Mexico East 3001 | | |

**Site** Thor 21 Fed Com

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 372,581.00 usft | **Latitude:** | 32° 1' 19.428 N |
| **From:** | Map | **Easting:** | 735,478.00 usft | **Longitude:** | 103° 34' 24.750 W |
| **Position Uncertainty:** | 0.0 usft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.40 ° |

**Well** #703H

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.0 usft | **Northing:** | 372,581.00 usft | **Latitude:** | 32° 1' 19.428 N |
| | **+E/-W** | 0.0 usft | **Easting:** | 735,478.00 usft | **Longitude:** | 103° 34' 24.750 W |
| **Position Uncertainty** | | 0.0 usft | **Wellhead Elevation:** | 0.0 usft | **Ground Level:** | 3,256.0 usft |

**Wellbore** OH

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2015 | 5/21/2015 | 7.16 | 59.90 | 48,032 |

**Design** Plan #0.2

**Audit Notes:**

| | | | |
|---|---|---|---|
| **Version:** | **Phase:** | PLAN | **Tie On Depth:** | 0.0 |

| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 359.19 |

**Survey Tool Program** **Date** 3/22/2016

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.0 | 17,266.0 | Plan #0.2 (OH) | MWD | MWD - Standard |

| | | | |
|---|---|---|---|
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| **Site:** | Thor 21 Fed Com | **MD Reference:** | KB = 25 @ 3281.0usft (H&P 651) |
| **Well:** | #703H | **North Reference:** | Grid |
| **Wellbore:** | OH | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Plan #0.2 | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (grid_north_azim | TVD (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | Build (°/100usft) | Turn (°/100usft) | High to Plan (usft) | Right to Plan (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 100.0 | 0.00 | 0.00 | 100.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 200.0 | 0.00 | 0.00 | 200.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 300.0 | 0.00 | 0.00 | 300.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 400.0 | 0.00 | 0.00 | 400.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 500.0 | 0.00 | 0.00 | 500.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 700.0 | 0.00 | 0.00 | 700.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 800.0 | 0.00 | 0.00 | 800.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 900.0 | 0.00 | 0.00 | 900.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 1,000.0 | 0.00 | 0.00 | 1,000.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 1,100.0 | 0.00 | 0.00 | 1,100.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 1,200.0 | 0.00 | 0.00 | 1,200.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 1,300.0 | 0.00 | 0.00 | 1,300.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 1,400.0 | 0.00 | 0.00 | 1,400.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 1,500.0 | 0.00 | 0.00 | 1,500.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 1,600.0 | 0.00 | 0.00 | 1,600.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 1,700.0 | 0.00 | 0.00 | 1,700.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 1,800.0 | 0.00 | 0.00 | 1,800.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 1,900.0 | 0.00 | 0.00 | 1,900.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 2,000.0 | 0.00 | 0.00 | 2,000.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 2,100.0 | 0.00 | 0.00 | 2,100.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 2,200.0 | 0.00 | 0.00 | 2,200.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 2,300.0 | 0.00 | 0.00 | 2,300.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 2,400.0 | 0.00 | 0.00 | 2,400.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 2,500.0 | 0.00 | 0.00 | 2,500.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 2,600.0 | 0.00 | 0.00 | 2,600.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |

| | | | |
|---|---|---|---|
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| Well: | #703H | North Reference: | Grid |
| Wellbore: | OH | Survey Calculation Method: | Minimum Curvature |
| Design: | Plan #0.2 | Database: | EDM 5000.1 Single User Db |

