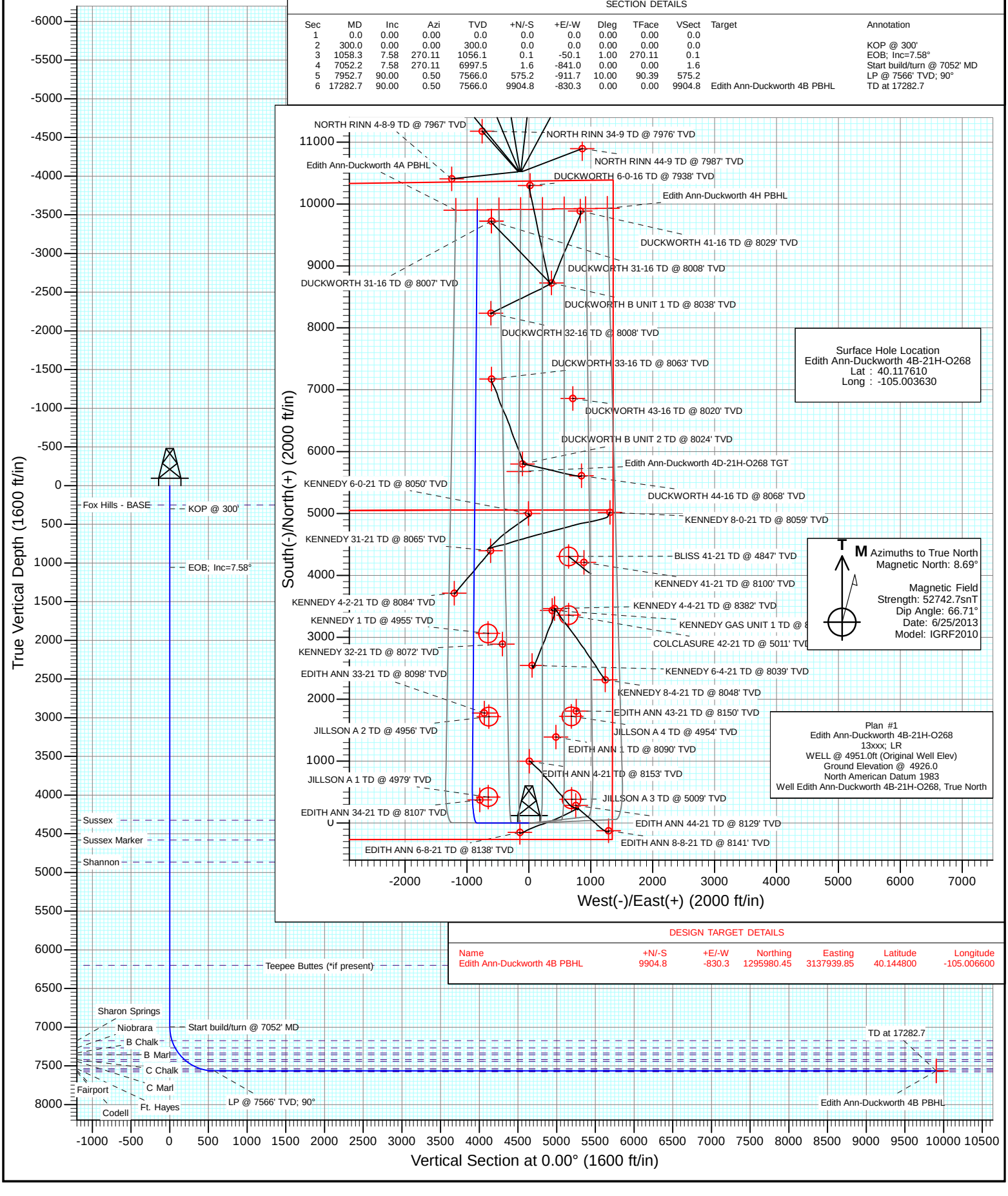
encana

Project: DJ Wattenberg
Site: S21-T2N-R68W (Edith Ann-Duckworth)
Well: Edith Ann-Duckworth 4B-21H-O268
Vellbore: Hz
Design: Plan #1

CATHEDRAL

SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target | Annotation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | | |
| 2 | 300.0 | 0.00 | 0.00 | 300.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | | KOP @ 300' |
| 3 | 1058.3 | 7.58 | 270.11 | 1056.1 | 0.1 | -50.1 | 1.00 | 270.11 | 0.1 | | EOB; Inc=7.58° |
| 4 | 7052.2 | 7.58 | 270.11 | 6997.5 | 1.6 | -841.0 | 0.00 | 0.00 | 1.6 | | Start build/turn @ 7052' MD |
| 5 | 7952.7 | 90.00 | 0.50 | 7566.0 | 575.2 | -911.7 | 10.00 | 90.39 | 575.2 | | LP @ 7566' TVD; 90° |
| 6 | 17282.7 | 90.00 | 0.50 | 7566.0 | 9904.8 | -830.3 | 0.00 | 0.00 | 9904.8 | Edith Ann-Duckworth 4B PBHL | TD at 17282.7 |




DESIGN TARGET DETAILS

| Name | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|---|---|
| Edith Ann-Duckworth 4B PBHL | 9904.8 | -830.3 | 1295980.45 | 3137939.85 | 40.144800 | -105.006600 |

# Planning Report

| | | | |
|---|---|---|---|
| **Database:** | USA EDM 5000 Multi Users DB | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Company:** | EnCana Oil & Gas (USA) Inc | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **North Reference:** | True |
| **Well:** | Edith Ann-Duckworth 4B-21H-O268 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #1 | | |

**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** S21-T2N-R68W (Edith Ann-Duckworth)

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 1,290,455.50 ft | **Latitude:** | 40.129630 |
| **From:** | Lat/Long | **Easting:** | 3,138,171.93 ft | **Longitude:** | -105.005880 |
| **Position Uncertainty:** | 0.0 ft | **Slot Radius:** | 13.200 in | **Grid Convergence:** | 0.32 ° |

**Well** Edith Ann-Duckworth 4B-21H-O268

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.0 ft | **Northing:** | 1,286,080.44 ft | **Latitude:** | 40.117610 |
| | **+E/-W** | 0.0 ft | **Easting:** | 3,138,825.57 ft | **Longitude:** | -105.003630 |
| **Position Uncertainty** | | 0.0 ft | **Wellhead Elevation:** | ft | **Ground Level:** | 4,926.0 ft |

**Wellbore** Hz

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 6/25/2013 | 8.69 | 66.71 | 52,743 |

**Design** Plan #1

**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 | |
| 300.0 | 0.00 | 0.00 | 300.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,058.3 | 7.58 | 270.11 | 1,056.1 | 0.1 | -50.1 | 1.00 | 1.00 | 0.00 | 270.11 | |
| 7,052.2 | 7.58 | 270.11 | 6,997.5 | 1.6 | -841.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,952.7 | 90.00 | 0.50 | 7,566.0 | 575.2 | -911.7 | 10.00 | 9.15 | 10.04 | 90.39 | |
| 17,282.7 | 90.00 | 0.50 | 7,566.0 | 9,904.8 | -830.3 | 0.00 | 0.00 | 0.00 | 0.00 | Edith Ann-Duckworth |

| | | | |
|---|---|---|---|
| **Database:** | USA EDM 5000 Multi Users DB | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Company:** | EnCana Oil & Gas (USA) Inc | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **North Reference:** | True |
| **Well:** | Edith Ann-Duckworth 4B-21H-O268 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #1 | | |

**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 | |
| 251.0 | 0.00 | 0.00 | 251.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | Fox Hills - BASE |
| 300.0 | 0.00 | 0.00 | 300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | KOP @ 300' |
| 400.0 | 1.00 | 270.11 | 400.0 | 0.0 | -0.9 | 0.0 | 1.00 | 1.00 | |
| 500.0 | 2.00 | 270.11 | 500.0 | 0.0 | -3.5 | 0.0 | 1.00 | 1.00 | |
| 600.0 | 3.00 | 270.11 | 599.9 | 0.0 | -7.9 | 0.0 | 1.00 | 1.00 | |
| 700.0 | 4.00 | 270.11 | 699.7 | 0.0 | -14.0 | 0.0 | 1.00 | 1.00 | |
| 800.0 | 5.00 | 270.11 | 799.4 | 0.0 | -21.8 | 0.0 | 1.00 | 1.00 | |
| 900.0 | 6.00 | 270.11 | 898.9 | 0.1 | -31.4 | 0.1 | 1.00 | 1.00 | |
| 1,000.0 | 7.00 | 270.11 | 998.3 | 0.1 | -42.7 | 0.1 | 1.00 | 1.00 | |
| 1,058.3 | 7.58 | 270.11 | 1,056.1 | 0.1 | -50.1 | 0.1 | 1.00 | 1.00 | EOB; Inc=7.58° |
| 1,100.0 | 7.58 | 270.11 | 1,097.4 | 0.1 | -55.6 | 0.1 | 0.00 | 0.00 | |
| 1,200.0 | 7.58 | 270.11 | 1,196.5 | 0.1 | -68.8 | 0.1 | 0.00 | 0.00 | |
| 1,300.0 | 7.58 | 270.11 | 1,295.7 | 0.2 | -82.0 | 0.2 | 0.00 | 0.00 | |
| 1,400.0 | 7.58 | 270.11 | 1,394.8 | 0.2 | -95.2 | 0.2 | 0.00 | 0.00 | |
| 1,500.0 | 7.58 | 270.11 | 1,493.9 | 0.2 | -108.4 | 0.2 | 0.00 | 0.00 | |
| 1,600.0 | 7.58 | 270.11 | 1,593.1 | 0.2 | -121.6 | 0.2 | 0.00 | 0.00 | |
| 1,700.0 | 7.58 | 270.11 | 1,692.2 | 0.3 | -134.8 | 0.3 | 0.00 | 0.00 | |
| 1,800.0 | 7.58 | 270.11 | 1,791.3 | 0.3 | -148.0 | 0.3 | 0.00 | 0.00 | |
| 1,900.0 | 7.58 | 270.11 | 1,890.4 | 0.3 | -161.2 | 0.3 | 0.00 | 0.00 | |
| 2,000.0 | 7.58 | 270.11 | 1,989.6 | 0.3 | -174.4 | 0.3 | 0.00 | 0.00 | |
| 2,100.0 | 7.58 | 270.11 | 2,088.7 | 0.3 | -187.6 | 0.3 | 0.00 | 0.00 | |
| 2,200.0 | 7.58 | 270.11 | 2,187.8 | 0.4 | -200.8 | 0.4 | 0.00 | 0.00 | |
| 2,300.0 | 7.58 | 270.11 | 2,286.9 | 0.4 | -214.0 | 0.4 | 0.00 | 0.00 | |
| 2,400.0 | 7.58 | 270.11 | 2,386.1 | 0.4 | -227.2 | 0.4 | 0.00 | 0.00 | |
| 2,500.0 | 7.58 | 270.11 | 2,485.2 | 0.4 | -240.3 | 0.4 | 0.00 | 0.00 | |
| 2,600.0 | 7.58 | 270.11 | 2,584.3 | 0.5 | -253.5 | 0.5 | 0.00 | 0.00 | |
| 2,700.0 | 7.58 | 270.11 | 2,683.4 | 0.5 | -266.7 | 0.5 | 0.00 | 0.00 | |
| 2,800.0 | 7.58 | 270.11 | 2,782.6 | 0.5 | -279.9 | 0.5 | 0.00 | 0.00 | |
| 2,900.0 | 7.58 | 270.11 | 2,881.7 | 0.5 | -293.1 | 0.5 | 0.00 | 0.00 | |
| 3,000.0 | 7.58 | 270.11 | 2,980.8 | 0.6 | -306.3 | 0.6 | 0.00 | 0.00 | |
| 3,100.0 | 7.58 | 270.11 | 3,079.9 | 0.6 | -319.5 | 0.6 | 0.00 | 0.00 | |
| 3,200.0 | 7.58 | 270.11 | 3,179.1 | 0.6 | -332.7 | 0.6 | 0.00 | 0.00 | |
| 3,300.0 | 7.58 | 270.11 | 3,278.2 | 0.6 | -345.9 | 0.6 | 0.00 | 0.00 | |
| 3,400.0 | 7.58 | 270.11 | 3,377.3 | 0.7 | -359.1 | 0.7 | 0.00 | 0.00 | |
| 3,500.0 | 7.58 | 270.11 | 3,476.4 | 0.7 | -372.3 | 0.7 | 0.00 | 0.00 | |
| 3,600.0 | 7.58 | 270.11 | 3,575.6 | 0.7 | -385.5 | 0.7 | 0.00 | 0.00 | |
| 3,700.0 | 7.58 | 270.11 | 3,674.7 | 0.7 | -398.7 | 0.7 | 0.00 | 0.00 | |
| 3,800.0 | 7.58 | 270.11 | 3,773.8 | 0.8 | -411.9 | 0.8 | 0.00 | 0.00 | |
| 3,900.0 | 7.58 | 270.11 | 3,872.9 | 0.8 | -425.1 | 0.8 | 0.00 | 0.00 | |
| 4,000.0 | 7.58 | 270.11 | 3,972.1 | 0.8 | -438.3 | 0.8 | 0.00 | 0.00 | |
| 4,100.0 | 7.58 | 270.11 | 4,071.2 | 0.8 | -451.5 | 0.8 | 0.00 | 0.00 | |
| 4,200.0 | 7.58 | 270.11 | 4,170.3 | 0.9 | -464.7 | 0.9 | 0.00 | 0.00 | |
| 4,300.0 | 7.58 | 270.11 | 4,269.4 | 0.9 | -477.9 | 0.9 | 0.00 | 0.00 | |
| 4,356.0 | 7.58 | 270.11 | 4,325.0 | 0.9 | -485.3 | 0.9 | 0.00 | 0.00 | Sussex |
| 4,400.0 | 7.58 | 270.11 | 4,368.6 | 0.9 | -491.1 | 0.9 | 0.00 | 0.00 | |
| 4,500.0 | 7.58 | 270.11 | 4,467.7 | 0.9 | -504.3 | 0.9 | 0.00 | 0.00 | |
| 4,600.0 | 7.58 | 270.11 | 4,566.8 | 1.0 | -517.5 | 1.0 | 0.00 | 0.00 | |
| 4,615.3 | 7.58 | 270.11 | 4,582.0 | 1.0 | -519.5 | 1.0 | 0.00 | 0.00 | Sussex Marker |
| 4,700.0 | 7.58 | 270.11 | 4,665.9 | 1.0 | -530.7 | 1.0 | 0.00 | 0.00 | |

| | | | |
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| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **North Reference:** | True |
| **Well:** | Edith Ann-Duckworth 4B-21H-O268 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #1 | | |

