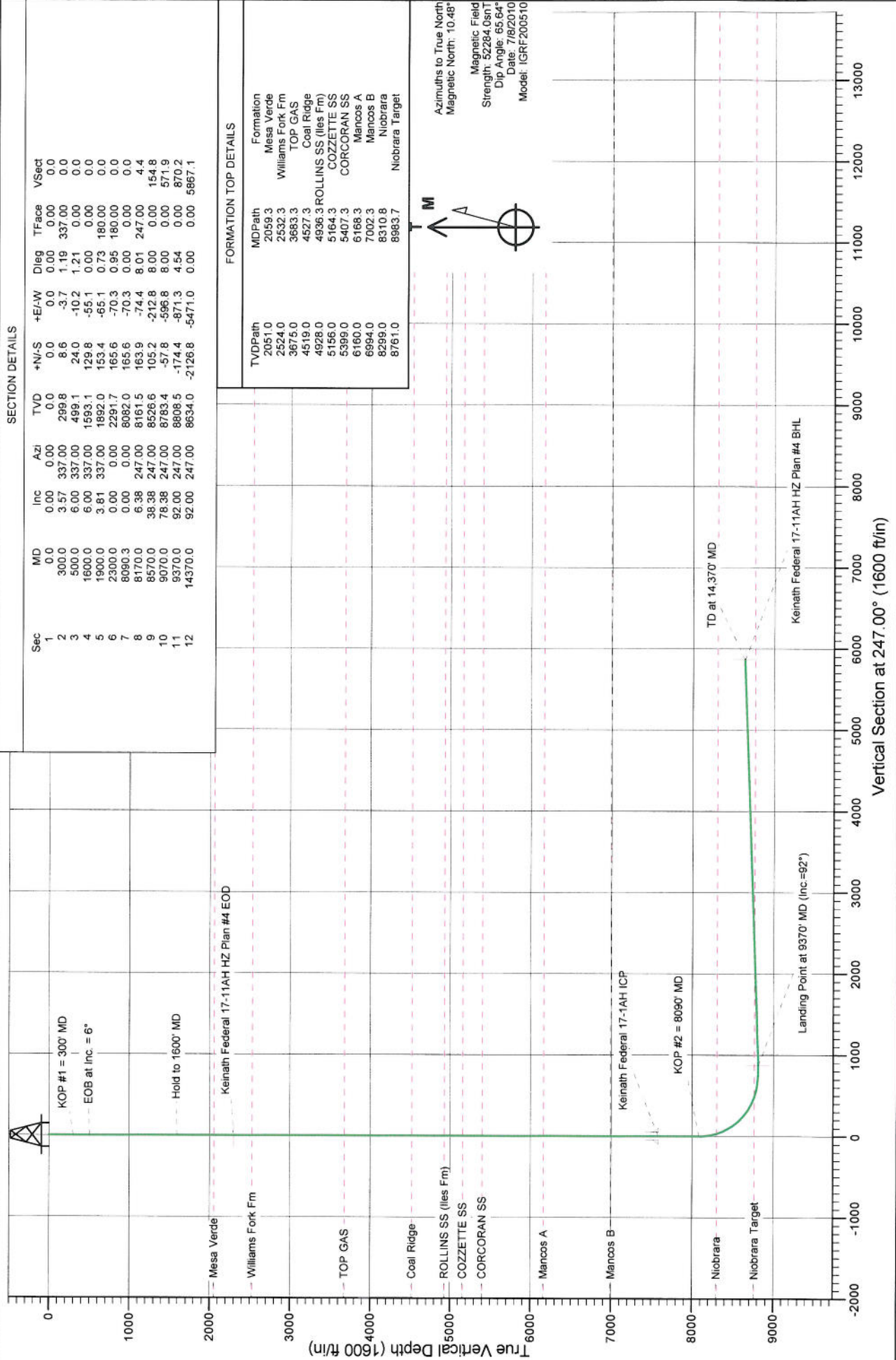


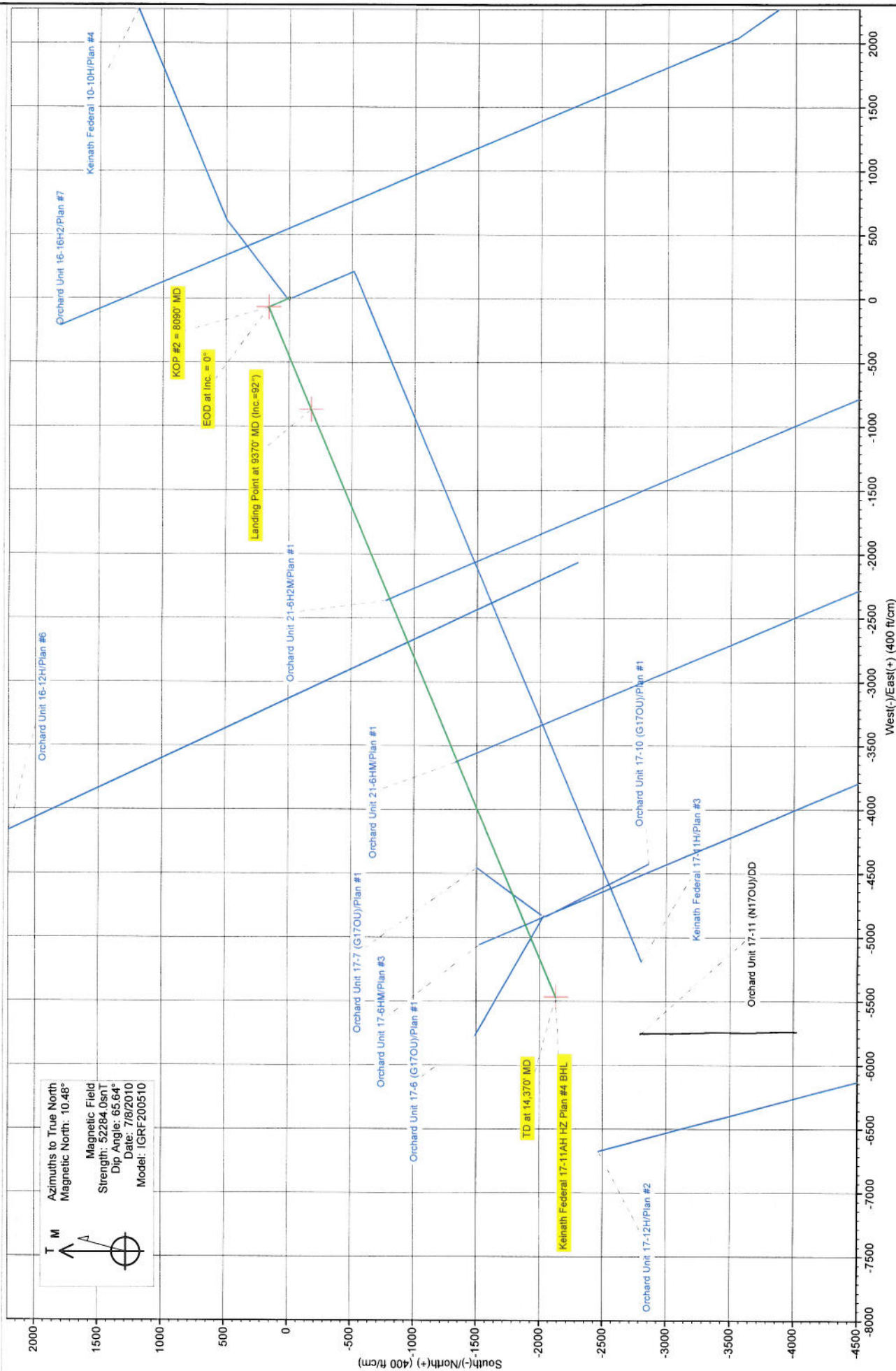


Project: Orchard
Site: NENW Sec16-T8S-R96W (C16OU)
Well: Keinath Federal 17-11AH
Wellbore: HZ
Design: Plan #4





Project: Orchard
Site: NENW Sec16-T8S-R96W (C16OU)
Well: Keinath Federal T7-11AH
Wellbore: HZ
Plan: Plan #4



Cathedral Energy Services

Planning Report

| | | | |
|------------------|------------------------------|-------------------------------------|------------------------------|
| Database: | EDM 5000.1 US Multi Users DB | Local Co-ordinate Reference: | Well Keinath Federal 17-11AH |
| Company: | EnCana Oil & Gas (USA) Inc | TVD Reference: | KBE @ 5789.0ft |
| Project: | Orchard | MD Reference: | KBE @ 5789.0ft |
| Site: | NENW Sec16-T8S-R96W (C16OU) | North Reference: | True |
| Well: | Keinath Federal 17-11AH | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | HZ | | |
| Design: | Plan #4 | | |

| | | | |
|--------------------|---------------------------|----------------------|----------------|
| Project | Orchard | | |
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | |
| Map Zone: | Colorado Central Zone | | |

| | | | | | |
|------------------------------|-----------------------------|---------------------|-----------------|--------------------------|-------------|
| Site | NENW Sec16-T8S-R96W (C16OU) | | | | |
| Site Position: | | Northing: | 1,564,927.77 ft | Latitude: | 39.355256 |
| From: | Lat/Long | Easting: | 2,260,675.21 ft | Longitude: | -108.115006 |
| Position Uncertainty: | 0.0 ft | Slot Radius: | 13.200 in | Grid Convergence: | -1.65 ° |

| | | | | | | |
|----------------------|-------------------------|--------|---------------------|-----------------|---------------|-------------|
| Well | Keinath Federal 17-11AH | | | | | |
| Well Position | +N/-S | 0.0 ft | Northing: | 1,564,964.07 ft | Latitude: | 39.355367 |
| | +E/-W | 0.0 ft | Easting: | 2,260,820.85 ft | Longitude: | -108.114494 |
| Position Uncertainty | | 0.0 ft | Wellhead Elevation: | ft | Ground Level: | 5,767.0 ft |