Planned Survey

| MD (usft) | Inc (°) | Azi (grid_north_azim | TVD (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | Build (°/100usft) | Turn (°/100usft) | High to Plan (usft) | Right to Plan (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2,700.0 | 0.00 | 0.00 | 2,700.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 2,800.0 | 0.00 | 0.00 | 2,800.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 2,900.0 | 0.00 | 0.00 | 2,900.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 3,000.0 | 0.00 | 0.00 | 3,000.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 3,100.0 | 0.00 | 0.00 | 3,100.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 3,200.0 | 0.00 | 0.00 | 3,200.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 3,300.0 | 0.00 | 0.00 | 3,300.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 3,400.0 | 0.00 | 0.00 | 3,400.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 3,500.0 | 0.00 | 0.00 | 3,500.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 3,600.0 | 0.00 | 0.00 | 3,600.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 3,700.0 | 0.00 | 0.00 | 3,700.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 3,800.0 | 0.00 | 0.00 | 3,800.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 3,900.0 | 0.00 | 0.00 | 3,900.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 4,000.0 | 0.00 | 0.00 | 4,000.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 4,100.0 | 0.00 | 0.00 | 4,100.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 4,200.0 | 0.00 | 0.00 | 4,200.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 4,300.0 | 0.00 | 0.00 | 4,300.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 4,400.0 | 0.00 | 0.00 | 4,400.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 4,500.0 | 0.00 | 0.00 | 4,500.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | | |
| 4,590.8 | 0.91 | 195.62 | 4,590.8 | -0.7 | -0.2 | 1.00 | 1.00 | 0.00 | | |
| 4,600.0 | 0.91 | 195.62 | 4,600.0 | -0.8 | -0.2 | 0.00 | 0.00 | 0.00 | | |
| 4,700.0 | 0.91 | 195.62 | 4,700.0 | -2.4 | -0.7 | 0.00 | 0.00 | 0.00 | | |
| 4,800.0 | 0.91 | 195.62 | 4,800.0 | -3.9 | -1.1 | 0.00 | 0.00 | 0.00 | | |
| 4,900.0 | 0.91 | 195.62 | 4,900.0 | -5.4 | -1.5 | 0.00 | 0.00 | 0.00 | | |
| 5,000.0 | 0.91 | 195.62 | 4,999.9 | -6.9 | -1.9 | 0.00 | 0.00 | 0.00 | | |
| 5,100.0 | 0.91 | 195.62 | 5,099.9 | -8.5 | -2.4 | 0.00 | 0.00 | 0.00 | | |
| 5,200.0 | 0.91 | 195.62 | 5,199.9 | -10.0 | -2.8 | 0.00 | 0.00 | 0.00 | | |

| | | | |
|---|---|---|---|
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| **Site:** | Thor 21 Fed Com | **MD Reference:** | KB = 25 @ 3281.0usft (H&P 651) |