**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 | 7.58 | 270.11 | 4,765.1 | 1.0 | -543.9 | 1.0 | 0.00 | 0.00 | |
| 4,900.0 | 7.58 | 270.11 | 4,864.2 | 1.0 | -557.0 | 1.0 | 0.00 | 0.00 | |
| 4,902.8 | 7.58 | 270.11 | 4,867.0 | 1.0 | -557.4 | 1.0 | 0.00 | 0.00 | Shannon |
| 5,000.0 | 7.58 | 270.11 | 4,963.3 | 1.1 | -570.2 | 1.1 | 0.00 | 0.00 | |
| 5,100.0 | 7.58 | 270.11 | 5,062.4 | 1.1 | -583.4 | 1.1 | 0.00 | 0.00 | |
| 5,200.0 | 7.58 | 270.11 | 5,161.6 | 1.1 | -596.6 | 1.1 | 0.00 | 0.00 | |
| 5,300.0 | 7.58 | 270.11 | 5,260.7 | 1.1 | -609.8 | 1.1 | 0.00 | 0.00 | |
| 5,400.0 | 7.58 | 270.11 | 5,359.8 | 1.2 | -623.0 | 1.2 | 0.00 | 0.00 | |
| 5,500.0 | 7.58 | 270.11 | 5,458.9 | 1.2 | -636.2 | 1.2 | 0.00 | 0.00 | |
| 5,600.0 | 7.58 | 270.11 | 5,558.1 | 1.2 | -649.4 | 1.2 | 0.00 | 0.00 | |
| 5,700.0 | 7.58 | 270.11 | 5,657.2 | 1.2 | -662.6 | 1.2 | 0.00 | 0.00 | |
| 5,800.0 | 7.58 | 270.11 | 5,756.3 | 1.3 | -675.8 | 1.3 | 0.00 | 0.00 | |
| 5,900.0 | 7.58 | 270.11 | 5,855.4 | 1.3 | -689.0 | 1.3 | 0.00 | 0.00 | |
| 6,000.0 | 7.58 | 270.11 | 5,954.6 | 1.3 | -702.2 | 1.3 | 0.00 | 0.00 | |
| 6,100.0 | 7.58 | 270.11 | 6,053.7 | 1.3 | -715.4 | 1.3 | 0.00 | 0.00 | |
| 6,200.0 | 7.58 | 270.11 | 6,152.8 | 1.4 | -728.6 | 1.4 | 0.00 | 0.00 | |
| 6,247.6 | 7.58 | 270.11 | 6,200.0 | 1.4 | -734.9 | 1.4 | 0.00 | 0.00 | Teepee Buttes (*if present) |
| 6,300.0 | 7.58 | 270.11 | 6,252.0 | 1.4 | -741.8 | 1.4 | 0.00 | 0.00 | |
| 6,400.0 | 7.58 | 270.11 | 6,351.1 | 1.4 | -755.0 | 1.4 | 0.00 | 0.00 | |
| 6,500.0 | 7.58 | 270.11 | 6,450.2 | 1.4 | -768.2 | 1.4 | 0.00 | 0.00 | |
| 6,600.0 | 7.58 | 270.11 | 6,549.3 | 1.5 | -781.4 | 1.5 | 0.00 | 0.00 | |
| 6,700.0 | 7.58 | 270.11 | 6,648.5 | 1.5 | -794.6 | 1.5 | 0.00 | 0.00 | |
| 6,800.0 | 7.58 | 270.11 | 6,747.6 | 1.5 | -807.8 | 1.5 | 0.00 | 0.00 | |
| 6,900.0 | 7.58 | 270.11 | 6,846.7 | 1.5 | -821.0 | 1.5 | 0.00 | 0.00 | |
| 7,000.0 | 7.58 | 270.11 | 6,945.8 | 1.6 | -834.2 | 1.6 | 0.00 | 0.00 | |
| 7,052.2 | 7.58 | 270.11 | 6,997.5 | 1.6 | -841.0 | 1.6 | 0.00 | 0.00 | Start build/turn @ 7052' MD |
| 7,100.0 | 8.93 | 302.60 | 7,044.9 | 3.6 | -847.3 | 3.6 | 10.00 | 2.82 | |
| 7,200.0 | 16.53 | 333.85 | 7,142.5 | 20.6 | -860.2 | 20.6 | 10.00 | 7.60 | |
| 7,234.2 | 19.62 | 338.58 | 7,175.0 | 30.3 | -864.4 | 30.3 | 10.00 | 9.04 | Sharon Springs |
| 7,300.0 | 25.80 | 344.51 | 7,235.7 | 54.4 | -872.3 | 54.4 | 10.00 | 9.39 | |
| 7,336.5 | 29.29 | 346.77 | 7,268.0 | 70.7 | -876.4 | 70.7 | 10.00 | 9.58 | Niobrara |
| 7,400.0 | 35.45 | 349.72 | 7,321.6 | 104.0 | -883.3 | 104.0 | 10.00 | 9.69 | |
| 7,415.3 | 36.94 | 350.30 | 7,334.0 | 112.9 | -884.9 | 112.9 | 10.00 | 9.75 | B Chalk |
| 7,444.7 | 39.81 | 351.31 | 7,357.0 | 130.9 | -887.8 | 130.9 | 10.00 | 9.77 | B Marl |
| 7,500.0 | 45.24 | 352.91 | 7,397.8 | 167.9 | -892.9 | 167.9 | 10.00 | 9.81 | |
| 7,532.5 | 48.43 | 353.72 | 7,420.0 | 191.5 | -895.6 | 191.5 | 10.00 | 9.83 | C Chalk |
| 7,566.8 | 51.81 | 354.49 | 7,442.0 | 217.7 | -898.3 | 217.7 | 10.00 | 9.85 | C Marl |
| 7,600.0 | 55.09 | 355.17 | 7,461.8 | 244.2 | -900.7 | 244.2 | 10.00 | 9.86 | |
| 7,700.0 | 64.97 | 356.94 | 7,511.7 | 330.5 | -906.6 | 330.5 | 10.00 | 9.88 | |
| 7,765.6 | 71.46 | 357.94 | 7,536.0 | 391.4 | -909.3 | 391.4 | 10.00 | 9.90 | Ft. Hayes |
| 7,800.0 | 74.87 | 358.44 | 7,546.0 | 424.3 | -910.4 | 424.3 | 10.00 | 9.90 | |
| 7,845.0 | 79.33 | 359.06 | 7,556.0 | 468.1 | -911.3 | 468.1 | 10.00 | 9.91 | Codell |
| 7,900.0 | 84.78 | 359.80 | 7,563.6 | 522.6 | -911.8 | 522.6 | 10.00 | 9.91 | |
| 7,952.7 | 90.00 | 0.50 | 7,566.0 | 575.2 | -911.7 | 575.2 | 10.00 | 9.91 | LP @ 7566' TVD; 90° |
| 8,000.0 | 90.00 | 0.50 | 7,566.0 | 622.5 | -911.3 | 622.5 | 0.00 | 0.00 | |
| 8,100.0 | 90.00 | 0.50 | 7,566.0 | 722.5 | -910.4 | 722.5 | 0.00 | 0.00 | |
| 8,200.0 | 90.00 | 0.50 | 7,566.0 | 822.5 | -909.6 | 822.5 | 0.00 | 0.00 | |
| 8,300.0 | 90.00 | 0.50 | 7,566.0 | 922.5 | -908.7 | 922.5 | 0.00 | 0.00 | |
| 8,400.0 | 90.00 | 0.50 | 7,566.0 | 1,022.5 | -907.8 | 1,022.5 | 0.00 | 0.00 | |
| 8,500.0 | 90.00 | 0.50 | 7,566.0 | 1,122.5 | -906.9 | 1,122.5 | 0.00 | 0.00 | |
| 8,600.0 | 90.00 | 0.50 | 7,566.0 | 1,222.5 | -906.1 | 1,222.5 | 0.00 | 0.00 | |
| 8,700.0 | 90.00 | 0.50 | 7,566.0 | 1,322.5 | -905.2 | 1,322.5 | 0.00 | 0.00 | |

| | | | |
|---|---|---|---|
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| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **North Reference:** | True |
| **Well:** | Edith Ann-Duckworth 4B-21H-O268 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #1 | | |

**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 | 0.50 | 7,566.0 | 1,422.4 | -904.3 | 1,422.4 | 0.00 | 0.00 | |
| 8,900.0 | 90.00 | 0.50 | 7,566.0 | 1,522.4 | -903.4 | 1,522.4 | 0.00 | 0.00 | |
| 9,000.0 | 90.00 | 0.50 | 7,566.0 | 1,622.4 | -902.6 | 1,622.4 | 0.00 | 0.00 | |
| 9,100.0 | 90.00 | 0.50 | 7,566.0 | 1,722.4 | -901.7 | 1,722.4 | 0.00 | 0.00 | |
| 9,200.0 | 90.00 | 0.50 | 7,566.0 | 1,822.4 | -900.8 | 1,822.4 | 0.00 | 0.00 | |
| 9,300.0 | 90.00 | 0.50 | 7,566.0 | 1,922.4 | -900.0 | 1,922.4 | 0.00 | 0.00 | |
| 9,400.0 | 90.00 | 0.50 | 7,566.0 | 2,022.4 | -899.1 | 2,022.4 | 0.00 | 0.00 | |
| 9,500.0 | 90.00 | 0.50 | 7,566.0 | 2,122.4 | -898.2 | 2,122.4 | 0.00 | 0.00 | |
| 9,600.0 | 90.00 | 0.50 | 7,566.0 | 2,222.4 | -897.3 | 2,222.4 | 0.00 | 0.00 | |
| 9,700.0 | 90.00 | 0.50 | 7,566.0 | 2,322.4 | -896.5 | 2,322.4 | 0.00 | 0.00 | |
| 9,800.0 | 90.00 | 0.50 | 7,566.0 | 2,422.4 | -895.6 | 2,422.4 | 0.00 | 0.00 | |
| 9,900.0 | 90.00 | 0.50 | 7,566.0 | 2,522.4 | -894.7 | 2,522.4 | 0.00 | 0.00 | |
| 10,000.0 | 90.00 | 0.50 | 7,566.0 | 2,622.4 | -893.8 | 2,622.4 | 0.00 | 0.00 | |
| 10,100.0 | 90.00 | 0.50 | 7,566.0 | 2,722.4 | -893.0 | 2,722.4 | 0.00 | 0.00 | |
| 10,200.0 | 90.00 | 0.50 | 7,566.0 | 2,822.4 | -892.1 | 2,822.4 | 0.00 | 0.00 | |
| 10,300.0 | 90.00 | 0.50 | 7,566.0 | 2,922.4 | -891.2 | 2,922.4 | 0.00 | 0.00 | |
| 10,400.0 | 90.00 | 0.50 | 7,566.0 | 3,022.4 | -890.4 | 3,022.4 | 0.00 | 0.00 | |
| 10,500.0 | 90.00 | 0.50 | 7,566.0 | 3,122.4 | -889.5 | 3,122.4 | 0.00 | 0.00 | |
| 10,600.0 | 90.00 | 0.50 | 7,566.0 | 3,222.4 | -888.6 | 3,222.4 | 0.00 | 0.00 | |
| 10,700.0 | 90.00 | 0.50 | 7,566.0 | 3,322.4 | -887.7 | 3,322.4 | 0.00 | 0.00 | |
| 10,800.0 | 90.00 | 0.50 | 7,566.0 | 3,422.4 | -886.9 | 3,422.4 | 0.00 | 0.00 | |
| 10,900.0 | 90.00 | 0.50 | 7,566.0 | 3,522.4 | -886.0 | 3,522.4 | 0.00 | 0.00 | |
| 11,000.0 | 90.00 | 0.50 | 7,566.0 | 3,622.4 | -885.1 | 3,622.4 | 0.00 | 0.00 | |
| 11,100.0 | 90.00 | 0.50 | 7,566.0 | 3,722.4 | -884.2 | 3,722.4 | 0.00 | 0.00 | |
| 11,200.0 | 90.00 | 0.50 | 7,566.0 | 3,822.4 | -883.4 | 3,822.4 | 0.00 | 0.00 | |
| 11,300.0 | 90.00 | 0.50 | 7,566.0 | 3,922.4 | -882.5 | 3,922.4 | 0.00 | 0.00 | |
| 11,400.0 | 90.00 | 0.50 | 7,566.0 | 4,022.4 | -881.6 | 4,022.4 | 0.00 | 0.00 | |
| 11,500.0 | 90.00 | 0.50 | 7,566.0 | 4,122.3 | -880.8 | 4,122.3 | 0.00 | 0.00 | |
| 11,600.0 | 90.00 | 0.50 | 7,566.0 | 4,222.3 | -879.9 | 4,222.3 | 0.00 | 0.00 | |
| 11,700.0 | 90.00 | 0.50 | 7,566.0 | 4,322.3 | -879.0 | 4,322.3 | 0.00 | 0.00 | |
| 11,800.0 | 90.00 | 0.50 | 7,566.0 | 4,422.3 | -878.1 | 4,422.3 | 0.00 | 0.00 | |
| 11,900.0 | 90.00 | 0.50 | 7,566.0 | 4,522.3 | -877.3 | 4,522.3 | 0.00 | 0.00 | |
| 12,000.0 | 90.00 | 0.50 | 7,566.0 | 4,622.3 | -876.4 | 4,622.3 | 0.00 | 0.00 | |
| 12,100.0 | 90.00 | 0.50 | 7,566.0 | 4,722.3 | -875.5 | 4,722.3 | 0.00 | 0.00 | |
| 12,200.0 | 90.00 | 0.50 | 7,566.0 | 4,822.3 | -874.6 | 4,822.3 | 0.00 | 0.00 | |
| 12,300.0 | 90.00 | 0.50 | 7,566.0 | 4,922.3 | -873.8 | 4,922.3 | 0.00 | 0.00 | |
| 12,400.0 | 90.00 | 0.50 | 7,566.0 | 5,022.3 | -872.9 | 5,022.3 | 0.00 | 0.00 | |
| 12,500.0 | 90.00 | 0.50 | 7,566.0 | 5,122.3 | -872.0 | 5,122.3 | 0.00 | 0.00 | |
| 12,600.0 | 90.00 | 0.50 | 7,566.0 | 5,222.3 | -871.2 | 5,222.3 | 0.00 | 0.00 | |
| 12,700.0 | 90.00 | 0.50 | 7,566.0 | 5,322.3 | -870.3 | 5,322.3 | 0.00 | 0.00 | |
| 12,800.0 | 90.00 | 0.50 | 7,566.0 | 5,422.3 | -869.4 | 5,422.3 | 0.00 | 0.00 | |
| 12,900.0 | 90.00 | 0.50 | 7,566.0 | 5,522.3 | -868.5 | 5,522.3 | 0.00 | 0.00 | |
| 13,000.0 | 90.00 | 0.50 | 7,566.0 | 5,622.3 | -867.7 | 5,622.3 | 0.00 | 0.00 | |
| 13,100.0 | 90.00 | 0.50 | 7,566.0 | 5,722.3 | -866.8 | 5,722.3 | 0.00 | 0.00 | |
| 13,200.0 | 90.00 | 0.50 | 7,566.0 | 5,822.3 | -865.9 | 5,822.3 | 0.00 | 0.00 | |
| 13,300.0 | 90.00 | 0.50 | 7,566.0 | 5,922.3 | -865.0 | 5,922.3 | 0.00 | 0.00 | |
| 13,400.0 | 90.00 | 0.50 | 7,566.0 | 6,022.3 | -864.2 | 6,022.3 | 0.00 | 0.00 | |
| 13,500.0 | 90.00 | 0.50 | 7,566.0 | 6,122.3 | -863.3 | 6,122.3 | 0.00 | 0.00 | |
| 13,600.0 | 90.00 | 0.50 | 7,566.0 | 6,222.3 | -862.4 | 6,222.3 | 0.00 | 0.00 | |
| 13,700.0 | 90.00 | 0.50 | 7,566.0 | 6,322.3 | -861.6 | 6,322.3 | 0.00 | 0.00 | |
| 13,800.0 | 90.00 | 0.50 | 7,566.0 | 6,422.3 | -860.7 | 6,422.3 | 0.00 | 0.00 | |
| 13,900.0 | 90.00 | 0.50 | 7,566.0 | 6,522.3 | -859.8 | 6,522.3 | 0.00 | 0.00 | |

| | | | |
|---|---|---|---|
| **Database:** | USA EDM 5000 Multi Users DB | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Company:** | EnCana Oil & Gas (USA) Inc | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **North Reference:** | True |
| **Well:** | Edith Ann-Duckworth 4B-21H-O268 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #1 | | |

**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 |
|---|---|---|---|---|---|---|---|---|---|
| 14,000.0 | 90.00 | 0.50 | 7,566.0 | 6,622.3 | -858.9 | 6,622.3 | 0.00 | 0.00 | |
| 14,100.0 | 90.00 | 0.50 | 7,566.0 | 6,722.2 | -858.1 | 6,722.2 | 0.00 | 0.00 | |
| 14,200.0 | 90.00 | 0.50 | 7,566.0 | 6,822.2 | -857.2 | 6,822.2 | 0.00 | 0.00 | |
| 14,300.0 | 90.00 | 0.50 | 7,566.0 | 6,922.2 | -856.3 | 6,922.2 | 0.00 | 0.00 | |
| 14,400.0 | 90.00 | 0.50 | 7,566.0 | 7,022.2 | -855.4 | 7,022.2 | 0.00 | 0.00 | |
| 14,500.0 | 90.00 | 0.50 | 7,566.0 | 7,122.2 | -854.6 | 7,122.2 | 0.00 | 0.00 | |
| 14,600.0 | 90.00 | 0.50 | 7,566.0 | 7,222.2 | -853.7 | 7,222.2 | 0.00 | 0.00 | |
| 14,700.0 | 90.00 | 0.50 | 7,566.0 | 7,322.2 | -852.8 | 7,322.2 | 0.00 | 0.00 | |
| 14,800.0 | 90.00 | 0.50 | 7,566.0 | 7,422.2 | -852.0 | 7,422.2 | 0.00 | 0.00 | |
| 14,900.0 | 90.00 | 0.50 | 7,566.0 | 7,522.2 | -851.1 | 7,522.2 | 0.00 | 0.00 | |
| 15,000.0 | 90.00 | 0.50 | 7,566.0 | 7,622.2 | -850.2 | 7,622.2 | 0.00 | 0.00 | |
| 15,100.0 | 90.00 | 0.50 | 7,566.0 | 7,722.2 | -849.3 | 7,722.2 | 0.00 | 0.00 | |
| 15,200.0 | 90.00 | 0.50 | 7,566.0 | 7,822.2 | -848.5 | 7,822.2 | 0.00 | 0.00 | |
| 15,300.0 | 90.00 | 0.50 | 7,566.0 | 7,922.2 | -847.6 | 7,922.2 | 0.00 | 0.00 | |
| 15,400.0 | 90.00 | 0.50 | 7,566.0 | 8,022.2 | -846.7 | 8,022.2 | 0.00 | 0.00 | |
| 15,500.0 | 90.00 | 0.50 | 7,566.0 | 8,122.2 | -845.8 | 8,122.2 | 0.00 | 0.00 | |
| 15,600.0 | 90.00 | 0.50 | 7,566.0 | 8,222.2 | -845.0 | 8,222.2 | 0.00 | 0.00 | |
| 15,700.0 | 90.00 | 0.50 | 7,566.0 | 8,322.2 | -844.1 | 8,322.2 | 0.00 | 0.00 | |
| 15,800.0 | 90.00 | 0.50 | 7,566.0 | 8,422.2 | -843.2 | 8,422.2 | 0.00 | 0.00 | |
| 15,900.0 | 90.00 | 0.50 | 7,566.0 | 8,522.2 | -842.4 | 8,522.2 | 0.00 | 0.00 | |
| 16,000.0 | 90.00 | 0.50 | 7,566.0 | 8,622.2 | -841.5 | 8,622.2 | 0.00 | 0.00 | |
| 16,100.0 | 90.00 | 0.50 | 7,566.0 | 8,722.2 | -840.6 | 8,722.2 | 0.00 | 0.00 | |
| 16,200.0 | 90.00 | 0.50 | 7,566.0 | 8,822.2 | -839.7 | 8,822.2 | 0.00 | 0.00 | |
| 16,300.0 | 90.00 | 0.50 | 7,566.0 | 8,922.2 | -838.9 | 8,922.2 | 0.00 | 0.00 | |
| 16,400.0 | 90.00 | 0.50 | 7,566.0 | 9,022.2 | -838.0 | 9,022.2 | 0.00 | 0.00 | |
| 16,500.0 | 90.00 | 0.50 | 7,566.0 | 9,122.2 | -837.1 | 9,122.2 | 0.00 | 0.00 | |
| 16,600.0 | 90.00 | 0.50 | 7,566.0 | 9,222.2 | -836.2 | 9,222.2 | 0.00 | 0.00 | |
| 16,700.0 | 90.00 | 0.50 | 7,566.0 | 9,322.1 | -835.4 | 9,322.1 | 0.00 | 0.00 | |
| 16,800.0 | 90.00 | 0.50 | 7,566.0 | 9,422.1 | -834.5 | 9,422.1 | 0.00 | 0.00 | |
| 16,900.0 | 90.00 | 0.50 | 7,566.0 | 9,522.1 | -833.6 | 9,522.1 | 0.00 | 0.00 | |
| 17,000.0 | 90.00 | 0.50 | 7,566.0 | 9,622.1 | -832.8 | 9,622.1 | 0.00 | 0.00 | |
| 17,100.0 | 90.00 | 0.50 | 7,566.0 | 9,722.1 | -831.9 | 9,722.1 | 0.00 | 0.00 | |
| 17,200.0 | 90.00 | 0.50 | 7,566.0 | 9,822.1 | -831.0 | 9,822.1 | 0.00 | 0.00 | |
| 17,282.7 | 90.00 | 0.50 | 7,566.0 | 9,904.8 | -830.3 | 9,904.8 | 0.00 | 0.00 | TD at 17282.7 |