Wellbore HZ

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|-----------|------------|-------------|-----------------|---------------|---------------------|
| | IGRF200510 | 7/8/2010 | 10.48 | 65.64 | 52,284 |

Design Plan #4

Audit Notes:

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

| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) |
|-------------------|--------------------------|---------------|---------------|------------------|
| | 0.0 | 0.0 | 0.0 | 247.00 |

Plan Sections

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|----------------------|---------------------|---------|--------|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 300.0 | 3.57 | 337.00 | 299.8 | 8.6 | -3.7 | 1.19 | 1.19 | 0.00 | 337.00 | |
| 500.0 | 6.00 | 337.00 | 499.1 | 24.0 | -10.2 | 1.21 | 1.21 | 0.00 | 0.00 | |
| 1,600.0 | 6.00 | 337.00 | 1,593.1 | 129.8 | -55.1 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,900.0 | 3.81 | 337.00 | 1,892.0 | 153.4 | -65.1 | 0.73 | -0.73 | 0.00 | 180.00 | |
| 2,300.0 | 0.00 | 0.00 | 2,291.7 | 165.6 | -70.3 | 0.95 | -0.95 | 0.00 | 180.00 | |
| 8,090.3 | 0.00 | 0.00 | 8,082.0 | 165.6 | -70.3 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 8,170.0 | 6.38 | 247.00 | 8,161.5 | 163.9 | -74.4 | 8.01 | 8.01 | 0.00 | 247.00 | |
| 8,570.0 | 38.38 | 247.00 | 8,526.6 | 105.2 | -212.8 | 8.00 | 8.00 | 0.00 | 0.00 | |
| 9,070.0 | 78.38 | 247.00 | 8,783.4 | -57.8 | -596.8 | 8.00 | 8.00 | 0.00 | 0.00 | |
| 9,370.0 | 92.00 | 247.00 | 8,808.5 | -174.4 | -871.3 | 4.54 | 4.54 | 0.00 | 0.00 | |
| 14,370.0 | 92.00 | 247.00 | 8,634.0 | -2,126.8 | -5,471.0 | 0.00 | 0.00 | 0.00 | 0.00 | |

Cathedral Energy Services

Planning Report

| | | | |
|-----------|------------------------------|------------------------------|------------------------------|
| Database: | EDM 5000.1 US Multi Users DB | Local Co-ordinate Reference: | Well Keinath Federal 17-11AH |
| Company: | EnCana Oil & Gas (USA) Inc | TVD Reference: | KBE @ 5789.0ft |
| Project: | Orchard | MD Reference: | KBE @ 5789.0ft |
| Site: | NENW Sec16-T8S-R96W (C16OU) | North Reference: | True |
| Well: | Keinath Federal 17-11AH | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | HZ | | |
| Design: | Plan #4 | | |