| **Well:** | #703H | **North Reference:** | Grid |
| **Wellbore:** | OH | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Plan #0.2 | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (grid_north_azim | TVD (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | Build (°/100usft) | Turn (°/100usft) | High to Plan (usft) | Right to Plan (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 5,300.0 | 0.91 | 195.62 | 5,299.9 | -11.5 | -3.2 | 0.00 | 0.00 | 0.00 | | |
| 5,400.0 | 0.91 | 195.62 | 5,399.9 | -13.0 | -3.6 | 0.00 | 0.00 | 0.00 | | |
| 5,500.0 | 0.91 | 195.62 | 5,499.9 | -14.6 | -4.1 | 0.00 | 0.00 | 0.00 | | |
| 5,600.0 | 0.91 | 195.62 | 5,599.9 | -16.1 | -4.5 | 0.00 | 0.00 | 0.00 | | |
| 5,700.0 | 0.91 | 195.62 | 5,699.9 | -17.6 | -4.9 | 0.00 | 0.00 | 0.00 | | |
| 5,800.0 | 0.91 | 195.62 | 5,799.8 | -19.1 | -5.4 | 0.00 | 0.00 | 0.00 | | |
| 5,900.0 | 0.91 | 195.62 | 5,899.8 | -20.7 | -5.8 | 0.00 | 0.00 | 0.00 | | |
| 6,000.0 | 0.91 | 195.62 | 5,999.8 | -22.2 | -6.2 | 0.00 | 0.00 | 0.00 | | |
| 6,100.0 | 0.91 | 195.62 | 6,099.8 | -23.7 | -6.6 | 0.00 | 0.00 | 0.00 | | |
| 6,200.0 | 0.91 | 195.62 | 6,199.8 | -25.2 | -7.1 | 0.00 | 0.00 | 0.00 | | |
| 6,300.0 | 0.91 | 195.62 | 6,299.8 | -26.8 | -7.5 | 0.00 | 0.00 | 0.00 | | |
| 6,400.0 | 0.91 | 195.62 | 6,399.8 | -28.3 | -7.9 | 0.00 | 0.00 | 0.00 | | |
| 6,500.0 | 0.91 | 195.62 | 6,499.8 | -29.8 | -8.3 | 0.00 | 0.00 | 0.00 | | |
| 6,600.0 | 0.91 | 195.62 | 6,599.7 | -31.3 | -8.8 | 0.00 | 0.00 | 0.00 | | |
| 6,700.0 | 0.91 | 195.62 | 6,699.7 | -32.9 | -9.2 | 0.00 | 0.00 | 0.00 | | |
| 6,800.0 | 0.91 | 195.62 | 6,799.7 | -34.4 | -9.6 | 0.00 | 0.00 | 0.00 | | |
| 6,900.0 | 0.91 | 195.62 | 6,899.7 | -35.9 | -10.0 | 0.00 | 0.00 | 0.00 | | |
| 7,000.0 | 0.91 | 195.62 | 6,999.7 | -37.4 | -10.5 | 0.00 | 0.00 | 0.00 | | |
| 7,100.0 | 0.91 | 195.62 | 7,099.7 | -39.0 | -10.9 | 0.00 | 0.00 | 0.00 | | |
| 7,200.0 | 0.91 | 195.62 | 7,199.7 | -40.5 | -11.3 | 0.00 | 0.00 | 0.00 | | |
| 7,300.0 | 0.91 | 195.62 | 7,299.7 | -42.0 | -11.8 | 0.00 | 0.00 | 0.00 | | |
| 7,400.0 | 0.91 | 195.62 | 7,399.6 | -43.6 | -12.2 | 0.00 | 0.00 | 0.00 | | |
| 7,500.0 | 0.91 | 195.62 | 7,499.6 | -45.1 | -12.6 | 0.00 | 0.00 | 0.00 | | |
| 7,600.0 | 0.91 | 195.62 | 7,599.6 | -46.6 | -13.0 | 0.00 | 0.00 | 0.00 | | |
| 7,700.0 | 0.91 | 195.62 | 7,699.6 | -48.1 | -13.5 | 0.00 | 0.00 | 0.00 | | |
| 7,800.0 | 0.91 | 195.62 | 7,799.6 | -49.7 | -13.9 | 0.00 | 0.00 | 0.00 | | |
| 7,900.0 | 0.91 | 195.62 | 7,899.6 | -51.2 | -14.3 | 0.00 | 0.00 | 0.00 | | |