**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 |
|---|---|---|---|---|---|---|---|---|---|
| Edith Ann-Duckworth 4B<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 7,566.0 | 9,904.8 | -830.3 | 1,295,980.45 | 3,137,939.85 | 40.144800 | -105.006600 |

| | | | |
|---|---|---|---|
| **Database:** | USA EDM 5000 Multi Users DB | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Company:** | EnCana Oil & Gas (USA) Inc | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Project:** | DJ Wattenberg | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **North Reference:** | True |
| **Well:** | Edith Ann-Duckworth 4B-21H-O268 | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | Hz | | |
| **Design:** | Plan #1 | | |

**Formations**

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 251.0 | 251.0 | Fox Hills - BASE | | | |
| 4,356.0 | 4,325.0 | Sussex | | | |
| 4,615.3 | 4,582.0 | Sussex Marker | | | |
| 4,902.8 | 4,867.0 | Shannon | | | |
| 6,247.6 | 6,200.0 | Teepee Buttes (*if present) | | | |
| 7,234.2 | 7,175.0 | Sharon Springs | | | |
| 7,336.5 | 7,268.0 | Niobrara | | | |
| 7,415.3 | 7,334.0 | B Chalk | | | |
| 7,444.7 | 7,357.0 | B Marl | | | |
| 7,532.5 | 7,420.0 | C Chalk | | | |
| 7,566.8 | 7,442.0 | C Marl | | | |
| 7,765.6 | 7,536.0 | Ft. Hayes | | | |
| 7,845.0 | 7,556.0 | Codell | | | |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | Local Coordinates +E/-W (ft) | Comment |
|---|---|---|---|---|
| 300.0 | 300.0 | 0.0 | 0.0 | KOP @ 300' |
| 1,058.3 | 1,056.1 | 0.1 | -50.1 | EOB; Inc=7.58° |
| 7,052.2 | 6,997.5 | 1.6 | -841.0 | Start build/turn @ 7052' MD |
| 7,952.7 | 7,566.0 | 575.2 | -911.7 | LP @ 7566' TVD; 90° |
| 17,282.7 | 7,566.0 | 9,904.8 | -830.3 | TD at 17282.7 |

# EnCana Oil & Gas (USA) Inc

**DJ Wattenberg**
**S21-T2N-R68W (Edith Ann-Duckworth)**
**Edith Ann-Duckworth 4B-21H-O268**
**Hz**
**Plan #1**

# Anticollision Report

**26 June, 2013**

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

| | |
|---|---|
| **Reference** | Plan #1 |

| | | | |
|---|---|---|---|
| **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** 6/26/2013

| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.0 | 17,282.7 | Plan #1 (Hz) | Geolink MWD | Geolink MWD |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **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 |
|---|---|---|---|---|---|---|
| S21-T2N-R68W (Edith Ann-Duckworth) | | | | | | |
| BLISS 41-21 (EXISTING) - KPK WELL - SURVEYS | | | | | | Out of range |
| COLCLASURE 42-21 (EXISTING) - KPK WELL - NO SU | | | | | | Out of range |
| DUCKWORTH 31-16 (EXISTING) - ENCANA WELL - SU | 17,106.0 | 7,720.5 | 227.4 | 32.3 | 1.165 | Level 2, CC, ES, SF |
| DUCKWORTH 32-16 (EXISTING) - ENCANA WELL - SU | 15,613.5 | 7,634.2 | 234.6 | 72.3 | 1.445 | Level 3, CC, ES, SF |
| DUCKWORTH 33-16 (EXISTING) - ENCANA WELL - SU | 14,552.6 | 7,691.2 | 250.5 | 95.3 | 1.614 | CC, ES, SF |
| DUCKWORTH 41-16 (EXISING) - ENCANA WELL - SUR | | | | | | Out of range |
| DUCKWORTH 43-16 (EXISTING) - ENCANA WELL - NO | | | | | | Out of range |
| DUCKWORTH 44-16 (EXISTING) - ENCANA WELL - SU | | | | | | Out of range |
| DUCKWORTH 6-0-16 (EXISTING) - ENCANA WELL - S | | | | | | Out of range |
| DUCKWORTH B UNIT 1 (EXISTING) - ENCANA WELL - | | | | | | Out of range |
| DUCKWORTH B UNIT 2 (EXISTING) - ENCANA WELL - | | | | | | Out of range |
| EDITH ANN 1 (EXISTING) - ENCANA WELL - NO SURV | | | | | | Out of range |
| EDITH ANN 33-21 (EXISTING) - ENCANA WELL - NO S | 9,155.8 | 7,517.0 | 182.0 | 133.7 | 3.770 | CC, ES, SF |
| EDITH ANN 34-21 (EXISTING) - ENCANA WELL - NO S | 7,740.4 | 7,484.5 | 118.4 | 90.0 | 4.160 | CC, ES, SF |
| EDITH ANN 4-21 (EXISTING) - ENCANA WELL - SURVE | | | | | | Out of range |
| EDITH ANN 43-21 (EXISTING) - ENCANA WELL - NO S | | | | | | Out of range |
| EDITH ANN 44-21 (EXISTING) - ENCANA WELL - NO S | | | | | | Out of range |
| EDITH ANN 6-8-21 (EXISTING) - ENCANA WELL - SUR | 4,593.8 | 4,744.3 | 459.1 | 436.4 | 20.245 | CC |
| EDITH ANN 6-8-21 (EXISTING) - ENCANA WELL - SUR | 4,600.0 | 4,750.0 | 459.1 | 436.4 | 20.211 | ES |
| EDITH ANN 6-8-21 (EXISTING) - ENCANA WELL - SUR | 5,000.0 | 5,119.6 | 472.2 | 447.6 | 19.186 | SF |
| EDITH ANN 8-8-21 (EXISTING) - ENCANA WELL - SUR | | | | | | Out of range |
| Edith Ann-Duckworth 4A-21H-O268 - Hz - Plan #1 | 200.0 | 199.0 | 11.2 | 10.6 | 18.366 | CC, ES |
| Edith Ann-Duckworth 4A-21H-O268 - Hz - Plan #1 | 17,282.7 | 17,127.7 | 413.5 | 114.7 | 1.384 | Level 3, SF |
| Edith Ann-Duckworth 4C-21H-O268 - Hz - Plan #1 | 300.0 | 300.0 | 8.4 | 7.4 | 8.740 | CC, ES |
| Edith Ann-Duckworth 4C-21H-O268 - Hz - Plan #1 | 17,282.7 | 17,013.3 | 414.0 | 115.7 | 1.388 | Level 3, SF |
| Edith Ann-Duckworth 4D-21H-O268 - Hz - Plan #1 | 300.0 | 300.0 | 19.6 | 18.6 | 20.394 | CC, ES |
| Edith Ann-Duckworth 4D-21H-O268 - Hz - Plan #1 | 700.0 | 700.4 | 30.6 | 28.2 | 12.979 | SF |
| Edith Ann-Duckworth 4E-21H-O268 - Hz - Plan #1 | 300.0 | 300.0 | 28.0 | 27.0 | 29.134 | CC, ES |
| Edith Ann-Duckworth 4E-21H-O268 - Hz - Plan #1 | 700.0 | 699.7 | 41.9 | 39.6 | 17.819 | SF |
| Edith Ann-Duckworth 4F-21H-O268 - Hz - Plan #1 | 300.0 | 301.0 | 39.2 | 38.2 | 40.714 | CC, ES |
| Edith Ann-Duckworth 4F-21H-O268 - Hz - Plan #1 | 600.0 | 599.1 | 50.5 | 48.5 | 25.198 | SF |
| Edith Ann-Duckworth 4G-21H-O268 - Hz - Plan #1 | 266.3 | 267.3 | 50.3 | 49.5 | 59.635 | CC |
| Edith Ann-Duckworth 4G-21H-O268 - Hz - Plan #1 | 300.0 | 301.0 | 50.3 | 49.4 | 52.347 | ES |
| Edith Ann-Duckworth 4G-21H-O268 - Hz - Plan #1 | 600.0 | 597.6 | 66.0 | 64.0 | 32.986 | SF |
| Edith Ann-Duckworth 4H-21H-O268 - Hz - Plan #1 | 166.3 | 167.3 | 58.7 | 58.2 | 118.629 | CC |
| Edith Ann-Duckworth 4H-21H-O268 - Hz - Plan #1 | 200.0 | 201.0 | 58.7 | 58.1 | 95.871 | ES |
| Edith Ann-Duckworth 4H-21H-O268 - Hz - Plan #1 | 600.0 | 595.6 | 80.4 | 78.4 | 40.269 | SF |
| JILLSON A 1 (EXISTING) - FOUNDATION WELL - NO S | 5,076.8 | 4,979.0 | 424.5 | 402.3 | 19.171 | CC, ES |
| JILLSON A 1 (EXISTING) - FOUNDATION WELL - NO S | 5,100.0 | 4,979.0 | 425.1 | 402.9 | 19.141 | SF |
| JILLSON A 2 (EXISTING) - FOUNDATION WELL - NO S | | | | | | Out of range |
| JILLSON A 3 (EXISTING) - FOUNDATION WELL - NO S | | | | | | Out of range |
| JILLSON A 4 (EXISTING) - FOUNDATION WELL - NO S | | | | | | Out of range |
| KENNEDY 1 (EXISTING) - MACEY & MERSHON WELL | | | | | | Out of range |
| KENNEDY 31-21 (EXISTING) - ENCANA WELL - NO SU | | | | | | Out of range |
| KENNEDY 32-21 (EXISTING) - ENCANA WELL - NO SU | 10,273.0 | 7,507.0 | 467.0 | 400.0 | 6.972 | CC, ES |
| KENNEDY 32-21 (EXISTING) - ENCANA WELL - NO SU | 10,300.0 | 7,507.0 | 467.8 | 400.3 | 6.936 | SF |
| KENNEDY 41-21 (EXISTING) - ENCANA WELL - NO SU | | | | | | Out of range |
| KENNEDY 4-2-21 (EXISTING) - ENCANA WELL - SURV | 11,082.8 | 7,593.5 | 314.5 | 228.9 | 3.677 | CC, ES |
| KENNEDY 4-2-21 (EXISTING) - ENCANA WELL - SURV | 11,100.0 | 7,593.6 | 314.9 | 229.1 | 3.670 | SF |
| KENNEDY 6-0-21 (EXISTING) - ENCANA WELL - SURV | | | | | | Out of range |
| KENNEDY 6-4-21 (EXISTING) - ENCANA WELL - SURV | | | | | | Out of range |
| KENNEDY 8-0-21 (EXISTING) - ENCANA WELL - SURV | | | | | | Out of range |
| KENNEDY 8-4-21 (EXISTING) - ENCANA WELL - SURV | | | | | | 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 Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **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 |
|---|---|---|---|---|---|---|
| S21-T2N-R68W (Edith Ann-Duckworth) | | | | | | |
| KENNEDY GAS UNIT 1 (EXISTING) - ENCANA WELL - | | | | | | Out of range |
| NORTH RINN 33-9 (EXISTING) - ENCANA WELL - PLA | | | | | | Out of range |
| NORTH RINN 34-9 (EXISTING) - ENCANA WELL - PLA | | | | | | Out of range |
| NORTH RINN 43-9 (EXISTING) - ENCANA WELL - PLA | | | | | | Out of range |
| NORTH RINN 44-9 (EXISTING) - ENCANA WELL - PLA | | | | | | Out of range |
| NORTH RINN 4-4-9 (EXISTING) - ENCANA WELL - PLA | | | | | | Out of range |
| NORTH RINN 4-6-9 (EXISTING) - ENCANA WELL - PLA | | | | | | Out of range |
| NORTH RINN 4-8-9 (EXISTING) - ENCANA WELL - PLA | | | | | | Out of range |
| NORTH RINN 6-6-9 (EXISTING) - ENCANA WELL - PLA | | | | | | Out of range |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - DUCKWORTH 31-16 (EXISTING) - ENCANA WELL - SURVE

**Offset Site Error:** 0.0 ft

**Survey Program:** 716-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16,700.0 | 7,566.0 | 7,724.0 | 7,506.7 | 166.4 | 28.4 | 90.93 | 9,726.1 | -604.5 | 465.3 | 277.4 | 187.97 | 2.476 | |
| 16,800.0 | 7,566.0 | 7,723.2 | 7,505.9 | 168.1 | 28.4 | 90.73 | 9,726.1 | -604.5 | 381.2 | 191.5 | 189.72 | 2.009 | |
| 16,900.0 | 7,566.0 | 7,722.3 | 7,505.1 | 169.8 | 28.4 | 90.52 | 9,726.1 | -604.5 | 306.8 | 115.3 | 191.47 | 1.602 | |
| 17,000.0 | 7,566.0 | 7,721.5 | 7,504.2 | 171.6 | 28.4 | 90.30 | 9,726.1 | -604.5 | 250.9 | 57.6 | 193.22 | 1.298 | Level 3 |
| 17,100.0 | 7,566.0 | 7,720.6 | 7,503.3 | 173.3 | 28.4 | 90.07 | 9,726.2 | -604.5 | 227.4 | 32.5 | 194.97 | 1.167 | Level 2 |
| 17,106.0 | 7,566.0 | 7,720.5 | 7,503.2 | 173.4 | 28.4 | 90.06 | 9,726.2 | -604.5 | 227.4 | 32.3 | 195.08 | 1.165 | Level 2, CC, ES, SF |
| 17,200.0 | 7,566.0 | 7,719.6 | 7,502.4 | 175.1 | 28.4 | 89.83 | 9,726.2 | -604.5 | 246.0 | 49.3 | 196.72 | 1.251 | Level 3 |
| 17,282.7 | 7,566.0 | 7,718.8 | 7,501.5 | 176.5 | 28.4 | 89.63 | 9,726.2 | -604.5 | 287.9 | 89.8 | 198.16 | 1.453 | Level 3 |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - DUCKWORTH 32-16 (EXISTING) - ENCANA WELL - SURVE

**Offset Site Error:** 0.0 ft

**Survey Program:** 717-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15,200.0 | 7,566.0 | 7,631.3 | 7,500.1 | 140.3 | 23.3 | 89.30 | 8,233.6 | -610.2 | 475.4 | 320.3 | 155.11 | 3.065 | |
| 15,300.0 | 7,566.0 | 7,632.0 | 7,500.8 | 142.0 | 23.3 | 89.47 | 8,233.6 | -610.2 | 391.5 | 234.7 | 156.87 | 2.496 | |
| 15,400.0 | 7,566.0 | 7,632.7 | 7,501.5 | 143.8 | 23.3 | 89.64 | 8,233.6 | -610.2 | 317.2 | 158.6 | 158.62 | 2.000 | |
| 15,500.0 | 7,566.0 | 7,633.4 | 7,502.2 | 145.5 | 23.3 | 89.81 | 8,233.6 | -610.2 | 260.6 | 100.2 | 160.37 | 1.625 | |
| 15,600.0 | 7,566.0 | 7,634.1 | 7,502.9 | 147.2 | 23.3 | 89.98 | 8,233.6 | -610.2 | 235.0 | 72.9 | 162.13 | 1.450 | Level 3 |
| 15,613.5 | 7,566.0 | 7,634.2 | 7,503.0 | 147.5 | 23.3 | 90.00 | 8,233.6 | -610.2 | 234.6 | 72.3 | 162.36 | 1.445 | Level 3, CC, ES, SF |
| 15,700.0 | 7,566.0 | 7,634.8 | 7,503.6 | 149.0 | 23.3 | 90.15 | 8,233.6 | -610.2 | 250.1 | 86.2 | 163.88 | 1.526 | |
| 15,800.0 | 7,566.0 | 7,635.5 | 7,504.3 | 150.7 | 23.3 | 90.32 | 8,233.6 | -610.2 | 299.7 | 134.1 | 165.63 | 1.810 | |
| 15,900.0 | 7,566.0 | 7,636.2 | 7,505.0 | 152.5 | 23.3 | 90.49 | 8,233.6 | -610.2 | 370.3 | 203.0 | 167.38 | 2.213 | |
| 16,000.0 | 7,566.0 | 7,636.9 | 7,505.7 | 154.2 | 23.3 | 90.66 | 8,233.6 | -610.2 | 452.2 | 283.0 | 169.12 | 2.674 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - DUCKWORTH 33-16 (EXISTING) - ENCANA WELL - SURVE

**Offset Site Error:** 0.0 ft

**Survey Program:** 60-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 | 7,566.0 | 7,691.4 | 7,511.4 | 123.0 | 28.6 | 89.86 | 7,172.6 | -603.7 | 432.5 | 283.5 | 149.00 | 2.903 | |
| 14,300.0 | 7,566.0 | 7,691.3 | 7,511.3 | 124.7 | 28.6 | 89.85 | 7,172.6 | -603.7 | 355.7 | 205.0 | 150.74 | 2.360 | |
| 14,400.0 | 7,566.0 | 7,691.3 | 7,511.3 | 126.4 | 28.6 | 89.84 | 7,172.6 | -603.7 | 293.3 | 140.8 | 152.49 | 1.923 | |
| 14,500.0 | 7,566.0 | 7,691.2 | 7,511.2 | 128.2 | 28.6 | 89.82 | 7,172.6 | -603.7 | 255.9 | 101.7 | 154.23 | 1.659 | |
| 14,552.6 | 7,566.0 | 7,691.2 | 7,511.2 | 129.1 | 28.6 | 89.82 | 7,172.6 | -603.7 | 250.5 | 95.3 | 155.15 | 1.614 | CC, ES, SF |
| 14,600.0 | 7,566.0 | 7,691.2 | 7,511.2 | 129.9 | 28.6 | 89.81 | 7,172.6 | -603.7 | 254.9 | 98.9 | 155.98 | 1.634 | |
| 14,700.0 | 7,566.0 | 7,691.1 | 7,511.1 | 131.6 | 28.6 | 89.80 | 7,172.6 | -603.7 | 290.6 | 132.9 | 157.72 | 1.843 | |
| 14,800.0 | 7,566.0 | 7,691.1 | 7,511.1 | 133.4 | 28.6 | 89.79 | 7,172.6 | -603.7 | 352.1 | 192.6 | 159.47 | 2.208 | |
| 14,900.0 | 7,566.0 | 7,691.0 | 7,511.0 | 135.1 | 28.6 | 89.78 | 7,172.6 | -603.7 | 428.3 | 267.1 | 161.21 | 2.657 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - EDITH ANN 33-21 (EXISTING) - ENCANA WELL - NO SURVE

