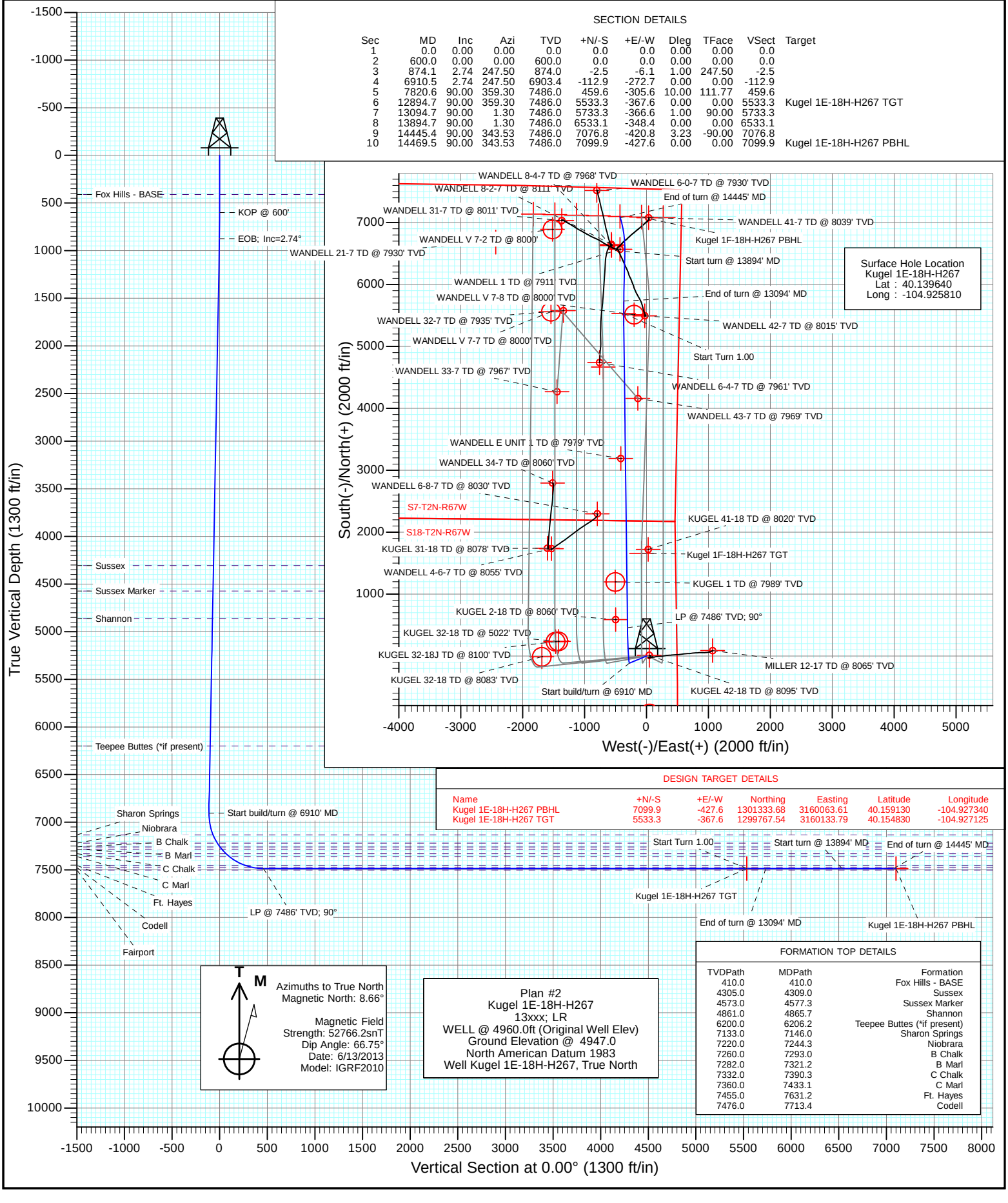
encana natural gas

Project: DJ Wattenberg
Site: S18-T2N-R67W (Kugel)
Well: Kugel 1E-18H-H267
Wellbore: Hz
Design: Plan #2

CATHEDRAL

SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | DLeg | TFace | VSect | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 2 | 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 3 | 874.1 | 2.74 | 247.50 | 874.0 | -2.5 | -6.1 | 1.00 | 247.50 | -2.5 | |
| 4 | 6910.5 | 2.74 | 247.50 | 6903.4 | -112.9 | -272.7 | 0.00 | 0.00 | -112.9 | |
| 5 | 7820.6 | 90.00 | 359.30 | 7486.0 | 459.6 | -305.6 | 10.00 | 111.77 | 459.6 | |
| 6 | 12894.7 | 90.00 | 359.30 | 7486.0 | 5533.3 | -367.6 | 0.00 | 0.00 | 5533.3 | Kugel 1E-18H-H267 TGT |
| 7 | 13094.7 | 90.00 | 1.30 | 7486.0 | 5733.3 | -366.6 | 1.00 | 90.00 | 5733.3 | |
| 8 | 13894.7 | 90.00 | 1.30 | 7486.0 | 6533.1 | -348.4 | 0.00 | 0.00 | 6533.1 | |
| 9 | 14445.4 | 90.00 | 343.53 | 7486.0 | 7076.8 | -420.8 | 3.23 | -90.00 | 7076.8 | |
| 10 | 14469.5 | 90.00 | 343.53 | 7486.0 | 7099.9 | -427.6 | 0.00 | 0.00 | 7099.9 | Kugel 1E-18H-H267 PBHL |




DESIGN TARGET DETAILS

| Name | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|---|---|
| Kugel 1E-18H-H267 PBHL | 7099.9 | -427.6 | 1301333.68 | 3160063.61 | 40.159130 | -104.927340 |
| Kugel 1E-18H-H267 TGT | 5533.3 | -367.6 | 1299767.54 | 3160133.79 | 40.154830 | -104.927125 |

T M

Azimuths to True North
Magnetic North: 8.66°

Magnetic Field
Strength: 52766.2snT
Dip Angle: 66.75°
Date: 6/13/2013
Model: IGRF2010

Plan #2
Kugel 1E-18H-H267
13xxx; LR
WELL @ 4960.0ft (Original Well Elev)
Ground Elevation @ 4947.0
North American Datum 1983
Well Kugel 1E-18H-H267, True North

FORMATION TOP DETAILS

| TVDPath | MDPath | Formation |
|---|---|---|
| 410.0 | 410.0 | Fox Hills - BASE |
| 4305.0 | 4309.0 | Sussex |
| 4573.0 | 4577.3 | Sussex Marker |
| 4861.0 | 4865.7 | Shannon |
| 6200.0 | 6206.2 | Teepee Buttes (*if present) |
| 7133.0 | 7146.0 | Sharon Springs |
| 7220.0 | 7244.3 | Niobrara |
| 7260.0 | 7293.0 | B Chalk |
| 7282.0 | 7321.2 | B Marl |
| 7332.0 | 7390.3 | C Chalk |
| 7360.0 | 7433.1 | C Marl |
| 7455.0 | 7631.2 | Ft. Hayes |
| 7476.0 | 7713.4 | Codell |

# Planning Report

| | | | |
|---|---|---|---|
| **Database:** | USA EDM 5000 Multi Users DB | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Company:** | EnCana Oil & Gas (USA) Inc | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site:** | S18-T2N-R67W (Kugel) | **North Reference:** | True |
| **Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #2 | | |

**Project** DJ Wattenberg

| | | | |
|---|---|---|---|
| **Map System:** | US State Plane 1983 | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | North American Datum 1983 | | |
| **Map Zone:** | Colorado Northern Zone | | |

**Site** S18-T2N-R67W (Kugel)

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 1,294,236.49 ft | **Latitude:** | 40.139640 |
| **From:** | Lat/Long | **Easting:** | 3,160,498.07 ft | **Longitude:** | -104.925950 |
| **Position Uncertainty:** | 0.0 ft | **Slot Radius:** | 13.200 in | **Grid Convergence:** | 0.37 ° |

**Well** Kugel 1E-18H-H267

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.0 ft | **Northing:** | 1,294,236.72 ft | **Latitude:** | 40.139640 |
| | **+E/-W** | 0.0 ft | **Easting:** | 3,160,537.21 ft | **Longitude:** | -104.925810 |
| **Position Uncertainty** | | 0.0 ft | **Wellhead Elevation:** | ft | **Ground Level:** | 4,947.0 ft |

**Wellbore** Hz

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 6/13/2013 | 8.66 | 66.75 | 52,766 |

**Design** Plan #2

**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 | 0.00 |

**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 | |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 874.1 | 2.74 | 247.50 | 874.0 | -2.5 | -6.1 | 1.00 | 1.00 | 0.00 | 247.50 | |
| 6,910.5 | 2.74 | 247.50 | 6,903.4 | -112.9 | -272.7 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,820.6 | 90.00 | 359.30 | 7,486.0 | 459.6 | -305.6 | 10.00 | 9.59 | 12.28 | 111.77 | |
| 12,894.7 | 90.00 | 359.30 | 7,486.0 | 5,533.3 | -367.6 | 0.00 | 0.00 | 0.00 | 0.00 | Kugel 1E-18H-H267 T |
| 13,094.7 | 90.00 | 1.30 | 7,486.0 | 5,733.3 | -366.6 | 1.00 | 0.00 | 1.00 | 90.00 | |
| 13,894.7 | 90.00 | 1.30 | 7,486.0 | 6,533.1 | -348.4 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 14,445.4 | 90.00 | 343.53 | 7,486.0 | 7,076.8 | -420.8 | 3.23 | 0.00 | -3.23 | -90.00 | |
| 14,469.5 | 90.00 | 343.53 | 7,486.0 | 7,099.9 | -427.6 | 0.00 | 0.00 | 0.00 | 0.00 | Kugel 1E-18H-H267 F |

| | | | |
|---|---|---|---|
| **Database:** | USA EDM 5000 Multi Users DB | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Company:** | EnCana Oil & Gas (USA) Inc | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site:** | S18-T2N-R67W (Kugel) | **North Reference:** | True |
| **Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #2 | | |

**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 | 0.00 | 0.00 | 100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | |
| 200.0 | 0.00 | 0.00 | 200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | |
| 300.0 | 0.00 | 0.00 | 300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | |
| 400.0 | 0.00 | 0.00 | 400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | |
| 410.0 | 0.00 | 0.00 | 410.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | Fox Hills - BASE |
| 500.0 | 0.00 | 0.00 | 500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | KOP @ 600' |
| 700.0 | 1.00 | 247.50 | 700.0 | -0.3 | -0.8 | -0.3 | 1.00 | 1.00 | |
| 800.0 | 2.00 | 247.50 | 800.0 | -1.3 | -3.2 | -1.3 | 1.00 | 1.00 | |
| 874.1 | 2.74 | 247.50 | 874.0 | -2.5 | -6.1 | -2.5 | 1.00 | 1.00 | EOB; Inc=2.74° |
| 900.0 | 2.74 | 247.50 | 899.9 | -3.0 | -7.2 | -3.0 | 0.00 | 0.00 | |
| 1,000.0 | 2.74 | 247.50 | 999.8 | -4.8 | -11.6 | -4.8 | 0.00 | 0.00 | |
| 1,100.0 | 2.74 | 247.50 | 1,099.6 | -6.6 | -16.0 | -6.6 | 0.00 | 0.00 | |
| 1,200.0 | 2.74 | 247.50 | 1,199.5 | -8.5 | -20.5 | -8.5 | 0.00 | 0.00 | |
| 1,300.0 | 2.74 | 247.50 | 1,299.4 | -10.3 | -24.9 | -10.3 | 0.00 | 0.00 | |
| 1,400.0 | 2.74 | 247.50 | 1,399.3 | -12.1 | -29.3 | -12.1 | 0.00 | 0.00 | |
| 1,500.0 | 2.74 | 247.50 | 1,499.2 | -14.0 | -33.7 | -14.0 | 0.00 | 0.00 | |
| 1,600.0 | 2.74 | 247.50 | 1,599.1 | -15.8 | -38.1 | -15.8 | 0.00 | 0.00 | |
| 1,700.0 | 2.74 | 247.50 | 1,699.0 | -17.6 | -42.5 | -17.6 | 0.00 | 0.00 | |
| 1,800.0 | 2.74 | 247.50 | 1,798.8 | -19.4 | -47.0 | -19.4 | 0.00 | 0.00 | |
| 1,900.0 | 2.74 | 247.50 | 1,898.7 | -21.3 | -51.4 | -21.3 | 0.00 | 0.00 | |
| 2,000.0 | 2.74 | 247.50 | 1,998.6 | -23.1 | -55.8 | -23.1 | 0.00 | 0.00 | |
| 2,100.0 | 2.74 | 247.50 | 2,098.5 | -24.9 | -60.2 | -24.9 | 0.00 | 0.00 | |
| 2,200.0 | 2.74 | 247.50 | 2,198.4 | -26.8 | -64.6 | -26.8 | 0.00 | 0.00 | |
| 2,300.0 | 2.74 | 247.50 | 2,298.3 | -28.6 | -69.0 | -28.6 | 0.00 | 0.00 | |
| 2,400.0 | 2.74 | 247.50 | 2,398.2 | -30.4 | -73.5 | -30.4 | 0.00 | 0.00 | |
| 2,500.0 | 2.74 | 247.50 | 2,498.0 | -32.3 | -77.9 | -32.3 | 0.00 | 0.00 | |
| 2,600.0 | 2.74 | 247.50 | 2,597.9 | -34.1 | -82.3 | -34.1 | 0.00 | 0.00 | |
| 2,700.0 | 2.74 | 247.50 | 2,697.8 | -35.9 | -86.7 | -35.9 | 0.00 | 0.00 | |
| 2,800.0 | 2.74 | 247.50 | 2,797.7 | -37.7 | -91.1 | -37.7 | 0.00 | 0.00 | |
| 2,900.0 | 2.74 | 247.50 | 2,897.6 | -39.6 | -95.6 | -39.6 | 0.00 | 0.00 | |
| 3,000.0 | 2.74 | 247.50 | 2,997.5 | -41.4 | -100.0 | -41.4 | 0.00 | 0.00 | |
| 3,100.0 | 2.74 | 247.50 | 3,097.3 | -43.2 | -104.4 | -43.2 | 0.00 | 0.00 | |
| 3,200.0 | 2.74 | 247.50 | 3,197.2 | -45.1 | -108.8 | -45.1 | 0.00 | 0.00 | |
| 3,300.0 | 2.74 | 247.50 | 3,297.1 | -46.9 | -113.2 | -46.9 | 0.00 | 0.00 | |
| 3,400.0 | 2.74 | 247.50 | 3,397.0 | -48.7 | -117.6 | -48.7 | 0.00 | 0.00 | |
| 3,500.0 | 2.74 | 247.50 | 3,496.9 | -50.5 | -122.1 | -50.5 | 0.00 | 0.00 | |
| 3,600.0 | 2.74 | 247.50 | 3,596.8 | -52.4 | -126.5 | -52.4 | 0.00 | 0.00 | |
| 3,700.0 | 2.74 | 247.50 | 3,696.7 | -54.2 | -130.9 | -54.2 | 0.00 | 0.00 | |
| 3,800.0 | 2.74 | 247.50 | 3,796.5 | -56.0 | -135.3 | -56.0 | 0.00 | 0.00 | |
| 3,900.0 | 2.74 | 247.50 | 3,896.4 | -57.9 | -139.7 | -57.9 | 0.00 | 0.00 | |
| 4,000.0 | 2.74 | 247.50 | 3,996.3 | -59.7 | -144.1 | -59.7 | 0.00 | 0.00 | |
| 4,100.0 | 2.74 | 247.50 | 4,096.2 | -61.5 | -148.6 | -61.5 | 0.00 | 0.00 | |
| 4,200.0 | 2.74 | 247.50 | 4,196.1 | -63.4 | -153.0 | -63.4 | 0.00 | 0.00 | |
| 4,300.0 | 2.74 | 247.50 | 4,296.0 | -65.2 | -157.4 | -65.2 | 0.00 | 0.00 | |
| 4,309.0 | 2.74 | 247.50 | 4,305.0 | -65.3 | -157.8 | -65.3 | 0.00 | 0.00 | Sussex |
| 4,400.0 | 2.74 | 247.50 | 4,395.9 | -67.0 | -161.8 | -67.0 | 0.00 | 0.00 | |
| 4,500.0 | 2.74 | 247.50 | 4,495.7 | -68.8 | -166.2 | -68.8 | 0.00 | 0.00 | |
| 4,577.3 | 2.74 | 247.50 | 4,573.0 | -70.3 | -169.7 | -70.3 | 0.00 | 0.00 | Sussex Marker |
| 4,600.0 | 2.74 | 247.50 | 4,595.6 | -70.7 | -170.7 | -70.7 | 0.00 | 0.00 | |
| 4,700.0 | 2.74 | 247.50 | 4,695.5 | -72.5 | -175.1 | -72.5 | 0.00 | 0.00 | |

| | | | |
|---|---|---|---|
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| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site:** | S18-T2N-R67W (Kugel) | **North Reference:** | True |
| **Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #2 | | |

**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 | 2.74 | 247.50 | 4,795.4 | -74.3 | -179.5 | -74.3 | 0.00 | 0.00 | |
| 4,865.7 | 2.74 | 247.50 | 4,861.0 | -75.5 | -182.4 | -75.5 | 0.00 | 0.00 | Shannon |
| 4,900.0 | 2.74 | 247.50 | 4,895.3 | -76.2 | -183.9 | -76.2 | 0.00 | 0.00 | |
| 5,000.0 | 2.74 | 247.50 | 4,995.2 | -78.0 | -188.3 | -78.0 | 0.00 | 0.00 | |
| 5,100.0 | 2.74 | 247.50 | 5,095.1 | -79.8 | -192.7 | -79.8 | 0.00 | 0.00 | |
| 5,200.0 | 2.74 | 247.50 | 5,194.9 | -81.6 | -197.2 | -81.6 | 0.00 | 0.00 | |
| 5,300.0 | 2.74 | 247.50 | 5,294.8 | -83.5 | -201.6 | -83.5 | 0.00 | 0.00 | |
| 5,400.0 | 2.74 | 247.50 | 5,394.7 | -85.3 | -206.0 | -85.3 | 0.00 | 0.00 | |
| 5,500.0 | 2.74 | 247.50 | 5,494.6 | -87.1 | -210.4 | -87.1 | 0.00 | 0.00 | |
| 5,600.0 | 2.74 | 247.50 | 5,594.5 | -89.0 | -214.8 | -89.0 | 0.00 | 0.00 | |
| 5,700.0 | 2.74 | 247.50 | 5,694.4 | -90.8 | -219.2 | -90.8 | 0.00 | 0.00 | |
| 5,800.0 | 2.74 | 247.50 | 5,794.3 | -92.6 | -223.7 | -92.6 | 0.00 | 0.00 | |
| 5,900.0 | 2.74 | 247.50 | 5,894.1 | -94.5 | -228.1 | -94.5 | 0.00 | 0.00 | |
| 6,000.0 | 2.74 | 247.50 | 5,994.0 | -96.3 | -232.5 | -96.3 | 0.00 | 0.00 | |
| 6,100.0 | 2.74 | 247.50 | 6,093.9 | -98.1 | -236.9 | -98.1 | 0.00 | 0.00 | |
| 6,200.0 | 2.74 | 247.50 | 6,193.8 | -99.9 | -241.3 | -99.9 | 0.00 | 0.00 | |
| 6,206.2 | 2.74 | 247.50 | 6,200.0 | -100.1 | -241.6 | -100.1 | 0.00 | 0.00 | Teepee Buttes (*if present) |
| 6,300.0 | 2.74 | 247.50 | 6,293.7 | -101.8 | -245.8 | -101.8 | 0.00 | 0.00 | |
| 6,400.0 | 2.74 | 247.50 | 6,393.6 | -103.6 | -250.2 | -103.6 | 0.00 | 0.00 | |
| 6,500.0 | 2.74 | 247.50 | 6,493.5 | -105.4 | -254.6 | -105.4 | 0.00 | 0.00 | |
| 6,600.0 | 2.74 | 247.50 | 6,593.3 | -107.3 | -259.0 | -107.3 | 0.00 | 0.00 | |
| 6,700.0 | 2.74 | 247.50 | 6,693.2 | -109.1 | -263.4 | -109.1 | 0.00 | 0.00 | |
| 6,800.0 | 2.74 | 247.50 | 6,793.1 | -110.9 | -267.8 | -110.9 | 0.00 | 0.00 | |
| 6,900.0 | 2.74 | 247.50 | 6,893.0 | -112.7 | -272.3 | -112.7 | 0.00 | 0.00 | |
| 6,910.5 | 2.74 | 247.50 | 6,903.4 | -112.9 | -272.7 | -112.9 | 0.00 | 0.00 | Start build/turn @ 6910' MD |
| 7,000.0 | 8.33 | 341.63 | 6,992.6 | -107.6 | -276.8 | -107.6 | 10.00 | 6.25 | |
| 7,100.0 | 18.11 | 351.49 | 7,089.9 | -85.3 | -281.3 | -85.3 | 10.00 | 9.78 | |
| 7,146.0 | 22.67 | 353.19 | 7,133.0 | -69.4 | -283.5 | -69.4 | 10.00 | 9.92 | Sharon Springs |
| 7,200.0 | 28.04 | 354.51 | 7,181.8 | -46.4 | -285.9 | -46.4 | 10.00 | 9.95 | |
| 7,244.3 | 32.45 | 355.29 | 7,220.0 | -24.2 | -287.9 | -24.2 | 10.00 | 9.96 | Niobrara |
| 7,293.0 | 37.32 | 355.96 | 7,260.0 | 3.6 | -290.0 | 3.6 | 10.00 | 9.97 | B Chalk |
| 7,300.0 | 38.01 | 356.04 | 7,265.5 | 7.8 | -290.3 | 7.8 | 10.00 | 9.97 | |
| 7,321.2 | 40.13 | 356.28 | 7,282.0 | 21.2 | -291.2 | 21.2 | 10.00 | 9.98 | B Marl |
| 7,390.3 | 47.02 | 356.93 | 7,332.0 | 68.7 | -294.0 | 68.7 | 10.00 | 9.98 | C Chalk |
| 7,400.0 | 47.99 | 357.01 | 7,338.6 | 75.8 | -294.4 | 75.8 | 10.00 | 9.98 | |
| 7,433.1 | 51.29 | 357.26 | 7,360.0 | 101.0 | -295.6 | 101.0 | 10.00 | 9.98 | C Marl |
| 7,500.0 | 57.97 | 357.71 | 7,398.7 | 155.5 | -298.0 | 155.5 | 10.00 | 9.99 | |
| 7,600.0 | 67.96 | 358.27 | 7,444.1 | 244.4 | -301.1 | 244.4 | 10.00 | 9.99 | |
| 7,631.2 | 71.08 | 358.43 | 7,455.0 | 273.6 | -302.0 | 273.6 | 10.00 | 9.99 | Ft. Hayes |
| 7,700.0 | 77.95 | 358.76 | 7,473.4 | 339.8 | -303.6 | 339.8 | 10.00 | 9.99 | |
| 7,713.4 | 79.29 | 358.82 | 7,476.0 | 353.0 | -303.9 | 353.0 | 10.00 | 9.99 | Codell |
| 7,800.0 | 87.94 | 359.21 | 7,485.6 | 438.9 | -305.3 | 438.9 | 10.00 | 9.99 | |
| 7,820.6 | 90.00 | 359.30 | 7,486.0 | 459.6 | -305.6 | 459.6 | 10.00 | 9.99 | LP @ 7486' TVD; 90° |
| 7,900.0 | 90.00 | 359.30 | 7,486.0 | 538.9 | -306.6 | 538.9 | 0.00 | 0.00 | |
| 8,000.0 | 90.00 | 359.30 | 7,486.0 | 638.9 | -307.8 | 638.9 | 0.00 | 0.00 | |
| 8,100.0 | 90.00 | 359.30 | 7,486.0 | 738.9 | -309.0 | 738.9 | 0.00 | 0.00 | |
| 8,200.0 | 90.00 | 359.30 | 7,486.0 | 838.9 | -310.2 | 838.9 | 0.00 | 0.00 | |
| 8,300.0 | 90.00 | 359.30 | 7,486.0 | 938.9 | -311.5 | 938.9 | 0.00 | 0.00 | |
| 8,400.0 | 90.00 | 359.30 | 7,486.0 | 1,038.9 | -312.7 | 1,038.9 | 0.00 | 0.00 | |
| 8,500.0 | 90.00 | 359.30 | 7,486.0 | 1,138.9 | -313.9 | 1,138.9 | 0.00 | 0.00 | |
| 8,600.0 | 90.00 | 359.30 | 7,486.0 | 1,238.9 | -315.1 | 1,238.9 | 0.00 | 0.00 | |
| 8,700.0 | 90.00 | 359.30 | 7,486.0 | 1,338.9 | -316.4 | 1,338.9 | 0.00 | 0.00 | |

| | | | |
|---|---|---|---|
| **Database:** | USA EDM 5000 Multi Users DB | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Company:** | EnCana Oil & Gas (USA) Inc | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site:** | S18-T2N-R67W (Kugel) | **North Reference:** | True |
| **Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #2 | | |