| | | | |
|---|---|---|---|
| Company: | EOG Resources - Midland | Local Co-ordinate Reference: | Well #703H |
| Project: | Lea County, NM (NAD 27 NME) | TVD Reference: | KB = 25 @ 3281.0usft (H&P 651) |
| Site: | Thor 21 Fed Com | MD Reference: | KB = 25 @ 3281.0usft (H&P 651) |
| Well: | #703H | North Reference: | Grid |
| Wellbore: | OH | Survey Calculation Method: | Minimum Curvature |
| Design: | Plan #0.2 | Database: | EDM 5000.1 Single User Db |

Planned Survey

| MD (usft) | Inc (°) | Azi (grid_north_azim | TVD (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | Build (°/100usft) | Turn (°/100usft) | High to Plan (usft) | Right to Plan (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 8,000.0 | 0.91 | 195.62 | 7,999.6 | -52.7 | -14.7 | 0.00 | 0.00 | 0.00 | | |
| 8,100.0 | 0.91 | 195.62 | 8,099.6 | -54.2 | -15.2 | 0.00 | 0.00 | 0.00 | | |
| 8,200.0 | 0.91 | 195.62 | 8,199.5 | -55.8 | -15.6 | 0.00 | 0.00 | 0.00 | | |
| 8,300.0 | 0.91 | 195.62 | 8,299.5 | -57.3 | -16.0 | 0.00 | 0.00 | 0.00 | | |
| 8,400.0 | 0.91 | 195.62 | 8,399.5 | -58.8 | -16.4 | 0.00 | 0.00 | 0.00 | | |
| 8,500.0 | 0.91 | 195.62 | 8,499.5 | -60.3 | -16.9 | 0.00 | 0.00 | 0.00 | | |
| 8,600.0 | 0.91 | 195.62 | 8,599.5 | -61.9 | -17.3 | 0.00 | 0.00 | 0.00 | | |
| 8,700.0 | 0.91 | 195.62 | 8,699.5 | -63.4 | -17.7 | 0.00 | 0.00 | 0.00 | | |
| 8,800.0 | 0.91 | 195.62 | 8,799.5 | -64.9 | -18.2 | 0.00 | 0.00 | 0.00 | | |
| 8,900.0 | 0.91 | 195.62 | 8,899.5 | -66.4 | -18.6 | 0.00 | 0.00 | 0.00 | | |
| 9,000.0 | 0.91 | 195.62 | 8,999.4 | -68.0 | -19.0 | 0.00 | 0.00 | 0.00 | | |
| 9,100.0 | 0.91 | 195.62 | 9,099.4 | -69.5 | -19.4 | 0.00 | 0.00 | 0.00 | | |
| 9,200.0 | 0.91 | 195.62 | 9,199.4 | -71.0 | -19.9 | 0.00 | 0.00 | 0.00 | | |
| 9,300.0 | 0.91 | 195.62 | 9,299.4 | -72.5 | -20.3 | 0.00 | 0.00 | 0.00 | | |
| 9,400.0 | 0.91 | 195.62 | 9,399.4 | -74.1 | -20.7 | 0.00 | 0.00 | 0.00 | | |
| 9,500.0 | 0.91 | 195.62 | 9,499.4 | -75.6 | -21.1 | 0.00 | 0.00 | 0.00 | | |
| 9,600.0 | 0.91 | 195.62 | 9,599.4 | -77.1 | -21.6 | 0.00 | 0.00 | 0.00 | | |
| 9,700.0 | 0.91 | 195.62 | 9,699.4 | -78.6 | -22.0 | 0.00 | 0.00 | 0.00 | | |
| 9,800.0 | 0.91 | 195.62 | 9,799.3 | -80.2 | -22.4 | 0.00 | 0.00 | 0.00 | | |
| 9,900.0 | 0.91 | 195.62 | 9,899.3 | -81.7 | -22.8 | 0.00 | 0.00 | 0.00 | | |
| 10,000.0 | 0.91 | 195.62 | 9,999.3 | -83.2 | -23.3 | 0.00 | 0.00 | 0.00 | | |
| 10,100.0 | 0.91 | 195.62 | 10,099.3 | -84.7 | -23.7 | 0.00 | 0.00 | 0.00 | | |
| 10,200.0 | 0.91 | 195.62 | 10,199.3 | -86.3 | -24.1 | 0.00 | 0.00 | 0.00 | | |
| 10,300.0 | 0.91 | 195.62 | 10,299.3 | -87.8 | -24.6 | 0.00 | 0.00 | 0.00 | | |
| 10,400.0 | 0.91 | 195.62 | 10,399.3 | -89.3 | -25.0 | 0.00 | 0.00 | 0.00 | | |
| 10,500.0 | 0.91 | 195.62 | 10,499.3 | -90.8 | -25.4 | 0.00 | 0.00 | 0.00 | | |
| 10,600.0 | 0.91 | 195.62 | 10,599.2 | -92.4 | -25.8 | 0.00 | 0.00 | 0.00 | | |