**Offset Site Error:** 0.0 ft

**Survey Program:** 8098-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8,700.0 | 7,566.0 | 7,517.0 | 7,517.0 | 32.2 | 13.1 | 90.00 | 1,776.6 | -719.3 | 490.7 | 449.8 | 40.96 | 11.982 | |
| 8,800.0 | 7,566.0 | 7,517.0 | 7,517.0 | 33.6 | 13.1 | 90.00 | 1,776.6 | -719.3 | 399.6 | 357.1 | 42.53 | 9.396 | |
| 8,900.0 | 7,566.0 | 7,517.0 | 7,517.0 | 35.0 | 13.1 | 90.00 | 1,776.6 | -719.3 | 313.9 | 269.8 | 44.12 | 7.115 | |
| 9,000.0 | 7,566.0 | 7,517.0 | 7,517.0 | 36.4 | 13.1 | 90.00 | 1,776.6 | -719.3 | 239.5 | 193.8 | 45.73 | 5.238 | |
| 9,100.0 | 7,566.0 | 7,517.0 | 7,517.0 | 37.9 | 13.1 | 90.00 | 1,776.6 | -719.3 | 190.3 | 143.0 | 47.35 | 4.019 | |
| 9,155.8 | 7,566.0 | 7,517.0 | 7,517.0 | 38.7 | 13.1 | 90.00 | 1,776.6 | -719.3 | 182.0 | 133.7 | 48.26 | 3.770 | CC, ES, SF |
| 9,200.0 | 7,566.0 | 7,517.0 | 7,517.0 | 39.3 | 13.1 | 90.00 | 1,776.6 | -719.3 | 187.3 | 138.3 | 48.98 | 3.823 | |
| 9,300.0 | 7,566.0 | 7,517.0 | 7,517.0 | 40.8 | 13.1 | 90.00 | 1,776.6 | -719.3 | 232.2 | 181.6 | 50.63 | 4.586 | |
| 9,400.0 | 7,566.0 | 7,517.0 | 7,517.0 | 42.4 | 13.1 | 90.00 | 1,776.6 | -719.3 | 304.6 | 252.3 | 52.28 | 5.825 | |
| 9,500.0 | 7,566.0 | 7,517.0 | 7,517.0 | 43.9 | 13.1 | 90.00 | 1,776.6 | -719.3 | 389.4 | 335.4 | 53.95 | 7.218 | |
| 9,600.0 | 7,566.0 | 7,517.0 | 7,517.0 | 45.5 | 13.1 | 90.00 | 1,776.6 | -719.3 | 480.1 | 424.4 | 55.62 | 8.632 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - EDITH ANN 34-21 (EXISTING) - ENCANA WELL - NO SURVE

**Offset Site Error:** 0.0 ft

**Survey Program:** 8107-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,200.0 | 4,170.3 | 4,127.3 | 4,127.3 | 11.0 | 7.2 | 48.95 | 372.7 | -790.1 | 494.1 | 477.3 | 16.79 | 29.429 | |
| 4,300.0 | 4,269.4 | 4,226.4 | 4,226.4 | 11.3 | 7.4 | 50.12 | 372.7 | -790.1 | 485.5 | 468.2 | 17.28 | 28.090 | |
| 4,400.0 | 4,368.6 | 4,325.6 | 4,325.6 | 11.6 | 7.5 | 51.33 | 372.7 | -790.1 | 477.1 | 459.3 | 17.78 | 26.828 | |
| 4,500.0 | 4,467.7 | 4,424.7 | 4,424.7 | 11.9 | 7.7 | 52.58 | 372.7 | -790.1 | 468.9 | 450.6 | 18.29 | 25.639 | |
| 4,600.0 | 4,566.8 | 4,523.8 | 4,523.8 | 12.2 | 7.9 | 53.88 | 372.7 | -790.1 | 461.0 | 442.2 | 18.80 | 24.519 | |
| 4,700.0 | 4,665.9 | 4,622.9 | 4,622.9 | 12.5 | 8.1 | 55.22 | 372.7 | -790.1 | 453.3 | 433.9 | 19.32 | 23.464 | |
| 4,800.0 | 4,765.1 | 4,722.1 | 4,722.1 | 12.8 | 8.2 | 56.60 | 372.7 | -790.1 | 445.8 | 426.0 | 19.84 | 22.471 | |
| 4,900.0 | 4,864.2 | 4,821.2 | 4,821.2 | 13.1 | 8.4 | 58.03 | 372.7 | -790.1 | 438.6 | 418.3 | 20.37 | 21.537 | |
| 5,000.0 | 4,963.3 | 4,920.3 | 4,920.3 | 13.4 | 8.6 | 59.51 | 372.7 | -790.1 | 431.8 | 410.9 | 20.90 | 20.659 | |
| 5,100.0 | 5,062.4 | 5,019.4 | 5,019.4 | 13.6 | 8.8 | 61.03 | 372.7 | -790.1 | 425.2 | 403.7 | 21.44 | 19.835 | |
| 5,200.0 | 5,161.6 | 5,118.6 | 5,118.6 | 13.9 | 8.9 | 62.60 | 372.7 | -790.1 | 418.9 | 396.9 | 21.98 | 19.062 | |
| 5,300.0 | 5,260.7 | 5,217.7 | 5,217.7 | 14.2 | 9.1 | 64.21 | 372.7 | -790.1 | 412.9 | 390.4 | 22.52 | 18.338 | |
| 5,400.0 | 5,359.8 | 5,316.8 | 5,316.8 | 14.5 | 9.3 | 65.87 | 372.7 | -790.1 | 407.3 | 384.3 | 23.06 | 17.662 | |
| 5,500.0 | 5,458.9 | 5,415.9 | 5,415.9 | 14.8 | 9.5 | 67.58 | 372.7 | -790.1 | 402.1 | 378.5 | 23.61 | 17.031 | |
| 5,600.0 | 5,558.1 | 5,515.1 | 5,515.1 | 15.1 | 9.6 | 69.32 | 372.7 | -790.1 | 397.2 | 373.0 | 24.15 | 16.444 | |
| 5,700.0 | 5,657.2 | 5,614.2 | 5,614.2 | 15.4 | 9.8 | 71.11 | 372.7 | -790.1 | 392.7 | 368.0 | 24.70 | 15.899 | |
| 5,800.0 | 5,756.3 | 5,713.3 | 5,713.3 | 15.7 | 10.0 | 72.94 | 372.7 | -790.1 | 388.6 | 363.4 | 25.24 | 15.395 | |
| 5,900.0 | 5,855.4 | 5,812.4 | 5,812.4 | 16.0 | 10.1 | 74.80 | 372.7 | -790.1 | 384.9 | 359.1 | 25.78 | 14.930 | |
| 6,000.0 | 5,954.6 | 5,911.6 | 5,911.6 | 16.3 | 10.3 | 76.70 | 372.7 | -790.1 | 381.6 | 355.3 | 26.32 | 14.502 | |
| 6,100.0 | 6,053.7 | 6,010.7 | 6,010.7 | 16.5 | 10.5 | 78.62 | 372.7 | -790.1 | 378.8 | 351.9 | 26.84 | 14.111 | |
| 6,200.0 | 6,152.8 | 6,109.8 | 6,109.8 | 16.8 | 10.7 | 80.58 | 372.7 | -790.1 | 376.4 | 349.0 | 27.36 | 13.754 | |
| 6,300.0 | 6,252.0 | 6,209.0 | 6,209.0 | 17.1 | 10.8 | 82.55 | 372.7 | -790.1 | 374.4 | 346.5 | 27.88 | 13.431 | |
| 6,400.0 | 6,351.1 | 6,308.1 | 6,308.1 | 17.4 | 11.0 | 84.54 | 372.7 | -790.1 | 372.9 | 344.5 | 28.38 | 13.141 | |
| 6,500.0 | 6,450.2 | 6,407.2 | 6,407.2 | 17.7 | 11.2 | 86.55 | 372.7 | -790.1 | 371.9 | 343.0 | 28.87 | 12.882 | |
| 6,600.0 | 6,549.3 | 6,506.3 | 6,506.3 | 18.0 | 11.4 | 88.57 | 372.7 | -790.1 | 371.3 | 342.0 | 29.35 | 12.652 | |
| 6,671.1 | 6,619.8 | 6,576.8 | 6,576.8 | 18.2 | 11.5 | 90.00 | 372.7 | -790.1 | 371.2 | 341.5 | 29.68 | 12.506 | |
| 6,700.0 | 6,648.5 | 6,605.5 | 6,605.5 | 18.3 | 11.5 | 90.58 | 372.7 | -790.1 | 371.2 | 341.4 | 29.82 | 12.451 | |
| 6,800.0 | 6,747.6 | 6,704.6 | 6,704.6 | 18.6 | 11.7 | 92.60 | 372.7 | -790.1 | 371.6 | 341.3 | 30.27 | 12.277 | |
| 6,900.0 | 6,846.7 | 6,803.7 | 6,803.7 | 18.9 | 11.9 | 94.61 | 372.7 | -790.1 | 372.4 | 341.7 | 30.71 | 12.129 | |
| 7,000.0 | 6,945.8 | 6,902.8 | 6,902.8 | 19.2 | 12.0 | 96.61 | 372.7 | -790.1 | 373.7 | 342.6 | 31.13 | 12.006 | |
| 7,100.0 | 7,044.9 | 7,001.9 | 7,001.9 | 19.4 | 12.2 | 66.48 | 372.7 | -790.1 | 373.5 | 342.0 | 31.47 | 11.868 | |
| 7,200.0 | 7,142.5 | 7,099.5 | 7,099.5 | 19.7 | 12.4 | 38.58 | 372.7 | -790.1 | 359.0 | 327.8 | 31.22 | 11.500 | |
| 7,300.0 | 7,235.7 | 7,192.7 | 7,192.7 | 20.0 | 12.6 | 32.64 | 372.7 | -790.1 | 328.7 | 298.4 | 30.33 | 10.838 | |
| 7,400.0 | 7,321.6 | 7,278.6 | 7,278.6 | 20.4 | 12.7 | 34.69 | 372.7 | -790.1 | 284.4 | 255.3 | 29.03 | 9.797 | |
| 7,500.0 | 7,397.8 | 7,354.8 | 7,354.8 | 20.7 | 12.8 | 43.50 | 372.7 | -790.1 | 229.1 | 201.3 | 27.84 | 8.229 | |
| 7,600.0 | 7,461.8 | 7,418.8 | 7,418.8 | 21.2 | 12.9 | 60.71 | 372.7 | -790.1 | 169.5 | 141.9 | 27.67 | 6.127 | |
| 7,700.0 | 7,511.7 | 7,468.7 | 7,468.7 | 21.8 | 13.0 | 82.71 | 372.7 | -790.1 | 123.9 | 95.6 | 28.30 | 4.379 | |
| 7,740.4 | 7,527.5 | 7,484.5 | 7,484.5 | 22.0 | 13.1 | 90.00 | 372.7 | -790.1 | 118.4 | 90.0 | 28.47 | 4.160 | CC, ES, SF |
| 7,800.0 | 7,546.0 | 7,503.0 | 7,503.0 | 22.5 | 13.1 | 96.87 | 372.7 | -790.1 | 130.9 | 102.2 | 28.67 | 4.565 | |
| 7,900.0 | 7,563.6 | 7,520.6 | 7,520.6 | 23.2 | 13.1 | 96.44 | 372.7 | -790.1 | 193.1 | 163.4 | 29.74 | 6.493 | |
| 8,000.0 | 7,566.0 | 7,523.0 | 7,523.0 | 24.1 | 13.1 | 90.00 | 372.7 | -790.1 | 277.7 | 246.7 | 30.95 | 8.973 | |
| 8,100.0 | 7,566.0 | 7,523.0 | 7,523.0 | 25.0 | 13.1 | 90.00 | 372.7 | -790.1 | 369.9 | 337.7 | 32.22 | 11.483 | |
| 8,200.0 | 7,566.0 | 7,523.0 | 7,523.0 | 26.1 | 13.1 | 90.00 | 372.7 | -790.1 | 465.4 | 431.8 | 33.56 | 13.868 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - EDITH ANN 6-8-21 (EXISTING) - ENCANA WELL - SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 80-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,000.0 | 3,972.1 | 4,226.5 | 4,109.7 | 10.5 | 16.7 | -169.11 | -92.5 | 27.3 | 496.3 | 478.0 | 18.25 | 27.189 | |
| 4,100.0 | 4,071.2 | 4,307.8 | 4,186.6 | 10.7 | 17.2 | -167.60 | -102.6 | 2.8 | 481.6 | 462.6 | 19.01 | 25.332 | |
| 4,200.0 | 4,170.3 | 4,386.4 | 4,261.8 | 11.0 | 17.6 | -166.24 | -111.6 | -17.8 | 471.2 | 451.5 | 19.74 | 23.871 | |
| 4,300.0 | 4,269.4 | 4,466.4 | 4,339.4 | 11.3 | 17.9 | -164.97 | -120.5 | -35.3 | 465.3 | 444.9 | 20.45 | 22.753 | |
| 4,400.0 | 4,368.6 | 4,561.9 | 4,432.5 | 11.6 | 18.3 | -163.56 | -130.6 | -53.8 | 462.1 | 440.8 | 21.24 | 21.751 | |
| 4,500.0 | 4,467.7 | 4,657.6 | 4,526.2 | 11.9 | 18.7 | -162.25 | -140.0 | -71.4 | 459.8 | 437.8 | 22.02 | 20.885 | |
| 4,593.8 | 4,560.7 | 4,744.3 | 4,611.2 | 12.2 | 19.0 | -161.22 | -147.6 | -86.1 | 459.1 | 436.4 | 22.68 | 20.245 | CC |
| 4,600.0 | 4,566.8 | 4,750.0 | 4,616.8 | 12.2 | 19.0 | -161.16 | -148.1 | -87.0 | 459.1 | 436.4 | 22.71 | 20.211 | ES |
| 4,700.0 | 4,665.9 | 4,842.4 | 4,708.1 | 12.5 | 19.3 | -160.45 | -153.8 | -100.2 | 460.1 | 436.8 | 23.29 | 19.759 | |
| 4,800.0 | 4,765.1 | 4,936.2 | 4,801.1 | 12.8 | 19.5 | -159.99 | -158.0 | -111.6 | 462.5 | 438.8 | 23.78 | 19.447 | |
| 4,900.0 | 4,864.2 | 5,028.5 | 4,892.8 | 13.1 | 19.8 | -159.65 | -161.8 | -121.4 | 466.5 | 442.2 | 24.24 | 19.243 | |
| 5,000.0 | 4,963.3 | 5,119.6 | 4,983.6 | 13.4 | 19.9 | -159.53 | -164.5 | -128.8 | 472.2 | 447.6 | 24.61 | 19.186 | SF |
| 5,100.0 | 5,062.4 | 5,212.8 | 5,076.7 | 13.6 | 20.1 | -159.65 | -166.0 | -134.3 | 479.7 | 454.8 | 24.91 | 19.257 | |
| 5,200.0 | 5,161.6 | 5,305.9 | 5,169.6 | 13.9 | 20.2 | -159.91 | -166.7 | -138.3 | 488.3 | 463.1 | 25.16 | 19.410 | |
| 5,300.0 | 5,260.7 | 5,401.2 | 5,264.9 | 14.2 | 20.3 | -160.26 | -167.1 | -141.0 | 498.2 | 472.8 | 25.37 | 19.636 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4A-21H-O268 - 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 | -89.96 | 0.0 | -11.2 | 11.2 | | | | |
| 100.0 | 100.0 | 99.0 | 99.0 | 0.1 | 0.1 | -89.96 | 0.0 | -11.2 | 11.2 | 10.9 | 0.26 | 42.945 | |
| 200.0 | 200.0 | 199.0 | 199.0 | 0.3 | 0.3 | -89.96 | 0.0 | -11.2 | 11.2 | 10.6 | 0.61 | 18.366 | CC, ES |
| 300.0 | 300.0 | 298.8 | 298.8 | 0.5 | 0.5 | -89.95 | 0.0 | -12.0 | 12.0 | 11.1 | 0.96 | 12.558 | |
| 400.0 | 400.0 | 398.6 | 398.5 | 0.7 | 0.7 | -0.05 | 0.0 | -14.6 | 13.8 | 12.5 | 1.31 | 10.535 | |
| 500.0 | 500.0 | 498.3 | 498.2 | 0.8 | 0.8 | -0.04 | 0.0 | -18.9 | 15.5 | 13.8 | 1.65 | 9.355 | |
| 600.0 | 599.9 | 598.0 | 597.7 | 1.0 | 1.0 | -0.03 | 0.0 | -25.0 | 17.2 | 15.2 | 2.00 | 8.584 | |
| 700.0 | 699.7 | 697.7 | 697.0 | 1.2 | 1.3 | -0.01 | 0.1 | -32.8 | 18.9 | 16.5 | 2.35 | 8.040 | |
| 800.0 | 799.4 | 797.3 | 796.2 | 1.4 | 1.5 | 0.00 | 0.1 | -42.3 | 20.6 | 17.9 | 2.70 | 7.635 | |
| 900.0 | 898.9 | 896.9 | 895.2 | 1.7 | 1.7 | 0.01 | 0.1 | -53.5 | 22.3 | 19.3 | 3.05 | 7.321 | |
| 1,000.0 | 998.3 | 996.5 | 993.9 | 1.9 | 2.0 | 0.02 | 0.1 | -66.5 | 24.0 | 20.6 | 3.39 | 7.070 | |
| 1,100.0 | 1,097.4 | 1,096.1 | 1,092.4 | 2.2 | 2.3 | 0.03 | 0.2 | -81.1 | 25.8 | 22.1 | 3.74 | 6.903 | |
| 1,200.0 | 1,196.5 | 1,195.5 | 1,190.5 | 2.4 | 2.6 | 0.04 | 0.2 | -97.5 | 29.1 | 25.0 | 4.09 | 7.113 | |
| 1,300.0 | 1,295.7 | 1,294.8 | 1,288.2 | 2.7 | 3.0 | 0.04 | 0.2 | -115.5 | 34.1 | 29.7 | 4.44 | 7.680 | |
| 1,400.0 | 1,394.8 | 1,394.3 | 1,385.7 | 3.0 | 3.4 | 0.04 | 0.3 | -135.1 | 40.7 | 35.9 | 4.79 | 8.497 | |
| 1,500.0 | 1,493.9 | 1,494.0 | 1,483.4 | 3.3 | 3.7 | 0.05 | 0.3 | -155.0 | 47.6 | 42.5 | 5.14 | 9.264 | |
| 1,600.0 | 1,593.1 | 1,593.8 | 1,581.1 | 3.6 | 4.1 | 0.05 | 0.4 | -175.0 | 54.5 | 49.0 | 5.49 | 9.933 | |
| 1,700.0 | 1,692.2 | 1,693.5 | 1,678.9 | 3.8 | 4.5 | 0.05 | 0.4 | -195.0 | 61.4 | 55.6 | 5.84 | 10.521 | |
| 1,800.0 | 1,791.3 | 1,793.3 | 1,776.6 | 4.1 | 4.9 | 0.05 | 0.5 | -215.0 | 68.4 | 62.2 | 6.19 | 11.043 | |
| 1,900.0 | 1,890.4 | 1,893.1 | 1,874.4 | 4.4 | 5.3 | 0.05 | 0.5 | -234.9 | 75.3 | 68.7 | 6.54 | 11.510 | |
| 2,000.0 | 1,989.6 | 1,992.8 | 1,972.1 | 4.7 | 5.7 | 0.05 | 0.5 | -254.9 | 82.2 | 75.3 | 6.89 | 11.929 | |
| 2,100.0 | 2,088.7 | 2,092.6 | 2,069.8 | 5.0 | 6.0 | 0.05 | 0.6 | -274.9 | 89.1 | 81.9 | 7.24 | 12.308 | |
| 2,200.0 | 2,187.8 | 2,192.3 | 2,167.6 | 5.3 | 6.4 | 0.05 | 0.6 | -294.8 | 96.0 | 88.4 | 7.59 | 12.651 | |
| 2,300.0 | 2,286.9 | 2,292.1 | 2,265.3 | 5.5 | 6.8 | 0.05 | 0.7 | -314.8 | 102.9 | 95.0 | 7.94 | 12.965 | |
| 2,400.0 | 2,386.1 | 2,391.9 | 2,363.1 | 5.8 | 7.2 | 0.05 | 0.7 | -334.8 | 109.8 | 101.6 | 8.29 | 13.252 | |
| 2,500.0 | 2,485.2 | 2,491.6 | 2,460.8 | 6.1 | 7.6 | 0.05 | 0.8 | -354.7 | 116.8 | 108.1 | 8.64 | 13.516 | |
| 2,600.0 | 2,584.3 | 2,591.4 | 2,558.5 | 6.4 | 8.0 | 0.05 | 0.8 | -374.7 | 123.7 | 114.7 | 8.99 | 13.759 | |
| 2,700.0 | 2,683.4 | 2,691.1 | 2,656.3 | 6.7 | 8.4 | 0.05 | 0.9 | -394.7 | 130.6 | 121.3 | 9.34 | 13.984 | |
| 2,800.0 | 2,782.6 | 2,790.9 | 2,754.0 | 7.0 | 8.8 | 0.05 | 0.9 | -414.7 | 137.5 | 127.8 | 9.69 | 14.193 | |
| 2,900.0 | 2,881.7 | 2,890.7 | 2,851.8 | 7.3 | 9.2 | 0.05 | 0.9 | -434.6 | 144.4 | 134.4 | 10.04 | 14.387 | |
| 3,000.0 | 2,980.8 | 2,990.4 | 2,949.5 | 7.6 | 9.6 | 0.05 | 1.0 | -454.6 | 151.3 | 141.0 | 10.39 | 14.569 | |
| 3,100.0 | 3,079.9 | 3,090.2 | 3,047.3 | 7.9 | 10.0 | 0.05 | 1.0 | -474.6 | 158.3 | 147.5 | 10.74 | 14.738 | |
| 3,200.0 | 3,179.1 | 3,189.9 | 3,145.0 | 8.1 | 10.3 | 0.05 | 1.1 | -494.5 | 165.2 | 154.1 | 11.09 | 14.897 | |
| 3,300.0 | 3,278.2 | 3,289.7 | 3,242.7 | 8.4 | 10.7 | 0.05 | 1.1 | -514.5 | 172.1 | 160.7 | 11.44 | 15.046 | |
| 3,400.0 | 3,377.3 | 3,389.5 | 3,340.5 | 8.7 | 11.1 | 0.05 | 1.2 | -534.5 | 179.0 | 167.2 | 11.79 | 15.186 | |
| 3,500.0 | 3,476.4 | 3,489.2 | 3,438.2 | 9.0 | 11.5 | 0.06 | 1.2 | -554.5 | 185.9 | 173.8 | 12.14 | 15.319 | |
| 3,600.0 | 3,575.6 | 3,589.0 | 3,536.0 | 9.3 | 11.9 | 0.06 | 1.3 | -574.4 | 192.8 | 180.3 | 12.49 | 15.443 | |
| 3,700.0 | 3,674.7 | 3,688.7 | 3,633.7 | 9.6 | 12.3 | 0.06 | 1.3 | -594.4 | 199.8 | 186.9 | 12.84 | 15.561 | |
| 3,800.0 | 3,773.8 | 3,788.5 | 3,731.4 | 9.9 | 12.7 | 0.06 | 1.3 | -614.4 | 206.7 | 193.5 | 13.19 | 15.673 | |
| 3,900.0 | 3,872.9 | 3,888.3 | 3,829.2 | 10.2 | 13.1 | 0.06 | 1.4 | -634.3 | 213.6 | 200.0 | 13.54 | 15.779 | |
| 4,000.0 | 3,972.1 | 3,988.0 | 3,926.9 | 10.5 | 13.5 | 0.06 | 1.4 | -654.3 | 220.5 | 206.6 | 13.89 | 15.880 | |
| 4,100.0 | 4,071.2 | 4,087.8 | 4,024.7 | 10.7 | 13.9 | 0.06 | 1.5 | -674.3 | 227.4 | 213.2 | 14.24 | 15.975 | |
| 4,200.0 | 4,170.3 | 4,187.6 | 4,122.4 | 11.0 | 14.3 | 0.06 | 1.5 | -694.3 | 234.3 | 219.7 | 14.58 | 16.067 | |
| 4,300.0 | 4,269.4 | 4,287.3 | 4,220.1 | 11.3 | 14.7 | 0.06 | 1.6 | -714.2 | 241.2 | 226.3 | 14.93 | 16.153 | |
| 4,400.0 | 4,368.6 | 4,387.1 | 4,317.9 | 11.6 | 15.1 | 0.06 | 1.6 | -734.2 | 248.2 | 232.9 | 15.28 | 16.236 | |
| 4,500.0 | 4,467.7 | 4,486.8 | 4,415.6 | 11.9 | 15.5 | 0.06 | 1.7 | -754.2 | 255.1 | 239.4 | 15.63 | 16.315 | |
| 4,600.0 | 4,566.8 | 4,586.6 | 4,513.4 | 12.2 | 15.9 | 0.06 | 1.7 | -774.1 | 262.0 | 246.0 | 15.98 | 16.391 | |
| 4,700.0 | 4,665.9 | 4,686.4 | 4,611.1 | 12.5 | 16.3 | 0.06 | 1.7 | -794.1 | 268.9 | 252.6 | 16.33 | 16.464 | |
| 4,800.0 | 4,765.1 | 4,786.1 | 4,708.9 | 12.8 | 16.7 | 0.06 | 1.8 | -814.1 | 275.8 | 259.1 | 16.68 | 16.533 | |
| 4,900.0 | 4,864.2 | 4,885.9 | 4,806.6 | 13.1 | 17.1 | 0.06 | 1.8 | -834.1 | 282.7 | 265.7 | 17.03 | 16.600 | |
| 5,000.0 | 4,963.3 | 4,985.6 | 4,904.3 | 13.4 | 17.5 | 0.06 | 1.9 | -854.0 | 289.7 | 272.3 | 17.38 | 16.664 | |
| 5,100.0 | 5,062.4 | 5,085.4 | 5,002.1 | 13.6 | 17.8 | 0.06 | 1.9 | -874.0 | 296.6 | 278.8 | 17.73 | 16.725 | |