**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 |
|---|---|---|---|---|---|---|---|---|---|
| 8,800.0 | 90.00 | 359.30 | 7,486.0 | 1,438.9 | -317.6 | 1,438.9 | 0.00 | 0.00 | |
| 8,900.0 | 90.00 | 359.30 | 7,486.0 | 1,538.9 | -318.8 | 1,538.9 | 0.00 | 0.00 | |
| 9,000.0 | 90.00 | 359.30 | 7,486.0 | 1,638.9 | -320.0 | 1,638.9 | 0.00 | 0.00 | |
| 9,100.0 | 90.00 | 359.30 | 7,486.0 | 1,738.8 | -321.2 | 1,738.8 | 0.00 | 0.00 | |
| 9,200.0 | 90.00 | 359.30 | 7,486.0 | 1,838.8 | -322.5 | 1,838.8 | 0.00 | 0.00 | |
| 9,300.0 | 90.00 | 359.30 | 7,486.0 | 1,938.8 | -323.7 | 1,938.8 | 0.00 | 0.00 | |
| 9,400.0 | 90.00 | 359.30 | 7,486.0 | 2,038.8 | -324.9 | 2,038.8 | 0.00 | 0.00 | |
| 9,500.0 | 90.00 | 359.30 | 7,486.0 | 2,138.8 | -326.1 | 2,138.8 | 0.00 | 0.00 | |
| 9,600.0 | 90.00 | 359.30 | 7,486.0 | 2,238.8 | -327.3 | 2,238.8 | 0.00 | 0.00 | |
| 9,700.0 | 90.00 | 359.30 | 7,486.0 | 2,338.8 | -328.6 | 2,338.8 | 0.00 | 0.00 | |
| 9,800.0 | 90.00 | 359.30 | 7,486.0 | 2,438.8 | -329.8 | 2,438.8 | 0.00 | 0.00 | |
| 9,900.0 | 90.00 | 359.30 | 7,486.0 | 2,538.8 | -331.0 | 2,538.8 | 0.00 | 0.00 | |
| 10,000.0 | 90.00 | 359.30 | 7,486.0 | 2,638.8 | -332.2 | 2,638.8 | 0.00 | 0.00 | |
| 10,100.0 | 90.00 | 359.30 | 7,486.0 | 2,738.8 | -333.5 | 2,738.8 | 0.00 | 0.00 | |
| 10,200.0 | 90.00 | 359.30 | 7,486.0 | 2,838.8 | -334.7 | 2,838.8 | 0.00 | 0.00 | |
| 10,300.0 | 90.00 | 359.30 | 7,486.0 | 2,938.8 | -335.9 | 2,938.8 | 0.00 | 0.00 | |
| 10,400.0 | 90.00 | 359.30 | 7,486.0 | 3,038.7 | -337.1 | 3,038.7 | 0.00 | 0.00 | |
| 10,500.0 | 90.00 | 359.30 | 7,486.0 | 3,138.7 | -338.3 | 3,138.7 | 0.00 | 0.00 | |
| 10,600.0 | 90.00 | 359.30 | 7,486.0 | 3,238.7 | -339.6 | 3,238.7 | 0.00 | 0.00 | |
| 10,700.0 | 90.00 | 359.30 | 7,486.0 | 3,338.7 | -340.8 | 3,338.7 | 0.00 | 0.00 | |
| 10,800.0 | 90.00 | 359.30 | 7,486.0 | 3,438.7 | -342.0 | 3,438.7 | 0.00 | 0.00 | |
| 10,900.0 | 90.00 | 359.30 | 7,486.0 | 3,538.7 | -343.2 | 3,538.7 | 0.00 | 0.00 | |
| 11,000.0 | 90.00 | 359.30 | 7,486.0 | 3,638.7 | -344.5 | 3,638.7 | 0.00 | 0.00 | |
| 11,100.0 | 90.00 | 359.30 | 7,486.0 | 3,738.7 | -345.7 | 3,738.7 | 0.00 | 0.00 | |
| 11,200.0 | 90.00 | 359.30 | 7,486.0 | 3,838.7 | -346.9 | 3,838.7 | 0.00 | 0.00 | |
| 11,300.0 | 90.00 | 359.30 | 7,486.0 | 3,938.7 | -348.1 | 3,938.7 | 0.00 | 0.00 | |
| 11,400.0 | 90.00 | 359.30 | 7,486.0 | 4,038.7 | -349.3 | 4,038.7 | 0.00 | 0.00 | |
| 11,500.0 | 90.00 | 359.30 | 7,486.0 | 4,138.7 | -350.6 | 4,138.7 | 0.00 | 0.00 | |
| 11,600.0 | 90.00 | 359.30 | 7,486.0 | 4,238.7 | -351.8 | 4,238.7 | 0.00 | 0.00 | |
| 11,700.0 | 90.00 | 359.30 | 7,486.0 | 4,338.7 | -353.0 | 4,338.7 | 0.00 | 0.00 | |
| 11,800.0 | 90.00 | 359.30 | 7,486.0 | 4,438.6 | -354.2 | 4,438.6 | 0.00 | 0.00 | |
| 11,900.0 | 90.00 | 359.30 | 7,486.0 | 4,538.6 | -355.4 | 4,538.6 | 0.00 | 0.00 | |
| 12,000.0 | 90.00 | 359.30 | 7,486.0 | 4,638.6 | -356.7 | 4,638.6 | 0.00 | 0.00 | |
| 12,100.0 | 90.00 | 359.30 | 7,486.0 | 4,738.6 | -357.9 | 4,738.6 | 0.00 | 0.00 | |
| 12,200.0 | 90.00 | 359.30 | 7,486.0 | 4,838.6 | -359.1 | 4,838.6 | 0.00 | 0.00 | |
| 12,300.0 | 90.00 | 359.30 | 7,486.0 | 4,938.6 | -360.3 | 4,938.6 | 0.00 | 0.00 | |
| 12,400.0 | 90.00 | 359.30 | 7,486.0 | 5,038.6 | -361.6 | 5,038.6 | 0.00 | 0.00 | |
| 12,500.0 | 90.00 | 359.30 | 7,486.0 | 5,138.6 | -362.8 | 5,138.6 | 0.00 | 0.00 | |
| 12,600.0 | 90.00 | 359.30 | 7,486.0 | 5,238.6 | -364.0 | 5,238.6 | 0.00 | 0.00 | |
| 12,700.0 | 90.00 | 359.30 | 7,486.0 | 5,338.6 | -365.2 | 5,338.6 | 0.00 | 0.00 | |
| 12,800.0 | 90.00 | 359.30 | 7,486.0 | 5,438.6 | -366.4 | 5,438.6 | 0.00 | 0.00 | |
| 12,894.7 | 90.00 | 359.30 | 7,486.0 | 5,533.3 | -367.6 | 5,533.3 | 0.00 | 0.00 | Start Turn 1.00 |
| 12,900.0 | 90.00 | 359.35 | 7,486.0 | 5,538.6 | -367.7 | 5,538.6 | 1.00 | 0.00 | |
| 13,000.0 | 90.00 | 0.35 | 7,486.0 | 5,638.6 | -367.9 | 5,638.6 | 1.00 | 0.00 | |
| 13,094.7 | 90.00 | 1.30 | 7,486.0 | 5,733.3 | -366.6 | 5,733.3 | 1.00 | 0.00 | End of turn @ 13094' MD |
| 13,100.0 | 90.00 | 1.30 | 7,486.0 | 5,738.5 | -366.4 | 5,738.5 | 0.00 | 0.00 | |
| 13,200.0 | 90.00 | 1.30 | 7,486.0 | 5,838.5 | -364.2 | 5,838.5 | 0.00 | 0.00 | |
| 13,300.0 | 90.00 | 1.30 | 7,486.0 | 5,938.5 | -361.9 | 5,938.5 | 0.00 | 0.00 | |
| 13,400.0 | 90.00 | 1.30 | 7,486.0 | 6,038.5 | -359.6 | 6,038.5 | 0.00 | 0.00 | |
| 13,500.0 | 90.00 | 1.30 | 7,486.0 | 6,138.4 | -357.4 | 6,138.4 | 0.00 | 0.00 | |
| 13,600.0 | 90.00 | 1.30 | 7,486.0 | 6,238.4 | -355.1 | 6,238.4 | 0.00 | 0.00 | |
| 13,700.0 | 90.00 | 1.30 | 7,486.0 | 6,338.4 | -352.8 | 6,338.4 | 0.00 | 0.00 | |

| | | | |
|---|---|---|---|
| **Database:** | USA EDM 5000 Multi Users DB | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Company:** | EnCana Oil & Gas (USA) Inc | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site:** | S18-T2N-R67W (Kugel) | **North Reference:** | True |
| **Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #2 | | |

**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 |
|---|---|---|---|---|---|---|---|---|---|
| 13,800.0 | 90.00 | 1.30 | 7,486.0 | 6,438.4 | -350.6 | 6,438.4 | 0.00 | 0.00 | |
| 13,894.7 | 90.00 | 1.30 | 7,486.0 | 6,533.1 | -348.4 | 6,533.1 | 0.00 | 0.00 | Start turn @ 13894' MD |
| 13,900.0 | 90.00 | 1.13 | 7,486.0 | 6,538.3 | -348.3 | 6,538.3 | 3.23 | 0.00 | |
| 14,000.0 | 90.00 | 357.90 | 7,486.0 | 6,638.3 | -349.1 | 6,638.3 | 3.23 | 0.00 | |
| 14,100.0 | 90.00 | 354.68 | 7,486.0 | 6,738.1 | -355.6 | 6,738.1 | 3.23 | 0.00 | |
| 14,200.0 | 90.00 | 351.45 | 7,486.0 | 6,837.4 | -367.7 | 6,837.4 | 3.23 | 0.00 | |
| 14,300.0 | 90.00 | 348.22 | 7,486.0 | 6,935.8 | -385.3 | 6,935.8 | 3.23 | 0.00 | |
| 14,400.0 | 90.00 | 345.00 | 7,486.0 | 7,033.0 | -408.5 | 7,033.0 | 3.23 | 0.00 | |
| 14,445.4 | 90.00 | 343.53 | 7,486.0 | 7,076.8 | -420.8 | 7,076.8 | 3.23 | 0.00 | End of turn @ 14445' MD |
| 14,469.5 | 90.00 | 343.53 | 7,486.0 | 7,099.9 | -427.6 | 7,099.9 | 0.00 | 0.00 | TD at 14469.5 |

**Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| Kugel 1E-18H-H267 TG<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 7,486.0 | 5,533.3 | -367.6 | 1,299,767.54 | 3,160,133.79 | 40.154830 | -104.927125 |
| Kugel 1E-18H-H267 PBł<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 7,486.0 | 7,099.9 | -427.6 | 1,301,333.68 | 3,160,063.61 | 40.159130 | -104.927340 |

**Formations**

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 410.0 | 410.0 | Fox Hills - BASE | | | |
| 4,309.0 | 4,305.0 | Sussex | | | |
| 4,577.3 | 4,573.0 | Sussex Marker | | | |
| 4,865.7 | 4,861.0 | Shannon | | | |
| 6,206.2 | 6,200.0 | Teepee Buttes (*if present) | | | |
| 7,146.0 | 7,133.0 | Sharon Springs | | | |
| 7,244.3 | 7,220.0 | Niobrara | | | |
| 7,293.0 | 7,260.0 | B Chalk | | | |
| 7,321.2 | 7,282.0 | B Marl | | | |
| 7,390.3 | 7,332.0 | C Chalk | | | |
| 7,433.1 | 7,360.0 | C Marl | | | |
| 7,631.2 | 7,455.0 | Ft. Hayes | | | |
| 7,713.4 | 7,476.0 | Codell | | | |

| | | | |
|---|---|---|---|
| **Database:** | USA EDM 5000 Multi Users DB | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Company:** | EnCana Oil & Gas (USA) Inc | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site:** | S18-T2N-R67W (Kugel) | **North Reference:** | True |
| **Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #2 | | |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | Local Coordinates +E/-W (ft) | Comment |
|---|---|---|---|---|
| 600.0 | 600.0 | 0.0 | 0.0 | KOP @ 600' |
| 874.1 | 874.0 | -2.5 | -6.1 | EOB; Inc=2.74° |
| 6,910.5 | 6,903.4 | -112.9 | -272.7 | Start build/turn @ 6910' MD |
| 7,820.6 | 7,486.0 | 459.6 | -305.6 | LP @ 7486' TVD; 90° |
| 12,894.7 | 7,486.0 | 5,533.3 | -367.6 | Start Turn 1.00 |
| 13,094.7 | 7,486.0 | 5,733.3 | -366.6 | End of turn @ 13094' MD |
| 13,894.7 | 7,486.0 | 6,533.1 | -348.4 | Start turn @ 13894' MD |
| 14,445.4 | 7,486.0 | 7,076.8 | -420.8 | End of turn @ 14445' MD |
| 14,469.5 | 7,486.0 | 7,099.9 | -427.6 | TD at 14469.5 |

# EnCana Oil & Gas (USA) Inc

**DJ Wattenberg**
**S18-T2N-R67W (Kugel)**
**Kugel 1E-18H-H267**
**Hz**
**Plan #2**

# Anticollision Report

**25 June, 2013**

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

| | |
|---|---|
| **Reference** | Plan #2 |

| | | | |
|---|---|---|---|
| **Filter type:** | NO GLOBAL FILTER: Using user defined selection & filtering criteria | | |
| **Interpolation Method:** | MD Interval 100.0ft | **Error Model:** | Systematic Ellipse |
| **Depth Range:** | Unlimited | **Scan Method:** | Closest Approach 3D |
| **Results Limited by:** | Maximum center-center distance of 500.0ft | **Error Surface:** | Elliptical Conic |
| **Warning Levels Evaluated at:** | 2.00 **Sigma** | | |