Planned Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Comments / Formations |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|-----------------------|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | |
| 100.0 | 1.19 | 337.00 | 100.0 | 1.0 | -0.4 | 0.0 | 1.19 | 1.19 | |
| 200.0 | 2.38 | 337.00 | 199.9 | 3.8 | -1.6 | 0.0 | 1.19 | 1.19 | |
| 300.0 | 3.57 | 337.00 | 299.8 | 8.6 | -3.7 | 0.0 | 1.19 | 1.19 | KOP #1 = 300' MD |
| 400.0 | 4.79 | 337.00 | 399.5 | 15.3 | -6.5 | 0.0 | 1.21 | 1.21 | |
| 500.0 | 6.00 | 337.00 | 499.1 | 24.0 | -10.2 | 0.0 | 1.21 | 1.21 | EOB at Inc. = 6° |
| 600.0 | 6.00 | 337.00 | 598.5 | 33.6 | -14.3 | 0.0 | 0.00 | 0.00 | |
| 700.0 | 6.00 | 337.00 | 698.0 | 43.2 | -18.3 | 0.0 | 0.00 | 0.00 | |
| 800.0 | 6.00 | 337.00 | 797.5 | 52.8 | -22.4 | 0.0 | 0.00 | 0.00 | |
| 900.0 | 6.00 | 337.00 | 896.9 | 62.4 | -26.5 | 0.0 | 0.00 | 0.00 | |
| 1,000.0 | 6.00 | 337.00 | 996.4 | 72.1 | -30.6 | 0.0 | 0.00 | 0.00 | |
| 1,100.0 | 6.00 | 337.00 | 1,095.8 | 81.7 | -34.7 | 0.0 | 0.00 | 0.00 | |
| 1,200.0 | 6.00 | 337.00 | 1,195.3 | 91.3 | -38.8 | 0.0 | 0.00 | 0.00 | |
| 1,300.0 | 6.00 | 337.00 | 1,294.7 | 100.9 | -42.8 | 0.0 | 0.00 | 0.00 | |
| 1,400.0 | 6.00 | 337.00 | 1,394.2 | 110.6 | -46.9 | 0.0 | 0.00 | 0.00 | |
| 1,500.0 | 6.00 | 337.00 | 1,493.6 | 120.2 | -51.0 | 0.0 | 0.00 | 0.00 | |
| 1,600.0 | 6.00 | 337.00 | 1,593.1 | 129.8 | -55.1 | 0.0 | 0.00 | 0.00 | Hold to 1600' MD |
| 1,700.0 | 5.27 | 337.00 | 1,692.6 | 138.8 | -58.9 | 0.0 | 0.73 | -0.73 | |
| 1,800.0 | 4.54 | 337.00 | 1,792.2 | 146.7 | -62.3 | 0.0 | 0.73 | -0.73 | |
| 1,900.0 | 3.81 | 337.00 | 1,892.0 | 153.4 | -65.1 | 0.0 | 0.73 | -0.73 | |
| 2,000.0 | 2.86 | 337.00 | 1,991.8 | 158.8 | -67.4 | 0.0 | 0.95 | -0.95 | |
| 2,059.3 | 2.29 | 337.00 | 2,051.0 | 161.2 | -68.4 | 0.0 | 0.95 | -0.95 | Mesa Verde |
| 2,100.0 | 1.91 | 337.00 | 2,091.7 | 162.6 | -69.0 | 0.0 | 0.95 | -0.95 | |
| 2,200.0 | 0.95 | 337.00 | 2,191.7 | 164.9 | -70.0 | 0.0 | 0.95 | -0.95 | |
| 2,300.0 | 0.00 | 0.00 | 2,291.7 | 165.6 | -70.3 | 0.0 | 0.95 | -0.95 | EOD at Inc. = 0° |
| 2,400.0 | 0.00 | 0.00 | 2,391.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 2,500.0 | 0.00 | 0.00 | 2,491.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 2,532.3 | 0.00 | 0.00 | 2,524.0 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | Williams Fork Fm |
| 2,600.0 | 0.00 | 0.00 | 2,591.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 2,700.0 | 0.00 | 0.00 | 2,691.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 2,800.0 | 0.00 | 0.00 | 2,791.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 2,900.0 | 0.00 | 0.00 | 2,891.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 3,000.0 | 0.00 | 0.00 | 2,991.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 3,100.0 | 0.00 | 0.00 | 3,091.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 3,200.0 | 0.00 | 0.00 | 3,191.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 3,300.0 | 0.00 | 0.00 | 3,291.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 3,400.0 | 0.00 | 0.00 | 3,391.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 3,500.0 | 0.00 | 0.00 | 3,491.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 3,600.0 | 0.00 | 0.00 | 3,591.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 3,683.3 | 0.00 | 0.00 | 3,675.0 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | TOP GAS |
| 3,700.0 | 0.00 | 0.00 | 3,691.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 3,800.0 | 0.00 | 0.00 | 3,791.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 3,900.0 | 0.00 | 0.00 | 3,891.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 4,000.0 | 0.00 | 0.00 | 3,991.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 4,100.0 | 0.00 | 0.00 | 4,091.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 4,200.0 | 0.00 | 0.00 | 4,191.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 4,300.0 | 0.00 | 0.00 | 4,291.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 4,400.0 | 0.00 | 0.00 | 4,391.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 4,500.0 | 0.00 | 0.00 | 4,491.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 4,527.3 | 0.00 | 0.00 | 4,519.0 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | Coal Ridge |
| 4,600.0 | 0.00 | 0.00 | 4,591.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 4,700.0 | 0.00 | 0.00 | 4,691.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |

Cathedral Energy Services

Planning Report

| | | | |
|-----------|------------------------------|------------------------------|------------------------------|
| Database: | EDM 5000.1 US Multi Users DB | Local Co-ordinate Reference: | Well Keinath Federal 17-11AH |
| Company: | EnCana Oil & Gas (USA) Inc | TVD Reference: | KBE @ 5789.0ft |
| Project: | Orchard | MD Reference: | KBE @ 5789.0ft |
| Site: | NENW Sec16-T8S-R96W (C16OU) | North Reference: | True |
| Well: | Keinath Federal 17-11AH | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | HZ | | |
| Design: | Plan #4 | | |