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 Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4A-21H-O268 - 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 | 5,161.6 | 5,185.2 | 5,099.8 | 13.9 | 18.2 | 0.06 | 2.0 | -894.0 | 303.5 | 285.4 | 18.08 | 16.784 | |
| 5,300.0 | 5,260.7 | 5,284.9 | 5,197.6 | 14.2 | 18.6 | 0.06 | 2.0 | -913.9 | 310.4 | 292.0 | 18.43 | 16.841 | |
| 5,400.0 | 5,359.8 | 5,384.7 | 5,295.3 | 14.5 | 19.0 | 0.06 | 2.1 | -933.9 | 317.3 | 298.5 | 18.78 | 16.895 | |
| 5,500.0 | 5,458.9 | 5,484.4 | 5,393.0 | 14.8 | 19.4 | 0.06 | 2.1 | -953.9 | 324.2 | 305.1 | 19.13 | 16.948 | |
| 5,600.0 | 5,558.1 | 5,584.2 | 5,490.8 | 15.1 | 19.8 | 0.06 | 2.1 | -973.9 | 331.1 | 311.7 | 19.48 | 16.999 | |
| 5,700.0 | 5,657.2 | 5,684.0 | 5,588.5 | 15.4 | 20.2 | 0.06 | 2.2 | -993.8 | 338.1 | 318.2 | 19.83 | 17.048 | |
| 5,800.0 | 5,756.3 | 5,783.7 | 5,686.3 | 15.7 | 20.6 | 0.06 | 2.2 | -1,013.8 | 345.0 | 324.8 | 20.18 | 17.095 | |
| 5,900.0 | 5,855.4 | 5,883.5 | 5,784.0 | 16.0 | 21.0 | 0.06 | 2.3 | -1,033.8 | 351.9 | 331.4 | 20.53 | 17.141 | |
| 6,000.0 | 5,954.6 | 5,983.2 | 5,881.7 | 16.3 | 21.4 | 0.06 | 2.3 | -1,053.7 | 358.8 | 337.9 | 20.88 | 17.185 | |
| 6,100.0 | 6,053.7 | 6,083.0 | 5,979.5 | 16.5 | 21.8 | 0.06 | 2.4 | -1,073.7 | 365.7 | 344.5 | 21.23 | 17.228 | |
| 6,200.0 | 6,152.8 | 6,182.8 | 6,077.2 | 16.8 | 22.2 | 0.06 | 2.4 | -1,093.7 | 372.6 | 351.1 | 21.58 | 17.269 | |
| 6,300.0 | 6,252.0 | 6,282.5 | 6,175.0 | 17.1 | 22.6 | 0.06 | 2.5 | -1,113.7 | 379.6 | 357.6 | 21.93 | 17.309 | |
| 6,400.0 | 6,351.1 | 6,382.3 | 6,272.7 | 17.4 | 23.0 | 0.06 | 2.5 | -1,133.6 | 386.5 | 364.2 | 22.28 | 17.348 | |
| 6,500.0 | 6,450.2 | 6,482.0 | 6,370.5 | 17.7 | 23.4 | 0.06 | 2.5 | -1,153.6 | 393.4 | 370.8 | 22.63 | 17.385 | |
| 6,600.0 | 6,549.3 | 6,581.8 | 6,468.2 | 18.0 | 23.8 | 0.06 | 2.6 | -1,173.6 | 400.3 | 377.3 | 22.98 | 17.422 | |
| 6,700.0 | 6,648.5 | 6,681.6 | 6,565.9 | 18.3 | 24.2 | 0.06 | 2.6 | -1,193.5 | 407.2 | 383.9 | 23.33 | 17.457 | |
| 6,800.0 | 6,747.6 | 6,781.3 | 6,663.7 | 18.6 | 24.6 | 0.06 | 2.7 | -1,213.5 | 414.1 | 390.5 | 23.68 | 17.492 | |
| 6,900.0 | 6,846.7 | 6,881.1 | 6,761.4 | 18.9 | 25.0 | 0.06 | 2.7 | -1,233.5 | 421.0 | 397.0 | 24.03 | 17.525 | |
| 7,000.0 | 6,945.8 | 6,981.2 | 6,859.2 | 19.2 | 25.4 | 0.81 | 8.4 | -1,253.4 | 427.9 | 403.5 | 24.38 | 17.553 | |
| 7,100.0 | 7,044.9 | 7,077.4 | 6,951.1 | 19.4 | 25.7 | -28.44 | 29.7 | -1,271.8 | 435.3 | 410.5 | 24.78 | 17.562 | |
| 7,200.0 | 7,142.5 | 7,169.9 | 7,035.0 | 19.7 | 26.1 | -55.66 | 64.8 | -1,288.3 | 443.4 | 418.2 | 25.22 | 17.580 | |
| 7,300.0 | 7,235.7 | 7,259.7 | 7,110.2 | 20.0 | 26.4 | -62.59 | 111.5 | -1,302.8 | 451.8 | 426.3 | 25.55 | 17.685 | |
| 7,400.0 | 7,321.6 | 7,350.0 | 7,177.7 | 20.4 | 26.8 | -64.35 | 170.0 | -1,315.6 | 460.1 | 434.4 | 25.72 | 17.886 | |
| 7,500.0 | 7,397.8 | 7,432.8 | 7,231.0 | 20.7 | 27.2 | -64.56 | 232.5 | -1,325.4 | 467.7 | 441.9 | 25.84 | 18.098 | |
| 7,600.0 | 7,461.8 | 7,517.0 | 7,275.6 | 21.2 | 27.6 | -64.16 | 303.3 | -1,333.3 | 474.2 | 448.1 | 26.14 | 18.145 | |
| 7,700.0 | 7,511.7 | 7,600.0 | 7,309.2 | 21.8 | 28.0 | -63.62 | 379.0 | -1,338.8 | 479.3 | 452.4 | 26.91 | 17.813 | |
| 7,800.0 | 7,546.0 | 7,682.2 | 7,331.6 | 22.5 | 28.5 | -63.17 | 458.0 | -1,342.0 | 482.7 | 454.3 | 28.45 | 16.968 | |
| 7,900.0 | 7,563.6 | 7,764.0 | 7,342.7 | 23.2 | 29.0 | -62.90 | 538.8 | -1,342.9 | 484.2 | 453.3 | 30.84 | 15.700 | |
| 8,000.0 | 7,566.0 | 7,855.1 | 7,344.0 | 24.1 | 29.7 | -62.82 | 630.0 | -1,341.6 | 483.8 | 450.3 | 33.42 | 14.474 | |
| 8,100.0 | 7,566.0 | 7,955.1 | 7,344.0 | 25.0 | 30.4 | -62.77 | 730.0 | -1,339.8 | 483.0 | 447.4 | 35.63 | 13.556 | |
| 8,200.0 | 7,566.0 | 8,055.1 | 7,344.0 | 26.1 | 31.3 | -62.72 | 830.0 | -1,338.1 | 482.2 | 444.3 | 37.96 | 12.703 | |
| 8,300.0 | 7,566.0 | 8,155.1 | 7,344.0 | 27.2 | 32.2 | -62.67 | 929.9 | -1,336.3 | 481.4 | 441.0 | 40.40 | 11.918 | |
| 8,400.0 | 7,566.0 | 8,255.1 | 7,344.0 | 28.4 | 33.2 | -62.63 | 1,029.9 | -1,334.6 | 480.7 | 437.8 | 42.92 | 11.199 | |
| 8,500.0 | 7,566.0 | 8,355.1 | 7,344.0 | 29.6 | 34.2 | -62.58 | 1,129.9 | -1,332.8 | 479.9 | 434.4 | 45.51 | 10.545 | |
| 8,600.0 | 7,566.0 | 8,455.1 | 7,344.0 | 30.9 | 35.3 | -62.53 | 1,229.9 | -1,331.1 | 479.1 | 431.0 | 48.16 | 9.948 | |
| 8,700.0 | 7,566.0 | 8,555.1 | 7,344.0 | 32.2 | 36.5 | -62.48 | 1,329.9 | -1,329.4 | 478.3 | 427.5 | 50.86 | 9.405 | |
| 8,800.0 | 7,566.0 | 8,655.1 | 7,344.0 | 33.6 | 37.7 | -62.43 | 1,429.8 | -1,327.6 | 477.6 | 424.0 | 53.60 | 8.910 | |
| 8,900.0 | 7,566.0 | 8,755.1 | 7,344.0 | 35.0 | 38.9 | -62.39 | 1,529.8 | -1,325.9 | 476.8 | 420.4 | 56.38 | 8.458 | |
| 9,000.0 | 7,566.0 | 8,855.1 | 7,344.0 | 36.4 | 40.2 | -62.34 | 1,629.8 | -1,324.1 | 476.0 | 416.8 | 59.18 | 8.044 | |
| 9,100.0 | 7,566.0 | 8,955.1 | 7,344.0 | 37.9 | 41.5 | -62.29 | 1,729.8 | -1,322.4 | 475.3 | 413.2 | 62.01 | 7.664 | |
| 9,200.0 | 7,566.0 | 9,055.1 | 7,344.0 | 39.3 | 42.8 | -62.24 | 1,829.8 | -1,320.6 | 474.5 | 409.6 | 64.86 | 7.316 | |
| 9,300.0 | 7,566.0 | 9,155.1 | 7,344.0 | 40.8 | 44.2 | -62.19 | 1,929.7 | -1,318.9 | 473.7 | 406.0 | 67.73 | 6.994 | |
| 9,400.0 | 7,566.0 | 9,255.1 | 7,344.0 | 42.4 | 45.6 | -62.14 | 2,029.7 | -1,317.1 | 472.9 | 402.3 | 70.61 | 6.698 | |
| 9,500.0 | 7,566.0 | 9,355.1 | 7,344.0 | 43.9 | 47.0 | -62.09 | 2,129.7 | -1,315.4 | 472.2 | 398.7 | 73.51 | 6.423 | |
| 9,600.0 | 7,566.0 | 9,455.1 | 7,344.0 | 45.5 | 48.5 | -62.04 | 2,229.7 | -1,313.7 | 471.4 | 395.0 | 76.42 | 6.169 | |
| 9,700.0 | 7,566.0 | 9,555.1 | 7,344.0 | 47.0 | 50.0 | -61.99 | 2,329.7 | -1,311.9 | 470.6 | 391.3 | 79.33 | 5.932 | |
| 9,800.0 | 7,566.0 | 9,655.1 | 7,344.0 | 48.6 | 51.4 | -61.94 | 2,429.6 | -1,310.2 | 469.9 | 387.6 | 82.26 | 5.712 | |
| 9,900.0 | 7,566.0 | 9,755.1 | 7,344.0 | 50.2 | 53.0 | -61.89 | 2,529.6 | -1,308.4 | 469.1 | 383.9 | 85.20 | 5.506 | |
| 10,000.0 | 7,566.0 | 9,855.1 | 7,344.0 | 51.8 | 54.5 | -61.84 | 2,629.6 | -1,306.7 | 468.3 | 380.2 | 88.14 | 5.314 | |
| 10,100.0 | 7,566.0 | 9,955.1 | 7,344.0 | 53.4 | 56.0 | -61.79 | 2,729.6 | -1,304.9 | 467.5 | 376.5 | 91.08 | 5.133 | |
| 10,200.0 | 7,566.0 | 10,055.1 | 7,344.0 | 55.1 | 57.5 | -61.74 | 2,829.6 | -1,303.2 | 466.8 | 372.7 | 94.03 | 4.964 | |
| 10,300.0 | 7,566.0 | 10,155.1 | 7,344.0 | 56.7 | 59.1 | -61.69 | 2,929.6 | -1,301.4 | 466.0 | 369.0 | 96.98 | 4.805 | |