**Survey Tool Program** **Date** 6/25/2013

| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.0 | 14,469.0 | Plan #2 (Hz) | Geolink MWD | Geolink MWD |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| S18-T2N-R67W (Kugel) | | | | | | |
| BRETT 1 (EXISTING) - HS RESOURCES WELL - NO S | | | | | | Out of range |
| BRETT 2 (EXISTING) - HS RESOURCES WELL - NO S | | | | | | Out of range |
| BRETT 3 (EXISTING) - KERR-MCGEE WELL - NO SUR | | | | | | Out of range |
| BRETT 4 (EXISTING) - KERR-MCGEE WELL - NO SUR | | | | | | Out of range |
| DREW GAS UNIT TRUE 1 (EXISTING) - KERR-MCGEE | | | | | | Out of range |
| FARNSWORTH 9-18A (EXISTING) - KERR-MCGEE WE | | | | | | Out of range |
| HSR-OWEN 15-18A (EXISTING) - KERR-MCGEE WELL | | | | | | Out of range |
| KUGEL 1 (EXISTING) - MACHII-ROSS WELL - NO SUR | 8,559.7 | 7,471.0 | 187.8 | 148.6 | 4.798 | CC, ES, SF |
| Kugel 1A-18H-H267 - Hz - Plan #1 | 166.3 | 167.3 | 39.1 | 38.6 | 72.893 | CC |
| Kugel 1A-18H-H267 - Hz - Plan #1 | 200.0 | 201.0 | 39.1 | 38.5 | 59.804 | ES |
| Kugel 1A-18H-H267 - Hz - Plan #1 | 900.0 | 893.6 | 74.2 | 71.1 | 24.030 | SF |
| Kugel 1B-18H-H267 - Hz - Plan #1 | 266.3 | 267.3 | 28.0 | 27.1 | 31.554 | CC |
| Kugel 1B-18H-H267 - Hz - Plan #1 | 300.0 | 301.0 | 28.0 | 27.0 | 27.859 | ES |
| Kugel 1B-18H-H267 - Hz - Plan #1 | 900.0 | 896.6 | 52.0 | 48.9 | 16.801 | SF |
| Kugel 1C-18H-H267 - Hz - Plan #1 | 366.3 | 367.3 | 19.6 | 18.3 | 15.845 | CC |
| Kugel 1C-18H-H267 - Hz - Plan #1 | 400.0 | 401.0 | 19.6 | 18.2 | 14.469 | ES |
| Kugel 1C-18H-H267 - Hz - Plan #1 | 900.0 | 898.6 | 34.0 | 31.0 | 10.998 | SF |
| Kugel 1D-18H-H267 - Hz - Plan #1 | 500.0 | 500.0 | 8.4 | 6.7 | 4.934 | CC, ES |
| Kugel 1D-18H-H267 - Hz - Plan #1 | 14,469.5 | 14,265.7 | 410.3 | 198.9 | 1.941 | SF |
| Kugel 1F-18H-H267 - Hz - Plan #1 | 600.0 | 600.0 | 11.2 | 9.1 | 5.458 | CC, ES |
| Kugel 1F-18H-H267 - Hz - Plan #1 | 14,200.0 | 14,017.9 | 381.2 | 178.7 | 1.883 | SF |
| Kugel 1G-18H-H267 - Hz - Plan #1 | 500.0 | 500.0 | 22.4 | 20.7 | 13.157 | CC, ES |
| Kugel 1G-18H-H267 - Hz - Plan #1 | 700.0 | 699.2 | 26.3 | 23.9 | 10.980 | SF |
| KUGEL 2-18 (EXISTING) - ENCANA WELL - NO SURVE | 7,952.1 | 7,476.0 | 189.9 | 159.3 | 6.200 | CC, ES, SF |
| KUGEL 31-18 (EXISTING) - ENCANA WELL - NO SURV | | | | | | Out of range |
| KUGEL 32-18 (EXISTING) - MACHII-ROSS WELL - NO | | | | | | Out of range |
| KUGEL 32-18 (EXISTING) NARC - NORTH AMERICAN | | | | | | Out of range |
| KUGEL 32-18J (EXISTING) - MACHII-ROSS WELL - NO | | | | | | Out of range |
| KUGEL 41-18 (EXISTING) - ENCANA WELL - ENCANA | 9,079.2 | 7,451.0 | 350.6 | 303.3 | 7.407 | CC, ES |
| KUGEL 41-18 (EXISTING) - ENCANA WELL - ENCANA | 9,100.0 | 7,451.0 | 351.3 | 303.6 | 7.367 | SF |
| KUGEL 42-18 (EXISTING) - ENCANA WELL - NO SURV | 600.0 | 588.0 | 48.4 | 46.4 | 23.602 | CC, ES |
| KUGEL 42-18 (EXISTING) - ENCANA WELL - NO SURV | 7,300.0 | 7,253.5 | 337.0 | 311.6 | 13.274 | SF |
| MILLER 12-17 (EXISTING) - ENCANA WELL - SURVEY | 706.1 | 690.4 | 62.3 | 59.8 | 24.345 | CC, ES |
| MILLER 12-17 (EXISTING) - ENCANA WELL - SURVEY | 1,800.0 | 1,781.9 | 84.3 | 78.0 | 13.272 | SF |
| WANDELL 1 (EXISTING) - ENCANA WELL - NO SURVE | 13,930.6 | 7,416.0 | 78.9 | -51.7 | 0.604 | Level 1, CC, ES, SF |
| WANDELL 21-7 (EXISTING) - ENCANA WELL - NO SUR | | | | | | Out of range |
| WANDELL 31-7 (EXISTING) - ENCANA WELL - SURVE | | | | | | Out of range |
| WANDELL 32-7 (EXISTING) - ENCANA WELL - NO SUR | | | | | | Out of range |
| WANDELL 33-7 (EXISTING) - ENCANA WELL - PLAN O | | | | | | Out of range |
| WANDELL 34-7 (EXISTING) - ENCANA WELL - SURVE | | | | | | Out of range |
| WANDELL 41-7 (EXISTING) - ENCANA WELL - SURVE | 14,336.6 | 7,489.3 | 443.3 | 305.6 | 3.219 | CC, ES, SF |
| WANDELL 42-7 (EXISTING) - ENCANA WELL - SURVE | 12,846.8 | 7,583.0 | 341.6 | 219.6 | 2.800 | CC, ES, SF |
| WANDELL 43-7 (EXISTING) - ENCANA WELL - PLAN O | 11,563.0 | 7,671.5 | 177.1 | 73.8 | 1.714 | CC, ES, SF |
| WANDELL 4-6-7 (EXISTING) - ENCANA WELL - NO SU | | | | | | Out of range |
| WANDELL 6-0-7 (EXISTING) - ENCANA WELL - SURVE | | | | | | Out of range |
| WANDELL 6-4-7 (EXISTING) - ENCANA WELL - SURVE | 12,105.7 | 7,805.5 | 399.2 | 277.5 | 3.280 | CC, ES, SF |
| WANDELL 6-8-7 (EXISTING) - ENCANA WELL - SURVE | 9,662.9 | 7,587.7 | 466.1 | 405.6 | 7.700 | CC, ES |
| WANDELL 6-8-7 (EXISTING) - ENCANA WELL - SURVE | 9,700.0 | 7,587.9 | 467.6 | 406.4 | 7.645 | SF |
| WANDELL 8-2-7 (EXISTING) - ENCANA WELL - NO SU | 14,022.4 | 7,418.0 | 217.6 | 85.2 | 1.644 | CC, ES, SF |
| WANDELL 8-4-7 (EXISTING) - ENCANA WELL - NO SU | 13,999.4 | 7,419.0 | 213.4 | 81.5 | 1.618 | CC |
| WANDELL 8-4-7 (EXISTING) - ENCANA WELL - NO SU | 14,000.0 | 7,419.0 | 213.4 | 81.5 | 1.618 | ES, SF |
| WANDELL E UNIT 1 (EXISTING) - ENCANA WELL - NO | 10,553.3 | 7,441.0 | 74.7 | 2.6 | 1.036 | Level 2, CC, ES, SF |
| WANDELL V 7-2 (EXISTING) - GERRITY OIL WELL - NO | | | | | | Out of range |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| S18-T2N-R67W (Kugel) | | | | | | |
| WANDELL V 7-7 (EXISTING) - GERRITY OIL WELL - NO | | | | | | Out of range |
| WANDELL V 7-8 (EXISTING) - GERRITY OIL WELL - NO | 12,873.3 | 7,425.0 | 167.7 | 55.5 | 1.495 | Level 3, CC, ES, SF |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - KUGEL 1 (EXISTING) - MACHII-ROSS WELL - NO SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 7989-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8,100.0 | 7,486.0 | 7,471.0 | 7,471.0 | 20.1 | 13.0 | -90.00 | 1,196.3 | -502.4 | 496.6 | 464.1 | 32.49 | 15.287 | |
| 8,200.0 | 7,486.0 | 7,471.0 | 7,471.0 | 21.5 | 13.0 | -90.00 | 1,196.3 | -502.4 | 405.8 | 371.9 | 33.85 | 11.989 | |
| 8,300.0 | 7,486.0 | 7,471.0 | 7,471.0 | 22.8 | 13.0 | -90.00 | 1,196.3 | -502.4 | 320.5 | 285.2 | 35.26 | 9.089 | |
| 8,400.0 | 7,486.0 | 7,471.0 | 7,471.0 | 24.3 | 13.0 | -90.00 | 1,196.3 | -502.4 | 246.5 | 209.8 | 36.72 | 6.713 | |
| 8,500.0 | 7,486.0 | 7,471.0 | 7,471.0 | 25.7 | 13.0 | -90.00 | 1,196.3 | -502.4 | 197.0 | 158.8 | 38.22 | 5.155 | |
| 8,559.7 | 7,486.0 | 7,471.0 | 7,471.0 | 26.6 | 13.0 | -90.00 | 1,196.3 | -502.4 | 187.8 | 148.6 | 39.13 | 4.798 | CC, ES, SF |
| 8,600.0 | 7,486.0 | 7,471.0 | 7,471.0 | 27.2 | 13.0 | -90.00 | 1,196.3 | -502.4 | 192.0 | 152.3 | 39.75 | 4.831 | |
| 8,700.0 | 7,486.0 | 7,471.0 | 7,471.0 | 28.8 | 13.0 | -90.00 | 1,196.3 | -502.4 | 234.4 | 193.1 | 41.30 | 5.674 | |
| 8,800.0 | 7,486.0 | 7,471.0 | 7,471.0 | 30.3 | 13.0 | -90.00 | 1,196.3 | -502.4 | 304.9 | 262.0 | 42.88 | 7.111 | |
| 8,900.0 | 7,486.0 | 7,471.0 | 7,471.0 | 31.9 | 13.0 | -90.00 | 1,196.3 | -502.4 | 388.6 | 344.1 | 44.48 | 8.738 | |
| 9,000.0 | 7,486.0 | 7,471.0 | 7,471.0 | 33.5 | 13.0 | -90.00 | 1,196.3 | -502.4 | 478.6 | 432.5 | 46.09 | 10.385 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1A-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | -89.95 | 0.0 | -39.1 | 39.1 | | | | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.2 | 0.2 | -89.95 | 0.0 | -39.1 | 39.1 | 38.8 | 0.31 | 128.150 | |
| 166.3 | 166.3 | 167.3 | 167.3 | 0.3 | 0.3 | -89.95 | 0.0 | -39.1 | 39.1 | 38.6 | 0.54 | 72.893 | CC |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | -89.95 | 0.0 | -39.1 | 39.1 | 38.5 | 0.65 | 59.804 | ES |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.5 | 0.5 | -90.08 | -0.1 | -40.0 | 40.0 | 39.0 | 1.00 | 39.921 | |
| 400.0 | 400.0 | 399.6 | 399.5 | 0.7 | 0.7 | -90.44 | -0.3 | -42.6 | 42.6 | 41.3 | 1.35 | 31.459 | |
| 500.0 | 500.0 | 498.7 | 498.6 | 0.8 | 0.9 | -90.94 | -0.8 | -46.9 | 47.0 | 45.2 | 1.71 | 27.412 | |
| 600.0 | 600.0 | 597.7 | 597.3 | 1.0 | 1.1 | -91.51 | -1.4 | -52.9 | 53.0 | 50.9 | 2.08 | 25.485 | |
| 700.0 | 700.0 | 696.4 | 695.8 | 1.2 | 1.3 | 20.69 | -2.2 | -60.5 | 60.0 | 57.6 | 2.39 | 25.065 | |
| 800.0 | 800.0 | 795.1 | 794.0 | 1.4 | 1.5 | 20.87 | -3.2 | -69.9 | 67.0 | 64.3 | 2.74 | 24.459 | |
| 900.0 | 899.9 | 893.6 | 891.9 | 1.6 | 1.8 | 21.38 | -4.3 | -80.9 | 74.2 | 71.1 | 3.09 | 24.030 | SF |
| 1,000.0 | 999.8 | 991.9 | 989.4 | 1.7 | 2.0 | 21.82 | -5.6 | -93.5 | 82.7 | 79.2 | 3.44 | 24.050 | |
| 1,100.0 | 1,099.6 | 1,089.9 | 1,086.3 | 1.9 | 2.3 | 22.08 | -7.1 | -107.7 | 92.8 | 89.0 | 3.79 | 24.515 | |
| 1,200.0 | 1,199.5 | 1,187.5 | 1,182.7 | 2.1 | 2.6 | 22.20 | -8.7 | -123.6 | 104.7 | 100.5 | 4.14 | 25.312 | |
| 1,300.0 | 1,299.4 | 1,284.7 | 1,278.3 | 2.3 | 3.0 | 22.21 | -10.5 | -141.0 | 118.2 | 113.7 | 4.48 | 26.361 | |
| 1,400.0 | 1,399.3 | 1,381.5 | 1,373.1 | 2.5 | 3.3 | 22.14 | -12.5 | -159.9 | 133.4 | 128.6 | 4.83 | 27.609 | |
| 1,500.0 | 1,499.2 | 1,477.7 | 1,467.1 | 2.7 | 3.7 | 22.03 | -14.6 | -180.3 | 150.2 | 145.1 | 5.18 | 29.013 | |
| 1,600.0 | 1,599.1 | 1,573.3 | 1,560.2 | 2.9 | 4.1 | 21.89 | -16.9 | -202.1 | 168.7 | 163.2 | 5.52 | 30.543 | |
| 1,700.0 | 1,699.0 | 1,668.3 | 1,652.3 | 3.1 | 4.6 | 21.73 | -19.3 | -225.3 | 188.8 | 183.0 | 5.87 | 32.177 | |
| 1,800.0 | 1,798.8 | 1,762.6 | 1,743.3 | 3.3 | 5.0 | 21.57 | -21.8 | -249.8 | 210.6 | 204.3 | 6.21 | 33.897 | |
| 1,900.0 | 1,898.7 | 1,857.4 | 1,834.4 | 3.4 | 5.5 | 21.40 | -24.5 | -275.9 | 233.8 | 227.3 | 6.56 | 35.666 | |
| 2,000.0 | 1,998.6 | 1,954.6 | 1,927.7 | 3.6 | 6.0 | 21.25 | -27.3 | -302.9 | 257.4 | 250.5 | 6.90 | 37.293 | |
| 2,100.0 | 2,098.5 | 2,051.7 | 2,021.0 | 3.8 | 6.5 | 21.12 | -30.2 | -330.0 | 281.1 | 273.8 | 7.25 | 38.764 | |
| 2,200.0 | 2,198.4 | 2,148.9 | 2,114.2 | 4.0 | 7.0 | 21.02 | -33.0 | -357.1 | 304.7 | 297.1 | 7.60 | 40.102 | |
| 2,300.0 | 2,298.3 | 2,246.1 | 2,207.5 | 4.2 | 7.5 | 20.93 | -35.8 | -384.2 | 328.3 | 320.4 | 7.95 | 41.322 | |
| 2,400.0 | 2,398.2 | 2,343.2 | 2,300.8 | 4.4 | 8.0 | 20.85 | -38.6 | -411.3 | 352.0 | 343.7 | 8.29 | 42.441 | |
| 2,500.0 | 2,498.0 | 2,440.4 | 2,394.0 | 4.6 | 8.6 | 20.78 | -41.4 | -438.4 | 375.6 | 367.0 | 8.64 | 43.470 | |
| 2,600.0 | 2,597.9 | 2,537.6 | 2,487.3 | 4.8 | 9.1 | 20.72 | -44.2 | -465.5 | 399.3 | 390.3 | 8.99 | 44.419 | |
| 2,700.0 | 2,697.8 | 2,634.7 | 2,580.6 | 5.0 | 9.6 | 20.67 | -47.0 | -492.6 | 422.9 | 413.6 | 9.34 | 45.298 | |
| 2,800.0 | 2,797.7 | 2,731.9 | 2,673.8 | 5.2 | 10.1 | 20.62 | -49.8 | -519.7 | 446.5 | 436.8 | 9.68 | 46.114 | |
| 2,900.0 | 2,897.6 | 2,829.1 | 2,767.1 | 5.4 | 10.6 | 20.58 | -52.6 | -546.8 | 470.2 | 460.1 | 10.03 | 46.874 | |
| 3,000.0 | 2,997.5 | 2,926.2 | 2,860.4 | 5.6 | 11.1 | 20.54 | -55.5 | -573.9 | 493.8 | 483.4 | 10.38 | 47.583 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1B-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | -89.95 | 0.0 | -28.0 | 28.0 | | | | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.2 | 0.2 | -89.95 | 0.0 | -28.0 | 28.0 | 27.7 | 0.31 | 91.536 | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | -89.95 | 0.0 | -28.0 | 28.0 | 27.3 | 0.65 | 42.717 | |
| 266.3 | 266.3 | 267.3 | 267.3 | 0.4 | 0.4 | -89.95 | 0.0 | -28.0 | 28.0 | 27.1 | 0.89 | 31.554 | CC |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.5 | 0.5 | -89.95 | 0.0 | -28.0 | 28.0 | 27.0 | 1.00 | 27.859 | ES |
| 400.0 | 400.0 | 400.5 | 400.5 | 0.7 | 0.7 | -90.10 | -0.1 | -28.8 | 28.8 | 27.5 | 1.35 | 21.327 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 0.8 | 0.9 | -90.50 | -0.3 | -31.4 | 31.5 | 29.8 | 1.70 | 18.461 | |
| 600.0 | 600.0 | 599.3 | 599.1 | 1.0 | 1.0 | -91.03 | -0.6 | -35.7 | 35.8 | 33.7 | 2.06 | 17.372 | |
| 700.0 | 700.0 | 698.5 | 698.1 | 1.2 | 1.2 | 21.32 | -1.2 | -41.8 | 41.1 | 38.7 | 2.40 | 17.139 | |
| 800.0 | 800.0 | 797.6 | 796.9 | 1.4 | 1.4 | 21.85 | -1.8 | -49.5 | 46.4 | 43.7 | 2.74 | 16.921 | |
| 900.0 | 899.9 | 896.6 | 895.5 | 1.6 | 1.7 | 22.81 | -2.6 | -58.9 | 52.0 | 48.9 | 3.09 | 16.801 | SF |
| 1,000.0 | 999.8 | 995.4 | 993.7 | 1.7 | 1.9 | 23.61 | -3.6 | -70.0 | 58.8 | 55.3 | 3.44 | 17.073 | |
| 1,100.0 | 1,099.6 | 1,093.9 | 1,091.4 | 1.9 | 2.2 | 24.07 | -4.7 | -82.7 | 67.3 | 63.5 | 3.79 | 17.745 | |
| 1,200.0 | 1,199.5 | 1,192.2 | 1,188.6 | 2.1 | 2.5 | 24.28 | -5.9 | -97.0 | 77.5 | 73.4 | 4.14 | 18.713 | |
| 1,300.0 | 1,299.4 | 1,290.1 | 1,285.1 | 2.3 | 2.8 | 24.31 | -7.2 | -113.0 | 89.5 | 85.0 | 4.49 | 19.908 | |
| 1,400.0 | 1,399.3 | 1,387.5 | 1,381.0 | 2.5 | 3.1 | 24.22 | -8.7 | -130.5 | 103.1 | 98.2 | 4.84 | 21.279 | |
| 1,500.0 | 1,499.2 | 1,484.5 | 1,476.0 | 2.7 | 3.5 | 24.06 | -10.4 | -149.5 | 118.3 | 113.2 | 5.19 | 22.791 | |
| 1,600.0 | 1,599.1 | 1,580.9 | 1,570.3 | 2.9 | 3.9 | 23.86 | -12.1 | -170.0 | 135.3 | 129.7 | 5.54 | 24.415 | |
| 1,700.0 | 1,699.0 | 1,678.6 | 1,665.5 | 3.1 | 4.3 | 23.65 | -14.0 | -192.0 | 153.4 | 147.5 | 5.89 | 26.043 | |
| 1,800.0 | 1,798.8 | 1,777.0 | 1,761.3 | 3.3 | 4.7 | 23.48 | -15.9 | -214.1 | 171.6 | 165.4 | 6.24 | 27.493 | |
| 1,900.0 | 1,898.7 | 1,875.3 | 1,857.0 | 3.4 | 5.1 | 23.35 | -17.8 | -236.3 | 189.8 | 183.2 | 6.59 | 28.789 | |
| 2,000.0 | 1,998.6 | 1,973.6 | 1,952.8 | 3.6 | 5.5 | 23.24 | -19.7 | -258.4 | 208.0 | 201.0 | 6.94 | 29.954 | |
| 2,100.0 | 2,098.5 | 2,072.0 | 2,048.6 | 3.8 | 5.9 | 23.14 | -21.6 | -280.6 | 226.2 | 218.9 | 7.29 | 31.007 | |
| 2,200.0 | 2,198.4 | 2,170.3 | 2,144.4 | 4.0 | 6.3 | 23.06 | -23.5 | -302.7 | 244.4 | 236.7 | 7.65 | 31.964 | |
| 2,300.0 | 2,298.3 | 2,268.6 | 2,240.2 | 4.2 | 6.8 | 22.99 | -25.4 | -324.9 | 262.6 | 254.6 | 8.00 | 32.836 | |
| 2,400.0 | 2,398.2 | 2,366.9 | 2,336.0 | 4.4 | 7.2 | 22.93 | -27.3 | -347.0 | 280.8 | 272.4 | 8.35 | 33.636 | |
| 2,500.0 | 2,498.0 | 2,465.3 | 2,431.8 | 4.6 | 7.6 | 22.88 | -29.2 | -369.2 | 299.0 | 290.3 | 8.70 | 34.371 | |
| 2,600.0 | 2,597.9 | 2,563.6 | 2,527.5 | 4.8 | 8.0 | 22.84 | -31.1 | -391.3 | 317.2 | 308.1 | 9.05 | 35.048 | |
| 2,700.0 | 2,697.8 | 2,661.9 | 2,623.3 | 5.0 | 8.5 | 22.79 | -32.9 | -413.4 | 335.3 | 325.9 | 9.40 | 35.676 | |
| 2,800.0 | 2,797.7 | 2,760.3 | 2,719.1 | 5.2 | 8.9 | 22.76 | -34.8 | -435.6 | 353.5 | 343.8 | 9.75 | 36.258 | |
| 2,900.0 | 2,897.6 | 2,858.6 | 2,814.9 | 5.4 | 9.3 | 22.72 | -36.7 | -457.7 | 371.7 | 361.6 | 10.10 | 36.799 | |
| 3,000.0 | 2,997.5 | 2,956.9 | 2,910.7 | 5.6 | 9.7 | 22.69 | -38.6 | -479.9 | 389.9 | 379.5 | 10.45 | 37.305 | |
| 3,100.0 | 3,097.3 | 3,055.3 | 3,006.5 | 5.8 | 10.2 | 22.67 | -40.5 | -502.0 | 408.1 | 397.3 | 10.80 | 37.777 | |
| 3,200.0 | 3,197.2 | 3,153.6 | 3,102.2 | 5.9 | 10.6 | 22.64 | -42.4 | -524.2 | 426.3 | 415.2 | 11.15 | 38.220 | |
| 3,300.0 | 3,297.1 | 3,251.9 | 3,198.0 | 6.1 | 11.0 | 22.62 | -44.3 | -546.3 | 444.5 | 433.0 | 11.51 | 38.636 | |
| 3,400.0 | 3,397.0 | 3,350.2 | 3,293.8 | 6.3 | 11.5 | 22.60 | -46.2 | -568.5 | 462.7 | 450.9 | 11.86 | 39.027 | |
| 3,500.0 | 3,496.9 | 3,448.6 | 3,389.6 | 6.5 | 11.9 | 22.58 | -48.1 | -590.6 | 480.9 | 468.7 | 12.21 | 39.395 | |
| 3,600.0 | 3,596.8 | 3,546.9 | 3,485.4 | 6.7 | 12.3 | 22.56 | -50.0 | -612.8 | 499.1 | 486.6 | 12.56 | 39.744 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1C-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | -89.95 | 0.0 | -19.6 | 19.6 | | | | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.2 | 0.2 | -89.95 | 0.0 | -19.6 | 19.6 | 19.3 | 0.31 | 64.075 | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | -89.95 | 0.0 | -19.6 | 19.6 | 18.9 | 0.65 | 29.902 | |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.5 | 0.5 | -89.95 | 0.0 | -19.6 | 19.6 | 18.6 | 1.00 | 19.501 | |
| 366.3 | 366.3 | 367.3 | 367.3 | 0.6 | 0.6 | -89.95 | 0.0 | -19.6 | 19.6 | 18.3 | 1.24 | 15.845 | CC |
| 400.0 | 400.0 | 401.0 | 401.0 | 0.7 | 0.7 | -89.95 | 0.0 | -19.6 | 19.6 | 18.2 | 1.35 | 14.469 | ES |
| 500.0 | 500.0 | 500.6 | 500.6 | 0.8 | 0.9 | -90.23 | -0.1 | -20.4 | 20.5 | 18.8 | 1.70 | 12.020 | |
| 600.0 | 600.0 | 600.2 | 600.2 | 1.0 | 1.0 | -90.92 | -0.4 | -23.0 | 23.1 | 21.0 | 2.05 | 11.237 | |
| 700.0 | 700.0 | 699.7 | 699.6 | 1.2 | 1.2 | 21.37 | -0.9 | -27.4 | 26.6 | 24.2 | 2.40 | 11.092 | |
| 800.0 | 800.0 | 799.2 | 798.9 | 1.4 | 1.4 | 22.10 | -1.5 | -33.4 | 30.2 | 27.5 | 2.75 | 11.010 | |
| 900.0 | 899.9 | 898.6 | 897.9 | 1.6 | 1.6 | 23.44 | -2.4 | -41.1 | 34.0 | 31.0 | 3.10 | 10.998 | SF |
| 1,000.0 | 999.8 | 997.8 | 996.7 | 1.7 | 1.8 | 24.44 | -3.4 | -50.5 | 39.2 | 35.7 | 3.45 | 11.359 | |
| 1,100.0 | 1,099.6 | 1,096.8 | 1,095.1 | 1.9 | 2.1 | 24.86 | -4.7 | -61.6 | 46.0 | 42.2 | 3.80 | 12.103 | |
| 1,200.0 | 1,199.5 | 1,195.6 | 1,193.1 | 2.1 | 2.3 | 24.89 | -6.1 | -74.4 | 54.5 | 50.3 | 4.15 | 13.130 | |
| 1,300.0 | 1,299.4 | 1,294.1 | 1,290.5 | 2.3 | 2.6 | 24.69 | -7.7 | -88.8 | 64.7 | 60.2 | 4.50 | 14.374 | |
| 1,400.0 | 1,399.3 | 1,392.6 | 1,387.7 | 2.5 | 2.9 | 24.36 | -9.5 | -104.7 | 76.5 | 71.7 | 4.85 | 15.767 | |
| 1,500.0 | 1,499.2 | 1,491.9 | 1,485.5 | 2.7 | 3.2 | 24.08 | -11.3 | -121.2 | 88.7 | 83.5 | 5.21 | 17.039 | |
| 1,600.0 | 1,599.1 | 1,591.1 | 1,583.4 | 2.9 | 3.5 | 23.87 | -13.1 | -137.6 | 100.9 | 95.3 | 5.56 | 18.150 | |
| 1,700.0 | 1,699.0 | 1,690.4 | 1,681.3 | 3.1 | 3.9 | 23.70 | -15.0 | -154.0 | 113.1 | 107.2 | 5.91 | 19.129 | |
| 1,800.0 | 1,798.8 | 1,789.6 | 1,779.1 | 3.3 | 4.2 | 23.57 | -16.8 | -170.5 | 125.3 | 119.0 | 6.26 | 19.997 | |
| 1,900.0 | 1,898.7 | 1,888.9 | 1,877.0 | 3.4 | 4.5 | 23.46 | -18.6 | -186.9 | 137.5 | 130.8 | 6.62 | 20.773 | |
| 2,000.0 | 1,998.6 | 1,988.1 | 1,974.9 | 3.6 | 4.8 | 23.37 | -20.4 | -203.4 | 149.6 | 142.7 | 6.97 | 21.469 | |
| 2,100.0 | 2,098.5 | 2,087.4 | 2,072.7 | 3.8 | 5.2 | 23.29 | -22.3 | -219.8 | 161.8 | 154.5 | 7.32 | 22.099 | |
| 2,200.0 | 2,198.4 | 2,186.6 | 2,170.6 | 4.0 | 5.5 | 23.23 | -24.1 | -236.2 | 174.0 | 166.4 | 7.68 | 22.671 | |
| 2,300.0 | 2,298.3 | 2,285.9 | 2,268.5 | 4.2 | 5.8 | 23.17 | -25.9 | -252.7 | 186.2 | 178.2 | 8.03 | 23.192 | |
| 2,400.0 | 2,398.2 | 2,385.2 | 2,366.3 | 4.4 | 6.2 | 23.12 | -27.8 | -269.1 | 198.4 | 190.0 | 8.38 | 23.670 | |
| 2,500.0 | 2,498.0 | 2,484.4 | 2,464.2 | 4.6 | 6.5 | 23.07 | -29.6 | -285.6 | 210.6 | 201.9 | 8.74 | 24.109 | |
| 2,600.0 | 2,597.9 | 2,583.7 | 2,562.1 | 4.8 | 6.8 | 23.03 | -31.4 | -302.0 | 222.8 | 213.7 | 9.09 | 24.513 | |
| 2,700.0 | 2,697.8 | 2,682.9 | 2,659.9 | 5.0 | 7.2 | 23.00 | -33.3 | -318.4 | 235.0 | 225.5 | 9.44 | 24.888 | |
| 2,800.0 | 2,797.7 | 2,782.2 | 2,757.8 | 5.2 | 7.5 | 22.96 | -35.1 | -334.9 | 247.2 | 237.4 | 9.79 | 25.235 | |
| 2,900.0 | 2,897.6 | 2,881.4 | 2,855.7 | 5.4 | 7.8 | 22.94 | -36.9 | -351.3 | 259.4 | 249.2 | 10.15 | 25.558 | |
| 3,000.0 | 2,997.5 | 2,980.7 | 2,953.5 | 5.6 | 8.2 | 22.91 | -38.7 | -367.8 | 271.6 | 261.1 | 10.50 | 25.860 | |
| 3,100.0 | 3,097.3 | 3,079.9 | 3,051.4 | 5.8 | 8.5 | 22.88 | -40.6 | -384.2 | 283.7 | 272.9 | 10.85 | 26.142 | |
| 3,200.0 | 3,197.2 | 3,179.2 | 3,149.3 | 5.9 | 8.9 | 22.86 | -42.4 | -400.6 | 295.9 | 284.7 | 11.21 | 26.406 | |
| 3,300.0 | 3,297.1 | 3,278.4 | 3,247.1 | 6.1 | 9.2 | 22.84 | -44.2 | -417.1 | 308.1 | 296.6 | 11.56 | 26.654 | |
| 3,400.0 | 3,397.0 | 3,377.7 | 3,345.0 | 6.3 | 9.5 | 22.82 | -46.1 | -433.5 | 320.3 | 308.4 | 11.91 | 26.887 | |
| 3,500.0 | 3,496.9 | 3,476.9 | 3,442.9 | 6.5 | 9.9 | 22.80 | -47.9 | -450.0 | 332.5 | 320.2 | 12.27 | 27.107 | |
| 3,600.0 | 3,596.8 | 3,576.2 | 3,540.7 | 6.7 | 10.2 | 22.79 | -49.7 | -466.4 | 344.7 | 332.1 | 12.62 | 27.314 | |
| 3,700.0 | 3,696.7 | 3,675.5 | 3,638.6 | 6.9 | 10.5 | 22.77 | -51.6 | -482.9 | 356.9 | 343.9 | 12.97 | 27.510 | |
| 3,800.0 | 3,796.5 | 3,774.7 | 3,736.5 | 7.1 | 10.9 | 22.76 | -53.4 | -499.3 | 369.1 | 355.8 | 13.33 | 27.696 | |
| 3,900.0 | 3,896.4 | 3,874.0 | 3,834.3 | 7.3 | 11.2 | 22.74 | -55.2 | -515.7 | 381.3 | 367.6 | 13.68 | 27.872 | |
| 4,000.0 | 3,996.3 | 3,973.2 | 3,932.2 | 7.5 | 11.6 | 22.73 | -57.0 | -532.2 | 393.5 | 379.4 | 14.03 | 28.039 | |
| 4,100.0 | 4,096.2 | 4,072.5 | 4,030.1 | 7.7 | 11.9 | 22.72 | -58.9 | -548.6 | 405.7 | 391.3 | 14.39 | 28.198 | |
| 4,200.0 | 4,196.1 | 4,171.7 | 4,127.9 | 7.9 | 12.2 | 22.71 | -60.7 | -565.1 | 417.8 | 403.1 | 14.74 | 28.350 | |
| 4,300.0 | 4,296.0 | 4,271.0 | 4,225.8 | 8.1 | 12.6 | 22.70 | -62.5 | -581.5 | 430.0 | 414.9 | 15.09 | 28.494 | |
| 4,400.0 | 4,395.9 | 4,370.2 | 4,323.6 | 8.3 | 12.9 | 22.69 | -64.4 | -597.9 | 442.2 | 426.8 | 15.45 | 28.632 | |
| 4,500.0 | 4,495.7 | 4,469.5 | 4,421.5 | 8.5 | 13.2 | 22.68 | -66.2 | -614.4 | 454.4 | 438.6 | 15.80 | 28.763 | |
| 4,600.0 | 4,595.6 | 4,568.7 | 4,519.4 | 8.6 | 13.6 | 22.67 | -68.0 | -630.8 | 466.6 | 450.5 | 16.15 | 28.889 | |
| 4,700.0 | 4,695.5 | 4,668.0 | 4,617.2 | 8.8 | 13.9 | 22.66 | -69.9 | -647.3 | 478.8 | 462.3 | 16.51 | 29.009 | |
| 4,800.0 | 4,795.4 | 4,767.3 | 4,715.1 | 9.0 | 14.3 | 22.65 | -71.7 | -663.7 | 491.0 | 474.1 | 16.86 | 29.125 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1D-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -89.94 | 0.0 | -8.4 | 8.4 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.2 | 0.2 | -89.94 | 0.0 | -8.4 | 8.4 | 8.1 | 0.30 | 27.619 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | -89.94 | 0.0 | -8.4 | 8.4 | 7.7 | 0.65 | 12.849 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.5 | 0.5 | -89.94 | 0.0 | -8.4 | 8.4 | 7.4 | 1.00 | 8.372 | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.7 | 0.7 | -89.94 | 0.0 | -8.4 | 8.4 | 7.0 | 1.35 | 6.209 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 0.8 | 0.8 | -89.94 | 0.0 | -8.4 | 8.4 | 6.7 | 1.70 | 4.934 | CC, ES |
| 600.0 | 600.0 | 599.8 | 599.8 | 1.0 | 1.0 | -90.92 | -0.1 | -9.2 | 9.2 | 7.2 | 2.05 | 4.512 | |
| 700.0 | 700.0 | 699.7 | 699.6 | 1.2 | 1.2 | 21.00 | -0.6 | -11.8 | 11.0 | 8.6 | 2.40 | 4.593 | |
| 800.0 | 800.0 | 799.4 | 799.3 | 1.4 | 1.4 | 22.16 | -1.4 | -16.1 | 12.9 | 10.1 | 2.75 | 4.688 | |
| 900.0 | 899.9 | 899.2 | 898.9 | 1.6 | 1.6 | 24.29 | -2.5 | -22.1 | 14.9 | 11.8 | 3.10 | 4.812 | |
| 1,000.0 | 999.8 | 998.8 | 998.2 | 1.7 | 1.8 | 25.26 | -3.9 | -29.7 | 18.2 | 14.8 | 3.45 | 5.277 | |
| 1,100.0 | 1,099.6 | 1,098.4 | 1,097.3 | 1.9 | 2.0 | 24.91 | -5.6 | -39.1 | 23.2 | 19.4 | 3.80 | 6.101 | |
| 1,200.0 | 1,199.5 | 1,198.1 | 1,196.4 | 2.1 | 2.2 | 24.17 | -7.6 | -49.6 | 29.3 | 25.2 | 4.15 | 7.064 | |
| 1,300.0 | 1,299.4 | 1,297.9 | 1,295.7 | 2.3 | 2.5 | 23.68 | -9.5 | -60.2 | 35.5 | 31.0 | 4.51 | 7.884 | |
| 1,400.0 | 1,399.3 | 1,397.7 | 1,394.9 | 2.5 | 2.7 | 23.34 | -11.5 | -70.8 | 41.7 | 36.9 | 4.86 | 8.584 | |
| 1,500.0 | 1,499.2 | 1,497.5 | 1,494.1 | 2.7 | 2.9 | 23.08 | -13.4 | -81.4 | 47.9 | 42.7 | 5.21 | 9.190 | |
| 1,600.0 | 1,599.1 | 1,597.3 | 1,593.3 | 2.9 | 3.2 | 22.88 | -15.3 | -91.9 | 54.1 | 48.5 | 5.57 | 9.719 | |
| 1,700.0 | 1,699.0 | 1,697.1 | 1,692.6 | 3.1 | 3.4 | 22.73 | -17.3 | -102.5 | 60.3 | 54.4 | 5.92 | 10.185 | |
| 1,800.0 | 1,798.8 | 1,796.9 | 1,791.8 | 3.3 | 3.7 | 22.60 | -19.2 | -113.1 | 66.5 | 60.2 | 6.27 | 10.598 | |
| 1,900.0 | 1,898.7 | 1,896.8 | 1,891.0 | 3.4 | 3.9 | 22.49 | -21.2 | -123.7 | 72.7 | 66.1 | 6.63 | 10.967 | |
| 2,000.0 | 1,998.6 | 1,996.6 | 1,990.2 | 3.6 | 4.2 | 22.40 | -23.1 | -134.2 | 78.9 | 71.9 | 6.98 | 11.299 | |
| 2,100.0 | 2,098.5 | 2,096.4 | 2,089.5 | 3.8 | 4.4 | 22.33 | -25.1 | -144.8 | 85.1 | 77.7 | 7.34 | 11.598 | |
| 2,200.0 | 2,198.4 | 2,196.2 | 2,188.7 | 4.0 | 4.7 | 22.26 | -27.0 | -155.4 | 91.3 | 83.6 | 7.69 | 11.870 | |
| 2,300.0 | 2,298.3 | 2,296.0 | 2,287.9 | 4.2 | 4.9 | 22.20 | -28.9 | -166.0 | 97.5 | 89.4 | 8.04 | 12.118 | |
| 2,400.0 | 2,398.2 | 2,395.8 | 2,387.2 | 4.4 | 5.2 | 22.15 | -30.9 | -176.5 | 103.7 | 95.3 | 8.40 | 12.345 | |
| 2,500.0 | 2,498.0 | 2,495.6 | 2,486.4 | 4.6 | 5.4 | 22.11 | -32.8 | -187.1 | 109.9 | 101.1 | 8.75 | 12.554 | |
| 2,600.0 | 2,597.9 | 2,595.4 | 2,585.6 | 4.8 | 5.7 | 22.07 | -34.8 | -197.7 | 116.0 | 106.9 | 9.10 | 12.747 | |
| 2,700.0 | 2,697.8 | 2,695.2 | 2,684.8 | 5.0 | 5.9 | 22.03 | -36.7 | -208.3 | 122.2 | 112.8 | 9.46 | 12.925 | |
| 2,800.0 | 2,797.7 | 2,795.0 | 2,784.1 | 5.2 | 6.2 | 22.00 | -38.7 | -218.8 | 128.4 | 118.6 | 9.81 | 13.090 | |
| 2,900.0 | 2,897.6 | 2,894.8 | 2,883.3 | 5.4 | 6.4 | 21.97 | -40.6 | -229.4 | 134.6 | 124.5 | 10.17 | 13.244 | |
| 3,000.0 | 2,997.5 | 2,994.6 | 2,982.5 | 5.6 | 6.7 | 21.94 | -42.5 | -240.0 | 140.8 | 130.3 | 10.52 | 13.387 | |
| 3,100.0 | 3,097.3 | 3,094.4 | 3,081.7 | 5.8 | 7.0 | 21.92 | -44.5 | -250.6 | 147.0 | 136.1 | 10.87 | 13.521 | |
| 3,200.0 | 3,197.2 | 3,194.3 | 3,181.0 | 5.9 | 7.2 | 21.90 | -46.4 | -261.1 | 153.2 | 142.0 | 11.23 | 13.646 | |
| 3,300.0 | 3,297.1 | 3,294.1 | 3,280.2 | 6.1 | 7.5 | 21.87 | -48.4 | -271.7 | 159.4 | 147.8 | 11.58 | 13.764 | |
| 3,400.0 | 3,397.0 | 3,393.9 | 3,379.4 | 6.3 | 7.7 | 21.85 | -50.3 | -282.3 | 165.6 | 153.7 | 11.94 | 13.875 | |
| 3,500.0 | 3,496.9 | 3,493.7 | 3,478.7 | 6.5 | 8.0 | 21.84 | -52.3 | -292.9 | 171.8 | 159.5 | 12.29 | 13.980 | |
| 3,600.0 | 3,596.8 | 3,593.5 | 3,577.9 | 6.7 | 8.2 | 21.82 | -54.2 | -303.5 | 178.0 | 165.4 | 12.64 | 14.078 | |
| 3,700.0 | 3,696.7 | 3,693.3 | 3,677.1 | 6.9 | 8.5 | 21.80 | -56.1 | -314.0 | 184.2 | 171.2 | 13.00 | 14.171 | |
| 3,800.0 | 3,796.5 | 3,793.1 | 3,776.3 | 7.1 | 8.7 | 21.79 | -58.1 | -324.6 | 190.4 | 177.0 | 13.35 | 14.260 | |
| 3,900.0 | 3,896.4 | 3,892.9 | 3,875.6 | 7.3 | 9.0 | 21.78 | -60.0 | -335.2 | 196.6 | 182.9 | 13.71 | 14.343 | |
| 4,000.0 | 3,996.3 | 3,992.7 | 3,974.8 | 7.5 | 9.3 | 21.76 | -62.0 | -345.8 | 202.8 | 188.7 | 14.06 | 14.423 | |
| 4,100.0 | 4,096.2 | 4,092.5 | 4,074.0 | 7.7 | 9.5 | 21.75 | -63.9 | -356.3 | 209.0 | 194.6 | 14.41 | 14.499 | |
| 4,200.0 | 4,196.1 | 4,192.3 | 4,173.2 | 7.9 | 9.8 | 21.74 | -65.9 | -366.9 | 215.2 | 200.4 | 14.77 | 14.571 | |
| 4,300.0 | 4,296.0 | 4,292.1 | 4,272.5 | 8.1 | 10.0 | 21.73 | -67.8 | -377.5 | 221.4 | 206.2 | 15.12 | 14.639 | |
| 4,400.0 | 4,395.9 | 4,391.9 | 4,371.7 | 8.3 | 10.3 | 21.72 | -69.7 | -388.1 | 227.6 | 212.1 | 15.47 | 14.705 | |
| 4,500.0 | 4,495.7 | 4,491.8 | 4,470.9 | 8.5 | 10.5 | 21.71 | -71.7 | -398.6 | 233.7 | 217.9 | 15.83 | 14.767 | |
| 4,600.0 | 4,595.6 | 4,591.6 | 4,570.1 | 8.6 | 10.8 | 21.70 | -73.6 | -409.2 | 239.9 | 223.8 | 16.18 | 14.827 | |
| 4,700.0 | 4,695.5 | 4,691.4 | 4,669.4 | 8.8 | 11.0 | 21.69 | -75.6 | -419.8 | 246.1 | 229.6 | 16.54 | 14.884 | |
| 4,800.0 | 4,795.4 | 4,791.2 | 4,768.6 | 9.0 | 11.3 | 21.68 | -77.5 | -430.4 | 252.3 | 235.4 | 16.89 | 14.939 | |
| 4,900.0 | 4,895.3 | 4,891.0 | 4,867.8 | 9.2 | 11.6 | 21.68 | -79.5 | -440.9 | 258.5 | 241.3 | 17.24 | 14.991 | |
| 5,000.0 | 4,995.2 | 4,990.8 | 4,967.1 | 9.4 | 11.8 | 21.67 | -81.4 | -451.5 | 264.7 | 247.1 | 17.60 | 15.042 | |
| 5,100.0 | 5,095.1 | 5,090.6 | 5,066.3 | 9.6 | 12.1 | 21.66 | -83.3 | -462.1 | 270.9 | 253.0 | 17.95 | 15.090 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1D-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,200.0 | 5,194.9 | 5,190.4 | 5,165.5 | 9.8 | 12.3 | 21.65 | -85.3 | -472.7 | 277.1 | 258.8 | 18.31 | 15.137 | |
| 5,300.0 | 5,294.8 | 5,290.2 | 5,264.7 | 10.0 | 12.6 | 21.65 | -87.2 | -483.3 | 283.3 | 264.6 | 18.66 | 15.182 | |
| 5,400.0 | 5,394.7 | 5,390.0 | 5,364.0 | 10.2 | 12.8 | 21.64 | -89.2 | -493.8 | 289.5 | 270.5 | 19.01 | 15.225 | |
| 5,500.0 | 5,494.6 | 5,489.8 | 5,463.2 | 10.4 | 13.1 | 21.63 | -91.1 | -504.4 | 295.7 | 276.3 | 19.37 | 15.266 | |
| 5,600.0 | 5,594.5 | 5,589.6 | 5,562.4 | 10.6 | 13.3 | 21.63 | -93.1 | -515.0 | 301.9 | 282.2 | 19.72 | 15.306 | |
| 5,700.0 | 5,694.4 | 5,689.5 | 5,661.6 | 10.8 | 13.6 | 21.62 | -95.0 | -525.6 | 308.1 | 288.0 | 20.08 | 15.345 | |
| 5,800.0 | 5,794.3 | 5,789.3 | 5,760.9 | 11.0 | 13.9 | 21.62 | -96.9 | -536.1 | 314.3 | 293.8 | 20.43 | 15.382 | |
| 5,900.0 | 5,894.1 | 5,889.1 | 5,860.1 | 11.2 | 14.1 | 21.61 | -98.9 | -546.7 | 320.5 | 299.7 | 20.79 | 15.418 | |
| 6,000.0 | 5,994.0 | 5,988.9 | 5,959.3 | 11.4 | 14.4 | 21.61 | -100.8 | -557.3 | 326.7 | 305.5 | 21.14 | 15.453 | |
| 6,100.0 | 6,093.9 | 6,088.7 | 6,058.6 | 11.5 | 14.6 | 21.60 | -102.8 | -567.9 | 332.9 | 311.4 | 21.49 | 15.487 | |
| 6,200.0 | 6,193.8 | 6,188.5 | 6,157.8 | 11.7 | 14.9 | 21.60 | -104.7 | -578.4 | 339.1 | 317.2 | 21.85 | 15.520 | |
| 6,300.0 | 6,293.7 | 6,288.3 | 6,257.0 | 11.9 | 15.1 | 21.59 | -106.7 | -589.0 | 345.3 | 323.1 | 22.20 | 15.551 | |
| 6,400.0 | 6,393.6 | 6,388.1 | 6,356.2 | 12.1 | 15.4 | 21.59 | -108.6 | -599.6 | 351.4 | 328.9 | 22.56 | 15.582 | |
| 6,500.0 | 6,493.5 | 6,487.9 | 6,455.5 | 12.3 | 15.7 | 21.59 | -110.5 | -610.2 | 357.6 | 334.7 | 22.91 | 15.611 | |
| 6,600.0 | 6,593.3 | 6,587.7 | 6,554.7 | 12.5 | 15.9 | 21.58 | -112.5 | -620.7 | 363.8 | 340.6 | 23.26 | 15.640 | |
| 6,700.0 | 6,693.2 | 6,687.5 | 6,653.9 | 12.7 | 16.2 | 21.58 | -114.4 | -631.3 | 370.0 | 346.4 | 23.62 | 15.668 | |
| 6,800.0 | 6,793.1 | 6,787.7 | 6,753.4 | 12.9 | 16.4 | 22.13 | -112.7 | -641.9 | 376.2 | 352.2 | 23.98 | 15.688 | |
| 6,900.0 | 6,893.0 | 6,884.4 | 6,847.9 | 13.1 | 16.6 | 24.96 | -95.7 | -652.0 | 382.8 | 358.4 | 24.39 | 15.693 | |
| 7,000.0 | 6,992.6 | 6,974.9 | 6,932.7 | 13.3 | 16.8 | -64.43 | -65.4 | -661.0 | 391.2 | 366.4 | 24.82 | 15.763 | |
| 7,100.0 | 7,089.9 | 7,062.1 | 7,008.8 | 13.4 | 17.0 | -69.85 | -23.9 | -669.1 | 400.9 | 375.8 | 25.08 | 15.986 | |
| 7,200.0 | 7,181.8 | 7,146.4 | 7,075.7 | 13.5 | 17.2 | -68.92 | 26.8 | -676.3 | 411.1 | 385.9 | 25.19 | 16.320 | |
| 7,300.0 | 7,265.5 | 7,228.4 | 7,133.0 | 13.7 | 17.4 | -67.02 | 85.1 | -682.4 | 421.0 | 395.9 | 25.16 | 16.736 | |
| 7,400.0 | 7,338.6 | 7,308.7 | 7,180.5 | 14.0 | 17.7 | -65.10 | 149.5 | -687.5 | 430.0 | 404.9 | 25.13 | 17.115 | |
| 7,500.0 | 7,398.7 | 7,387.7 | 7,218.1 | 14.4 | 18.1 | -63.47 | 218.8 | -691.5 | 437.5 | 412.2 | 25.31 | 17.285 | |
| 7,600.0 | 7,444.1 | 7,465.6 | 7,245.5 | 15.0 | 18.6 | -62.23 | 291.6 | -694.4 | 443.1 | 417.1 | 25.93 | 17.085 | |
| 7,700.0 | 7,473.4 | 7,542.9 | 7,262.8 | 15.8 | 19.1 | -61.44 | 366.8 | -696.2 | 446.4 | 419.2 | 27.15 | 16.437 | |
| 7,800.0 | 7,485.6 | 7,619.7 | 7,269.8 | 16.7 | 19.7 | -61.11 | 443.3 | -697.0 | 447.2 | 418.1 | 29.03 | 15.404 | |
| 7,900.0 | 7,486.0 | 7,715.4 | 7,270.0 | 17.7 | 20.6 | -61.04 | 538.9 | -697.0 | 446.2 | 415.1 | 31.04 | 14.377 | |
| 8,000.0 | 7,486.0 | 7,815.4 | 7,270.0 | 18.9 | 21.6 | -60.97 | 638.9 | -697.0 | 445.1 | 412.0 | 33.12 | 13.440 | |
| 8,100.0 | 7,486.0 | 7,915.3 | 7,270.0 | 20.1 | 22.7 | -60.89 | 738.9 | -697.0 | 444.0 | 408.7 | 35.34 | 12.564 | |
| 8,200.0 | 7,486.0 | 8,015.3 | 7,270.0 | 21.5 | 23.8 | -60.81 | 838.9 | -697.0 | 443.0 | 405.3 | 37.68 | 11.757 | |
| 8,300.0 | 7,486.0 | 8,115.3 | 7,270.0 | 22.8 | 25.1 | -60.74 | 938.9 | -697.0 | 441.9 | 401.8 | 40.11 | 11.018 | |
| 8,400.0 | 7,486.0 | 8,215.3 | 7,270.0 | 24.3 | 26.4 | -60.66 | 1,038.9 | -697.0 | 440.8 | 398.2 | 42.61 | 10.346 | |
| 8,500.0 | 7,486.0 | 8,315.3 | 7,270.0 | 25.7 | 27.7 | -60.58 | 1,138.9 | -697.0 | 439.8 | 394.6 | 45.18 | 9.734 | |
| 8,600.0 | 7,486.0 | 8,415.3 | 7,270.0 | 27.2 | 29.1 | -60.50 | 1,238.9 | -697.0 | 438.7 | 390.9 | 47.80 | 9.179 | |
| 8,700.0 | 7,486.0 | 8,515.3 | 7,270.0 | 28.8 | 30.5 | -60.42 | 1,338.9 | -697.0 | 437.7 | 387.2 | 50.46 | 8.674 | |