| | | | |
|---|---|---|---|
| **Company:** | EOG Resources - Midland | **Local Co-ordinate Reference:** | Well #703H |
| **Project:** | Lea County, NM (NAD 27 NME) | **TVD Reference:** | KB = 25 @ 3281.0usft (H&P 651) |
| **Site:** | Thor 21 Fed Com | **MD Reference:** | KB = 25 @ 3281.0usft (H&P 651) |
| **Well:** | #703H | **North Reference:** | Grid |
| **Wellbore:** | OH | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Plan #0.2 | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (grid_north_azim | TVD (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | Build (°/100usft) | Turn (°/100usft) | High to Plan (usft) | Right to Plan (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 10,700.0 | 0.91 | 195.62 | 10,699.2 | -93.9 | -26.3 | 0.00 | 0.00 | 0.00 | | |
| 10,800.0 | 0.91 | 195.62 | 10,799.2 | -95.4 | -26.7 | 0.00 | 0.00 | 0.00 | | |
| 10,900.0 | 0.91 | 195.62 | 10,899.2 | -96.9 | -27.1 | 0.00 | 0.00 | 0.00 | | |
| 11,000.0 | 0.91 | 195.62 | 10,999.2 | -98.5 | -27.5 | 0.00 | 0.00 | 0.00 | | |
| 11,100.0 | 0.91 | 195.62 | 11,099.2 | -100.0 | -28.0 | 0.00 | 0.00 | 0.00 | | |
| 11,200.0 | 0.91 | 195.62 | 11,199.2 | -101.5 | -28.4 | 0.00 | 0.00 | 0.00 | | |
| 11,300.0 | 0.91 | 195.62 | 11,299.2 | -103.1 | -28.8 | 0.00 | 0.00 | 0.00 | | |
| 11,400.0 | 0.91 | 195.62 | 11,399.1 | -104.6 | -29.2 | 0.00 | 0.00 | 0.00 | | |
| 11,500.0 | 0.91 | 195.62 | 11,499.1 | -106.1 | -29.7 | 0.00 | 0.00 | 0.00 | | |
| 11,600.0 | 0.91 | 195.62 | 11,599.1 | -107.6 | -30.1 | 0.00 | 0.00 | 0.00 | | |
| 11,700.0 | 0.91 | 195.62 | 11,699.1 | -109.2 | -30.5 | 0.00 | 0.00 | 0.00 | | |
| 11,800.0 | 0.91 | 195.62 | 11,799.1 | -110.7 | -31.0 | 0.00 | 0.00 | 0.00 | | |
| 11,900.0 | 0.91 | 195.62 | 11,899.1 | -112.2 | -31.4 | 0.00 | 0.00 | 0.00 | | |
| 11,939.2 | 0.91 | 195.62 | 11,938.3 | -112.8 | -31.5 | 0.00 | 0.00 | 0.00 | | |
| 11,950.0 | 0.32 | 308.55 | 11,949.1 | -112.9 | -31.6 | 10.00 | -5.45 | 1,050.47 | | |
| 12,000.0 | 5.21 | 356.85 | 11,999.0 | -110.5 | -31.8 | 10.00 | 9.77 | 96.59 | | |
| 12,050.0 | 10.21 | 358.21 | 12,048.5 | -103.8 | -32.1 | 10.00 | 9.99 | 2.72 | | |
| 12,100.0 | 15.20 | 358.68 | 12,097.3 | -92.8 | -32.4 | 10.00 | 10.00 | 0.94 | | |
| 12,150.0 | 20.20 | 358.92 | 12,144.9 | -77.6 | -32.7 | 10.00 | 10.00 | 0.48 | | |
| 12,200.0 | 25.20 | 359.07 | 12,191.0 | -58.3 | -33.0 | 10.00 | 10.00 | 0.30 | | |
| 12,250.0 | 30.20 | 359.17 | 12,235.3 | -35.1 | -33.4 | 10.00 | 10.00 | 0.20 | | |
| 12,300.0 | 35.20 | 359.24 | 12,277.3 | -8.1 | -33.8 | 10.00 | 10.00 | 0.15 | | |
| 12,350.0 | 40.20 | 359.30 | 12,316.9 | 22.5 | -34.1 | 10.00 | 10.00 | 0.12 | | |
| 12,400.0 | 45.20 | 359.35 | 12,353.6 | 56.4 | -34.5 | 10.00 | 10.00 | 0.10 | | |
| 12,450.0 | 50.20 | 359.39 | 12,387.3 | 93.3 | -35.0 | 10.00 | 10.00 | 0.08 | | |
| 12,500.0 | 55.20 | 359.43 | 12,417.5 | 133.1 | -35.4 | 10.00 | 10.00 | 0.07 | | |
| 12,550.0 | 60.20 | 359.46 | 12,444.2 | 175.3 | -35.8 | 10.00 | 10.00 | 0.06 | | |

| | | | |
|---|---|---|---|
| Company: | EOG Resources - Midland | Local Co-ordinate Reference: | Well #703H |
| Project: | Lea County, NM (NAD 27 NME) | TVD Reference: | KB = 25 @ 3281.0usft (H&P 651) |
| Site: | Thor 21 Fed Com | MD Reference: | KB = 25 @ 3281.0usft (H&P 651) |
| Well: | #703H | North Reference: | Grid |
| Wellbore: | OH | Survey Calculation Method: | Minimum Curvature |
| Design: | Plan #0.2 | Database: | EDM 5000.1 Single User Db |