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 Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4A-21H-O268 - 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 | 7,566.0 | 10,255.1 | 7,344.0 | 58.3 | 60.7 | -61.64 | 3,029.5 | -1,299.7 | 465.2 | 365.3 | 99.94 | 4.655 | |
| 10,500.0 | 7,566.0 | 10,355.1 | 7,344.0 | 60.0 | 62.2 | -61.59 | 3,129.5 | -1,297.9 | 464.5 | 361.6 | 102.90 | 4.514 | |
| 10,600.0 | 7,566.0 | 10,455.0 | 7,344.0 | 61.6 | 63.8 | -61.54 | 3,229.5 | -1,296.2 | 463.7 | 357.8 | 105.86 | 4.380 | |
| 10,700.0 | 7,566.0 | 10,555.0 | 7,344.0 | 63.3 | 65.4 | -61.48 | 3,329.5 | -1,294.5 | 462.9 | 354.1 | 108.82 | 4.254 | |
| 10,800.0 | 7,566.0 | 10,655.0 | 7,344.0 | 64.9 | 67.0 | -61.43 | 3,429.5 | -1,292.7 | 462.2 | 350.4 | 111.78 | 4.134 | |
| 10,900.0 | 7,566.0 | 10,755.0 | 7,344.0 | 66.6 | 68.6 | -61.38 | 3,529.4 | -1,291.0 | 461.4 | 346.7 | 114.75 | 4.021 | |
| 11,000.0 | 7,566.0 | 10,855.0 | 7,344.0 | 68.3 | 70.3 | -61.33 | 3,629.4 | -1,289.2 | 460.6 | 342.9 | 117.71 | 3.913 | |
| 11,100.0 | 7,566.0 | 10,955.0 | 7,344.0 | 69.9 | 71.9 | -61.28 | 3,729.4 | -1,287.5 | 459.9 | 339.2 | 120.68 | 3.811 | |
| 11,200.0 | 7,566.0 | 11,055.0 | 7,344.0 | 71.6 | 73.5 | -61.22 | 3,829.4 | -1,285.7 | 459.1 | 335.5 | 123.64 | 3.713 | |
| 11,300.0 | 7,566.0 | 11,155.0 | 7,344.0 | 73.3 | 75.2 | -61.17 | 3,929.4 | -1,284.0 | 458.3 | 331.7 | 126.61 | 3.620 | |
| 11,400.0 | 7,566.0 | 11,255.0 | 7,344.0 | 75.0 | 76.8 | -61.12 | 4,029.3 | -1,282.2 | 457.6 | 328.0 | 129.57 | 3.532 | |
| 11,500.0 | 7,566.0 | 11,355.0 | 7,344.0 | 76.7 | 78.4 | -61.07 | 4,129.3 | -1,280.5 | 456.8 | 324.3 | 132.53 | 3.447 | |
| 11,600.0 | 7,566.0 | 11,455.0 | 7,344.0 | 78.4 | 80.1 | -61.01 | 4,229.3 | -1,278.7 | 456.1 | 320.6 | 135.49 | 3.366 | |
| 11,700.0 | 7,566.0 | 11,555.0 | 7,344.0 | 80.1 | 81.7 | -60.96 | 4,329.3 | -1,277.0 | 455.3 | 316.8 | 138.45 | 3.288 | |
| 11,800.0 | 7,566.0 | 11,655.0 | 7,344.0 | 81.8 | 83.4 | -60.91 | 4,429.3 | -1,275.3 | 454.5 | 313.1 | 141.41 | 3.214 | |
| 11,900.0 | 7,566.0 | 11,755.0 | 7,344.0 | 83.5 | 85.1 | -60.85 | 4,529.2 | -1,273.5 | 453.8 | 309.4 | 144.37 | 3.143 | |
| 12,000.0 | 7,566.0 | 11,855.0 | 7,344.0 | 85.2 | 86.7 | -60.80 | 4,629.2 | -1,271.8 | 453.0 | 305.7 | 147.33 | 3.075 | |
| 12,100.0 | 7,566.0 | 11,955.0 | 7,344.0 | 86.9 | 88.4 | -60.75 | 4,729.2 | -1,270.0 | 452.2 | 302.0 | 150.28 | 3.009 | |
| 12,200.0 | 7,566.0 | 12,055.0 | 7,344.0 | 88.6 | 90.1 | -60.69 | 4,829.2 | -1,268.3 | 451.5 | 298.2 | 153.23 | 2.946 | |
| 12,300.0 | 7,566.0 | 12,155.0 | 7,344.0 | 90.3 | 91.8 | -60.64 | 4,929.2 | -1,266.5 | 450.7 | 294.5 | 156.18 | 2.886 | |
| 12,400.0 | 7,566.0 | 12,255.0 | 7,344.0 | 92.0 | 93.4 | -60.58 | 5,029.2 | -1,264.8 | 450.0 | 290.8 | 159.13 | 2.828 | |
| 12,500.0 | 7,566.0 | 12,355.0 | 7,344.0 | 93.7 | 95.1 | -60.53 | 5,129.1 | -1,263.0 | 449.2 | 287.1 | 162.08 | 2.772 | |
| 12,600.0 | 7,566.0 | 12,455.0 | 7,344.0 | 95.4 | 96.8 | -60.47 | 5,229.1 | -1,261.3 | 448.4 | 283.4 | 165.02 | 2.717 | |
| 12,700.0 | 7,566.0 | 12,555.0 | 7,344.0 | 97.1 | 98.5 | -60.42 | 5,329.1 | -1,259.5 | 447.7 | 279.7 | 167.96 | 2.665 | |
| 12,800.0 | 7,566.0 | 12,655.0 | 7,344.0 | 98.8 | 100.2 | -60.36 | 5,429.1 | -1,257.8 | 446.9 | 276.0 | 170.90 | 2.615 | |
| 12,900.0 | 7,566.0 | 12,755.0 | 7,344.0 | 100.6 | 101.9 | -60.31 | 5,529.1 | -1,256.1 | 446.2 | 272.3 | 173.83 | 2.567 | |
| 13,000.0 | 7,566.0 | 12,855.0 | 7,344.0 | 102.3 | 103.6 | -60.25 | 5,629.0 | -1,254.3 | 445.4 | 268.6 | 176.77 | 2.520 | |
| 13,100.0 | 7,566.0 | 12,955.0 | 7,344.0 | 104.0 | 105.3 | -60.20 | 5,729.0 | -1,252.6 | 444.6 | 264.9 | 179.70 | 2.474 | |
| 13,200.0 | 7,566.0 | 13,054.9 | 7,344.0 | 105.7 | 107.0 | -60.14 | 5,829.0 | -1,250.8 | 443.9 | 261.3 | 182.62 | 2.431 | |
| 13,300.0 | 7,566.0 | 13,154.9 | 7,344.0 | 107.4 | 108.7 | -60.08 | 5,929.0 | -1,249.1 | 443.1 | 257.6 | 185.55 | 2.388 | |
| 13,400.0 | 7,566.0 | 13,254.9 | 7,344.0 | 109.2 | 110.4 | -60.03 | 6,029.0 | -1,247.3 | 442.4 | 253.9 | 188.47 | 2.347 | |
| 13,500.0 | 7,566.0 | 13,354.9 | 7,344.0 | 110.9 | 112.1 | -59.97 | 6,128.9 | -1,245.6 | 441.6 | 250.2 | 191.39 | 2.307 | |
| 13,600.0 | 7,566.0 | 13,454.9 | 7,344.0 | 112.6 | 113.8 | -59.91 | 6,228.9 | -1,243.8 | 440.9 | 246.6 | 194.30 | 2.269 | |
| 13,700.0 | 7,566.0 | 13,554.9 | 7,344.0 | 114.3 | 115.5 | -59.86 | 6,328.9 | -1,242.1 | 440.1 | 242.9 | 197.21 | 2.232 | |
| 13,800.0 | 7,566.0 | 13,654.9 | 7,344.0 | 116.1 | 117.2 | -59.80 | 6,428.9 | -1,240.4 | 439.4 | 239.2 | 200.12 | 2.195 | |
| 13,900.0 | 7,566.0 | 13,754.9 | 7,344.0 | 117.8 | 118.9 | -59.74 | 6,528.9 | -1,238.6 | 438.6 | 235.6 | 203.02 | 2.160 | |
| 14,000.0 | 7,566.0 | 13,854.9 | 7,344.0 | 119.5 | 120.6 | -59.68 | 6,628.8 | -1,236.9 | 437.8 | 231.9 | 205.93 | 2.126 | |
| 14,100.0 | 7,566.0 | 13,954.9 | 7,344.0 | 121.2 | 122.3 | -59.63 | 6,728.8 | -1,235.1 | 437.1 | 228.3 | 208.82 | 2.093 | |
| 14,200.0 | 7,566.0 | 14,054.9 | 7,344.0 | 123.0 | 124.0 | -59.57 | 6,828.8 | -1,233.4 | 436.3 | 224.6 | 211.72 | 2.061 | |
| 14,300.0 | 7,566.0 | 14,154.9 | 7,344.0 | 124.7 | 125.7 | -59.51 | 6,928.8 | -1,231.6 | 435.6 | 221.0 | 214.61 | 2.030 | |
| 14,400.0 | 7,566.0 | 14,254.9 | 7,344.0 | 126.4 | 127.4 | -59.45 | 7,028.8 | -1,229.9 | 434.8 | 217.3 | 217.49 | 1.999 | |
| 14,500.0 | 7,566.0 | 14,354.9 | 7,344.0 | 128.2 | 129.2 | -59.39 | 7,128.8 | -1,228.1 | 434.1 | 213.7 | 220.38 | 1.970 | |
| 14,600.0 | 7,566.0 | 14,454.9 | 7,344.0 | 129.9 | 130.9 | -59.34 | 7,228.7 | -1,226.4 | 433.3 | 210.1 | 223.26 | 1.941 | |
| 14,700.0 | 7,566.0 | 14,554.9 | 7,344.0 | 131.6 | 132.6 | -59.28 | 7,328.7 | -1,224.6 | 432.6 | 206.5 | 226.13 | 1.913 | |
| 14,800.0 | 7,566.0 | 14,654.9 | 7,344.0 | 133.4 | 134.3 | -59.22 | 7,428.7 | -1,222.9 | 431.8 | 202.8 | 229.00 | 1.886 | |
| 14,900.0 | 7,566.0 | 14,754.9 | 7,344.0 | 135.1 | 136.0 | -59.16 | 7,528.7 | -1,221.2 | 431.1 | 199.2 | 231.87 | 1.859 | |
| 15,000.0 | 7,566.0 | 14,854.9 | 7,344.0 | 136.8 | 137.7 | -59.10 | 7,628.7 | -1,219.4 | 430.3 | 195.6 | 234.74 | 1.833 | |
| 15,100.0 | 7,566.0 | 14,954.9 | 7,344.0 | 138.6 | 139.5 | -59.04 | 7,728.6 | -1,217.7 | 429.6 | 192.0 | 237.60 | 1.808 | |
| 15,200.0 | 7,566.0 | 15,054.9 | 7,344.0 | 140.3 | 141.2 | -58.98 | 7,828.6 | -1,215.9 | 428.8 | 188.4 | 240.45 | 1.783 | |
| 15,300.0 | 7,566.0 | 15,154.9 | 7,344.0 | 142.0 | 142.9 | -58.92 | 7,928.6 | -1,214.2 | 428.1 | 184.8 | 243.30 | 1.759 | |
| 15,400.0 | 7,566.0 | 15,254.9 | 7,344.0 | 143.8 | 144.6 | -58.86 | 8,028.6 | -1,212.4 | 427.3 | 181.2 | 246.15 | 1.736 | |
| 15,500.0 | 7,566.0 | 15,354.9 | 7,344.0 | 145.5 | 146.4 | -58.80 | 8,128.6 | -1,210.7 | 426.6 | 177.6 | 248.99 | 1.713 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4A-21H-O268 - 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15,600.0 | 7,566.0 | 15,454.9 | 7,344.0 | 147.2 | 148.1 | -58.74 | 8,228.5 | -1,208.9 | 425.9 | 174.0 | 251.83 | 1.691 | |
| 15,700.0 | 7,566.0 | 15,554.9 | 7,344.0 | 149.0 | 149.8 | -58.68 | 8,328.5 | -1,207.2 | 425.1 | 170.4 | 254.67 | 1.669 | |
| 15,800.0 | 7,566.0 | 15,654.8 | 7,344.0 | 150.7 | 151.5 | -58.61 | 8,428.5 | -1,205.4 | 424.4 | 166.9 | 257.50 | 1.648 | |
| 15,900.0 | 7,566.0 | 15,754.8 | 7,344.0 | 152.5 | 153.3 | -58.55 | 8,528.5 | -1,203.7 | 423.6 | 163.3 | 260.32 | 1.627 | |
| 16,000.0 | 7,566.0 | 15,854.8 | 7,344.0 | 154.2 | 155.0 | -58.49 | 8,628.5 | -1,202.0 | 422.9 | 159.7 | 263.15 | 1.607 | |
| 16,100.0 | 7,566.0 | 15,954.8 | 7,344.0 | 155.9 | 156.7 | -58.43 | 8,728.4 | -1,200.2 | 422.1 | 156.2 | 265.96 | 1.587 | |
| 16,200.0 | 7,566.0 | 16,054.8 | 7,344.0 | 157.7 | 158.5 | -58.37 | 8,828.4 | -1,198.5 | 421.4 | 152.6 | 268.78 | 1.568 | |
| 16,300.0 | 7,566.0 | 16,154.8 | 7,344.0 | 159.4 | 160.2 | -58.30 | 8,928.4 | -1,196.7 | 420.6 | 149.1 | 271.58 | 1.549 | |
| 16,400.0 | 7,566.0 | 16,254.8 | 7,344.0 | 161.1 | 161.9 | -58.24 | 9,028.4 | -1,195.0 | 419.9 | 145.5 | 274.39 | 1.530 | |
| 16,500.0 | 7,566.0 | 16,354.8 | 7,344.0 | 162.9 | 163.6 | -58.18 | 9,128.4 | -1,193.2 | 419.2 | 142.0 | 277.18 | 1.512 | |
| 16,600.0 | 7,566.0 | 16,454.8 | 7,344.0 | 164.6 | 165.4 | -58.12 | 9,228.4 | -1,191.5 | 418.4 | 138.4 | 279.98 | 1.494 | Level 3 |
| 16,700.0 | 7,566.0 | 16,554.8 | 7,344.0 | 166.4 | 167.1 | -58.05 | 9,328.3 | -1,189.7 | 417.7 | 134.9 | 282.77 | 1.477 | Level 3 |
| 16,800.0 | 7,566.0 | 16,654.8 | 7,344.0 | 168.1 | 168.8 | -57.99 | 9,428.3 | -1,188.0 | 416.9 | 131.4 | 285.55 | 1.460 | Level 3 |
| 16,900.0 | 7,566.0 | 16,754.8 | 7,344.0 | 169.8 | 170.6 | -57.93 | 9,528.3 | -1,186.2 | 416.2 | 127.9 | 288.33 | 1.443 | Level 3 |
| 17,000.0 | 7,566.0 | 16,854.8 | 7,344.0 | 171.6 | 172.3 | -57.86 | 9,628.3 | -1,184.5 | 415.5 | 124.4 | 291.11 | 1.427 | Level 3 |
| 17,100.0 | 7,566.0 | 16,954.8 | 7,344.0 | 173.3 | 174.0 | -57.80 | 9,728.3 | -1,182.8 | 414.7 | 120.8 | 293.88 | 1.411 | Level 3 |
| 17,200.0 | 7,566.0 | 17,054.8 | 7,344.0 | 175.1 | 175.8 | -57.73 | 9,828.2 | -1,181.0 | 414.0 | 117.3 | 296.64 | 1.396 | Level 3 |
| 17,269.1 | 7,566.0 | 17,123.9 | 7,344.0 | 176.3 | 177.0 | -57.69 | 9,897.3 | -1,179.8 | 413.5 | 114.9 | 298.55 | 1.385 | Level 3 |
| 17,282.7 | 7,566.0 | 17,127.7 | 7,344.0 | 176.5 | 177.0 | -57.69 | 9,901.2 | -1,179.7 | 413.5 | 114.7 | 298.80 | 1.384 | Level 3, SF |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4C-21H-O268 - 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 | 90.06 | 0.0 | 8.4 | 8.4 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | 90.06 | 0.0 | 8.4 | 8.4 | 8.1 | 0.26 | 32.048 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 90.06 | 0.0 | 8.4 | 8.4 | 7.8 | 0.61 | 13.735 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.5 | 0.5 | 90.06 | 0.0 | 8.4 | 8.4 | 7.4 | 0.96 | 8.740 | CC, ES |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.7 | 0.7 | 179.95 | 0.0 | 8.4 | 9.3 | 8.0 | 1.31 | 7.077 | |
| 500.0 | 500.0 | 500.2 | 500.2 | 0.8 | 0.8 | 179.93 | 0.0 | 7.5 | 11.0 | 9.3 | 1.66 | 6.639 | |
| 600.0 | 599.9 | 600.3 | 600.3 | 1.0 | 1.0 | 179.86 | 0.0 | 4.9 | 12.7 | 10.7 | 2.01 | 6.353 | |
| 700.0 | 699.7 | 700.5 | 700.4 | 1.2 | 1.2 | 179.77 | 0.1 | 0.6 | 14.6 | 12.2 | 2.35 | 6.196 | |
| 800.0 | 799.4 | 800.4 | 800.2 | 1.4 | 1.4 | 179.71 | 0.1 | -4.0 | 17.8 | 15.1 | 2.70 | 6.588 | |
| 900.0 | 898.9 | 900.3 | 900.0 | 1.7 | 1.6 | 179.70 | 0.1 | -8.7 | 22.8 | 19.7 | 3.05 | 7.465 | |
| 1,000.0 | 998.3 | 1,000.1 | 999.6 | 1.9 | 1.8 | 179.70 | 0.2 | -13.3 | 29.5 | 26.1 | 3.39 | 8.678 | |
| 1,100.0 | 1,097.4 | 1,099.7 | 1,099.2 | 2.2 | 1.9 | 179.72 | 0.2 | -17.9 | 37.7 | 34.0 | 3.74 | 10.089 | |
| 1,200.0 | 1,196.5 | 1,199.4 | 1,198.7 | 2.4 | 2.1 | 179.74 | 0.3 | -22.5 | 46.3 | 42.2 | 4.09 | 11.327 | |
| 1,300.0 | 1,295.7 | 1,299.0 | 1,298.2 | 2.7 | 2.3 | 179.75 | 0.3 | -27.1 | 54.9 | 50.5 | 4.44 | 12.371 | |
| 1,400.0 | 1,394.8 | 1,398.6 | 1,397.7 | 3.0 | 2.5 | 179.75 | 0.3 | -31.8 | 63.5 | 58.7 | 4.79 | 13.263 | |
| 1,500.0 | 1,493.9 | 1,498.3 | 1,497.3 | 3.3 | 2.7 | 179.76 | 0.4 | -36.4 | 72.1 | 66.9 | 5.14 | 14.034 | |
| 1,600.0 | 1,593.1 | 1,597.9 | 1,596.8 | 3.6 | 2.9 | 179.76 | 0.4 | -41.0 | 80.7 | 75.2 | 5.48 | 14.707 | |
| 1,700.0 | 1,692.2 | 1,697.5 | 1,696.3 | 3.8 | 3.1 | 179.76 | 0.5 | -45.6 | 89.2 | 83.4 | 5.83 | 15.300 | |
| 1,800.0 | 1,791.3 | 1,797.2 | 1,795.8 | 4.1 | 3.3 | 179.77 | 0.5 | -50.3 | 97.8 | 91.6 | 6.18 | 15.826 | |
| 1,900.0 | 1,890.4 | 1,896.8 | 1,895.4 | 4.4 | 3.5 | 179.77 | 0.5 | -54.9 | 106.4 | 99.9 | 6.53 | 16.295 | |
| 2,000.0 | 1,989.6 | 1,996.4 | 1,994.9 | 4.7 | 3.7 | 179.77 | 0.6 | -59.5 | 115.0 | 108.1 | 6.88 | 16.717 | |
| 2,100.0 | 2,088.7 | 2,096.0 | 2,094.4 | 5.0 | 3.8 | 179.77 | 0.6 | -64.1 | 123.6 | 116.3 | 7.23 | 17.099 | |
| 2,200.0 | 2,187.8 | 2,195.7 | 2,193.9 | 5.3 | 4.0 | 179.77 | 0.6 | -68.7 | 132.2 | 124.6 | 7.58 | 17.445 | |
| 2,300.0 | 2,286.9 | 2,295.3 | 2,293.5 | 5.5 | 4.2 | 179.77 | 0.7 | -73.4 | 140.7 | 132.8 | 7.92 | 17.761 | |
| 2,400.0 | 2,386.1 | 2,394.9 | 2,393.0 | 5.8 | 4.4 | 179.78 | 0.7 | -78.0 | 149.3 | 141.0 | 8.27 | 18.050 | |
| 2,500.0 | 2,485.2 | 2,494.6 | 2,492.5 | 6.1 | 4.6 | 179.78 | 0.8 | -82.6 | 157.9 | 149.3 | 8.62 | 18.316 | |
| 2,600.0 | 2,584.3 | 2,594.2 | 2,592.0 | 6.4 | 4.8 | 179.78 | 0.8 | -87.2 | 166.5 | 157.5 | 8.97 | 18.562 | |
| 2,700.0 | 2,683.4 | 2,693.8 | 2,691.6 | 6.7 | 5.0 | 179.78 | 0.8 | -91.9 | 175.1 | 165.8 | 9.32 | 18.789 | |
| 2,800.0 | 2,782.6 | 2,793.5 | 2,791.1 | 7.0 | 5.2 | 179.78 | 0.9 | -96.5 | 183.7 | 174.0 | 9.67 | 18.999 | |
| 2,900.0 | 2,881.7 | 2,893.1 | 2,890.6 | 7.3 | 5.4 | 179.78 | 0.9 | -101.1 | 192.2 | 182.2 | 10.01 | 19.195 | |
| 3,000.0 | 2,980.8 | 2,992.7 | 2,990.1 | 7.6 | 5.6 | 179.78 | 1.0 | -105.7 | 200.8 | 190.5 | 10.36 | 19.378 | |
| 3,100.0 | 3,079.9 | 3,092.4 | 3,089.6 | 7.9 | 5.8 | 179.78 | 1.0 | -110.3 | 209.4 | 198.7 | 10.71 | 19.549 | |
| 3,200.0 | 3,179.1 | 3,192.0 | 3,189.2 | 8.1 | 5.9 | 179.78 | 1.0 | -115.0 | 218.0 | 206.9 | 11.06 | 19.709 | |
| 3,300.0 | 3,278.2 | 3,291.6 | 3,288.7 | 8.4 | 6.1 | 179.78 | 1.1 | -119.6 | 226.6 | 215.2 | 11.41 | 19.859 | |
| 3,400.0 | 3,377.3 | 3,391.3 | 3,388.2 | 8.7 | 6.3 | 179.78 | 1.1 | -124.2 | 235.1 | 223.4 | 11.76 | 20.001 | |
| 3,500.0 | 3,476.4 | 3,490.9 | 3,487.7 | 9.0 | 6.5 | 179.78 | 1.2 | -128.8 | 243.7 | 231.6 | 12.11 | 20.134 | |
| 3,600.0 | 3,575.6 | 3,590.5 | 3,587.3 | 9.3 | 6.7 | 179.78 | 1.2 | -133.5 | 252.3 | 239.9 | 12.45 | 20.260 | |
| 3,700.0 | 3,674.7 | 3,690.1 | 3,686.8 | 9.6 | 6.9 | 179.78 | 1.2 | -138.1 | 260.9 | 248.1 | 12.80 | 20.379 | |
| 3,800.0 | 3,773.8 | 3,789.8 | 3,786.3 | 9.9 | 7.1 | 179.78 | 1.3 | -142.7 | 269.5 | 256.3 | 13.15 | 20.491 | |
| 3,900.0 | 3,872.9 | 3,889.4 | 3,885.8 | 10.2 | 7.3 | 179.78 | 1.3 | -147.3 | 278.1 | 264.6 | 13.50 | 20.598 | |
| 4,000.0 | 3,972.1 | 3,989.0 | 3,985.4 | 10.5 | 7.5 | 179.78 | 1.4 | -151.9 | 286.6 | 272.8 | 13.85 | 20.700 | |
| 4,100.0 | 4,071.2 | 4,088.7 | 4,084.9 | 10.7 | 7.7 | 179.79 | 1.4 | -156.6 | 295.2 | 281.0 | 14.20 | 20.796 | |
| 4,200.0 | 4,170.3 | 4,188.3 | 4,184.4 | 11.0 | 7.9 | 179.79 | 1.4 | -161.2 | 303.8 | 289.3 | 14.54 | 20.888 | |
| 4,300.0 | 4,269.4 | 4,287.9 | 4,283.9 | 11.3 | 8.1 | 179.79 | 1.5 | -165.8 | 312.4 | 297.5 | 14.89 | 20.976 | |
| 4,400.0 | 4,368.6 | 4,387.6 | 4,383.5 | 11.6 | 8.2 | 179.79 | 1.5 | -170.4 | 321.0 | 305.7 | 15.24 | 21.059 | |
| 4,500.0 | 4,467.7 | 4,487.2 | 4,483.0 | 11.9 | 8.4 | 179.79 | 1.6 | -175.1 | 329.6 | 314.0 | 15.59 | 21.139 | |
| 4,600.0 | 4,566.8 | 4,586.8 | 4,582.5 | 12.2 | 8.6 | 179.79 | 1.6 | -179.7 | 338.1 | 322.2 | 15.94 | 21.216 | |
| 4,700.0 | 4,665.9 | 4,686.5 | 4,682.0 | 12.5 | 8.8 | 179.79 | 1.6 | -184.3 | 346.7 | 330.4 | 16.29 | 21.289 | |
| 4,800.0 | 4,765.1 | 4,786.1 | 4,781.6 | 12.8 | 9.0 | 179.79 | 1.7 | -188.9 | 355.3 | 338.7 | 16.64 | 21.359 | |
| 4,900.0 | 4,864.2 | 4,885.7 | 4,881.1 | 13.1 | 9.2 | 179.79 | 1.7 | -193.5 | 363.9 | 346.9 | 16.98 | 21.426 | |
| 5,000.0 | 4,963.3 | 4,985.3 | 4,980.6 | 13.4 | 9.4 | 179.79 | 1.7 | -198.2 | 372.5 | 355.1 | 17.33 | 21.490 | |
| 5,100.0 | 5,062.4 | 5,085.0 | 5,080.1 | 13.6 | 9.6 | 179.79 | 1.8 | -202.8 | 381.1 | 363.4 | 17.68 | 21.552 | |