Planned Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Comments / Formations |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|----------------------------|
| 4,800.0 | 0.00 | 0.00 | 4,791.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 4,900.0 | 0.00 | 0.00 | 4,891.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 4,936.3 | 0.00 | 0.00 | 4,928.0 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | ROLLINS SS (lles Fm) |
| 5,000.0 | 0.00 | 0.00 | 4,991.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 5,100.0 | 0.00 | 0.00 | 5,091.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 5,164.3 | 0.00 | 0.00 | 5,156.0 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | COZZETTE SS |
| 5,200.0 | 0.00 | 0.00 | 5,191.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 5,300.0 | 0.00 | 0.00 | 5,291.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 5,400.0 | 0.00 | 0.00 | 5,391.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 5,407.3 | 0.00 | 0.00 | 5,399.0 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | CORCORAN SS |
| 5,500.0 | 0.00 | 0.00 | 5,491.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 5,600.0 | 0.00 | 0.00 | 5,591.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 5,700.0 | 0.00 | 0.00 | 5,691.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 5,800.0 | 0.00 | 0.00 | 5,791.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 5,900.0 | 0.00 | 0.00 | 5,891.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 6,000.0 | 0.00 | 0.00 | 5,991.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 6,100.0 | 0.00 | 0.00 | 6,091.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 6,168.3 | 0.00 | 0.00 | 6,160.0 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | Mancos A |
| 6,200.0 | 0.00 | 0.00 | 6,191.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 6,300.0 | 0.00 | 0.00 | 6,291.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 6,400.0 | 0.00 | 0.00 | 6,391.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 6,500.0 | 0.00 | 0.00 | 6,491.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 6,600.0 | 0.00 | 0.00 | 6,591.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 6,700.0 | 0.00 | 0.00 | 6,691.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 6,800.0 | 0.00 | 0.00 | 6,791.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 6,900.0 | 0.00 | 0.00 | 6,891.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 7,000.0 | 0.00 | 0.00 | 6,991.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 7,002.3 | 0.00 | 0.00 | 6,994.0 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | Mancos B |
| 7,100.0 | 0.00 | 0.00 | 7,091.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 7,200.0 | 0.00 | 0.00 | 7,191.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 7,300.0 | 0.00 | 0.00 | 7,291.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 7,400.0 | 0.00 | 0.00 | 7,391.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 7,500.0 | 0.00 | 0.00 | 7,491.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 7,590.0 | 0.00 | 0.00 | 7,581.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | Keinath Federal 17-1AH ICP |
| 7,600.0 | 0.00 | 0.00 | 7,591.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 7,700.0 | 0.00 | 0.00 | 7,691.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 7,800.0 | 0.00 | 0.00 | 7,791.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 7,900.0 | 0.00 | 0.00 | 7,891.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 8,000.0 | 0.00 | 0.00 | 7,991.7 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | |
| 8,090.3 | 0.00 | 0.00 | 8,082.0 | 165.6 | -70.3 | 0.0 | 0.00 | 0.00 | KOP #2 = 8090' MD |
| 8,100.0 | 0.78 | 247.00 | 8,091.7 | 165.6 | -70.4 | 0.1 | 8.01 | 8.01 | |
| 8,170.0 | 6.38 | 247.00 | 8,161.5 | 163.9 | -74.4 | 4.4 | 8.01 | 8.01 | |
| 8,200.0 | 8.78 | 247.00 | 8,191.2 | 162.4 | -78.0 | 8.4 | 8.00 | 8.00 | |
| 8,300.0 | 16.78 | 247.00 | 8,288.7 | 153.7 | -98.4 | 30.5 | 8.00 | 8.00 | |
| 8,310.8 | 17.65 | 247.00 | 8,299.0 | 152.5 | -101.3 | 33.7 | 8.00 | 8.00 | Niobrara |
| 8,400.0 | 24.78 | 247.00 | 8,382.1 | 139.9 | -131.0 | 65.9 | 8.00 | 8.00 | |
| 8,500.0 | 32.78 | 247.00 | 8,469.7 | 121.1 | -175.3 | 114.0 | 8.00 | 8.00 | |
| 8,570.0 | 38.38 | 247.00 | 8,526.6 | 105.2 | -212.8 | 154.8 | 8.00 | 8.00 | |
| 8,600.0 | 40.78 | 247.00 | 8,549.7 | 97.7 | -230.4 | 173.9 | 8.00 | 8.00 | |
| 8,700.0 | 48.78 | 247.00 | 8,620.6 | 70.2 | -295.2 | 244.3 | 8.00 | 8.00 | |
| 8,800.0 | 56.78 | 247.00 | 8,681.1 | 39.1 | -368.4 | 323.8 | 8.00 | 8.00 | |
| 8,900.0 | 64.78 | 247.00 | 8,729.8 | 5.0 | -448.7 | 411.0 | 8.00 | 8.00 | |

Cathedral Energy Services

Planning Report

| | | | |
|-----------|------------------------------|------------------------------|------------------------------|
| Database: | EDM 5000.1 US Multi Users DB | Local Co-ordinate Reference: | Well Keinath Federal 17-11AH |
| Company: | EnCana Oil & Gas (USA) Inc | TVD Reference: | KBE @ 5789.0ft |
| Project: | Orchard | MD Reference: | KBE @ 5789.0ft |
| Site: | NENW Sec16-T8S-R96W (C16OU) | North Reference: | True |
| Well: | Keinath Federal 17-11AH | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | HZ | | |
| Design: | Plan #4 | | |