| 8,800.0 | 7,486.0 | 8,615.3 | 7,270.0 | 30.3 | 32.0 | -60.35 | 1,438.9 | -697.0 | 436.6 | 383.4 | 53.15 | 8.214 | |
| 8,900.0 | 7,486.0 | 8,715.3 | 7,270.0 | 31.9 | 33.5 | -60.27 | 1,538.9 | -697.0 | 435.5 | 379.7 | 55.88 | 7.794 | |
| 9,000.0 | 7,486.0 | 8,815.3 | 7,270.0 | 33.5 | 35.0 | -60.19 | 1,638.9 | -697.0 | 434.5 | 375.8 | 58.63 | 7.411 | |
| 9,100.0 | 7,486.0 | 8,915.3 | 7,270.0 | 35.1 | 36.5 | -60.11 | 1,738.8 | -697.0 | 433.4 | 372.0 | 61.40 | 7.059 | |
| 9,200.0 | 7,486.0 | 9,015.3 | 7,270.0 | 36.7 | 38.1 | -60.02 | 1,838.8 | -697.0 | 432.3 | 368.2 | 64.18 | 6.736 | |
| 9,300.0 | 7,486.0 | 9,115.3 | 7,270.0 | 38.3 | 39.6 | -59.94 | 1,938.8 | -697.0 | 431.3 | 364.3 | 66.98 | 6.439 | |
| 9,400.0 | 7,486.0 | 9,215.3 | 7,270.0 | 40.0 | 41.2 | -59.86 | 2,038.8 | -697.0 | 430.2 | 360.4 | 69.79 | 6.164 | |
| 9,500.0 | 7,486.0 | 9,315.2 | 7,270.0 | 41.6 | 42.8 | -59.78 | 2,138.8 | -697.0 | 429.2 | 356.6 | 72.61 | 5.910 | |
| 9,600.0 | 7,486.0 | 9,415.2 | 7,270.0 | 43.3 | 44.4 | -59.70 | 2,238.8 | -697.0 | 428.1 | 352.7 | 75.44 | 5.675 | |
| 9,700.0 | 7,486.0 | 9,515.2 | 7,270.0 | 44.9 | 46.1 | -59.62 | 2,338.8 | -697.0 | 427.1 | 348.8 | 78.28 | 5.456 | |
| 9,800.0 | 7,486.0 | 9,615.2 | 7,270.0 | 46.6 | 47.7 | -59.53 | 2,438.8 | -697.0 | 426.0 | 344.9 | 81.12 | 5.252 | |
| 9,900.0 | 7,486.0 | 9,715.2 | 7,270.0 | 48.3 | 49.3 | -59.45 | 2,538.8 | -697.0 | 425.0 | 341.0 | 83.96 | 5.061 | |
| 10,000.0 | 7,486.0 | 9,815.2 | 7,270.0 | 50.0 | 51.0 | -59.36 | 2,638.8 | -697.0 | 423.9 | 337.1 | 86.81 | 4.883 | |
| 10,100.0 | 7,486.0 | 9,915.2 | 7,270.0 | 51.7 | 52.6 | -59.28 | 2,738.8 | -697.0 | 422.9 | 333.2 | 89.66 | 4.716 | |
| 10,200.0 | 7,486.0 | 10,015.2 | 7,270.0 | 53.4 | 54.3 | -59.20 | 2,838.8 | -697.0 | 421.8 | 329.3 | 92.51 | 4.560 | |
| 10,300.0 | 7,486.0 | 10,115.2 | 7,270.0 | 55.1 | 55.9 | -59.11 | 2,938.8 | -697.0 | 420.8 | 325.4 | 95.36 | 4.412 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1D-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,400.0 | 7,486.0 | 10,215.2 | 7,270.0 | 56.8 | 57.6 | -59.02 | 3,038.7 | -697.0 | 419.7 | 321.5 | 98.21 | 4.274 | |
| 10,500.0 | 7,486.0 | 10,315.2 | 7,270.0 | 58.5 | 59.3 | -58.94 | 3,138.7 | -697.0 | 418.7 | 317.6 | 101.06 | 4.143 | |
| 10,600.0 | 7,486.0 | 10,415.2 | 7,270.0 | 60.2 | 61.0 | -58.85 | 3,238.7 | -697.0 | 417.6 | 313.7 | 103.90 | 4.019 | |
| 10,700.0 | 7,486.0 | 10,515.2 | 7,270.0 | 61.9 | 62.7 | -58.77 | 3,338.7 | -697.0 | 416.6 | 309.8 | 106.75 | 3.902 | |
| 10,800.0 | 7,486.0 | 10,615.1 | 7,270.0 | 63.6 | 64.3 | -58.68 | 3,438.7 | -697.0 | 415.5 | 305.9 | 109.60 | 3.791 | |
| 10,900.0 | 7,486.0 | 10,715.1 | 7,270.0 | 65.3 | 66.0 | -58.59 | 3,538.7 | -697.0 | 414.5 | 302.0 | 112.44 | 3.686 | |
| 11,000.0 | 7,486.0 | 10,815.1 | 7,270.0 | 67.0 | 67.7 | -58.50 | 3,638.7 | -697.0 | 413.4 | 298.2 | 115.28 | 3.587 | |
| 11,100.0 | 7,486.0 | 10,915.1 | 7,270.0 | 68.7 | 69.4 | -58.41 | 3,738.7 | -697.0 | 412.4 | 294.3 | 118.11 | 3.492 | |
| 11,200.0 | 7,486.0 | 11,015.1 | 7,270.0 | 70.5 | 71.1 | -58.32 | 3,838.7 | -697.0 | 411.4 | 290.4 | 120.94 | 3.401 | |
| 11,300.0 | 7,486.0 | 11,115.1 | 7,270.0 | 72.2 | 72.8 | -58.23 | 3,938.7 | -697.0 | 410.3 | 286.6 | 123.77 | 3.315 | |
| 11,400.0 | 7,486.0 | 11,215.1 | 7,270.0 | 73.9 | 74.5 | -58.14 | 4,038.7 | -697.0 | 409.3 | 282.7 | 126.60 | 3.233 | |
| 11,500.0 | 7,486.0 | 11,315.1 | 7,270.0 | 75.6 | 76.2 | -58.05 | 4,138.7 | -697.0 | 408.2 | 278.8 | 129.42 | 3.155 | |
| 11,600.0 | 7,486.0 | 11,415.1 | 7,270.0 | 77.3 | 77.9 | -57.96 | 4,238.7 | -697.0 | 407.2 | 275.0 | 132.23 | 3.079 | |
| 11,700.0 | 7,486.0 | 11,515.1 | 7,270.0 | 79.1 | 79.7 | -57.87 | 4,338.7 | -697.0 | 406.2 | 271.1 | 135.04 | 3.008 | |
| 11,800.0 | 7,486.0 | 11,615.1 | 7,270.0 | 80.8 | 81.4 | -57.78 | 4,438.6 | -697.0 | 405.1 | 267.3 | 137.85 | 2.939 | |
| 11,900.0 | 7,486.0 | 11,715.1 | 7,270.0 | 82.5 | 83.1 | -57.69 | 4,538.6 | -697.0 | 404.1 | 263.5 | 140.65 | 2.873 | |
| 12,000.0 | 7,486.0 | 11,815.1 | 7,270.0 | 84.3 | 84.8 | -57.59 | 4,638.6 | -697.0 | 403.1 | 259.6 | 143.45 | 2.810 | |
| 12,100.0 | 7,486.0 | 11,911.1 | 7,270.0 | 86.0 | 86.5 | -57.53 | 4,734.7 | -697.4 | 402.4 | 256.2 | 146.23 | 2.752 | |
| 12,103.3 | 7,486.0 | 11,914.2 | 7,270.0 | 86.0 | 86.5 | -57.53 | 4,737.7 | -697.4 | 402.4 | 256.1 | 146.32 | 2.750 | |
| 12,200.0 | 7,486.0 | 12,005.5 | 7,270.0 | 87.7 | 88.1 | -57.59 | 4,829.0 | -699.3 | 403.0 | 253.9 | 149.17 | 2.702 | |
| 12,300.0 | 7,486.0 | 12,103.4 | 7,270.0 | 89.5 | 89.8 | -57.75 | 4,926.9 | -702.5 | 404.8 | 252.5 | 152.31 | 2.658 | |
| 12,400.0 | 7,486.0 | 12,203.4 | 7,270.0 | 91.2 | 91.5 | -57.91 | 5,026.9 | -705.9 | 406.7 | 251.1 | 155.52 | 2.615 | |
| 12,500.0 | 7,486.0 | 12,303.4 | 7,270.0 | 92.9 | 93.2 | -58.07 | 5,126.8 | -709.3 | 408.5 | 249.8 | 158.73 | 2.574 | |
| 12,600.0 | 7,486.0 | 12,403.4 | 7,270.0 | 94.7 | 95.0 | -58.23 | 5,226.7 | -712.7 | 410.4 | 248.4 | 161.95 | 2.534 | |
| 12,700.0 | 7,486.0 | 12,503.3 | 7,270.0 | 96.4 | 96.7 | -58.39 | 5,326.6 | -716.1 | 412.2 | 247.1 | 165.18 | 2.496 | |
| 12,800.0 | 7,486.0 | 12,603.3 | 7,270.0 | 98.1 | 98.4 | -58.55 | 5,426.5 | -719.5 | 414.1 | 245.7 | 168.41 | 2.459 | |
| 12,900.0 | 7,486.0 | 12,703.3 | 7,270.0 | 99.9 | 100.2 | -58.71 | 5,526.4 | -723.0 | 416.0 | 244.3 | 171.64 | 2.423 | |
| 13,000.0 | 7,486.0 | 12,803.2 | 7,270.0 | 101.6 | 101.9 | -58.92 | 5,626.3 | -726.4 | 418.7 | 243.9 | 174.73 | 2.396 | |
| 13,100.0 | 7,486.0 | 12,903.1 | 7,270.0 | 103.3 | 103.6 | -59.24 | 5,726.2 | -729.8 | 422.9 | 244.9 | 177.99 | 2.376 | |
| 13,200.0 | 7,486.0 | 13,003.0 | 7,270.0 | 105.1 | 105.4 | -59.63 | 5,825.9 | -733.2 | 427.8 | 246.1 | 181.67 | 2.355 | |
| 13,300.0 | 7,486.0 | 13,102.8 | 7,270.0 | 106.8 | 107.1 | -60.01 | 5,925.7 | -736.6 | 432.7 | 247.3 | 185.34 | 2.334 | |
| 13,400.0 | 7,486.0 | 13,202.6 | 7,270.0 | 108.5 | 108.8 | -60.38 | 6,025.5 | -740.0 | 437.6 | 248.6 | 189.02 | 2.315 | |
| 13,500.0 | 7,486.0 | 13,302.5 | 7,270.0 | 110.3 | 110.6 | -60.75 | 6,125.3 | -743.4 | 442.5 | 249.8 | 192.70 | 2.296 | |
| 13,600.0 | 7,486.0 | 13,402.3 | 7,270.0 | 112.0 | 112.3 | -61.10 | 6,225.1 | -746.8 | 447.5 | 251.1 | 196.39 | 2.279 | |
| 13,700.0 | 7,486.0 | 13,502.2 | 7,270.0 | 113.8 | 114.0 | -61.45 | 6,324.8 | -750.2 | 452.5 | 252.4 | 200.07 | 2.262 | |
| 13,800.0 | 7,486.0 | 13,602.0 | 7,270.0 | 115.5 | 115.8 | -61.79 | 6,424.6 | -753.6 | 457.5 | 253.7 | 203.75 | 2.245 | |
| 13,900.0 | 7,486.0 | 13,701.8 | 7,270.0 | 117.2 | 117.5 | -62.12 | 6,524.4 | -757.0 | 462.5 | 255.0 | 207.49 | 2.229 | |
| 14,000.0 | 7,486.0 | 13,801.8 | 7,270.0 | 119.0 | 119.2 | -62.31 | 6,624.3 | -760.4 | 464.8 | 253.0 | 211.72 | 2.195 | |
| 14,100.0 | 7,486.0 | 13,901.7 | 7,270.0 | 120.7 | 121.0 | -62.09 | 6,724.2 | -763.8 | 462.0 | 247.5 | 214.56 | 2.153 | |
| 14,200.0 | 7,486.0 | 14,001.3 | 7,270.0 | 122.5 | 122.7 | -61.46 | 6,823.7 | -767.2 | 454.4 | 238.5 | 215.93 | 2.104 | |
| 14,300.0 | 7,486.0 | 14,100.3 | 7,270.0 | 124.2 | 124.4 | -60.37 | 6,922.6 | -770.6 | 441.9 | 226.2 | 215.65 | 2.049 | |
| 14,400.0 | 7,486.0 | 14,198.3 | 7,270.0 | 125.9 | 126.1 | -58.77 | 7,020.6 | -773.9 | 424.7 | 211.2 | 213.45 | 1.990 | |
| 14,469.5 | 7,486.0 | 14,265.7 | 7,270.0 | 127.1 | 127.3 | -57.39 | 7,088.0 | -776.2 | 410.3 | 198.9 | 211.41 | 1.941 | SF |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1F-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 90.04 | 0.0 | 11.2 | 11.2 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.2 | 0.2 | 90.04 | 0.0 | 11.2 | 11.2 | 10.9 | 0.30 | 36.825 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 90.04 | 0.0 | 11.2 | 11.2 | 10.5 | 0.65 | 17.132 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.5 | 0.5 | 90.04 | 0.0 | 11.2 | 11.2 | 10.2 | 1.00 | 11.163 | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.7 | 0.7 | 90.04 | 0.0 | 11.2 | 11.2 | 9.8 | 1.35 | 8.278 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 0.8 | 0.8 | 90.04 | 0.0 | 11.2 | 11.2 | 9.5 | 1.70 | 6.579 | |
| 600.0 | 600.0 | 600.0 | 600.0 | 1.0 | 1.0 | 90.04 | 0.0 | 11.2 | 11.2 | 9.1 | 2.05 | 5.458 | CC, ES |
| 700.0 | 700.0 | 700.0 | 700.0 | 1.2 | 1.2 | -159.06 | 0.0 | 11.2 | 12.0 | 9.6 | 2.40 | 5.002 | |
| 800.0 | 800.0 | 800.0 | 800.0 | 1.4 | 1.4 | -162.76 | 0.0 | 11.2 | 14.5 | 11.7 | 2.75 | 5.268 | |
| 900.0 | 899.9 | 899.9 | 899.9 | 1.6 | 1.5 | -166.68 | 0.0 | 11.2 | 18.6 | 15.5 | 3.09 | 6.018 | |
| 1,000.0 | 999.8 | 999.8 | 999.8 | 1.7 | 1.7 | -169.39 | 0.0 | 11.2 | 23.3 | 19.9 | 3.44 | 6.767 | |
| 1,100.0 | 1,099.6 | 1,099.6 | 1,099.6 | 1.9 | 1.9 | -171.19 | 0.0 | 11.2 | 28.0 | 24.2 | 3.79 | 7.387 | |
| 1,200.0 | 1,199.5 | 1,199.5 | 1,199.5 | 2.1 | 2.1 | -172.47 | 0.0 | 11.2 | 32.7 | 28.6 | 4.14 | 7.908 | |
| 1,300.0 | 1,299.4 | 1,299.4 | 1,299.4 | 2.3 | 2.2 | -173.43 | 0.0 | 11.2 | 37.5 | 33.0 | 4.49 | 8.350 | |
| 1,400.0 | 1,399.3 | 1,399.3 | 1,399.3 | 2.5 | 2.4 | -174.17 | 0.0 | 11.2 | 42.2 | 37.4 | 4.84 | 8.731 | |
| 1,500.0 | 1,499.2 | 1,499.2 | 1,499.2 | 2.7 | 2.6 | -174.76 | 0.0 | 11.2 | 47.0 | 41.8 | 5.19 | 9.061 | |
| 1,600.0 | 1,599.1 | 1,599.1 | 1,599.1 | 2.9 | 2.8 | -175.25 | 0.0 | 11.2 | 51.8 | 46.2 | 5.54 | 9.351 | |
| 1,700.0 | 1,699.0 | 1,699.0 | 1,699.0 | 3.1 | 2.9 | -175.65 | 0.0 | 11.2 | 56.5 | 50.7 | 5.89 | 9.607 | |
| 1,800.0 | 1,798.8 | 1,798.8 | 1,798.8 | 3.3 | 3.1 | -175.99 | 0.0 | 11.2 | 61.3 | 55.1 | 6.23 | 9.834 | |
| 1,900.0 | 1,898.7 | 1,898.7 | 1,898.7 | 3.4 | 3.3 | -176.28 | 0.0 | 11.2 | 66.1 | 59.5 | 6.58 | 10.038 | |
| 2,000.0 | 1,998.6 | 1,998.6 | 1,998.6 | 3.6 | 3.5 | -176.53 | 0.0 | 11.2 | 70.8 | 63.9 | 6.93 | 10.221 | |
| 2,100.0 | 2,098.5 | 2,098.5 | 2,098.5 | 3.8 | 3.6 | -176.75 | 0.0 | 11.2 | 75.6 | 68.3 | 7.28 | 10.387 | |
| 2,200.0 | 2,198.4 | 2,198.4 | 2,198.4 | 4.0 | 3.8 | -176.94 | 0.0 | 11.2 | 80.4 | 72.8 | 7.63 | 10.538 | |
| 2,300.0 | 2,298.3 | 2,298.3 | 2,298.3 | 4.2 | 4.0 | -177.11 | 0.0 | 11.2 | 85.2 | 77.2 | 7.98 | 10.676 | |
| 2,400.0 | 2,398.2 | 2,398.2 | 2,398.2 | 4.4 | 4.2 | -177.27 | 0.0 | 11.2 | 89.9 | 81.6 | 8.33 | 10.802 | |
| 2,500.0 | 2,498.0 | 2,498.0 | 2,498.0 | 4.6 | 4.3 | -177.40 | 0.0 | 11.2 | 94.7 | 86.0 | 8.68 | 10.919 | |
| 2,600.0 | 2,597.9 | 2,597.9 | 2,597.9 | 4.8 | 4.5 | -177.53 | 0.0 | 11.2 | 99.5 | 90.5 | 9.02 | 11.026 | |
| 2,700.0 | 2,697.8 | 2,697.8 | 2,697.8 | 5.0 | 4.7 | -177.64 | 0.0 | 11.2 | 104.3 | 94.9 | 9.37 | 11.125 | |
| 2,800.0 | 2,797.7 | 2,797.7 | 2,797.7 | 5.2 | 4.9 | -177.74 | 0.0 | 11.2 | 109.1 | 99.3 | 9.72 | 11.218 | |
| 2,900.0 | 2,897.6 | 2,897.6 | 2,897.6 | 5.4 | 5.0 | -177.84 | 0.0 | 11.2 | 113.8 | 103.8 | 10.07 | 11.304 | |
| 3,000.0 | 2,997.5 | 2,997.5 | 2,997.5 | 5.6 | 5.2 | -177.93 | 0.0 | 11.2 | 118.6 | 108.2 | 10.42 | 11.384 | |
| 3,100.0 | 3,097.3 | 3,097.3 | 3,097.3 | 5.8 | 5.4 | -178.01 | 0.0 | 11.2 | 123.4 | 112.6 | 10.77 | 11.459 | |
| 3,200.0 | 3,197.2 | 3,197.2 | 3,197.2 | 5.9 | 5.6 | -178.08 | 0.0 | 11.2 | 128.2 | 117.1 | 11.12 | 11.529 | |
| 3,300.0 | 3,297.1 | 3,297.1 | 3,297.1 | 6.1 | 5.7 | -178.15 | 0.0 | 11.2 | 132.9 | 121.5 | 11.47 | 11.595 | |
| 3,400.0 | 3,397.0 | 3,397.0 | 3,397.0 | 6.3 | 5.9 | -178.21 | 0.0 | 11.2 | 137.7 | 125.9 | 11.81 | 11.657 | |
| 3,500.0 | 3,496.9 | 3,496.9 | 3,496.9 | 6.5 | 6.1 | -178.27 | 0.0 | 11.2 | 142.5 | 130.3 | 12.16 | 11.716 | |
| 3,600.0 | 3,596.8 | 3,596.8 | 3,596.8 | 6.7 | 6.3 | -178.33 | 0.0 | 11.2 | 147.3 | 134.8 | 12.51 | 11.771 | |
| 3,700.0 | 3,696.7 | 3,696.7 | 3,696.7 | 6.9 | 6.4 | -178.38 | 0.0 | 11.2 | 152.1 | 139.2 | 12.86 | 11.824 | |
| 3,800.0 | 3,796.5 | 3,796.5 | 3,796.5 | 7.1 | 6.6 | -178.43 | 0.0 | 11.2 | 156.8 | 143.6 | 13.21 | 11.874 | |
| 3,900.0 | 3,896.4 | 3,896.4 | 3,896.4 | 7.3 | 6.8 | -178.48 | 0.0 | 11.2 | 161.6 | 148.1 | 13.56 | 11.921 | |
| 4,000.0 | 3,996.3 | 3,996.3 | 3,996.3 | 7.5 | 7.0 | -178.52 | 0.0 | 11.2 | 166.4 | 152.5 | 13.91 | 11.965 | |
| 4,100.0 | 4,096.2 | 4,098.6 | 4,098.6 | 7.7 | 7.1 | -178.40 | -0.7 | 10.7 | 170.5 | 156.3 | 14.26 | 11.958 | |
| 4,200.0 | 4,196.1 | 4,201.0 | 4,201.0 | 7.9 | 7.3 | -177.92 | -3.0 | 9.3 | 173.2 | 158.6 | 14.61 | 11.851 | |
| 4,300.0 | 4,296.0 | 4,303.4 | 4,303.3 | 8.1 | 7.5 | -177.09 | -6.8 | 6.8 | 174.5 | 159.5 | 14.97 | 11.655 | |
| 4,400.0 | 4,395.9 | 4,403.4 | 4,403.1 | 8.3 | 7.7 | -176.11 | -11.2 | 4.0 | 175.1 | 159.8 | 15.32 | 11.428 | |
| 4,500.0 | 4,495.7 | 4,503.3 | 4,502.9 | 8.5 | 7.8 | -175.14 | -15.6 | 1.1 | 175.7 | 160.1 | 15.67 | 11.213 | |
| 4,600.0 | 4,595.6 | 4,603.3 | 4,602.7 | 8.6 | 8.0 | -174.18 | -20.1 | -1.8 | 176.5 | 160.4 | 16.03 | 11.010 | |
| 4,700.0 | 4,695.5 | 4,703.2 | 4,702.5 | 8.8 | 8.2 | -173.23 | -24.5 | -4.6 | 177.2 | 160.8 | 16.38 | 10.818 | |
| 4,800.0 | 4,795.4 | 4,803.2 | 4,802.4 | 9.0 | 8.4 | -172.28 | -29.0 | -7.5 | 178.0 | 161.3 | 16.74 | 10.637 | |
| 4,900.0 | 4,895.3 | 4,903.2 | 4,902.2 | 9.2 | 8.6 | -171.34 | -33.4 | -10.3 | 178.9 | 161.8 | 17.09 | 10.465 | |
| 5,000.0 | 4,995.2 | 5,003.1 | 5,002.0 | 9.4 | 8.7 | -170.42 | -37.9 | -13.2 | 179.8 | 162.3 | 17.45 | 10.303 | |
| 5,100.0 | 5,095.1 | 5,103.1 | 5,101.8 | 9.6 | 8.9 | -169.50 | -42.3 | -16.1 | 180.7 | 162.9 | 17.81 | 10.149 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1F-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,200.0 | 5,194.9 | 5,203.0 | 5,201.6 | 9.8 | 9.1 | -168.59 | -46.8 | -18.9 | 181.7 | 163.6 | 18.17 | 10.003 | |
| 5,300.0 | 5,294.8 | 5,303.0 | 5,301.4 | 10.0 | 9.3 | -167.69 | -51.2 | -21.8 | 182.8 | 164.2 | 18.53 | 9.864 | |
| 5,400.0 | 5,394.7 | 5,402.9 | 5,401.2 | 10.2 | 9.5 | -166.80 | -55.6 | -24.7 | 183.9 | 165.0 | 18.89 | 9.733 | |
| 5,500.0 | 5,494.6 | 5,502.9 | 5,501.1 | 10.4 | 9.7 | -165.93 | -60.1 | -27.5 | 185.0 | 165.7 | 19.25 | 9.608 | |
| 5,600.0 | 5,594.5 | 5,602.8 | 5,600.9 | 10.6 | 9.9 | -165.06 | -64.5 | -30.4 | 186.2 | 166.5 | 19.62 | 9.489 | |
| 5,700.0 | 5,694.4 | 5,702.8 | 5,700.7 | 10.8 | 10.0 | -164.20 | -69.0 | -33.2 | 187.4 | 167.4 | 19.98 | 9.377 | |
| 5,800.0 | 5,794.3 | 5,802.7 | 5,800.5 | 11.0 | 10.2 | -163.36 | -73.4 | -36.1 | 188.6 | 168.3 | 20.35 | 9.269 | |
| 5,900.0 | 5,894.1 | 5,902.7 | 5,900.3 | 11.2 | 10.4 | -162.53 | -77.9 | -39.0 | 189.9 | 169.2 | 20.72 | 9.168 | |
| 6,000.0 | 5,994.0 | 6,002.6 | 6,000.1 | 11.4 | 10.6 | -161.70 | -82.3 | -41.8 | 191.3 | 170.2 | 21.09 | 9.071 | |
| 6,100.0 | 6,093.9 | 6,102.6 | 6,099.9 | 11.5 | 10.8 | -160.90 | -86.8 | -44.7 | 192.6 | 171.2 | 21.46 | 8.979 | |
| 6,200.0 | 6,193.8 | 6,202.6 | 6,199.8 | 11.7 | 11.0 | -160.10 | -91.2 | -47.6 | 194.1 | 172.2 | 21.83 | 8.891 | |
| 6,300.0 | 6,293.7 | 6,302.5 | 6,299.6 | 11.9 | 11.2 | -159.31 | -95.6 | -50.4 | 195.5 | 173.3 | 22.20 | 8.807 | |
| 6,400.0 | 6,393.6 | 6,402.5 | 6,399.4 | 12.1 | 11.4 | -158.54 | -100.1 | -53.3 | 197.0 | 174.4 | 22.57 | 8.728 | |
| 6,500.0 | 6,493.5 | 6,502.4 | 6,499.2 | 12.3 | 11.5 | -157.77 | -104.5 | -56.1 | 198.5 | 175.6 | 22.95 | 8.652 | |
| 6,600.0 | 6,593.3 | 6,602.4 | 6,599.0 | 12.5 | 11.7 | -157.02 | -109.0 | -59.0 | 200.1 | 176.8 | 23.32 | 8.580 | |
| 6,700.0 | 6,693.2 | 6,702.5 | 6,699.0 | 12.7 | 11.9 | -156.46 | -112.8 | -61.9 | 201.7 | 178.0 | 23.69 | 8.513 | |
| 6,800.0 | 6,793.1 | 6,801.7 | 6,797.7 | 12.9 | 12.1 | -159.48 | -103.9 | -64.7 | 203.3 | 179.4 | 23.95 | 8.488 | |
| 6,900.0 | 6,893.0 | 6,894.7 | 6,887.4 | 13.1 | 12.2 | -166.48 | -80.3 | -67.3 | 207.6 | 183.5 | 24.14 | 8.601 | |
| 7,000.0 | 6,992.6 | 6,980.4 | 6,965.8 | 13.3 | 12.3 | 90.73 | -45.9 | -69.5 | 217.9 | 193.5 | 24.36 | 8.945 | |
| 7,100.0 | 7,089.9 | 7,062.4 | 7,035.3 | 13.4 | 12.4 | 73.43 | -2.4 | -71.5 | 232.1 | 207.5 | 24.61 | 9.431 | |
| 7,200.0 | 7,181.8 | 7,141.6 | 7,095.8 | 13.5 | 12.6 | 64.35 | 48.6 | -73.3 | 248.3 | 223.5 | 24.80 | 10.011 | |
| 7,300.0 | 7,265.5 | 7,218.6 | 7,147.3 | 13.7 | 12.9 | 58.10 | 105.8 | -74.7 | 264.6 | 239.8 | 24.85 | 10.651 | |
| 7,400.0 | 7,338.6 | 7,293.9 | 7,189.8 | 14.0 | 13.2 | 53.60 | 167.8 | -76.0 | 279.8 | 255.0 | 24.75 | 11.306 | |
| 7,500.0 | 7,398.7 | 7,367.9 | 7,223.3 | 14.4 | 13.7 | 50.39 | 233.7 | -76.9 | 292.8 | 268.2 | 24.61 | 11.899 | |
| 7,600.0 | 7,444.1 | 7,440.9 | 7,247.9 | 15.0 | 14.2 | 48.23 | 302.4 | -77.6 | 303.0 | 278.5 | 24.56 | 12.338 | |
| 7,700.0 | 7,473.4 | 7,513.4 | 7,263.3 | 15.8 | 14.9 | 46.95 | 373.1 | -78.1 | 310.0 | 285.2 | 24.76 | 12.520 | |
| 7,800.0 | 7,485.6 | 7,585.5 | 7,269.8 | 16.7 | 15.6 | 46.47 | 444.9 | -78.3 | 313.4 | 288.0 | 25.33 | 12.373 | |
| 7,900.0 | 7,486.0 | 7,679.5 | 7,270.0 | 17.7 | 16.7 | 46.59 | 538.9 | -78.3 | 314.3 | 287.5 | 26.84 | 11.710 | |
| 8,000.0 | 7,486.0 | 7,779.5 | 7,270.0 | 18.9 | 17.9 | 46.74 | 638.9 | -78.3 | 315.2 | 286.5 | 28.66 | 10.998 | |
| 8,100.0 | 7,486.0 | 7,879.5 | 7,270.0 | 20.1 | 19.2 | 46.89 | 738.9 | -78.3 | 316.1 | 285.5 | 30.60 | 10.331 | |
| 8,200.0 | 7,486.0 | 7,979.5 | 7,270.0 | 21.5 | 20.5 | 47.04 | 838.9 | -78.3 | 317.0 | 284.3 | 32.64 | 9.712 | |
| 8,300.0 | 7,486.0 | 8,079.5 | 7,270.0 | 22.8 | 22.0 | 47.19 | 938.9 | -78.3 | 317.9 | 283.1 | 34.77 | 9.142 | |
| 8,400.0 | 7,486.0 | 8,179.5 | 7,270.0 | 24.3 | 23.4 | 47.34 | 1,038.9 | -78.3 | 318.8 | 281.8 | 36.97 | 8.622 | |
| 8,500.0 | 7,486.0 | 8,279.5 | 7,270.0 | 25.7 | 24.9 | 47.49 | 1,138.9 | -78.3 | 319.7 | 280.4 | 39.24 | 8.146 | |
| 8,600.0 | 7,486.0 | 8,379.5 | 7,270.0 | 27.2 | 26.5 | 47.64 | 1,238.9 | -78.3 | 320.6 | 279.0 | 41.57 | 7.712 | |
| 8,700.0 | 7,486.0 | 8,479.5 | 7,270.0 | 28.8 | 28.0 | 47.78 | 1,338.9 | -78.3 | 321.5 | 277.5 | 43.94 | 7.316 | |
| 8,800.0 | 7,486.0 | 8,579.4 | 7,270.0 | 30.3 | 29.6 | 47.93 | 1,438.9 | -78.3 | 322.4 | 276.0 | 46.36 | 6.954 | |
| 8,900.0 | 7,486.0 | 8,679.4 | 7,270.0 | 31.9 | 31.2 | 48.07 | 1,538.9 | -78.3 | 323.3 | 274.5 | 48.81 | 6.623 | |
| 9,000.0 | 7,486.0 | 8,779.4 | 7,270.0 | 33.5 | 32.8 | 48.22 | 1,638.9 | -78.3 | 324.2 | 272.9 | 51.30 | 6.319 | |
| 9,100.0 | 7,486.0 | 8,876.2 | 7,270.0 | 35.1 | 34.4 | 48.42 | 1,735.6 | -77.7 | 325.5 | 271.7 | 53.82 | 6.048 | |
| 9,200.0 | 7,486.0 | 8,972.0 | 7,270.0 | 36.7 | 36.0 | 48.79 | 1,831.4 | -75.7 | 328.1 | 271.6 | 56.49 | 5.807 | |
| 9,300.0 | 7,486.0 | 9,070.7 | 7,270.0 | 38.3 | 37.6 | 49.32 | 1,930.1 | -72.3 | 331.6 | 272.2 | 59.34 | 5.587 | |
| 9,400.0 | 7,486.0 | 9,170.6 | 7,270.0 | 40.0 | 39.3 | 49.84 | 2,029.9 | -68.8 | 335.1 | 272.9 | 62.26 | 5.383 | |
| 9,500.0 | 7,486.0 | 9,270.5 | 7,270.0 | 41.6 | 40.9 | 50.35 | 2,129.7 | -65.3 | 338.8 | 273.5 | 65.22 | 5.194 | |
| 9,600.0 | 7,486.0 | 9,370.4 | 7,270.0 | 43.3 | 42.6 | 50.86 | 2,229.5 | -61.8 | 342.4 | 274.2 | 68.22 | 5.019 | |
| 9,700.0 | 7,486.0 | 9,470.3 | 7,270.0 | 44.9 | 44.3 | 51.35 | 2,329.4 | -58.3 | 346.1 | 274.8 | 71.25 | 4.857 | |
| 9,800.0 | 7,486.0 | 9,570.2 | 7,270.0 | 46.6 | 46.0 | 51.83 | 2,429.2 | -54.9 | 349.8 | 275.4 | 74.31 | 4.707 | |
| 9,900.0 | 7,486.0 | 9,670.0 | 7,270.0 | 48.3 | 47.6 | 52.30 | 2,529.0 | -51.4 | 353.5 | 276.1 | 77.41 | 4.567 | |
| 10,000.0 | 7,486.0 | 9,769.9 | 7,270.0 | 50.0 | 49.3 | 52.76 | 2,628.8 | -47.9 | 357.2 | 276.7 | 80.53 | 4.436 | |
| 10,100.0 | 7,486.0 | 9,869.8 | 7,270.0 | 51.7 | 51.0 | 53.22 | 2,728.7 | -44.4 | 361.0 | 277.3 | 83.67 | 4.314 | |
| 10,200.0 | 7,486.0 | 9,969.7 | 7,270.0 | 53.4 | 52.7 | 53.66 | 2,828.5 | -40.9 | 364.8 | 277.9 | 86.85 | 4.200 | |
| 10,300.0 | 7,486.0 | 10,069.6 | 7,270.0 | 55.1 | 54.4 | 54.09 | 2,928.3 | -37.4 | 368.6 | 278.5 | 90.04 | 4.093 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1F-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,400.0 | 7,486.0 | 10,169.5 | 7,270.0 | 56.8 | 56.1 | 54.52 | 3,028.2 | -33.9 | 372.4 | 279.1 | 93.26 | 3.993 | |
| 10,500.0 | 7,486.0 | 10,269.4 | 7,270.0 | 58.5 | 57.8 | 54.93 | 3,128.0 | -30.5 | 376.3 | 279.8 | 96.49 | 3.899 | |
| 10,600.0 | 7,486.0 | 10,369.3 | 7,270.0 | 60.2 | 59.6 | 55.34 | 3,227.8 | -27.0 | 380.1 | 280.4 | 99.75 | 3.811 | |
| 10,700.0 | 7,486.0 | 10,469.2 | 7,270.0 | 61.9 | 61.3 | 55.74 | 3,327.6 | -23.5 | 384.0 | 281.0 | 103.02 | 3.727 | |
| 10,800.0 | 7,486.0 | 10,569.0 | 7,270.0 | 63.6 | 63.0 | 56.13 | 3,427.5 | -20.0 | 387.9 | 281.6 | 106.31 | 3.649 | |
| 10,900.0 | 7,486.0 | 10,668.9 | 7,270.0 | 65.3 | 64.7 | 56.52 | 3,527.3 | -16.5 | 391.8 | 282.2 | 109.62 | 3.575 | |
| 11,000.0 | 7,486.0 | 10,768.8 | 7,270.0 | 67.0 | 66.4 | 56.89 | 3,627.1 | -13.0 | 395.8 | 282.8 | 112.94 | 3.504 | |
| 11,100.0 | 7,486.0 | 10,868.7 | 7,270.0 | 68.7 | 68.1 | 57.26 | 3,727.0 | -9.5 | 399.7 | 283.4 | 116.27 | 3.438 | |
| 11,200.0 | 7,486.0 | 10,968.6 | 7,270.0 | 70.5 | 69.9 | 57.62 | 3,826.8 | -6.1 | 403.7 | 284.1 | 119.62 | 3.375 | |
| 11,300.0 | 7,486.0 | 11,068.5 | 7,270.0 | 72.2 | 71.6 | 57.98 | 3,926.6 | -2.6 | 407.7 | 284.7 | 122.98 | 3.315 | |
| 11,400.0 | 7,486.0 | 11,168.4 | 7,270.0 | 73.9 | 73.3 | 58.33 | 4,026.4 | 0.9 | 411.7 | 285.3 | 126.36 | 3.258 | |
| 11,500.0 | 7,486.0 | 11,268.3 | 7,270.0 | 75.6 | 75.1 | 58.67 | 4,126.3 | 4.4 | 415.7 | 286.0 | 129.74 | 3.204 | |
| 11,600.0 | 7,486.0 | 11,368.2 | 7,270.0 | 77.3 | 76.8 | 59.00 | 4,226.1 | 7.9 | 419.7 | 286.6 | 133.14 | 3.153 | |
| 11,700.0 | 7,486.0 | 11,468.0 | 7,270.0 | 79.1 | 78.5 | 59.33 | 4,325.9 | 11.4 | 423.8 | 287.2 | 136.54 | 3.104 | |
| 11,800.0 | 7,486.0 | 11,567.9 | 7,270.0 | 80.8 | 80.2 | 59.65 | 4,425.8 | 14.9 | 427.8 | 287.9 | 139.95 | 3.057 | |
| 11,900.0 | 7,486.0 | 11,667.8 | 7,270.0 | 82.5 | 82.0 | 59.97 | 4,525.6 | 18.3 | 431.9 | 288.5 | 143.38 | 3.012 | |
| 12,000.0 | 7,486.0 | 11,767.7 | 7,270.0 | 84.3 | 83.7 | 60.28 | 4,625.4 | 21.8 | 436.0 | 289.2 | 146.81 | 2.970 | |
| 12,100.0 | 7,486.0 | 11,867.6 | 7,270.0 | 86.0 | 85.4 | 60.58 | 4,725.2 | 25.3 | 440.1 | 289.8 | 150.25 | 2.929 | |
| 12,200.0 | 7,486.0 | 11,967.5 | 7,270.0 | 87.7 | 87.2 | 60.88 | 4,825.1 | 28.8 | 444.2 | 290.5 | 153.70 | 2.890 | |
| 12,300.0 | 7,486.0 | 12,067.4 | 7,270.0 | 89.5 | 88.9 | 61.17 | 4,924.9 | 32.3 | 448.3 | 291.2 | 157.15 | 2.853 | |
| 12,400.0 | 7,486.0 | 12,167.3 | 7,270.0 | 91.2 | 90.6 | 61.46 | 5,024.7 | 35.8 | 452.5 | 291.8 | 160.61 | 2.817 | |
| 12,500.0 | 7,486.0 | 12,267.2 | 7,270.0 | 92.9 | 92.4 | 61.74 | 5,124.6 | 39.3 | 456.6 | 292.5 | 164.08 | 2.783 | |
| 12,600.0 | 7,486.0 | 12,367.1 | 7,270.0 | 94.7 | 94.1 | 62.02 | 5,224.4 | 42.7 | 460.8 | 293.2 | 167.55 | 2.750 | |
| 12,700.0 | 7,486.0 | 12,466.9 | 7,270.0 | 96.4 | 95.9 | 62.29 | 5,324.2 | 46.2 | 464.9 | 293.9 | 171.03 | 2.718 | |
| 12,800.0 | 7,486.0 | 12,572.1 | 7,270.0 | 98.1 | 97.7 | 62.55 | 5,429.3 | 49.4 | 468.7 | 294.1 | 174.58 | 2.685 | |
| 12,900.0 | 7,486.0 | 12,679.9 | 7,270.0 | 99.9 | 99.6 | 62.70 | 5,537.1 | 50.8 | 471.0 | 292.9 | 178.02 | 2.646 | |
| 13,000.0 | 7,486.0 | 12,787.8 | 7,270.0 | 101.6 | 101.4 | 62.68 | 5,645.0 | 50.2 | 470.7 | 289.5 | 181.11 | 2.599 | |
| 13,100.0 | 7,486.0 | 12,895.5 | 7,270.0 | 103.3 | 103.3 | 62.42 | 5,752.7 | 47.5 | 467.1 | 283.4 | 183.78 | 2.542 | |
| 13,200.0 | 7,486.0 | 13,003.0 | 7,270.0 | 105.1 | 105.2 | 62.01 | 5,860.1 | 42.8 | 461.3 | 275.0 | 186.32 | 2.476 | |
| 13,300.0 | 7,486.0 | 13,110.2 | 7,270.0 | 106.8 | 107.0 | 61.47 | 5,967.1 | 36.2 | 453.8 | 265.2 | 188.59 | 2.406 | |
| 13,400.0 | 7,486.0 | 13,217.0 | 7,270.0 | 108.5 | 108.9 | 60.79 | 6,073.5 | 27.5 | 444.7 | 254.2 | 190.56 | 2.334 | |
| 13,500.0 | 7,486.0 | 13,321.7 | 7,270.0 | 110.3 | 110.7 | 59.96 | 6,177.7 | 17.2 | 434.2 | 242.0 | 192.17 | 2.259 | |
| 13,600.0 | 7,486.0 | 13,420.9 | 7,270.0 | 112.0 | 112.4 | 59.11 | 6,276.3 | 6.9 | 423.2 | 229.7 | 193.55 | 2.187 | |
| 13,700.0 | 7,486.0 | 13,520.1 | 7,270.0 | 113.8 | 114.2 | 58.20 | 6,375.0 | -3.5 | 412.4 | 217.6 | 194.74 | 2.117 | |
| 13,800.0 | 7,486.0 | 13,619.3 | 7,270.0 | 115.5 | 115.9 | 57.25 | 6,473.6 | -13.8 | 401.6 | 205.9 | 195.73 | 2.052 | |
| 13,900.0 | 7,486.0 | 13,718.5 | 7,270.0 | 117.2 | 117.6 | 56.26 | 6,572.3 | -24.1 | 391.0 | 194.4 | 196.55 | 1.989 | |
| 14,000.0 | 7,486.0 | 13,818.0 | 7,270.0 | 119.0 | 119.4 | 55.61 | 6,671.3 | -34.5 | 383.1 | 184.8 | 198.29 | 1.932 | |
| 14,100.0 | 7,486.0 | 13,917.9 | 7,270.0 | 120.7 | 121.1 | 55.34 | 6,770.6 | -44.9 | 379.8 | 179.6 | 200.23 | 1.897 | |
| 14,120.3 | 7,486.0 | 13,938.2 | 7,270.0 | 121.1 | 121.5 | 55.33 | 6,790.9 | -47.0 | 379.7 | 179.0 | 200.66 | 1.892 | |
| 14,200.0 | 7,486.0 | 14,017.9 | 7,270.0 | 122.5 | 122.8 | 55.45 | 6,870.1 | -55.3 | 381.2 | 178.7 | 202.48 | 1.883 | SF |
| 14,300.0 | 7,486.0 | 14,117.6 | 7,270.0 | 124.2 | 124.6 | 55.96 | 6,969.3 | -65.7 | 387.2 | 182.2 | 204.99 | 1.889 | |
| 14,400.0 | 7,486.0 | 14,216.7 | 7,270.0 | 125.9 | 126.3 | 56.80 | 7,067.9 | -76.1 | 398.0 | 190.3 | 207.64 | 1.917 | |
| 14,469.5 | 7,486.0 | 14,237.9 | 7,270.0 | 127.1 | 126.7 | 56.95 | 7,088.9 | -78.3 | 410.9 | 202.8 | 208.10 | 1.975 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1G-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 90.04 | 0.0 | 22.4 | 22.4 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.2 | 0.2 | 90.04 | 0.0 | 22.4 | 22.4 | 22.1 | 0.30 | 73.650 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 90.04 | 0.0 | 22.4 | 22.4 | 21.7 | 0.65 | 34.265 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.5 | 0.5 | 90.04 | 0.0 | 22.4 | 22.4 | 21.4 | 1.00 | 22.326 | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.7 | 0.7 | 90.04 | 0.0 | 22.4 | 22.4 | 21.0 | 1.35 | 16.557 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 0.8 | 0.8 | 90.04 | 0.0 | 22.4 | 22.4 | 20.7 | 1.70 | 13.157 | CC, ES |
| 600.0 | 600.0 | 599.6 | 599.6 | 1.0 | 1.0 | 90.99 | -0.4 | 23.1 | 23.1 | 21.1 | 2.05 | 11.299 | |
| 700.0 | 700.0 | 699.2 | 699.2 | 1.2 | 1.2 | -154.84 | -1.5 | 25.5 | 26.3 | 23.9 | 2.40 | 10.980 | SF |
| 800.0 | 800.0 | 798.9 | 798.8 | 1.4 | 1.4 | -154.00 | -3.3 | 29.0 | 32.3 | 29.6 | 2.75 | 11.764 | |
| 900.0 | 899.9 | 898.6 | 898.4 | 1.6 | 1.6 | -154.44 | -5.1 | 32.6 | 39.9 | 36.8 | 3.10 | 12.883 | |
| 1,000.0 | 999.8 | 998.3 | 998.0 | 1.7 | 1.7 | -155.01 | -6.8 | 36.2 | 47.9 | 44.5 | 3.45 | 13.895 | |
| 1,100.0 | 1,099.6 | 1,097.9 | 1,097.6 | 1.9 | 1.9 | -155.41 | -8.6 | 39.8 | 55.9 | 52.1 | 3.80 | 14.719 | |
| 1,200.0 | 1,199.5 | 1,197.6 | 1,197.2 | 2.1 | 2.1 | -155.71 | -10.4 | 43.4 | 63.9 | 59.8 | 4.15 | 15.403 | |
| 1,300.0 | 1,299.4 | 1,297.3 | 1,296.8 | 2.3 | 2.3 | -155.95 | -12.2 | 47.0 | 72.0 | 67.5 | 4.50 | 15.979 | |
| 1,400.0 | 1,399.3 | 1,397.0 | 1,396.4 | 2.5 | 2.5 | -156.14 | -13.9 | 50.6 | 80.0 | 75.1 | 4.86 | 16.471 | |
| 1,500.0 | 1,499.2 | 1,496.6 | 1,496.0 | 2.7 | 2.7 | -156.29 | -15.7 | 54.2 | 88.0 | 82.8 | 5.21 | 16.896 | |
| 1,600.0 | 1,599.1 | 1,596.3 | 1,595.6 | 2.9 | 2.9 | -156.42 | -17.5 | 57.8 | 96.1 | 90.5 | 5.56 | 17.267 | |
| 1,700.0 | 1,699.0 | 1,696.0 | 1,695.2 | 3.1 | 3.0 | -156.53 | -19.3 | 61.5 | 104.1 | 98.2 | 5.92 | 17.593 | |
| 1,800.0 | 1,798.8 | 1,795.7 | 1,794.8 | 3.3 | 3.2 | -156.62 | -21.1 | 65.1 | 112.1 | 105.8 | 6.27 | 17.882 | |
| 1,900.0 | 1,898.7 | 1,895.4 | 1,894.3 | 3.4 | 3.4 | -156.70 | -22.8 | 68.7 | 120.1 | 113.5 | 6.62 | 18.140 | |
| 2,000.0 | 1,998.6 | 1,995.0 | 1,993.9 | 3.6 | 3.6 | -156.77 | -24.6 | 72.3 | 128.2 | 121.2 | 6.98 | 18.373 | |
| 2,100.0 | 2,098.5 | 2,094.7 | 2,093.5 | 3.8 | 3.8 | -156.83 | -26.4 | 75.9 | 136.2 | 128.9 | 7.33 | 18.582 | |
| 2,200.0 | 2,198.4 | 2,194.4 | 2,193.1 | 4.0 | 4.0 | -156.89 | -28.2 | 79.5 | 144.2 | 136.5 | 7.68 | 18.772 | |
| 2,300.0 | 2,298.3 | 2,294.1 | 2,292.7 | 4.2 | 4.2 | -156.93 | -29.9 | 83.1 | 152.2 | 144.2 | 8.04 | 18.946 | |
| 2,400.0 | 2,398.2 | 2,393.7 | 2,392.3 | 4.4 | 4.3 | -156.98 | -31.7 | 86.7 | 160.3 | 151.9 | 8.39 | 19.104 | |
| 2,500.0 | 2,498.0 | 2,493.4 | 2,491.9 | 4.6 | 4.5 | -157.02 | -33.5 | 90.3 | 168.3 | 159.6 | 8.74 | 19.250 | |
| 2,600.0 | 2,597.9 | 2,593.1 | 2,591.5 | 4.8 | 4.7 | -157.06 | -35.3 | 93.9 | 176.3 | 167.2 | 9.10 | 19.385 | |
| 2,700.0 | 2,697.8 | 2,692.8 | 2,691.1 | 5.0 | 4.9 | -157.09 | -37.0 | 97.5 | 184.4 | 174.9 | 9.45 | 19.509 | |
| 2,800.0 | 2,797.7 | 2,792.5 | 2,790.7 | 5.2 | 5.1 | -157.12 | -38.8 | 101.1 | 192.4 | 182.6 | 9.80 | 19.624 | |
| 2,900.0 | 2,897.6 | 2,892.1 | 2,890.3 | 5.4 | 5.3 | -157.15 | -40.6 | 104.7 | 200.4 | 190.3 | 10.16 | 19.732 | |
| 3,000.0 | 2,997.5 | 2,991.8 | 2,989.9 | 5.6 | 5.5 | -157.17 | -42.4 | 108.3 | 208.4 | 197.9 | 10.51 | 19.832 | |
| 3,100.0 | 3,097.3 | 3,091.5 | 3,089.5 | 5.8 | 5.7 | -157.20 | -44.2 | 111.9 | 216.5 | 205.6 | 10.86 | 19.925 | |
| 3,200.0 | 3,197.2 | 3,191.2 | 3,189.1 | 5.9 | 5.8 | -157.22 | -45.9 | 115.5 | 224.5 | 213.3 | 11.22 | 20.013 | |
| 3,300.0 | 3,297.1 | 3,290.8 | 3,288.7 | 6.1 | 6.0 | -157.24 | -47.7 | 119.2 | 232.5 | 221.0 | 11.57 | 20.095 | |
| 3,400.0 | 3,397.0 | 3,390.5 | 3,388.3 | 6.3 | 6.2 | -157.26 | -49.5 | 122.8 | 240.6 | 228.6 | 11.93 | 20.172 | |
| 3,500.0 | 3,496.9 | 3,490.2 | 3,487.9 | 6.5 | 6.4 | -157.28 | -51.3 | 126.4 | 248.6 | 236.3 | 12.28 | 20.245 | |
| 3,600.0 | 3,596.8 | 3,589.9 | 3,587.5 | 6.7 | 6.6 | -157.29 | -53.0 | 130.0 | 256.6 | 244.0 | 12.63 | 20.314 | |
| 3,700.0 | 3,696.7 | 3,689.5 | 3,687.1 | 6.9 | 6.8 | -157.31 | -54.8 | 133.6 | 264.6 | 251.7 | 12.99 | 20.379 | |
| 3,800.0 | 3,796.5 | 3,789.2 | 3,786.7 | 7.1 | 7.0 | -157.32 | -56.6 | 137.2 | 272.7 | 259.3 | 13.34 | 20.440 | |
| 3,900.0 | 3,896.4 | 3,888.9 | 3,886.3 | 7.3 | 7.2 | -157.34 | -58.4 | 140.8 | 280.7 | 267.0 | 13.69 | 20.499 | |
| 4,000.0 | 3,996.3 | 3,988.6 | 3,985.9 | 7.5 | 7.3 | -157.35 | -60.2 | 144.4 | 288.7 | 274.7 | 14.05 | 20.554 | |
| 4,100.0 | 4,096.2 | 4,088.3 | 4,085.5 | 7.7 | 7.5 | -157.36 | -61.9 | 148.0 | 296.8 | 282.4 | 14.40 | 20.607 | |
| 4,200.0 | 4,196.1 | 4,187.9 | 4,185.1 | 7.9 | 7.7 | -157.38 | -63.7 | 151.6 | 304.8 | 290.0 | 14.75 | 20.657 | |
| 4,300.0 | 4,296.0 | 4,287.6 | 4,284.7 | 8.1 | 7.9 | -157.39 | -65.5 | 155.2 | 312.8 | 297.7 | 15.11 | 20.705 | |
| 4,400.0 | 4,395.9 | 4,387.3 | 4,384.2 | 8.3 | 8.1 | -157.40 | -67.3 | 158.8 | 320.8 | 305.4 | 15.46 | 20.750 | |
| 4,500.0 | 4,495.7 | 4,487.0 | 4,483.8 | 8.5 | 8.3 | -157.41 | -69.0 | 162.4 | 328.9 | 313.1 | 15.82 | 20.794 | |
| 4,600.0 | 4,595.6 | 4,586.6 | 4,583.4 | 8.6 | 8.5 | -157.42 | -70.8 | 166.0 | 336.9 | 320.7 | 16.17 | 20.836 | |
| 4,700.0 | 4,695.5 | 4,686.3 | 4,683.0 | 8.8 | 8.7 | -157.43 | -72.6 | 169.6 | 344.9 | 328.4 | 16.52 | 20.875 | |
| 4,800.0 | 4,795.4 | 4,786.0 | 4,782.6 | 9.0 | 8.8 | -157.44 | -74.4 | 173.2 | 353.0 | 336.1 | 16.88 | 20.914 | |
| 4,900.0 | 4,895.3 | 4,885.7 | 4,882.2 | 9.2 | 9.0 | -157.45 | -76.1 | 176.8 | 361.0 | 343.8 | 17.23 | 20.950 | |
| 5,000.0 | 4,995.2 | 4,985.3 | 4,981.8 | 9.4 | 9.2 | -157.45 | -77.9 | 180.5 | 369.0 | 351.4 | 17.58 | 20.985 | |
| 5,100.0 | 5,095.1 | 5,085.0 | 5,081.4 | 9.6 | 9.4 | -157.46 | -79.7 | 184.1 | 377.0 | 359.1 | 17.94 | 21.019 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - Kugel 1G-18H-H267 - Hz - Plan #1