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 Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4C-21H-O268 - 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 | 5,161.6 | 5,184.6 | 5,179.6 | 13.9 | 9.8 | 179.79 | 1.8 | -207.4 | 389.6 | 371.6 | 18.03 | 21.612 | |
| 5,300.0 | 5,260.7 | 5,284.2 | 5,279.2 | 14.2 | 10.0 | 179.79 | 1.9 | -212.0 | 398.2 | 379.8 | 18.38 | 21.669 | |
| 5,400.0 | 5,359.8 | 5,383.9 | 5,378.7 | 14.5 | 10.2 | 179.79 | 1.9 | -216.7 | 406.8 | 388.1 | 18.73 | 21.724 | |
| 5,500.0 | 5,458.9 | 5,483.5 | 5,478.2 | 14.8 | 10.4 | 179.79 | 1.9 | -221.3 | 415.4 | 396.3 | 19.07 | 21.777 | |
| 5,600.0 | 5,558.1 | 5,583.1 | 5,577.7 | 15.1 | 10.5 | 179.79 | 2.0 | -225.9 | 424.0 | 404.5 | 19.42 | 21.829 | |
| 5,700.0 | 5,657.2 | 5,682.8 | 5,677.3 | 15.4 | 10.7 | 179.79 | 2.0 | -230.5 | 432.6 | 412.8 | 19.77 | 21.878 | |
| 5,800.0 | 5,756.3 | 5,782.4 | 5,776.8 | 15.7 | 10.9 | 179.79 | 2.1 | -235.1 | 441.1 | 421.0 | 20.12 | 21.926 | |
| 5,900.0 | 5,855.4 | 5,882.0 | 5,876.3 | 16.0 | 11.1 | 179.79 | 2.1 | -239.8 | 449.7 | 429.3 | 20.47 | 21.972 | |
| 6,000.0 | 5,954.6 | 5,981.7 | 5,975.8 | 16.3 | 11.3 | 179.79 | 2.1 | -244.4 | 458.3 | 437.5 | 20.82 | 22.016 | |
| 6,100.0 | 6,053.7 | 6,081.3 | 6,075.4 | 16.5 | 11.5 | 179.79 | 2.2 | -249.0 | 466.9 | 445.7 | 21.16 | 22.059 | |
| 6,200.0 | 6,152.8 | 6,180.9 | 6,174.9 | 16.8 | 11.7 | 179.79 | 2.2 | -253.6 | 475.5 | 454.0 | 21.51 | 22.101 | |
| 6,300.0 | 6,252.0 | 6,280.5 | 6,274.4 | 17.1 | 11.9 | 179.79 | 2.3 | -258.3 | 484.1 | 462.2 | 21.86 | 22.141 | |
| 6,400.0 | 6,351.1 | 6,380.2 | 6,373.9 | 17.4 | 12.1 | 179.79 | 2.3 | -262.9 | 492.6 | 470.4 | 22.21 | 22.180 | |
| 13,600.0 | 7,566.0 | 13,334.4 | 7,344.0 | 112.6 | 111.9 | 63.52 | 6,230.0 | -416.6 | 498.1 | 297.6 | 200.42 | 2.485 | |
| 13,700.0 | 7,566.0 | 13,434.3 | 7,344.0 | 114.3 | 113.6 | 63.39 | 6,330.0 | -418.4 | 495.7 | 292.4 | 203.32 | 2.438 | |
| 13,800.0 | 7,566.0 | 13,534.3 | 7,344.0 | 116.1 | 115.4 | 63.25 | 6,429.9 | -420.1 | 493.4 | 287.2 | 206.21 | 2.393 | |
| 13,900.0 | 7,566.0 | 13,634.3 | 7,344.0 | 117.8 | 117.1 | 63.11 | 6,529.9 | -421.9 | 491.1 | 282.0 | 209.08 | 2.349 | |
| 14,000.0 | 7,566.0 | 13,734.2 | 7,344.0 | 119.5 | 118.8 | 62.98 | 6,629.9 | -423.6 | 488.7 | 276.8 | 211.95 | 2.306 | |
| 14,100.0 | 7,566.0 | 13,834.2 | 7,344.0 | 121.2 | 120.6 | 62.84 | 6,729.8 | -425.4 | 486.4 | 271.6 | 214.80 | 2.264 | |
| 14,200.0 | 7,566.0 | 13,934.2 | 7,344.0 | 123.0 | 122.3 | 62.69 | 6,829.8 | -427.1 | 484.1 | 266.4 | 217.64 | 2.224 | |
| 14,300.0 | 7,566.0 | 14,034.1 | 7,344.0 | 124.7 | 124.1 | 62.55 | 6,929.7 | -428.8 | 481.7 | 261.3 | 220.48 | 2.185 | |
| 14,400.0 | 7,566.0 | 14,134.1 | 7,344.0 | 126.4 | 125.8 | 62.41 | 7,029.7 | -430.6 | 479.4 | 256.1 | 223.30 | 2.147 | |
| 14,500.0 | 7,566.0 | 14,234.1 | 7,344.0 | 128.2 | 127.6 | 62.26 | 7,129.6 | -432.3 | 477.1 | 251.0 | 226.11 | 2.110 | |
| 14,600.0 | 7,566.0 | 14,334.0 | 7,344.0 | 129.9 | 129.3 | 62.11 | 7,229.6 | -434.1 | 474.8 | 245.9 | 228.90 | 2.074 | |
| 14,700.0 | 7,566.0 | 14,434.0 | 7,344.0 | 131.6 | 131.0 | 61.97 | 7,329.5 | -435.8 | 472.5 | 240.8 | 231.69 | 2.039 | |
| 14,800.0 | 7,566.0 | 14,534.0 | 7,344.0 | 133.4 | 132.8 | 61.82 | 7,429.5 | -437.6 | 470.2 | 235.7 | 234.46 | 2.005 | |
| 14,900.0 | 7,566.0 | 14,633.9 | 7,344.0 | 135.1 | 134.5 | 61.66 | 7,529.4 | -439.3 | 467.9 | 230.6 | 237.22 | 1.972 | |
| 15,000.0 | 7,566.0 | 14,733.9 | 7,344.0 | 136.8 | 136.3 | 61.51 | 7,629.4 | -441.1 | 465.6 | 225.6 | 239.97 | 1.940 | |
| 15,100.0 | 7,566.0 | 14,833.9 | 7,344.0 | 138.6 | 138.0 | 61.36 | 7,729.3 | -442.8 | 463.3 | 220.6 | 242.70 | 1.909 | |
| 15,200.0 | 7,566.0 | 14,933.8 | 7,344.0 | 140.3 | 139.8 | 61.20 | 7,829.3 | -444.5 | 461.0 | 215.5 | 245.42 | 1.878 | |
| 15,300.0 | 7,566.0 | 15,033.8 | 7,344.0 | 142.0 | 141.5 | 61.04 | 7,929.2 | -446.3 | 458.7 | 210.5 | 248.13 | 1.849 | |
| 15,400.0 | 7,566.0 | 15,133.8 | 7,344.0 | 143.8 | 143.3 | 60.88 | 8,029.2 | -448.0 | 456.4 | 205.6 | 250.82 | 1.820 | |
| 15,500.0 | 7,566.0 | 15,233.7 | 7,344.0 | 145.5 | 145.0 | 60.72 | 8,129.1 | -449.8 | 454.1 | 200.6 | 253.49 | 1.791 | |
| 15,600.0 | 7,566.0 | 15,333.7 | 7,344.0 | 147.2 | 146.7 | 60.56 | 8,229.1 | -451.5 | 451.8 | 195.7 | 256.15 | 1.764 | |
| 15,700.0 | 7,566.0 | 15,433.7 | 7,344.0 | 149.0 | 148.5 | 60.40 | 8,329.0 | -453.3 | 449.5 | 190.7 | 258.80 | 1.737 | |
| 15,800.0 | 7,566.0 | 15,533.6 | 7,344.0 | 150.7 | 150.2 | 60.23 | 8,429.0 | -455.0 | 447.3 | 185.8 | 261.43 | 1.711 | |
| 15,900.0 | 7,566.0 | 15,633.6 | 7,344.0 | 152.5 | 152.0 | 60.06 | 8,528.9 | -456.8 | 445.0 | 180.9 | 264.04 | 1.685 | |
| 16,000.0 | 7,566.0 | 15,733.6 | 7,344.0 | 154.2 | 153.7 | 59.90 | 8,628.9 | -458.5 | 442.7 | 176.1 | 266.64 | 1.660 | |
| 16,100.0 | 7,566.0 | 15,833.5 | 7,344.0 | 155.9 | 155.5 | 59.73 | 8,728.8 | -460.3 | 440.5 | 171.2 | 269.22 | 1.636 | |
| 16,200.0 | 7,566.0 | 15,933.5 | 7,344.0 | 157.7 | 157.2 | 59.55 | 8,828.8 | -462.0 | 438.2 | 166.4 | 271.79 | 1.612 | |
| 16,300.0 | 7,566.0 | 16,033.5 | 7,344.0 | 159.4 | 159.0 | 59.38 | 8,928.7 | -463.7 | 435.9 | 161.6 | 274.33 | 1.589 | |
| 16,400.0 | 7,566.0 | 16,133.4 | 7,344.0 | 161.1 | 160.7 | 59.20 | 9,028.7 | -465.5 | 433.7 | 156.8 | 276.86 | 1.566 | |
| 16,500.0 | 7,566.0 | 16,233.4 | 7,344.0 | 162.9 | 162.5 | 59.02 | 9,128.6 | -467.2 | 431.4 | 152.1 | 279.37 | 1.544 | |
| 16,600.0 | 7,566.0 | 16,333.4 | 7,344.0 | 164.6 | 164.2 | 58.84 | 9,228.6 | -469.0 | 429.2 | 147.3 | 281.86 | 1.523 | |
| 16,700.0 | 7,566.0 | 16,433.3 | 7,344.0 | 166.4 | 166.0 | 58.66 | 9,328.5 | -470.7 | 427.0 | 142.6 | 284.33 | 1.502 | |
| 16,800.0 | 7,566.0 | 16,533.3 | 7,344.0 | 168.1 | 167.7 | 58.48 | 9,428.5 | -472.5 | 424.7 | 137.9 | 286.79 | 1.481 | Level 3 |
| 16,900.0 | 7,566.0 | 16,633.3 | 7,344.0 | 169.8 | 169.5 | 58.29 | 9,528.4 | -474.2 | 422.5 | 133.3 | 289.22 | 1.461 | Level 3 |
| 17,000.0 | 7,566.0 | 16,733.2 | 7,344.0 | 171.6 | 171.2 | 58.11 | 9,628.4 | -476.0 | 420.3 | 128.6 | 291.63 | 1.441 | Level 3 |
| 17,100.0 | 7,566.0 | 16,833.2 | 7,344.0 | 173.3 | 173.0 | 57.92 | 9,728.3 | -477.7 | 418.1 | 124.0 | 294.02 | 1.422 | Level 3 |
| 17,200.0 | 7,566.0 | 16,933.1 | 7,344.0 | 175.1 | 174.7 | 57.72 | 9,828.3 | -479.4 | 415.8 | 119.4 | 296.39 | 1.403 | Level 3 |
| 17,282.7 | 7,566.0 | 17,013.3 | 7,344.0 | 176.5 | 176.1 | 57.57 | 9,908.4 | -480.8 | 414.0 | 115.7 | 298.32 | 1.388 | Level 3, SF |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4D-21H-O268 - 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 | 90.05 | 0.0 | 19.6 | 19.6 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | 90.05 | 0.0 | 19.6 | 19.6 | 19.3 | 0.26 | 74.778 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 90.05 | 0.0 | 19.6 | 19.6 | 19.0 | 0.61 | 32.048 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.5 | 0.5 | 90.05 | 0.0 | 19.6 | 19.6 | 18.6 | 0.96 | 20.394 | CC, ES |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.7 | 0.7 | 179.94 | 0.0 | 19.6 | 20.4 | 19.1 | 1.31 | 15.624 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 0.8 | 0.8 | 179.95 | 0.0 | 19.6 | 23.1 | 21.4 | 1.66 | 13.918 | |
| 600.0 | 599.9 | 600.3 | 600.3 | 1.0 | 1.0 | 179.96 | 0.0 | 18.7 | 26.6 | 24.5 | 2.01 | 13.236 | |
| 700.0 | 699.7 | 700.4 | 700.3 | 1.2 | 1.2 | 179.97 | 0.0 | 16.6 | 30.6 | 28.2 | 2.35 | 12.979 | SF |
| 800.0 | 799.4 | 800.2 | 800.1 | 1.4 | 1.4 | 179.98 | 0.0 | 14.4 | 36.2 | 33.5 | 2.70 | 13.420 | |
| 900.0 | 898.9 | 899.9 | 899.8 | 1.7 | 1.5 | 179.98 | 0.0 | 12.3 | 43.7 | 40.6 | 3.05 | 14.337 | |
| 1,000.0 | 998.3 | 999.5 | 999.4 | 1.9 | 1.7 | 179.99 | 0.0 | 10.1 | 52.9 | 49.5 | 3.39 | 15.585 | |
| 1,100.0 | 1,097.4 | 1,098.9 | 1,098.8 | 2.2 | 1.9 | 179.99 | 0.0 | 8.0 | 63.6 | 59.9 | 3.74 | 17.023 | |
| 1,200.0 | 1,196.5 | 1,198.3 | 1,198.2 | 2.4 | 2.1 | 179.99 | 0.0 | 5.9 | 74.7 | 70.6 | 4.09 | 18.279 | |
| 1,300.0 | 1,295.7 | 1,297.7 | 1,297.5 | 2.7 | 2.2 | 180.00 | 0.0 | 3.7 | 85.7 | 81.3 | 4.43 | 19.339 | |
| 1,400.0 | 1,394.8 | 1,397.1 | 1,396.9 | 3.0 | 2.4 | 180.00 | 0.0 | 1.6 | 96.8 | 92.0 | 4.78 | 20.244 | |
| 1,500.0 | 1,493.9 | 1,496.5 | 1,496.2 | 3.3 | 2.6 | 180.00 | 0.0 | -0.6 | 107.9 | 102.7 | 5.13 | 21.027 | |
| 1,600.0 | 1,593.1 | 1,595.8 | 1,595.6 | 3.6 | 2.8 | 180.00 | 0.0 | -2.7 | 118.9 | 113.4 | 5.48 | 21.711 | |
| 1,700.0 | 1,692.2 | 1,695.2 | 1,695.0 | 3.8 | 2.9 | -180.00 | 0.0 | -4.8 | 130.0 | 124.1 | 5.82 | 22.312 | |
| 1,800.0 | 1,791.3 | 1,794.6 | 1,794.3 | 4.1 | 3.1 | -180.00 | 0.0 | -7.0 | 141.0 | 134.9 | 6.17 | 22.847 | |
| 1,900.0 | 1,890.4 | 1,894.0 | 1,893.7 | 4.4 | 3.3 | -180.00 | 0.0 | -9.1 | 152.1 | 145.6 | 6.52 | 23.324 | |
| 2,000.0 | 1,989.6 | 1,993.4 | 1,993.1 | 4.7 | 3.5 | -180.00 | 0.0 | -11.3 | 163.1 | 156.3 | 6.87 | 23.753 | |
| 2,100.0 | 2,088.7 | 2,092.8 | 2,092.4 | 5.0 | 3.7 | -180.00 | 0.0 | -13.4 | 174.2 | 167.0 | 7.22 | 24.140 | |
| 2,200.0 | 2,187.8 | 2,192.2 | 2,191.8 | 5.3 | 3.8 | -180.00 | 0.0 | -15.6 | 185.2 | 177.7 | 7.56 | 24.492 | |
| 2,300.0 | 2,286.9 | 2,291.6 | 2,291.2 | 5.5 | 4.0 | -180.00 | 0.0 | -17.7 | 196.3 | 188.4 | 7.91 | 24.813 | |
| 2,400.0 | 2,386.1 | 2,390.9 | 2,390.5 | 5.8 | 4.2 | -180.00 | 0.0 | -19.8 | 207.4 | 199.1 | 8.26 | 25.107 | |
| 2,500.0 | 2,485.2 | 2,490.3 | 2,489.9 | 6.1 | 4.4 | -180.00 | 0.0 | -22.0 | 218.4 | 209.8 | 8.61 | 25.377 | |
| 2,600.0 | 2,584.3 | 2,589.7 | 2,589.3 | 6.4 | 4.5 | -180.00 | 0.0 | -24.1 | 229.5 | 220.5 | 8.95 | 25.627 | |
| 2,700.0 | 2,683.4 | 2,689.1 | 2,688.6 | 6.7 | 4.7 | -180.00 | 0.0 | -26.3 | 240.5 | 231.2 | 9.30 | 25.857 | |
| 2,800.0 | 2,782.6 | 2,788.5 | 2,788.0 | 7.0 | 4.9 | -180.00 | 0.0 | -28.4 | 251.6 | 241.9 | 9.65 | 26.072 | |
| 2,900.0 | 2,881.7 | 2,887.9 | 2,887.3 | 7.3 | 5.1 | -179.99 | 0.0 | -30.5 | 262.6 | 252.6 | 10.00 | 26.271 | |
| 3,000.0 | 2,980.8 | 2,987.3 | 2,986.7 | 7.6 | 5.3 | -179.99 | 0.0 | -32.7 | 273.7 | 263.4 | 10.35 | 26.456 | |
| 3,100.0 | 3,079.9 | 3,086.7 | 3,086.1 | 7.9 | 5.4 | -179.99 | 0.0 | -34.8 | 284.8 | 274.1 | 10.69 | 26.630 | |
| 3,200.0 | 3,179.1 | 3,186.0 | 3,185.4 | 8.1 | 5.6 | -179.99 | 0.0 | -37.0 | 295.8 | 284.8 | 11.04 | 26.793 | |
| 3,300.0 | 3,278.2 | 3,285.4 | 3,284.8 | 8.4 | 5.8 | -179.99 | 0.0 | -39.1 | 306.9 | 295.5 | 11.39 | 26.946 | |
| 3,400.0 | 3,377.3 | 3,384.8 | 3,384.2 | 8.7 | 6.0 | -179.99 | 0.0 | -41.3 | 317.9 | 306.2 | 11.74 | 27.090 | |
| 3,500.0 | 3,476.4 | 3,484.2 | 3,483.5 | 9.0 | 6.1 | -179.99 | 0.0 | -43.4 | 329.0 | 316.9 | 12.08 | 27.225 | |
| 3,600.0 | 3,575.6 | 3,583.6 | 3,582.9 | 9.3 | 6.3 | -179.99 | 0.0 | -45.5 | 340.0 | 327.6 | 12.43 | 27.353 | |
| 3,700.0 | 3,674.7 | 3,683.0 | 3,682.3 | 9.6 | 6.5 | -179.99 | 0.1 | -47.7 | 351.1 | 338.3 | 12.78 | 27.474 | |
| 3,800.0 | 3,773.8 | 3,782.4 | 3,781.6 | 9.9 | 6.7 | -179.99 | 0.1 | -49.8 | 362.2 | 349.0 | 13.13 | 27.589 | |
| 3,900.0 | 3,872.9 | 3,881.7 | 3,881.0 | 10.2 | 6.8 | -179.99 | 0.1 | -52.0 | 373.2 | 359.7 | 13.47 | 27.697 | |
| 4,000.0 | 3,972.1 | 3,981.1 | 3,980.3 | 10.5 | 7.0 | -179.99 | 0.1 | -54.1 | 384.3 | 370.4 | 13.82 | 27.801 | |
| 4,100.0 | 4,071.2 | 4,080.5 | 4,079.7 | 10.7 | 7.2 | -179.99 | 0.1 | -56.2 | 395.3 | 381.2 | 14.17 | 27.899 | |
| 4,200.0 | 4,170.3 | 4,179.9 | 4,179.1 | 11.0 | 7.4 | -179.99 | 0.1 | -58.4 | 406.4 | 391.9 | 14.52 | 27.992 | |
| 4,300.0 | 4,269.4 | 4,279.3 | 4,278.4 | 11.3 | 7.6 | -179.99 | 0.1 | -60.5 | 417.4 | 402.6 | 14.87 | 28.081 | |
| 4,400.0 | 4,368.6 | 4,378.7 | 4,377.8 | 11.6 | 7.7 | -179.99 | 0.1 | -62.7 | 428.5 | 413.3 | 15.21 | 28.166 | |
| 4,500.0 | 4,467.7 | 4,478.1 | 4,477.2 | 11.9 | 7.9 | -179.99 | 0.1 | -64.8 | 439.6 | 424.0 | 15.56 | 28.247 | |
| 4,600.0 | 4,566.8 | 4,577.5 | 4,576.5 | 12.2 | 8.1 | -179.99 | 0.1 | -67.0 | 450.6 | 434.7 | 15.91 | 28.325 | |
| 4,700.0 | 4,665.9 | 4,676.8 | 4,675.9 | 12.5 | 8.3 | -179.99 | 0.1 | -69.1 | 461.7 | 445.4 | 16.26 | 28.399 | |
| 4,800.0 | 4,765.1 | 4,776.2 | 4,775.3 | 12.8 | 8.4 | -179.99 | 0.1 | -71.2 | 472.7 | 456.1 | 16.60 | 28.471 | |
| 4,900.0 | 4,864.2 | 4,875.6 | 4,874.6 | 13.1 | 8.6 | -179.99 | 0.1 | -73.4 | 483.8 | 466.8 | 16.95 | 28.539 | |
| 5,000.0 | 4,963.3 | 4,975.0 | 4,974.0 | 13.4 | 8.8 | -179.99 | 0.1 | -75.5 | 494.8 | 477.5 | 17.30 | 28.605 | |