Planned Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Comments / Formations |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|--------------------------------------|
| 8,983.7 | 71.48 | 247.00 | 8,761.0 | -25.3 | -520.1 | 488.7 | 8.00 | 8.00 | Niobrara Target |
| 9,000.0 | 72.78 | 247.00 | 8,766.0 | -31.3 | -534.4 | 504.2 | 8.00 | 8.00 | |
| 9,070.0 | 78.38 | 247.00 | 8,783.4 | -57.8 | -596.8 | 571.9 | 8.00 | 8.00 | |
| 9,100.0 | 79.74 | 247.00 | 8,789.1 | -69.3 | -623.9 | 601.4 | 4.54 | 4.54 | |
| 9,200.0 | 84.28 | 247.00 | 8,803.0 | -108.0 | -715.0 | 700.4 | 4.54 | 4.54 | |
| 9,300.0 | 88.82 | 247.00 | 8,809.0 | -147.0 | -806.9 | 800.2 | 4.54 | 4.54 | |
| 9,370.0 | 92.00 | 247.00 | 8,808.5 | -174.4 | -871.3 | 870.2 | 4.54 | 4.54 | Landing Point at 9370' MD (Inc.=92°) |
| 9,400.0 | 92.00 | 247.00 | 8,807.5 | -186.1 | -898.9 | 900.2 | 0.00 | 0.00 | |
| 9,500.0 | 92.00 | 247.00 | 8,804.0 | -225.1 | -990.9 | 1,000.1 | 0.00 | 0.00 | |
| 9,600.0 | 92.00 | 247.00 | 8,800.5 | -264.2 | -1,082.9 | 1,100.0 | 0.00 | 0.00 | |
| 9,700.0 | 92.00 | 247.00 | 8,797.0 | -303.2 | -1,174.9 | 1,200.0 | 0.00 | 0.00 | |
| 9,800.0 | 92.00 | 247.00 | 8,793.5 | -342.3 | -1,266.9 | 1,299.9 | 0.00 | 0.00 | |
| 9,900.0 | 92.00 | 247.00 | 8,790.0 | -381.3 | -1,358.9 | 1,399.9 | 0.00 | 0.00 | |
| 10,000.0 | 92.00 | 247.00 | 8,786.5 | -420.4 | -1,450.9 | 1,499.8 | 0.00 | 0.00 | |
| 10,100.0 | 92.00 | 247.00 | 8,783.0 | -459.4 | -1,542.9 | 1,599.7 | 0.00 | 0.00 | |
| 10,200.0 | 92.00 | 247.00 | 8,779.6 | -498.5 | -1,634.9 | 1,699.7 | 0.00 | 0.00 | |
| 10,300.0 | 92.00 | 247.00 | 8,776.1 | -537.5 | -1,726.9 | 1,799.6 | 0.00 | 0.00 | |
| 10,400.0 | 92.00 | 247.00 | 8,772.6 | -576.6 | -1,818.9 | 1,899.6 | 0.00 | 0.00 | |
| 10,500.0 | 92.00 | 247.00 | 8,769.1 | -615.6 | -1,910.9 | 1,999.5 | 0.00 | 0.00 | |
| 10,600.0 | 92.00 | 247.00 | 8,765.6 | -654.7 | -2,002.8 | 2,099.4 | 0.00 | 0.00 | |
| 10,700.0 | 92.00 | 247.00 | 8,762.1 | -693.7 | -2,094.8 | 2,199.4 | 0.00 | 0.00 | |
| 10,800.0 | 92.00 | 247.00 | 8,758.6 | -732.8 | -2,186.8 | 2,299.3 | 0.00 | 0.00 | |
| 10,900.0 | 92.00 | 247.00 | 8,755.1 | -771.8 | -2,278.8 | 2,399.2 | 0.00 | 0.00 | |
| 11,000.0 | 92.00 | 247.00 | 8,751.6 | -810.9 | -2,370.8 | 2,499.2 | 0.00 | 0.00 | |
| 11,100.0 | 92.00 | 247.00 | 8,748.1 | -849.9 | -2,462.8 | 2,599.1 | 0.00 | 0.00 | |