Planned Survey

| MD (usft) | Inc (°) | Azi (grid_north_azim | TVD (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | Build (°/100usft) | Turn (°/100usft) | High to Plan (usft) | Right to Plan (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 12,571.1 | 62.31 | 359.47 | 12,454.4 | 193.9 | -35.9 | 10.00 | 10.00 | 0.06 | | |
| FTP(Thor 21 Fed Com #703H) | | | | | | | | | | |
| 12,600.0 | 65.20 | 359.48 | 12,467.2 | 219.8 | -36.2 | 10.00 | 10.00 | 0.05 | | |
| 12,650.0 | 70.20 | 359.51 | 12,486.1 | 266.0 | -36.6 | 10.00 | 10.00 | 0.05 | | |
| 12,700.0 | 75.20 | 359.53 | 12,501.0 | 313.7 | -37.0 | 10.00 | 10.00 | 0.05 | | |
| 12,750.0 | 80.20 | 359.56 | 12,511.6 | 362.6 | -37.4 | 10.00 | 10.00 | 0.05 | | |
| 12,800.0 | 85.20 | 359.58 | 12,518.0 | 412.1 | -37.8 | 10.00 | 10.00 | 0.04 | | |
| 12,848.0 | 90.00 | 359.60 | 12,520.0 | 460.1 | -38.1 | 10.00 | 10.00 | 0.04 | | |
| 12,900.0 | 90.00 | 359.60 | 12,520.0 | 512.1 | -38.5 | 0.00 | 0.00 | 0.00 | | |
| 13,000.0 | 90.00 | 359.60 | 12,520.0 | 612.1 | -39.2 | 0.00 | 0.00 | 0.00 | | |
| 13,100.0 | 90.00 | 359.60 | 12,520.0 | 712.1 | -39.9 | 0.00 | 0.00 | 0.00 | | |
| 13,200.0 | 90.00 | 359.60 | 12,520.0 | 812.1 | -40.6 | 0.00 | 0.00 | 0.00 | | |
| 13,300.0 | 90.00 | 359.60 | 12,520.0 | 912.1 | -41.3 | 0.00 | 0.00 | 0.00 | | |
| 13,400.0 | 90.00 | 359.60 | 12,520.0 | 1,012.1 | -42.0 | 0.00 | 0.00 | 0.00 | | |
| 13,500.0 | 90.00 | 359.60 | 12,520.0 | 1,112.1 | -42.7 | 0.00 | 0.00 | 0.00 | | |
| 13,600.0 | 90.00 | 359.60 | 12,520.0 | 1,212.1 | -43.4 | 0.00 | 0.00 | 0.00 | | |
| 13,700.0 | 90.00 | 359.60 | 12,520.0 | 1,312.1 | -44.1 | 0.00 | 0.00 | 0.00 | | |
| 13,800.0 | 90.00 | 359.60 | 12,520.0 | 1,412.1 | -44.8 | 0.00 | 0.00 | 0.00 | | |
| 13,900.0 | 90.00 | 359.60 | 12,520.0 | 1,512.1 | -45.5 | 0.00 | 0.00 | 0.00 | | |
| 14,000.0 | 90.00 | 359.60 | 12,520.0 | 1,612.1 | -46.2 | 0.00 | 0.00 | 0.00 | | |
| 14,100.0 | 90.00 | 359.60 | 12,520.0 | 1,712.1 | -46.9 | 0.00 | 0.00 | 0.00 | | |
| 14,200.0 | 90.00 | 359.60 | 12,520.0 | 1,812.0 | -47.6 | 0.00 | 0.00 | 0.00 | | |
| 14,300.0 | 90.00 | 359.60 | 12,520.0 | 1,912.0 | -48.3 | 0.00 | 0.00 | 0.00 | | |
| 14,400.0 | 90.00 | 359.60 | 12,520.0 | 2,012.0 | -49.0 | 0.00 | 0.00 | 0.00 | | |
| 14,500.0 | 90.00 | 359.60 | 12,520.0 | 2,112.0 | -49.7 | 0.00 | 0.00 | 0.00 | | |
| 14,600.0 | 90.00 | 359.60 | 12,520.0 | 2,212.0 | -50.4 | 0.00 | 0.00 | 0.00 | | |
| 14,700.0 | 90.00 | 359.60 | 12,520.0 | 2,312.0 | -51.1 | 0.00 | 0.00 | 0.00 | | |