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,200.0 | 5,194.9 | 5,184.7 | 5,181.0 | 9.8 | 9.6 | -157.47 | -81.5 | 187.7 | 385.1 | 366.8 | 18.29 | 21.052 | |
| 5,300.0 | 5,294.8 | 5,284.4 | 5,280.6 | 10.0 | 9.8 | -157.48 | -83.3 | 191.3 | 393.1 | 374.5 | 18.65 | 21.083 | |
| 5,400.0 | 5,394.7 | 5,384.1 | 5,380.2 | 10.2 | 10.0 | -157.48 | -85.0 | 194.9 | 401.1 | 382.1 | 19.00 | 21.113 | |
| 5,500.0 | 5,494.6 | 5,483.7 | 5,479.8 | 10.4 | 10.2 | -157.49 | -86.8 | 198.5 | 409.2 | 389.8 | 19.35 | 21.142 | |
| 5,600.0 | 5,594.5 | 5,583.4 | 5,579.4 | 10.6 | 10.3 | -157.50 | -88.6 | 202.1 | 417.2 | 397.5 | 19.71 | 21.170 | |
| 5,700.0 | 5,694.4 | 5,683.1 | 5,679.0 | 10.8 | 10.5 | -157.50 | -90.4 | 205.7 | 425.2 | 405.2 | 20.06 | 21.197 | |
| 5,800.0 | 5,794.3 | 5,782.8 | 5,778.6 | 11.0 | 10.7 | -157.51 | -92.1 | 209.3 | 433.3 | 412.8 | 20.41 | 21.223 | |
| 5,900.0 | 5,894.1 | 5,882.4 | 5,878.2 | 11.2 | 10.9 | -157.51 | -93.9 | 212.9 | 441.3 | 420.5 | 20.77 | 21.248 | |
| 6,000.0 | 5,994.0 | 5,982.1 | 5,977.8 | 11.4 | 11.1 | -157.52 | -95.7 | 216.5 | 449.3 | 428.2 | 21.12 | 21.272 | |
| 6,100.0 | 6,093.9 | 6,081.8 | 6,077.4 | 11.5 | 11.3 | -157.52 | -97.5 | 220.1 | 457.3 | 435.9 | 21.48 | 21.295 | |
| 6,200.0 | 6,193.8 | 6,181.5 | 6,177.0 | 11.7 | 11.5 | -157.53 | -99.2 | 223.7 | 465.4 | 443.5 | 21.83 | 21.318 | |
| 6,300.0 | 6,293.7 | 6,281.2 | 6,276.6 | 11.9 | 11.7 | -157.53 | -101.0 | 227.3 | 473.4 | 451.2 | 22.18 | 21.340 | |
| 6,400.0 | 6,393.6 | 6,380.8 | 6,376.2 | 12.1 | 11.8 | -157.54 | -102.8 | 230.9 | 481.4 | 458.9 | 22.54 | 21.361 | |
| 6,500.0 | 6,493.5 | 6,480.5 | 6,475.8 | 12.3 | 12.0 | -157.54 | -104.6 | 234.5 | 489.5 | 466.6 | 22.89 | 21.382 | |
| 6,600.0 | 6,593.3 | 6,580.2 | 6,575.4 | 12.5 | 12.2 | -157.55 | -106.4 | 238.2 | 497.5 | 474.2 | 23.24 | 21.402 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - KUGEL 2-18 (EXISTING) - ENCANA WELL - NO SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 8060-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7,500.0 | 7,398.7 | 7,388.7 | 7,388.7 | 14.4 | 12.9 | -37.83 | 588.7 | -497.1 | 476.8 | 454.8 | 21.99 | 21.685 | |
| 7,600.0 | 7,444.1 | 7,434.1 | 7,434.1 | 15.0 | 13.0 | -54.69 | 588.7 | -497.1 | 396.2 | 372.1 | 24.13 | 16.421 | |
| 7,700.0 | 7,473.4 | 7,463.4 | 7,463.4 | 15.8 | 13.0 | -74.31 | 588.7 | -497.1 | 315.2 | 288.0 | 27.19 | 11.594 | |
| 7,800.0 | 7,485.6 | 7,475.6 | 7,475.6 | 16.7 | 13.0 | -88.34 | 588.7 | -497.1 | 243.3 | 214.4 | 28.89 | 8.421 | |
| 7,900.0 | 7,486.0 | 7,476.0 | 7,476.0 | 17.7 | 13.0 | -90.00 | 588.7 | -497.1 | 196.9 | 166.9 | 30.00 | 6.564 | |
| 7,952.1 | 7,486.0 | 7,476.0 | 7,476.0 | 18.3 | 13.0 | -90.00 | 588.7 | -497.1 | 189.9 | 159.3 | 30.62 | 6.200 | CC, ES, SF |
| 8,000.0 | 7,486.0 | 7,476.0 | 7,476.0 | 18.9 | 13.0 | -90.00 | 588.7 | -497.1 | 195.8 | 164.6 | 31.20 | 6.276 | |
| 8,100.0 | 7,486.0 | 7,476.0 | 7,476.0 | 20.1 | 13.0 | -90.00 | 588.7 | -497.1 | 240.7 | 208.2 | 32.49 | 7.407 | |
| 8,200.0 | 7,486.0 | 7,476.0 | 7,476.0 | 21.5 | 13.0 | -90.00 | 588.7 | -497.1 | 312.3 | 278.4 | 33.85 | 9.224 | |
| 8,300.0 | 7,486.0 | 7,476.0 | 7,476.0 | 22.8 | 13.0 | -90.00 | 588.7 | -497.1 | 396.3 | 361.1 | 35.27 | 11.238 | |
| 8,400.0 | 7,486.0 | 7,476.0 | 7,476.0 | 24.3 | 13.0 | -90.00 | 588.7 | -497.1 | 486.5 | 449.8 | 36.73 | 13.245 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - KUGEL 41-18 (EXISTING) - ENCANA WELL - ENCANA WELL