| 11,200.0 | 92.00 | 247.00 | 8,744.7 | -889.0 | -2,554.8 | 2,699.1 | 0.00 | 0.00 | |
| 11,300.0 | 92.00 | 247.00 | 8,741.2 | -928.0 | -2,646.8 | 2,799.0 | 0.00 | 0.00 | |
| 11,400.0 | 92.00 | 247.00 | 8,737.7 | -967.1 | -2,738.8 | 2,898.9 | 0.00 | 0.00 | |
| 11,500.0 | 92.00 | 247.00 | 8,734.2 | -1,006.1 | -2,830.8 | 2,998.9 | 0.00 | 0.00 | |
| 11,600.0 | 92.00 | 247.00 | 8,730.7 | -1,045.2 | -2,922.8 | 3,098.8 | 0.00 | 0.00 | |
| 11,700.0 | 92.00 | 247.00 | 8,727.2 | -1,084.2 | -3,014.8 | 3,198.8 | 0.00 | 0.00 | |
| 11,800.0 | 92.00 | 247.00 | 8,723.7 | -1,123.3 | -3,106.8 | 3,298.7 | 0.00 | 0.00 | |
| 11,900.0 | 92.00 | 247.00 | 8,720.2 | -1,162.3 | -3,198.8 | 3,398.6 | 0.00 | 0.00 | |
| 12,000.0 | 92.00 | 247.00 | 8,716.7 | -1,201.4 | -3,290.8 | 3,498.6 | 0.00 | 0.00 | |
| 12,100.0 | 92.00 | 247.00 | 8,713.2 | -1,240.4 | -3,382.8 | 3,598.5 | 0.00 | 0.00 | |
| 12,200.0 | 92.00 | 247.00 | 8,709.8 | -1,279.5 | -3,474.8 | 3,698.5 | 0.00 | 0.00 | |
| 12,300.0 | 92.00 | 247.00 | 8,706.3 | -1,318.5 | -3,566.8 | 3,798.4 | 0.00 | 0.00 | |
| 12,400.0 | 92.00 | 247.00 | 8,702.8 | -1,357.6 | -3,658.7 | 3,898.3 | 0.00 | 0.00 | |
| 12,500.0 | 92.00 | 247.00 | 8,699.3 | -1,396.6 | -3,750.7 | 3,998.3 | 0.00 | 0.00 | |
| 12,600.0 | 92.00 | 247.00 | 8,695.8 | -1,435.7 | -3,842.7 | 4,098.2 | 0.00 | 0.00 | |
| 12,700.0 | 92.00 | 247.00 | 8,692.3 | -1,474.7 | -3,934.7 | 4,198.1 | 0.00 | 0.00 | |
| 12,800.0 | 92.00 | 247.00 | 8,688.8 | -1,513.8 | -4,026.7 | 4,298.1 | 0.00 | 0.00 | |
| 12,900.0 | 92.00 | 247.00 | 8,685.3 | -1,552.8 | -4,118.7 | 4,398.0 | 0.00 | 0.00 | |
| 13,000.0 | 92.00 | 247.00 | 8,681.8 | -1,591.9 | -4,210.7 | 4,498.0 | 0.00 | 0.00 | |
| 13,100.0 | 92.00 | 247.00 | 8,678.3 | -1,630.9 | -4,302.7 | 4,597.9 | 0.00 | 0.00 | |
| 13,200.0 | 92.00 | 247.00 | 8,674.9 | -1,669.9 | -4,394.7 | 4,697.8 | 0.00 | 0.00 | |
| 13,300.0 | 92.00 | 247.00 | 8,671.4 | -1,709.0 | -4,486.7 | 4,797.8 | 0.00 | 0.00 | |
| 13,400.0 | 92.00 | 247.00 | 8,667.9 | -1,748.0 | -4,578.7 | 4,897.7 | 0.00 | 0.00 | |
| 13,500.0 | 92.00 | 247.00 | 8,664.4 | -1,787.1 | -4,670.7 | 4,997.7 | 0.00 | 0.00 | |
| 13,600.0 | 92.00 | 247.00 | 8,660.9 | -1,826.1 | -4,762.7 | 5,097.6 | 0.00 | 0.00 | |
| 13,700.0 | 92.00 | 247.00 | 8,657.4 | -1,865.2 | -4,854.7 | 5,197.5 | 0.00 | 0.00 | |
| 13,800.0 | 92.00 | 247.00 | 8,653.9 | -1,904.2 | -4,946.7 | 5,297.5 | 0.00 | 0.00 | |