| | | | |
|---|---|---|---|
| **Company:** | EOG Resources - Midland | **Local Co-ordinate Reference:** | Well #703H |
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| **Site:** | Thor 21 Fed Com | **MD Reference:** | KB = 25 @ 3281.0usft (H&P 651) |
| **Well:** | #703H | **North Reference:** | Grid |
| **Wellbore:** | OH | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Plan #0.2 | **Database:** | EDM 5000.1 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (grid_north_azim | TVD (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | Build (°/100usft) | Turn (°/100usft) | High to Plan (usft) | Right to Plan (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 14,800.0 | 90.00 | 359.60 | 12,520.0 | 2,412.0 | -51.8 | 0.00 | 0.00 | 0.00 | | |
| 14,900.0 | 90.00 | 359.60 | 12,520.0 | 2,512.0 | -52.5 | 0.00 | 0.00 | 0.00 | | |
| 15,000.0 | 90.00 | 359.60 | 12,520.0 | 2,612.0 | -53.2 | 0.00 | 0.00 | 0.00 | | |
| 15,100.0 | 90.00 | 359.60 | 12,520.0 | 2,712.0 | -53.9 | 0.00 | 0.00 | 0.00 | | |
| 15,200.0 | 90.00 | 359.60 | 12,520.0 | 2,812.0 | -54.5 | 0.00 | 0.00 | 0.00 | | |
| 15,300.0 | 90.00 | 359.60 | 12,520.0 | 2,912.0 | -55.2 | 0.00 | 0.00 | 0.00 | | |
| 15,400.0 | 90.00 | 359.60 | 12,520.0 | 3,012.0 | -55.9 | 0.00 | 0.00 | 0.00 | | |
| 15,500.0 | 90.00 | 359.60 | 12,520.0 | 3,112.0 | -56.6 | 0.00 | 0.00 | 0.00 | | |
| 15,600.0 | 90.00 | 359.60 | 12,520.0 | 3,212.0 | -57.3 | 0.00 | 0.00 | 0.00 | | |
| 15,700.0 | 90.00 | 359.60 | 12,520.0 | 3,312.0 | -58.0 | 0.00 | 0.00 | 0.00 | | |
| 15,800.0 | 90.00 | 359.60 | 12,520.0 | 3,412.0 | -58.7 | 0.00 | 0.00 | 0.00 | | |
| 15,900.0 | 90.00 | 359.60 | 12,520.0 | 3,512.0 | -59.4 | 0.00 | 0.00 | 0.00 | | |
| 16,000.0 | 90.00 | 359.60 | 12,520.0 | 3,612.0 | -60.1 | 0.00 | 0.00 | 0.00 | | |
| 16,100.0 | 90.00 | 359.60 | 12,520.0 | 3,712.0 | -60.8 | 0.00 | 0.00 | 0.00 | | |
| 16,200.0 | 90.00 | 359.60 | 12,520.0 | 3,812.0 | -61.5 | 0.00 | 0.00 | 0.00 | | |
| 16,300.0 | 90.00 | 359.60 | 12,520.0 | 3,912.0 | -62.2 | 0.00 | 0.00 | 0.00 | | |
| 16,400.0 | 90.00 | 359.60 | 12,520.0 | 4,012.0 | -62.9 | 0.00 | 0.00 | 0.00 | | |
| 16,500.0 | 90.00 | 359.60 | 12,520.0 | 4,112.0 | -63.6 | 0.00 | 0.00 | 0.00 | | |
| 16,600.0 | 90.00 | 359.60 | 12,520.0 | 4,212.0 | -64.3 | 0.00 | 0.00 | 0.00 | | |
| 16,700.0 | 90.00 | 359.60 | 12,520.0 | 4,312.0 | -65.0 | 0.00 | 0.00 | 0.00 | | |
| 16,800.0 | 90.00 | 359.60 | 12,520.0 | 4,412.0 | -65.7 | 0.00 | 0.00 | 0.00 | | |
| 16,900.0 | 90.00 | 359.60 | 12,520.0 | 4,512.0 | -66.4 | 0.00 | 0.00 | 0.00 | | |
| 17,000.0 | 90.00 | 359.60 | 12,520.0 | 4,612.0 | -67.1 | 0.00 | 0.00 | 0.00 | | |
| 17,100.0 | 90.00 | 359.60 | 12,520.0 | 4,712.0 | -67.8 | 0.00 | 0.00 | 0.00 | | |
| 17,200.0 | 90.00 | 359.60 | 12,520.0 | 4,812.0 | -68.5 | 0.00 | 0.00 | 0.00 | | |
| 17,266.0 | 90.00 | 359.60 | 12,520.0 | 4,878.0 | -69.0 | 0.00 | 0.00 | 0.00 | | |
| PBHL(Thor 21 Fed Com #703H | | | | | | | | | | |

| | | | |
|---|---|---|---|
| **Company:** | EOG Resources - Midland | **Local Co-ordinate Reference:** | Well #703H |
| **Project:** | Lea County, NM (NAD 27 NME) | **TVD Reference:** | KB = 25 @ 3281.0usft (H&P 651) |
| **Site:** | Thor 21 Fed Com | **MD Reference:** | KB = 25 @ 3281.0usft (H&P 651) |
| **Well:** | #703H | **North Reference:** | Grid |
| **Wellbore:** | OH | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Plan #0.2 | **Database:** | EDM 5000.1 Single User Db |