**Offset Site Error:** 0.0 ft

**Survey Program:** 8020-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8,800.0 | 7,486.0 | 7,451.0 | 7,451.0 | 30.3 | 13.0 | 90.00 | 1,722.3 | 29.6 | 448.2 | 405.4 | 42.84 | 10.462 | |
| 8,900.0 | 7,486.0 | 7,451.0 | 7,451.0 | 31.9 | 13.0 | 90.00 | 1,722.3 | 29.6 | 393.8 | 349.3 | 44.44 | 8.861 | |
| 9,000.0 | 7,486.0 | 7,451.0 | 7,451.0 | 33.5 | 13.0 | 90.00 | 1,722.3 | 29.6 | 359.5 | 313.4 | 46.05 | 7.806 | |
| 9,079.2 | 7,486.0 | 7,451.0 | 7,451.0 | 34.7 | 13.0 | 90.00 | 1,722.3 | 29.6 | 350.6 | 303.3 | 47.34 | 7.407 | CC, ES |
| 9,100.0 | 7,486.0 | 7,451.0 | 7,451.0 | 35.1 | 13.0 | 90.00 | 1,722.3 | 29.6 | 351.3 | 303.6 | 47.68 | 7.367 | SF |
| 9,200.0 | 7,486.0 | 7,451.0 | 7,451.0 | 36.7 | 13.0 | 90.00 | 1,722.3 | 29.6 | 370.9 | 321.5 | 49.32 | 7.520 | |
| 9,300.0 | 7,486.0 | 7,451.0 | 7,451.0 | 38.3 | 13.0 | 90.00 | 1,722.3 | 29.6 | 414.4 | 363.4 | 50.96 | 8.130 | |
| 9,400.0 | 7,486.0 | 7,451.0 | 7,451.0 | 40.0 | 13.0 | 90.00 | 1,722.3 | 29.6 | 475.2 | 422.6 | 52.62 | 9.031 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - KUGEL 42-18 (EXISTING) - ENCANA WELL - NO SURVEYS — **Offset Site Error:** 0.0 ft