Cathedral Energy Services

Planning Report

| | | | |
|-----------|------------------------------|------------------------------|------------------------------|
| Database: | EDM 5000.1 US Multi Users DB | Local Co-ordinate Reference: | Well Keinath Federal 17-11AH |
| Company: | EnCana Oil & Gas (USA) Inc | TVD Reference: | KBE @ 5789.0ft |
| Project: | Orchard | MD Reference: | KBE @ 5789.0ft |
| Site: | NENW Sec16-T8S-R96W (C16OU) | North Reference: | True |
| Well: | Keinath Federal 17-11AH | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | HZ | | |
| Design: | Plan #4 | | |

Planned Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Comments / Formations |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|-----------------------|
| 13,900.0 | 92.00 | 247.00 | 8,650.4 | -1,943.3 | -5,038.7 | 5,397.4 | 0.00 | 0.00 | |
| 14,000.0 | 92.00 | 247.00 | 8,646.9 | -1,982.3 | -5,130.7 | 5,497.4 | 0.00 | 0.00 | |
| 14,100.0 | 92.00 | 247.00 | 8,643.4 | -2,021.4 | -5,222.7 | 5,597.3 | 0.00 | 0.00 | |
| 14,200.0 | 92.00 | 247.00 | 8,640.0 | -2,060.4 | -5,314.6 | 5,697.2 | 0.00 | 0.00 | |
| 14,300.0 | 92.00 | 247.00 | 8,636.5 | -2,099.5 | -5,406.6 | 5,797.2 | 0.00 | 0.00 | |
| 14,370.0 | 92.00 | 247.00 | 8,634.0 | -2,126.8 | -5,471.0 | 5,867.1 | 0.00 | 0.00 | TD at 14,370' MD |

Targets

| Target Name | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude | Longitude |
|---|---------------|--------------|----------|------------|------------|---------------|--------------|-----------|-------------|
| - hit/miss target | | | | | | | | | |
| - Shape | | | | | | | | | |
| Keinath Federal 17-11AH | 0.00 | 0.00 | 8,810.5 | -174.4 | -871.3 | 1,564,814.86 | 2,259,944.88 | 39.354888 | -108.117576 |
| - plan misses target center by 2.0ft at 9370.0ft MD (8808.5 TVD, -174.4 N, -871.3 E) | | | | | | | | | |
| - Point | | | | | | | | | |
| Keinath Federal 17-11AH | 0.00 | 0.00 | 8,636.0 | -2,126.8 | -5,471.0 | 1,562,995.56 | 2,255,290.88 | 39.349526 | -108.133841 |
| - plan misses target center by 2.0ft at 14369.9ft MD (8634.0 TVD, -2126.8 N, -5471.0 E) | | | | | | | | | |
| - Point | | | | | | | | | |
| Keinath Federal 17-11AH | 0.00 | 0.00 | 2,293.7 | 165.7 | -70.3 | 1,565,131.67 | 2,260,755.33 | 39.355821 | -108.114743 |
| - plan hits target center | | | | | | | | | |
| - Point | | | | | | | | | |

Casing Points

| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (in) | Hole Diameter (in) |
|---------------------|---------------------|-----------------------------|----------------------|--------------------|
| 7,590.0 | 7,581.7 | Keinath Federal 17-11AH ICP | | |

Formations

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---------------------|---------------------|----------------------|-----------|---------|-------------------|
| 2,059.3 | 2,051.0 | Mesa Verde | | | |
| 2,532.3 | 2,524.0 | Williams Fork Fm | | | |
| 3,683.3 | 3,675.0 | TOP GAS | | | |
| 4,527.3 | 4,519.0 | Coal Ridge | | | |
| 4,936.3 | 4,928.0 | ROLLINS SS (Iles Fm) | | | |
| 5,164.3 | 5,156.0 | COZZETTE SS | | | |
| 5,407.3 | 5,399.0 | CORCORAN SS | | | |
| 6,168.3 | 6,160.0 | Mancos A | | | |
| 7,002.3 | 6,994.0 | Mancos B | | | |
| 8,310.8 | 8,299.0 | Niobrara | | | |
| 8,983.7 | 8,761.0 | Niobrara Target | | | |

Cathedral Energy Services

Planning Report

| | | | |
|-----------|------------------------------|------------------------------|------------------------------|
| Database: | EDM 5000.1 US Multi Users DB | Local Co-ordinate Reference: | Well Keinath Federal 17-11AH |
| Company: | EnCana Oil & Gas (USA) Inc | TVD Reference: | KBE @ 5789.0ft |
| Project: | Orchard | MD Reference: | KBE @ 5789.0ft |
| Site: | NENW Sec16-T8S-R96W (C16OU) | North Reference: | True |
| Well: | Keinath Federal 17-11AH | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | HZ | | |
| Design: | Plan #4 | | |

Plan Annotations

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | Comment |
|---------------------------|---------------------------|-------------------|---------------|--------------------------------------|
| | | +N/-S (ft) | +E/-W (ft) | |
| 300.0 | 299.8 | 8.6 | -3.7 | KOP #1 = 300' MD |
| 500.0 | 499.1 | 24.0 | -10.2 | EOB at Inc. = 6° |
| 1,600.0 | 1,593.1 | 129.8 | -55.1 | Hold to 1600' MD |
| 2,300.0 | 2,291.7 | 165.6 | -70.3 | EOD at Inc. = 0° |
| 8,090.3 | 8,082.0 | 165.6 | -70.3 | KOP #2 = 8090' MD |
| 9,370.0 | 8,808.5 | -174.4 | -871.3 | Landing Point at 9370' MD (Inc.=92°) |
| 14,370.0 | 8,634.0 | -2,126.8 | -5,471.0 | TD at 14,370' MD |