Checked By: _____ Approved By: _____ Date: _____

263321o Sundry-Change to Original APD Thor 21 Fed Com 703H 30025 NM02965A EOG
KGR 3-30-2016 v12.41

10 3/4 surface csg in a 14 3/4 inch hole. Design Factors SURFACE

| Segment | #/ft | Grade | Coupling | Joint | Collapse | Burst | Length | Weight |
|---|---|---|---|---|---|---|---|---|
| "A" | 40.50 | J 55 | ST&C | 11.52 | 3.84 | 0.75 | 900 | 36,450 |
| "B" | | | | | | | 0 | 0 |
| w/8.4#/g mud, 30min Sfc Csg Test psig: 1,500 | | | Tail Cmt | does not | circ to sfc. | Totals: | 900 | 36,450 |

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 |
|---|---|---|---|---|---|---|---|---|---|
| 14 3/4 | 0.5563 | 525 | 830 | 526 | 58 | 8.80 | 2396 | 3M | 1.50 |

Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.

7 5/8 casing inside the 10 3/4 Design Factors INTERMEDIATE

| Segment | #/ft | Grade | Coupling | Joint | Collapse | Burst | Length | Weight |
|---|---|---|---|---|---|---|---|---|
| "A" | 29.70 | HCP 110 | LT&C | 3.24 | 1.72 | 1.67 | 8,000 | 237,600 |
| "B" | | | | | | | 0 | 0 |
| w/8.4#/g mud, 30min Sfc Csg Test psig: | | | | | | Totals: | 8,000 | 237,600 |

Cmt vol calc below includes this csg, TOC intended 0 ft from surface or a 900 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 |
|---|---|---|---|---|---|---|---|---|---|
| 9 7/8 | 0.2148 | | 0 | 1735 | | 10.00 | 3264 | 5M | 0.69 |

7 5/8 In tandem @ 8000 Design Factors Tandem

| Segment | #/ft | Grade | Coupling | Joint | Collapse | Burst | Length | Weight |
|---|---|---|---|---|---|---|---|---|
| "A" | 29.70 | HCP 110 | ~~#N/A~~ | 6.78 | 1.34 | 1.26 | 2,900 | 86,130 |
| "B" | | | Ultra FJ | | | | 0 | 0 |
| w/8.4#/g mud, 30min Sfc Csg Test psig: 2,398 | | | | | | Totals: | 2,900 | 86,130 |

Cmt vol calc includes previous csg (tandem conn) TOC 8000 ft from surface or a 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 3/4 | 0.1005 | 1500 | 3028 | 2038 | 49 | 10.00 | 4725 | 5M | 0.56 |

MASP is within 10% of 5000psig, need exrta equip?

0.56

Tail cmt

5 1/2 casing inside the 7 5/8 Design Factors PRODUCTION

| Segment | #/ft | Grade | Coupling | Joint | Collapse | Burst | Length | Weight |
|---|---|---|---|---|---|---|---|---|
| "A" | 23.00 | HCP 110 | ~~#N/A~~ | 2.16 | 2.03 | 1.94 | 11,939 | 274,602 |
| "B" | 23.00 | HCP 110 | ~~#N/A~~ | 6.73 | 1.78 | 1.94 | 5,327 | 122,516 |
| w/8.4#/g mud, 30min Sfc Csg Test psig: 2,627 | | | Ultra FJ11 | | | Totals: | 17,266 | 397,118 |

Segment Design Factors would be: 46.49 1.94 if it were a vertical wellbore.

No Pilot Hole Planned

| MTD | Max VTD | Csg VD | Curve KOP | Dogleg° | Severity° | MEOC |
|---|---|---|---|---|---|---|
| 17266 | 12520 | 12520 | 11939 | 90 | 10 | 12848 |

0.51

The cement volume(s) are intended to achieve a top of 10400 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 |
|---|---|---|---|---|---|---|---|---|---|
| 6 3/4 | 0.0835 | 575 | 725 | 583 | 24 | 11.50 | | | 0.51 |

Class 'H' tail cmt yld > 1.20 MASP is within 10% of 5000psig, need exrta equip?

Wolfcamp 12,163

See Email Conversation w/ Operator