**Survey Program:** 8095-Geolink MWD — **Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 74.69 | 12.8 | 46.7 | 49.9 | | | | |
| 100.0 | 100.0 | 88.0 | 88.0 | 0.2 | 0.2 | 74.69 | 12.8 | 46.7 | 48.4 | 48.1 | 0.31 | 158.385 | |
| 200.0 | 200.0 | 188.0 | 188.0 | 0.3 | 0.3 | 74.69 | 12.8 | 46.7 | 48.4 | 47.8 | 0.65 | 73.939 | |
| 300.0 | 300.0 | 288.0 | 288.0 | 0.5 | 0.5 | 74.69 | 12.8 | 46.7 | 48.4 | 47.4 | 1.00 | 48.226 | |
| 400.0 | 400.0 | 388.0 | 388.0 | 0.7 | 0.7 | 74.69 | 12.8 | 46.7 | 48.4 | 47.1 | 1.35 | 35.782 | |
| 500.0 | 500.0 | 488.0 | 488.0 | 0.8 | 0.9 | 74.69 | 12.8 | 46.7 | 48.4 | 46.7 | 1.70 | 28.443 | |
| 600.0 | 600.0 | 588.0 | 588.0 | 1.0 | 1.0 | 74.69 | 12.8 | 46.7 | 48.4 | 46.4 | 2.05 | 23.602 | CC, ES |
| 700.0 | 700.0 | 688.0 | 688.0 | 1.2 | 1.2 | -172.94 | 12.8 | 46.7 | 49.3 | 46.9 | 2.40 | 20.532 | |
| 800.0 | 800.0 | 788.0 | 788.0 | 1.4 | 1.4 | -173.29 | 12.8 | 46.7 | 51.9 | 49.1 | 2.75 | 18.876 | |
| 900.0 | 899.9 | 887.9 | 887.9 | 1.6 | 1.5 | -173.80 | 12.8 | 46.7 | 56.1 | 53.1 | 3.10 | 18.135 | |
| 1,000.0 | 999.8 | 987.8 | 987.8 | 1.7 | 1.7 | -174.29 | 12.8 | 46.7 | 60.9 | 57.5 | 3.44 | 17.679 | |
| 1,100.0 | 1,099.6 | 1,087.6 | 1,087.6 | 1.9 | 1.9 | -174.70 | 12.8 | 46.7 | 65.7 | 61.9 | 3.79 | 17.308 | |
| 1,200.0 | 1,199.5 | 1,187.5 | 1,187.5 | 2.1 | 2.1 | -175.06 | 12.8 | 46.7 | 70.4 | 66.3 | 4.14 | 17.000 | |
| 1,300.0 | 1,299.4 | 1,287.4 | 1,287.4 | 2.3 | 2.2 | -175.37 | 12.8 | 46.7 | 75.2 | 70.7 | 4.49 | 16.740 | |
| 1,400.0 | 1,399.3 | 1,387.3 | 1,387.3 | 2.5 | 2.4 | -175.65 | 12.8 | 46.7 | 80.0 | 75.1 | 4.84 | 16.519 | |
| 1,500.0 | 1,499.2 | 1,487.2 | 1,487.2 | 2.7 | 2.6 | -175.90 | 12.8 | 46.7 | 84.7 | 79.5 | 5.19 | 16.327 | |
| 1,600.0 | 1,599.1 | 1,587.1 | 1,587.1 | 2.9 | 2.8 | -176.11 | 12.8 | 46.7 | 89.5 | 84.0 | 5.54 | 16.160 | |
| 1,700.0 | 1,699.0 | 1,687.0 | 1,687.0 | 3.1 | 2.9 | -176.31 | 12.8 | 46.7 | 94.3 | 88.4 | 5.89 | 16.013 | |
| 1,800.0 | 1,798.8 | 1,786.8 | 1,786.8 | 3.3 | 3.1 | -176.49 | 12.8 | 46.7 | 99.0 | 92.8 | 6.24 | 15.882 | |
| 1,900.0 | 1,898.7 | 1,886.7 | 1,886.7 | 3.4 | 3.3 | -176.65 | 12.8 | 46.7 | 103.8 | 97.2 | 6.58 | 15.766 | |
| 2,000.0 | 1,998.6 | 1,986.6 | 1,986.6 | 3.6 | 3.5 | -176.80 | 12.8 | 46.7 | 108.6 | 101.7 | 6.93 | 15.661 | |
| 2,100.0 | 2,098.5 | 2,086.5 | 2,086.5 | 3.8 | 3.6 | -176.93 | 12.8 | 46.7 | 113.4 | 106.1 | 7.28 | 15.567 | |
| 2,200.0 | 2,198.4 | 2,186.4 | 2,186.4 | 4.0 | 3.8 | -177.06 | 12.8 | 46.7 | 118.1 | 110.5 | 7.63 | 15.481 | |
| 2,300.0 | 2,298.3 | 2,286.3 | 2,286.3 | 4.2 | 4.0 | -177.17 | 12.8 | 46.7 | 122.9 | 114.9 | 7.98 | 15.403 | |
| 2,400.0 | 2,398.2 | 2,386.2 | 2,386.2 | 4.4 | 4.2 | -177.28 | 12.8 | 46.7 | 127.7 | 119.4 | 8.33 | 15.331 | |
| 2,500.0 | 2,498.0 | 2,486.0 | 2,486.0 | 4.6 | 4.3 | -177.38 | 12.8 | 46.7 | 132.5 | 123.8 | 8.68 | 15.265 | |
| 2,600.0 | 2,597.9 | 2,585.9 | 2,585.9 | 4.8 | 4.5 | -177.47 | 12.8 | 46.7 | 137.2 | 128.2 | 9.03 | 15.205 | |
| 2,700.0 | 2,697.8 | 2,685.8 | 2,685.8 | 5.0 | 4.7 | -177.55 | 12.8 | 46.7 | 142.0 | 132.6 | 9.37 | 15.149 | |
| 2,800.0 | 2,797.7 | 2,785.7 | 2,785.7 | 5.2 | 4.9 | -177.63 | 12.8 | 46.7 | 146.8 | 137.1 | 9.72 | 15.096 | |
| 2,900.0 | 2,897.6 | 2,885.6 | 2,885.6 | 5.4 | 5.0 | -177.71 | 12.8 | 46.7 | 151.6 | 141.5 | 10.07 | 15.048 | |
| 3,000.0 | 2,997.5 | 2,985.5 | 2,985.5 | 5.6 | 5.2 | -177.78 | 12.8 | 46.7 | 156.3 | 145.9 | 10.42 | 15.003 | |
| 3,100.0 | 3,097.3 | 3,085.3 | 3,085.3 | 5.8 | 5.4 | -177.84 | 12.8 | 46.7 | 161.1 | 150.4 | 10.77 | 14.961 | |
| 3,200.0 | 3,197.2 | 3,185.2 | 3,185.2 | 5.9 | 5.6 | -177.91 | 12.8 | 46.7 | 165.9 | 154.8 | 11.12 | 14.921 | |
| 3,300.0 | 3,297.1 | 3,285.1 | 3,285.1 | 6.1 | 5.7 | -177.96 | 12.8 | 46.7 | 170.7 | 159.2 | 11.47 | 14.884 | |
| 3,400.0 | 3,397.0 | 3,385.0 | 3,385.0 | 6.3 | 5.9 | -178.02 | 12.8 | 46.7 | 175.5 | 163.6 | 11.82 | 14.849 | |
| 3,500.0 | 3,496.9 | 3,484.9 | 3,484.9 | 6.5 | 6.1 | -178.07 | 12.8 | 46.7 | 180.2 | 168.1 | 12.17 | 14.816 | |
| 3,600.0 | 3,596.8 | 3,584.8 | 3,584.8 | 6.7 | 6.3 | -178.12 | 12.8 | 46.7 | 185.0 | 172.5 | 12.51 | 14.785 | |
| 3,700.0 | 3,696.7 | 3,684.7 | 3,684.7 | 6.9 | 6.4 | -178.17 | 12.8 | 46.7 | 189.8 | 176.9 | 12.86 | 14.756 | |
| 3,800.0 | 3,796.5 | 3,784.5 | 3,784.5 | 7.1 | 6.6 | -178.21 | 12.8 | 46.7 | 194.6 | 181.4 | 13.21 | 14.728 | |
| 3,900.0 | 3,896.4 | 3,884.4 | 3,884.4 | 7.3 | 6.8 | -178.26 | 12.8 | 46.7 | 199.4 | 185.8 | 13.56 | 14.702 | |
| 4,000.0 | 3,996.3 | 3,984.3 | 3,984.3 | 7.5 | 7.0 | -178.30 | 12.8 | 46.7 | 204.1 | 190.2 | 13.91 | 14.676 | |
| 4,100.0 | 4,096.2 | 4,084.2 | 4,084.2 | 7.7 | 7.1 | -178.34 | 12.8 | 46.7 | 208.9 | 194.7 | 14.26 | 14.653 | |
| 4,200.0 | 4,196.1 | 4,184.1 | 4,184.1 | 7.9 | 7.3 | -178.37 | 12.8 | 46.7 | 213.7 | 199.1 | 14.61 | 14.630 | |
| 4,300.0 | 4,296.0 | 4,284.0 | 4,284.0 | 8.1 | 7.5 | -178.41 | 12.8 | 46.7 | 218.5 | 203.5 | 14.96 | 14.608 | |
| 4,400.0 | 4,395.9 | 4,383.9 | 4,383.9 | 8.3 | 7.7 | -178.44 | 12.8 | 46.7 | 223.3 | 207.9 | 15.30 | 14.588 | |
| 4,500.0 | 4,495.7 | 4,483.7 | 4,483.7 | 8.5 | 7.8 | -178.48 | 12.8 | 46.7 | 228.0 | 212.4 | 15.65 | 14.568 | |
| 4,600.0 | 4,595.6 | 4,583.6 | 4,583.6 | 8.6 | 8.0 | -178.51 | 12.8 | 46.7 | 232.8 | 216.8 | 16.00 | 14.549 | |
| 4,700.0 | 4,695.5 | 4,683.5 | 4,683.5 | 8.8 | 8.2 | -178.54 | 12.8 | 46.7 | 237.6 | 221.2 | 16.35 | 14.531 | |
| 4,800.0 | 4,795.4 | 4,783.4 | 4,783.4 | 9.0 | 8.3 | -178.57 | 12.8 | 46.7 | 242.4 | 225.7 | 16.70 | 14.514 | |
| 4,900.0 | 4,895.3 | 4,883.3 | 4,883.3 | 9.2 | 8.5 | -178.59 | 12.8 | 46.7 | 247.2 | 230.1 | 17.05 | 14.497 | |
| 5,000.0 | 4,995.2 | 4,983.2 | 4,983.2 | 9.4 | 8.7 | -178.62 | 12.8 | 46.7 | 251.9 | 234.5 | 17.40 | 14.482 | |
| 5,100.0 | 5,095.1 | 5,083.1 | 5,083.1 | 9.6 | 8.9 | -178.65 | 12.8 | 46.7 | 256.7 | 239.0 | 17.75 | 14.466 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - KUGEL 42-18 (EXISTING) - ENCANA WELL - NO SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 8095-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,200.0 | 5,194.9 | 5,182.9 | 5,182.9 | 9.8 | 9.0 | -178.67 | 12.8 | 46.7 | 261.5 | 243.4 | 18.09 | 14.452 | |
| 5,300.0 | 5,294.8 | 5,282.8 | 5,282.8 | 10.0 | 9.2 | -178.69 | 12.8 | 46.7 | 266.3 | 247.8 | 18.44 | 14.438 | |
| 5,400.0 | 5,394.7 | 5,382.7 | 5,382.7 | 10.2 | 9.4 | -178.72 | 12.8 | 46.7 | 271.1 | 252.3 | 18.79 | 14.424 | |
| 5,500.0 | 5,494.6 | 5,482.6 | 5,482.6 | 10.4 | 9.6 | -178.74 | 12.8 | 46.7 | 275.8 | 256.7 | 19.14 | 14.411 | |
| 5,600.0 | 5,594.5 | 5,582.5 | 5,582.5 | 10.6 | 9.7 | -178.76 | 12.8 | 46.7 | 280.6 | 261.1 | 19.49 | 14.398 | |
| 5,700.0 | 5,694.4 | 5,682.4 | 5,682.4 | 10.8 | 9.9 | -178.78 | 12.8 | 46.7 | 285.4 | 265.6 | 19.84 | 14.386 | |
| 5,800.0 | 5,794.3 | 5,782.3 | 5,782.3 | 11.0 | 10.1 | -178.80 | 12.8 | 46.7 | 290.2 | 270.0 | 20.19 | 14.374 | |
| 5,900.0 | 5,894.1 | 5,882.1 | 5,882.1 | 11.2 | 10.3 | -178.82 | 12.8 | 46.7 | 295.0 | 274.4 | 20.54 | 14.363 | |
| 6,000.0 | 5,994.0 | 5,982.0 | 5,982.0 | 11.4 | 10.4 | -178.84 | 12.8 | 46.7 | 299.7 | 278.9 | 20.88 | 14.352 | |
| 6,100.0 | 6,093.9 | 6,081.9 | 6,081.9 | 11.5 | 10.6 | -178.86 | 12.8 | 46.7 | 304.5 | 283.3 | 21.23 | 14.341 | |
| 6,200.0 | 6,193.8 | 6,181.8 | 6,181.8 | 11.7 | 10.8 | -178.88 | 12.8 | 46.7 | 309.3 | 287.7 | 21.58 | 14.331 | |
| 6,300.0 | 6,293.7 | 6,281.7 | 6,281.7 | 11.9 | 11.0 | -178.89 | 12.8 | 46.7 | 314.1 | 292.1 | 21.93 | 14.321 | |
| 6,400.0 | 6,393.6 | 6,381.6 | 6,381.6 | 12.1 | 11.1 | -178.91 | 12.8 | 46.7 | 318.9 | 296.6 | 22.28 | 14.312 | |
| 6,500.0 | 6,493.5 | 6,481.5 | 6,481.5 | 12.3 | 11.3 | -178.93 | 12.8 | 46.7 | 323.6 | 301.0 | 22.63 | 14.302 | |
| 6,600.0 | 6,593.3 | 6,581.3 | 6,581.3 | 12.5 | 11.5 | -178.94 | 12.8 | 46.7 | 328.4 | 305.4 | 22.98 | 14.293 | |
| 6,700.0 | 6,693.2 | 6,681.2 | 6,681.2 | 12.7 | 11.7 | -178.96 | 12.8 | 46.7 | 333.2 | 309.9 | 23.33 | 14.284 | |
| 6,800.0 | 6,793.1 | 6,781.1 | 6,781.1 | 12.9 | 11.8 | -178.97 | 12.8 | 46.7 | 338.0 | 314.3 | 23.67 | 14.276 | |
| 6,900.0 | 6,893.0 | 6,881.0 | 6,881.0 | 13.1 | 12.0 | -178.99 | 12.8 | 46.7 | 342.8 | 318.7 | 24.02 | 14.268 | |
| 7,000.0 | 6,992.6 | 6,980.6 | 6,980.6 | 13.3 | 12.2 | 87.97 | 12.8 | 46.7 | 345.1 | 320.7 | 24.37 | 14.160 | |
| 7,100.0 | 7,089.9 | 7,077.9 | 7,077.9 | 13.4 | 12.4 | 82.26 | 12.8 | 46.7 | 342.4 | 317.7 | 24.69 | 13.868 | |
| 7,200.0 | 7,181.8 | 7,169.8 | 7,169.8 | 13.5 | 12.5 | 85.93 | 12.8 | 46.7 | 337.8 | 312.8 | 25.03 | 13.495 | |
| 7,264.4 | 7,236.8 | 7,224.8 | 7,224.8 | 13.6 | 12.6 | 90.00 | 12.8 | 46.7 | 336.4 | 311.2 | 25.28 | 13.310 | |
| 7,300.0 | 7,265.5 | 7,253.5 | 7,253.5 | 13.7 | 12.7 | 92.46 | 12.8 | 46.7 | 337.0 | 311.6 | 25.39 | 13.274 | SF |
| 7,400.0 | 7,338.6 | 7,326.6 | 7,326.6 | 14.0 | 12.8 | 99.11 | 12.8 | 46.7 | 346.8 | 321.2 | 25.67 | 13.513 | |
| 7,500.0 | 7,398.7 | 7,386.7 | 7,386.7 | 14.4 | 12.9 | 103.76 | 12.8 | 46.7 | 373.1 | 347.2 | 25.92 | 14.393 | |
| 7,600.0 | 7,444.1 | 7,432.1 | 7,432.1 | 15.0 | 13.0 | 104.93 | 12.8 | 46.7 | 417.9 | 391.4 | 26.44 | 15.803 | |
| 7,700.0 | 7,473.4 | 7,461.4 | 7,461.4 | 15.8 | 13.0 | 101.51 | 12.8 | 46.7 | 479.2 | 451.7 | 27.51 | 17.421 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - MILLER 12-17 (EXISTING) - ENCANA WELL - SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 825-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 84.79 | 6.2 | 68.2 | 70.6 | | | | |
| 100.0 | 100.0 | 83.2 | 83.2 | 0.2 | 0.2 | 84.95 | 6.0 | 68.1 | 68.4 | 68.1 | 0.30 | 229.481 | |
| 200.0 | 200.0 | 183.4 | 183.4 | 0.3 | 0.4 | 85.57 | 5.2 | 67.7 | 67.9 | 67.3 | 0.65 | 104.780 | |
| 300.0 | 300.0 | 283.7 | 283.6 | 0.5 | 0.6 | 86.68 | 3.9 | 67.0 | 67.1 | 66.1 | 1.00 | 67.252 | |
| 400.0 | 400.0 | 383.9 | 383.8 | 0.7 | 0.8 | 88.32 | 1.9 | 66.0 | 66.0 | 64.7 | 1.35 | 49.000 | |
| 500.0 | 500.0 | 484.0 | 483.9 | 0.8 | 1.0 | 90.52 | -0.6 | 64.7 | 64.7 | 63.0 | 1.70 | 38.129 | |
| 600.0 | 600.0 | 584.1 | 584.0 | 1.0 | 1.2 | 93.35 | -3.7 | 63.0 | 63.2 | 61.1 | 2.04 | 30.885 | |
| 700.0 | 700.0 | 684.2 | 684.0 | 1.2 | 1.4 | -151.02 | -7.4 | 61.1 | 62.3 | 59.8 | 2.54 | 24.567 | |
| 706.1 | 706.1 | 690.4 | 690.1 | 1.2 | 1.4 | -150.83 | -7.6 | 61.0 | 62.3 | 59.8 | 2.56 | 24.345 | CC, ES |
| 800.0 | 800.0 | 784.3 | 784.0 | 1.4 | 1.6 | -148.07 | -11.7 | 58.9 | 63.0 | 60.0 | 2.91 | 21.613 | |
| 900.0 | 899.9 | 884.2 | 883.7 | 1.6 | 1.8 | -145.51 | -16.5 | 56.4 | 65.0 | 61.7 | 3.29 | 19.754 | |
| 1,000.0 | 999.8 | 984.1 | 983.5 | 1.7 | 1.9 | -143.64 | -21.0 | 54.1 | 67.7 | 64.1 | 3.66 | 18.483 | |
| 1,100.0 | 1,099.6 | 1,084.0 | 1,083.3 | 1.9 | 2.1 | -142.15 | -25.3 | 52.0 | 70.6 | 66.5 | 4.04 | 17.477 | |
| 1,200.0 | 1,199.5 | 1,185.2 | 1,184.3 | 2.1 | 2.3 | -141.24 | -28.9 | 49.4 | 72.8 | 68.4 | 4.40 | 16.558 | |
| 1,300.0 | 1,299.4 | 1,286.7 | 1,285.7 | 2.3 | 2.5 | -141.61 | -30.3 | 45.2 | 73.0 | 68.2 | 4.75 | 15.377 | |
| 1,349.2 | 1,348.6 | 1,335.3 | 1,334.3 | 2.4 | 2.6 | -142.30 | -30.3 | 43.1 | 72.8 | 67.9 | 4.90 | 14.849 | |
| 1,400.0 | 1,399.3 | 1,385.4 | 1,384.4 | 2.5 | 2.6 | -143.46 | -29.9 | 41.5 | 73.0 | 68.0 | 5.06 | 14.435 | |
| 1,500.0 | 1,499.2 | 1,483.9 | 1,482.9 | 2.7 | 2.8 | -146.95 | -27.7 | 40.0 | 75.0 | 69.6 | 5.36 | 13.985 | |
| 1,600.0 | 1,599.1 | 1,584.6 | 1,583.5 | 2.9 | 2.9 | -151.03 | -24.6 | 39.4 | 78.1 | 72.4 | 5.68 | 13.742 | |
| 1,700.0 | 1,699.0 | 1,684.2 | 1,683.1 | 3.1 | 3.1 | -153.83 | -22.7 | 37.4 | 80.1 | 74.1 | 6.01 | 13.318 | |
| 1,800.0 | 1,798.8 | 1,781.9 | 1,780.8 | 3.3 | 3.3 | -155.40 | -22.5 | 37.3 | 84.3 | 78.0 | 6.35 | 13.272 | SF |
| 1,900.0 | 1,898.7 | 1,880.3 | 1,879.2 | 3.4 | 3.4 | -155.88 | -23.8 | 39.6 | 91.1 | 84.4 | 6.70 | 13.591 | |
| 2,000.0 | 1,998.6 | 1,981.0 | 1,979.8 | 3.6 | 3.6 | -156.26 | -25.2 | 42.0 | 97.8 | 90.7 | 7.05 | 13.866 | |
| 2,100.0 | 2,098.5 | 2,082.2 | 2,081.0 | 3.8 | 3.8 | -156.86 | -26.1 | 43.2 | 103.4 | 96.0 | 7.40 | 13.973 | |
| 2,200.0 | 2,198.4 | 2,183.2 | 2,182.0 | 4.0 | 3.9 | -157.77 | -26.2 | 43.0 | 107.6 | 99.9 | 7.74 | 13.897 | |
| 2,300.0 | 2,298.3 | 2,282.2 | 2,281.0 | 4.2 | 4.1 | -159.16 | -25.3 | 42.8 | 111.9 | 103.8 | 8.07 | 13.861 | |
| 2,400.0 | 2,398.2 | 2,381.6 | 2,380.3 | 4.4 | 4.2 | -161.03 | -23.2 | 43.4 | 117.1 | 108.7 | 8.40 | 13.935 | |
| 2,500.0 | 2,498.0 | 2,481.7 | 2,480.4 | 4.6 | 4.4 | -163.13 | -20.2 | 44.0 | 122.5 | 113.8 | 8.74 | 14.023 | |
| 2,600.0 | 2,597.9 | 2,580.3 | 2,578.9 | 4.8 | 4.6 | -165.07 | -17.2 | 44.3 | 127.7 | 118.6 | 9.07 | 14.077 | |
| 2,700.0 | 2,697.8 | 2,676.1 | 2,674.7 | 5.0 | 4.7 | -165.84 | -16.2 | 47.1 | 135.4 | 126.0 | 9.41 | 14.382 | |
| 2,800.0 | 2,797.7 | 2,775.9 | 2,774.3 | 5.2 | 4.9 | -165.85 | -16.6 | 51.9 | 144.7 | 135.0 | 9.76 | 14.825 | |
| 2,900.0 | 2,897.6 | 2,876.7 | 2,875.1 | 5.4 | 5.1 | -165.98 | -16.9 | 56.0 | 153.3 | 143.2 | 10.11 | 15.162 | |
| 3,000.0 | 2,997.5 | 2,977.7 | 2,976.0 | 5.6 | 5.2 | -166.34 | -16.6 | 59.2 | 161.1 | 150.7 | 10.46 | 15.407 | |
| 3,100.0 | 3,097.3 | 3,078.7 | 3,077.0 | 5.8 | 5.4 | -166.93 | -15.6 | 61.5 | 168.2 | 157.4 | 10.81 | 15.565 | |
| 3,200.0 | 3,197.2 | 3,179.7 | 3,177.9 | 5.9 | 5.6 | -167.72 | -14.0 | 62.9 | 174.5 | 163.3 | 11.15 | 15.648 | |
| 3,300.0 | 3,297.1 | 3,280.2 | 3,278.5 | 6.1 | 5.8 | -168.42 | -12.7 | 63.8 | 180.3 | 168.8 | 11.50 | 15.677 | |
| 3,400.0 | 3,397.0 | 3,380.9 | 3,379.1 | 6.3 | 5.9 | -168.89 | -12.0 | 64.3 | 185.6 | 173.8 | 11.85 | 15.668 | |
| 3,500.0 | 3,496.9 | 3,481.5 | 3,479.8 | 6.5 | 6.1 | -169.14 | -12.1 | 64.6 | 190.6 | 178.4 | 12.20 | 15.624 | |
| 3,600.0 | 3,596.8 | 3,581.7 | 3,580.0 | 6.7 | 6.3 | -169.25 | -12.6 | 64.7 | 195.2 | 182.7 | 12.55 | 15.559 | |
| 3,700.0 | 3,696.7 | 3,681.9 | 3,680.2 | 6.9 | 6.5 | -169.23 | -13.6 | 64.7 | 199.8 | 186.9 | 12.90 | 15.485 | |
| 3,800.0 | 3,796.5 | 3,782.1 | 3,780.3 | 7.1 | 6.6 | -169.12 | -14.9 | 64.7 | 204.2 | 190.9 | 13.25 | 15.405 | |
| 3,900.0 | 3,896.4 | 3,882.2 | 3,880.5 | 7.3 | 6.8 | -168.93 | -16.5 | 64.5 | 208.4 | 194.8 | 13.61 | 15.317 | |
| 4,000.0 | 3,996.3 | 3,982.4 | 3,980.6 | 7.5 | 7.0 | -168.72 | -18.3 | 64.3 | 212.5 | 198.6 | 13.96 | 15.225 | |
| 4,100.0 | 4,096.2 | 4,082.6 | 4,080.8 | 7.7 | 7.2 | -168.47 | -20.3 | 64.0 | 216.5 | 202.2 | 14.31 | 15.129 | |
| 4,200.0 | 4,196.1 | 4,182.7 | 4,180.9 | 7.9 | 7.3 | -168.26 | -22.2 | 63.6 | 220.5 | 205.8 | 14.66 | 15.034 | |
| 4,300.0 | 4,296.0 | 4,282.8 | 4,281.0 | 8.1 | 7.5 | -168.18 | -23.6 | 63.0 | 224.3 | 209.3 | 15.01 | 14.939 | |
| 4,400.0 | 4,395.9 | 4,382.9 | 4,381.1 | 8.3 | 7.7 | -168.24 | -24.5 | 62.2 | 228.0 | 212.7 | 15.36 | 14.844 | |
| 4,500.0 | 4,495.7 | 4,483.4 | 4,481.5 | 8.5 | 7.9 | -168.42 | -24.9 | 61.3 | 231.7 | 216.0 | 15.71 | 14.748 | |
| 4,600.0 | 4,595.6 | 4,570.3 | 4,568.4 | 8.6 | 8.0 | -168.57 | -25.1 | 61.6 | 236.9 | 220.9 | 16.04 | 14.771 | |
| 4,700.0 | 4,695.5 | 4,653.5 | 4,651.4 | 8.8 | 8.2 | -168.80 | -23.6 | 68.1 | 249.5 | 233.2 | 16.36 | 15.256 | |
| 4,800.0 | 4,795.4 | 4,739.3 | 4,736.3 | 9.0 | 8.3 | -169.05 | -21.1 | 79.2 | 267.4 | 250.8 | 16.68 | 16.036 | |
| 4,900.0 | 4,895.3 | 4,823.2 | 4,818.9 | 9.2 | 8.5 | -168.81 | -19.9 | 94.5 | 290.2 | 273.2 | 17.00 | 17.070 | |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - MILLER 12-17 (EXISTING) - ENCANA WELL - SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 825-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,000.0 | 4,995.2 | 4,907.7 | 4,901.2 | 9.4 | 8.6 | -168.72 | -17.4 | 113.3 | 317.2 | 299.8 | 17.33 | 18.306 | |
| 5,100.0 | 5,095.1 | 4,989.3 | 4,980.0 | 9.6 | 8.8 | -168.71 | -14.0 | 134.4 | 347.8 | 330.1 | 17.64 | 19.714 | |
| 5,200.0 | 5,194.9 | 5,074.4 | 5,061.1 | 9.8 | 9.0 | -168.84 | -9.0 | 159.3 | 382.1 | 364.2 | 17.96 | 21.272 | |
| 5,300.0 | 5,294.8 | 5,157.5 | 5,139.8 | 10.0 | 9.2 | -168.65 | -5.7 | 185.9 | 418.6 | 400.3 | 18.28 | 22.893 | |
| 5,400.0 | 5,394.7 | 5,243.7 | 5,220.9 | 10.2 | 9.5 | -168.18 | -4.2 | 215.1 | 456.6 | 438.0 | 18.62 | 24.529 | |
| 5,500.0 | 5,494.6 | 5,333.2 | 5,304.9 | 10.4 | 9.8 | -167.70 | -3.1 | 246.1 | 495.3 | 476.3 | 18.95 | 26.133 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - WANDELL 1 (EXISTING) - ENCANA WELL - NO SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 7911-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13,500.0 | 7,486.0 | 7,416.0 | 7,416.0 | 110.3 | 12.9 | -90.00 | 6,569.1 | -426.8 | 436.2 | 313.3 | 122.89 | 3.550 | |
| 13,600.0 | 7,486.0 | 7,416.0 | 7,416.0 | 112.0 | 12.9 | -90.00 | 6,569.1 | -426.8 | 338.4 | 213.8 | 124.63 | 2.715 | |
| 13,700.0 | 7,486.0 | 7,416.0 | 7,416.0 | 113.8 | 12.9 | -90.00 | 6,569.1 | -426.8 | 242.3 | 115.9 | 126.37 | 1.917 | |
| 13,800.0 | 7,486.0 | 7,416.0 | 7,416.0 | 115.5 | 12.9 | -90.00 | 6,569.1 | -426.8 | 151.4 | 23.2 | 128.11 | 1.181 | Level 2 |
| 13,900.0 | 7,486.0 | 7,416.0 | 7,416.0 | 117.2 | 12.9 | -90.00 | 6,569.1 | -426.8 | 84.3 | -45.6 | 129.88 | 0.649 | Level 1 |
| 13,930.6 | 7,486.0 | 7,416.0 | 7,416.0 | 117.8 | 12.9 | -90.00 | 6,569.1 | -426.8 | 78.9 | -51.7 | 130.54 | 0.604 | Level 1, CC, ES, SF |
| 14,000.0 | 7,486.0 | 7,416.0 | 7,416.0 | 119.0 | 12.9 | -90.00 | 6,569.1 | -426.8 | 104.0 | -27.9 | 131.91 | 0.789 | Level 1 |
| 14,100.0 | 7,486.0 | 7,416.0 | 7,416.0 | 120.7 | 12.9 | -90.00 | 6,569.1 | -426.8 | 183.4 | 49.8 | 133.58 | 1.373 | Level 3 |
| 14,200.0 | 7,486.0 | 7,416.0 | 7,416.0 | 122.5 | 12.9 | -90.00 | 6,569.1 | -426.8 | 274.7 | 139.8 | 134.88 | 2.036 | |
| 14,300.0 | 7,486.0 | 7,416.0 | 7,416.0 | 124.2 | 12.9 | -90.00 | 6,569.1 | -426.8 | 369.0 | 233.2 | 135.82 | 2.717 | |
| 14,400.0 | 7,486.0 | 7,416.0 | 7,416.0 | 125.9 | 12.9 | -90.00 | 6,569.1 | -426.8 | 464.3 | 327.9 | 136.39 | 3.404 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - WANDELL 41-7 (EXISTING) - ENCANA WELL - SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 170-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14,200.0 | 7,486.0 | 7,486.4 | 7,415.9 | 122.5 | 18.2 | 89.72 | 7,070.9 | 38.8 | 468.8 | 331.9 | 136.91 | 3.424 | |
| 14,300.0 | 7,486.0 | 7,488.5 | 7,418.0 | 124.2 | 18.2 | 90.00 | 7,070.9 | 38.8 | 445.2 | 307.6 | 137.57 | 3.236 | |
| 14,336.6 | 7,486.0 | 7,489.3 | 7,418.8 | 124.8 | 18.2 | 90.10 | 7,070.9 | 38.8 | 443.3 | 305.6 | 137.71 | 3.219 | CC, ES, SF |
| 14,400.0 | 7,486.0 | 7,490.6 | 7,420.1 | 125.9 | 18.2 | 90.28 | 7,071.0 | 38.8 | 448.9 | 311.1 | 137.86 | 3.256 | |
| 14,469.5 | 7,486.0 | 7,492.1 | 7,421.6 | 127.1 | 18.2 | 90.47 | 7,071.0 | 38.8 | 467.4 | 329.1 | 138.29 | 3.380 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - WANDELL 42-7 (EXISTING) - ENCANA WELL - SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 370-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12,500.0 | 7,486.0 | 7,582.4 | 7,417.6 | 92.9 | 24.4 | 89.93 | 5,489.4 | -25.5 | 486.6 | 370.7 | 115.98 | 4.196 | |
| 12,600.0 | 7,486.0 | 7,582.5 | 7,417.8 | 94.7 | 24.4 | 89.96 | 5,489.4 | -25.5 | 421.3 | 303.6 | 117.72 | 3.579 | |
| 12,700.0 | 7,486.0 | 7,582.7 | 7,418.0 | 96.4 | 24.4 | 90.00 | 5,489.4 | -25.5 | 371.7 | 252.3 | 119.46 | 3.112 | |
| 12,800.0 | 7,486.0 | 7,582.9 | 7,418.2 | 98.1 | 24.4 | 90.03 | 5,489.4 | -25.5 | 344.7 | 223.5 | 121.20 | 2.844 | |
| 12,846.8 | 7,486.0 | 7,583.0 | 7,418.2 | 98.9 | 24.4 | 90.04 | 5,489.4 | -25.5 | 341.6 | 219.6 | 122.01 | 2.800 | CC, ES, SF |
| 12,900.0 | 7,486.0 | 7,583.1 | 7,418.3 | 99.9 | 24.4 | 90.06 | 5,489.4 | -25.5 | 345.7 | 222.8 | 122.93 | 2.812 | |
| 13,000.0 | 7,486.0 | 7,583.3 | 7,418.5 | 101.6 | 24.4 | 90.08 | 5,489.4 | -25.5 | 373.5 | 249.1 | 124.45 | 3.002 | |
| 13,100.0 | 7,486.0 | 7,583.4 | 7,418.7 | 103.3 | 24.4 | 90.11 | 5,489.4 | -25.5 | 422.3 | 296.4 | 125.96 | 3.353 | |
| 13,200.0 | 7,486.0 | 7,583.6 | 7,418.9 | 105.1 | 24.4 | 90.14 | 5,489.4 | -25.5 | 486.4 | 358.7 | 127.70 | 3.809 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - WANDELL 43-7 (EXISTING) - ENCANA WELL - PLAN ONLY

**Offset Site Error:** 0.0 ft

**Survey Program:** 0-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11,100.0 | 7,486.0 | 7,736.8 | 7,462.0 | 68.7 | 34.6 | 102.59 | 4,194.5 | -167.7 | 491.1 | 397.1 | 94.03 | 5.223 | |
| 11,200.0 | 7,486.0 | 7,723.9 | 7,449.4 | 70.5 | 34.5 | 98.86 | 4,196.3 | -169.2 | 400.3 | 303.5 | 96.82 | 4.135 | |
| 11,300.0 | 7,486.0 | 7,710.5 | 7,436.1 | 72.2 | 34.5 | 94.80 | 4,198.1 | -170.8 | 314.6 | 215.3 | 99.32 | 3.168 | |
| 11,400.0 | 7,486.0 | 7,696.3 | 7,422.2 | 73.9 | 34.5 | 90.39 | 4,200.2 | -172.5 | 239.5 | 138.1 | 101.37 | 2.362 | |
| 11,500.0 | 7,486.0 | 7,681.4 | 7,407.6 | 75.6 | 34.4 | 85.66 | 4,202.3 | -174.4 | 187.8 | 84.9 | 102.83 | 1.826 | |
| 11,563.0 | 7,486.0 | 7,671.5 | 7,397.9 | 76.7 | 34.4 | 82.52 | 4,203.8 | -175.7 | 177.1 | 73.8 | 103.36 | 1.714 | CC, ES, SF |
| 11,600.0 | 7,486.0 | 7,665.6 | 7,392.1 | 77.3 | 34.3 | 80.62 | 4,204.7 | -176.5 | 180.9 | 77.4 | 103.52 | 1.747 | |
| 11,700.0 | 7,486.0 | 7,649.0 | 7,375.8 | 79.1 | 34.3 | 75.34 | 4,207.3 | -178.7 | 222.9 | 119.6 | 103.32 | 2.157 | |
| 11,800.0 | 7,486.0 | 7,631.3 | 7,358.6 | 80.8 | 34.2 | 69.88 | 4,210.1 | -181.1 | 293.4 | 191.3 | 102.10 | 2.874 | |
| 11,900.0 | 7,486.0 | 7,612.7 | 7,340.4 | 82.5 | 34.1 | 64.32 | 4,213.1 | -183.8 | 376.7 | 276.9 | 99.85 | 3.773 | |
| 12,000.0 | 7,486.0 | 7,592.9 | 7,321.1 | 84.3 | 34.1 | 58.77 | 4,216.5 | -186.7 | 465.9 | 369.4 | 96.60 | 4.824 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - WANDELL 6-4-7 (EXISTING) - ENCANA WELL - SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 75-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11,900.0 | 7,486.0 | 7,806.8 | 7,418.0 | 82.5 | 36.0 | -90.00 | 4,739.4 | -757.1 | 449.1 | 330.9 | 118.15 | 3.801 | |
| 12,000.0 | 7,486.0 | 7,806.2 | 7,417.4 | 84.3 | 36.0 | -89.92 | 4,739.4 | -757.1 | 412.9 | 293.1 | 119.88 | 3.445 | |
| 12,100.0 | 7,486.0 | 7,805.6 | 7,416.8 | 86.0 | 36.0 | -89.83 | 4,739.4 | -757.1 | 399.2 | 277.6 | 121.62 | 3.283 | |
| 12,105.7 | 7,486.0 | 7,805.5 | 7,416.8 | 86.1 | 36.0 | -89.83 | 4,739.4 | -757.1 | 399.2 | 277.5 | 121.71 | 3.280 | CC, ES, SF |
| 12,200.0 | 7,486.0 | 7,805.0 | 7,416.2 | 87.7 | 36.0 | -89.75 | 4,739.4 | -757.1 | 410.2 | 286.8 | 123.35 | 3.325 | |
| 12,300.0 | 7,486.0 | 7,804.4 | 7,415.6 | 89.5 | 36.0 | -89.66 | 4,739.4 | -757.1 | 444.0 | 318.9 | 125.09 | 3.549 | |
| 12,400.0 | 7,486.0 | 7,803.8 | 7,415.0 | 91.2 | 36.0 | -89.57 | 4,739.4 | -757.1 | 496.0 | 369.1 | 126.82 | 3.911 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - WANDELL 6-8-7 (EXISTING) - ENCANA WELL - SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 78-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9,500.0 | 7,486.0 | 7,586.6 | 7,467.2 | 41.6 | 21.3 | -89.90 | 2,296.0 | -794.2 | 493.7 | 435.9 | 57.80 | 8.542 | |
| 9,600.0 | 7,486.0 | 7,587.3 | 7,467.8 | 43.3 | 21.3 | -89.98 | 2,296.0 | -794.2 | 470.3 | 410.9 | 59.48 | 7.908 | |
| 9,662.9 | 7,486.0 | 7,587.7 | 7,468.3 | 44.3 | 21.3 | -90.03 | 2,296.0 | -794.2 | 466.1 | 405.6 | 60.54 | 7.700 | CC, ES |
| 9,700.0 | 7,486.0 | 7,587.9 | 7,468.5 | 44.9 | 21.3 | -90.06 | 2,296.0 | -794.2 | 467.6 | 406.4 | 61.16 | 7.645 | SF |
| 9,800.0 | 7,486.0 | 7,588.6 | 7,469.2 | 46.6 | 21.3 | -90.14 | 2,296.0 | -794.2 | 485.9 | 423.0 | 62.84 | 7.731 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - WANDELL 8-2-7 (EXISTING) - ENCANA WELL - NO SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 8111-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13,600.0 | 7,486.0 | 7,418.0 | 7,418.0 | 112.0 | 12.9 | -90.00 | 6,650.0 | -567.4 | 463.1 | 338.5 | 124.63 | 3.716 | |
| 13,700.0 | 7,486.0 | 7,418.0 | 7,418.0 | 113.8 | 12.9 | -90.00 | 6,650.0 | -567.4 | 378.3 | 252.0 | 126.37 | 2.994 | |
| 13,800.0 | 7,486.0 | 7,418.0 | 7,418.0 | 115.5 | 12.9 | -90.00 | 6,650.0 | -567.4 | 303.0 | 174.9 | 128.12 | 2.365 | |
| 13,900.0 | 7,486.0 | 7,418.0 | 7,418.0 | 117.2 | 12.9 | -90.00 | 6,650.0 | -567.4 | 245.9 | 116.0 | 129.89 | 1.893 | |
| 14,000.0 | 7,486.0 | 7,418.0 | 7,418.0 | 119.0 | 12.9 | -90.00 | 6,650.0 | -567.4 | 218.6 | 86.7 | 131.91 | 1.657 | |
| 14,022.4 | 7,486.0 | 7,418.0 | 7,418.0 | 119.4 | 12.9 | -90.00 | 6,650.0 | -567.4 | 217.6 | 85.2 | 132.32 | 1.644 | CC, ES, SF |
| 14,100.0 | 7,486.0 | 7,418.0 | 7,418.0 | 120.7 | 12.9 | -90.00 | 6,650.0 | -567.4 | 229.4 | 95.8 | 133.58 | 1.717 | |
| 14,200.0 | 7,486.0 | 7,418.0 | 7,418.0 | 122.5 | 12.9 | -90.00 | 6,650.0 | -567.4 | 273.9 | 139.0 | 134.89 | 2.030 | |
| 14,300.0 | 7,486.0 | 7,418.0 | 7,418.0 | 124.2 | 12.9 | -90.00 | 6,650.0 | -567.4 | 338.9 | 203.0 | 135.82 | 2.495 | |
| 14,400.0 | 7,486.0 | 7,418.0 | 7,418.0 | 125.9 | 12.9 | -90.00 | 6,650.0 | -567.4 | 414.7 | 278.3 | 136.39 | 3.041 | |
| 14,469.5 | 7,486.0 | 7,418.0 | 7,418.0 | 127.1 | 12.9 | -90.00 | 6,650.0 | -567.4 | 471.1 | 334.2 | 136.95 | 3.440 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - WANDELL 8-4-7 (EXISTING) - ENCANA WELL - NO SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 7968-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13,600.0 | 7,486.0 | 7,419.0 | 7,419.0 | 112.0 | 12.9 | -90.00 | 6,630.0 | -562.4 | 443.0 | 318.4 | 124.63 | 3.555 | |
| 13,700.0 | 7,486.0 | 7,419.0 | 7,419.0 | 113.8 | 12.9 | -90.00 | 6,630.0 | -562.4 | 359.0 | 232.7 | 126.38 | 2.841 | |
| 13,800.0 | 7,486.0 | 7,419.0 | 7,419.0 | 115.5 | 12.9 | -90.00 | 6,630.0 | -562.4 | 285.6 | 157.5 | 128.12 | 2.229 | |
| 13,900.0 | 7,486.0 | 7,419.0 | 7,419.0 | 117.2 | 12.9 | -90.00 | 6,630.0 | -562.4 | 232.9 | 103.0 | 129.89 | 1.793 | |
| 13,999.4 | 7,486.0 | 7,419.0 | 7,419.0 | 119.0 | 12.9 | -90.00 | 6,630.0 | -562.4 | 213.4 | 81.5 | 131.90 | 1.618 | CC |
| 14,000.0 | 7,486.0 | 7,419.0 | 7,419.0 | 119.0 | 12.9 | -90.00 | 6,630.0 | -562.4 | 213.4 | 81.5 | 131.92 | 1.618 | ES, SF |
| 14,100.0 | 7,486.0 | 7,419.0 | 7,419.0 | 120.7 | 12.9 | -90.00 | 6,630.0 | -562.4 | 233.3 | 99.8 | 133.59 | 1.747 | |
| 14,200.0 | 7,486.0 | 7,419.0 | 7,419.0 | 122.5 | 12.9 | -90.00 | 6,630.0 | -562.4 | 284.5 | 149.6 | 134.89 | 2.109 | |
| 14,300.0 | 7,486.0 | 7,419.0 | 7,419.0 | 124.2 | 12.9 | -90.00 | 6,630.0 | -562.4 | 353.4 | 217.5 | 135.83 | 2.602 | |
| 14,400.0 | 7,486.0 | 7,419.0 | 7,419.0 | 125.9 | 12.9 | -90.00 | 6,630.0 | -562.4 | 431.5 | 295.1 | 136.39 | 3.163 | |
| 14,469.5 | 7,486.0 | 7,419.0 | 7,419.0 | 127.1 | 12.9 | -90.00 | 6,630.0 | -562.4 | 488.9 | 351.9 | 136.95 | 3.570 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - WANDELL E UNIT 1 (EXISTING) - ENCANA WELL - NO SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 7979-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,100.0 | 7,486.0 | 7,441.0 | 7,441.0 | 51.7 | 13.0 | -90.00 | 3,191.1 | -413.7 | 459.4 | 395.0 | 64.39 | 7.136 | |
| 10,200.0 | 7,486.0 | 7,441.0 | 7,441.0 | 53.4 | 13.0 | -90.00 | 3,191.1 | -413.7 | 361.1 | 295.0 | 66.09 | 5.464 | |
| 10,300.0 | 7,486.0 | 7,441.0 | 7,441.0 | 55.1 | 13.0 | -90.00 | 3,191.1 | -413.7 | 264.1 | 196.3 | 67.79 | 3.896 | |
| 10,400.0 | 7,486.0 | 7,441.0 | 7,441.0 | 56.8 | 13.0 | -90.00 | 3,191.1 | -413.7 | 170.6 | 101.1 | 69.50 | 2.454 | |
| 10,500.0 | 7,486.0 | 7,441.0 | 7,441.0 | 58.5 | 13.0 | -90.00 | 3,191.1 | -413.7 | 91.8 | 20.6 | 71.21 | 1.289 | Level 3 |
| 10,553.3 | 7,486.0 | 7,441.0 | 7,441.0 | 59.4 | 13.0 | -90.00 | 3,191.1 | -413.7 | 74.7 | 2.6 | 72.12 | 1.036 | Level 2, CC, ES, SF |
| 10,600.0 | 7,486.0 | 7,441.0 | 7,441.0 | 60.2 | 13.0 | -90.00 | 3,191.1 | -413.7 | 88.1 | 15.2 | 72.92 | 1.208 | Level 2 |
| 10,700.0 | 7,486.0 | 7,441.0 | 7,441.0 | 61.9 | 13.0 | -90.00 | 3,191.1 | -413.7 | 164.6 | 90.0 | 74.64 | 2.206 | |
| 10,800.0 | 7,486.0 | 7,441.0 | 7,441.0 | 63.6 | 13.0 | -90.00 | 3,191.1 | -413.7 | 257.8 | 181.4 | 76.36 | 3.376 | |
| 10,900.0 | 7,486.0 | 7,441.0 | 7,441.0 | 65.3 | 13.0 | -90.00 | 3,191.1 | -413.7 | 354.7 | 276.6 | 78.08 | 4.542 | |
| 11,000.0 | 7,486.0 | 7,441.0 | 7,441.0 | 67.0 | 13.0 | -90.00 | 3,191.1 | -413.7 | 452.9 | 373.1 | 79.80 | 5.676 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S18-T2N-R67W (Kugel) - WANDELL V 7-8 (EXISTING) - GERRITY OIL WELL - NO SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 8000-Geolink MWD

**Offset Well Error:** 0.0 ft

| Reference Measured Depth (ft) | Reference Vertical Depth (ft) | Offset Measured Depth (ft) | Offset Vertical Depth (ft) | Semi Major Axis Reference (ft) | Semi Major Axis Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Total Uncertainty Axis | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12,500.0 | 7,486.0 | 7,425.0 | 7,425.0 | 92.9 | 13.0 | 90.00 | 5,513.8 | -199.6 | 409.2 | 303.4 | 105.74 | 3.870 | |
| 12,600.0 | 7,486.0 | 7,425.0 | 7,425.0 | 94.7 | 13.0 | 90.00 | 5,513.8 | -199.6 | 320.6 | 213.1 | 107.47 | 2.983 | |
| 12,700.0 | 7,486.0 | 7,425.0 | 7,425.0 | 96.4 | 13.0 | 90.00 | 5,513.8 | -199.6 | 241.1 | 131.9 | 109.21 | 2.208 | |
| 12,800.0 | 7,486.0 | 7,425.0 | 7,425.0 | 98.1 | 13.0 | 90.00 | 5,513.8 | -199.6 | 183.0 | 72.1 | 110.95 | 1.650 | |
| 12,873.3 | 7,486.0 | 7,425.0 | 7,425.0 | 99.4 | 13.0 | 90.00 | 5,513.8 | -199.6 | 167.7 | 55.5 | 112.22 | 1.495 | Level 3, CC, ES, SF |
| 12,900.0 | 7,486.0 | 7,425.0 | 7,425.0 | 99.9 | 13.0 | 90.00 | 5,513.8 | -199.6 | 169.9 | 57.2 | 112.69 | 1.508 | |
| 13,000.0 | 7,486.0 | 7,425.0 | 7,425.0 | 101.6 | 13.0 | 90.00 | 5,513.8 | -199.6 | 209.5 | 95.2 | 114.32 | 1.833 | |
| 13,100.0 | 7,486.0 | 7,425.0 | 7,425.0 | 103.3 | 13.0 | 90.00 | 5,513.8 | -199.6 | 279.9 | 164.0 | 115.93 | 2.415 | |
| 13,200.0 | 7,486.0 | 7,425.0 | 7,425.0 | 105.1 | 13.0 | 90.00 | 5,513.8 | -199.6 | 364.1 | 246.4 | 117.67 | 3.094 | |
| 13,300.0 | 7,486.0 | 7,425.0 | 7,425.0 | 106.8 | 13.0 | 90.00 | 5,513.8 | -199.6 | 454.7 | 335.3 | 119.42 | 3.807 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Kugel 1E-18H-H267 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Reference Site:** | S18-T2N-R67W (Kugel) | **MD Reference:** | WELL @ 4960.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Kugel 1E-18H-H267 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.0ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Hz | **Database:** | USA EDM 5000 Multi Users DB |
| **Reference Design:** | Plan #2 | **Offset TVD Reference:** | Offset Datum |

Reference Depths are relative to WELL @ 4960.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Kugel 1E-18H-H267
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.37°