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 Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4E-21H-O268 - 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 | 90.05 | 0.0 | 28.0 | 28.0 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | 90.05 | 0.0 | 28.0 | 28.0 | 27.7 | 0.26 | 106.826 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 90.05 | 0.0 | 28.0 | 28.0 | 27.4 | 0.61 | 45.783 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.5 | 0.5 | 90.05 | 0.0 | 28.0 | 28.0 | 27.0 | 0.96 | 29.134 | CC, ES |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.7 | 0.7 | 179.95 | 0.0 | 28.0 | 28.8 | 27.5 | 1.31 | 22.034 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 0.8 | 0.8 | 179.95 | 0.0 | 28.0 | 31.5 | 29.8 | 1.66 | 18.980 | |
| 600.0 | 599.9 | 599.9 | 599.9 | 1.0 | 1.0 | 179.96 | 0.0 | 28.0 | 35.8 | 33.8 | 2.01 | 17.861 | |
| 700.0 | 699.7 | 699.7 | 699.7 | 1.2 | 1.2 | 179.96 | 0.0 | 28.0 | 41.9 | 39.6 | 2.35 | 17.819 | SF |
| 800.0 | 799.4 | 799.4 | 799.4 | 1.4 | 1.4 | 179.97 | 0.0 | 28.0 | 49.8 | 47.1 | 2.70 | 18.439 | |
| 900.0 | 898.9 | 898.9 | 898.9 | 1.7 | 1.5 | 179.97 | 0.0 | 28.0 | 59.4 | 56.3 | 3.04 | 19.495 | |
| 1,000.0 | 998.3 | 998.3 | 998.3 | 1.9 | 1.7 | 179.98 | 0.0 | 28.0 | 70.7 | 67.3 | 3.39 | 20.856 | |
| 1,100.0 | 1,097.4 | 1,097.4 | 1,097.4 | 2.2 | 1.9 | 179.98 | 0.0 | 28.0 | 83.6 | 79.8 | 3.73 | 22.386 | |
| 1,200.0 | 1,196.5 | 1,196.5 | 1,196.5 | 2.4 | 2.0 | 179.98 | 0.0 | 28.0 | 96.8 | 92.7 | 4.08 | 23.715 | |
| 1,300.0 | 1,295.7 | 1,295.7 | 1,295.7 | 2.7 | 2.2 | 179.99 | 0.0 | 28.0 | 110.0 | 105.5 | 4.43 | 24.836 | |
| 1,400.0 | 1,394.8 | 1,394.8 | 1,394.8 | 3.0 | 2.4 | 179.99 | 0.0 | 28.0 | 123.2 | 118.4 | 4.77 | 25.795 | |
| 1,500.0 | 1,493.9 | 1,493.9 | 1,493.9 | 3.3 | 2.6 | 179.99 | 0.0 | 28.0 | 136.4 | 131.2 | 5.12 | 26.623 | |
| 1,600.0 | 1,593.1 | 1,593.1 | 1,593.1 | 3.6 | 2.7 | 179.99 | 0.0 | 28.0 | 149.6 | 144.1 | 5.47 | 27.346 | |
| 1,700.0 | 1,692.2 | 1,692.2 | 1,692.2 | 3.8 | 2.9 | 179.99 | 0.0 | 28.0 | 162.8 | 156.9 | 5.82 | 27.984 | |
| 1,800.0 | 1,791.3 | 1,791.3 | 1,791.3 | 4.1 | 3.1 | 179.99 | 0.0 | 28.0 | 175.9 | 169.8 | 6.16 | 28.549 | |
| 1,900.0 | 1,890.4 | 1,890.4 | 1,890.4 | 4.4 | 3.3 | 179.99 | 0.0 | 28.0 | 189.1 | 182.6 | 6.51 | 29.054 | |
| 2,000.0 | 1,989.6 | 1,989.6 | 1,989.6 | 4.7 | 3.4 | 179.99 | 0.0 | 28.0 | 202.3 | 195.5 | 6.86 | 29.508 | |
| 2,100.0 | 2,088.7 | 2,088.7 | 2,088.7 | 5.0 | 3.6 | 179.99 | 0.0 | 28.0 | 215.5 | 208.3 | 7.20 | 29.919 | |
| 2,200.0 | 2,187.8 | 2,187.8 | 2,187.8 | 5.3 | 3.8 | 179.99 | 0.0 | 28.0 | 228.7 | 221.2 | 7.55 | 30.292 | |
| 2,300.0 | 2,286.9 | 2,286.9 | 2,286.9 | 5.5 | 3.9 | 179.99 | 0.0 | 28.0 | 241.9 | 234.0 | 7.90 | 30.632 | |
| 2,400.0 | 2,386.1 | 2,386.1 | 2,386.1 | 5.8 | 4.1 | 179.99 | 0.0 | 28.0 | 255.1 | 246.9 | 8.24 | 30.943 | |
| 2,500.0 | 2,485.2 | 2,485.2 | 2,485.2 | 6.1 | 4.3 | 179.99 | 0.0 | 28.0 | 268.3 | 259.7 | 8.59 | 31.229 | |
| 2,600.0 | 2,584.3 | 2,584.3 | 2,584.3 | 6.4 | 4.5 | 179.99 | 0.0 | 28.0 | 281.5 | 272.6 | 8.94 | 31.493 | |
| 2,700.0 | 2,683.4 | 2,683.4 | 2,683.4 | 6.7 | 4.6 | 179.99 | 0.0 | 28.0 | 294.7 | 285.4 | 9.29 | 31.738 | |
| 2,800.0 | 2,782.6 | 2,782.6 | 2,782.6 | 7.0 | 4.8 | 179.99 | 0.0 | 28.0 | 307.9 | 298.3 | 9.63 | 31.965 | |
| 2,900.0 | 2,881.7 | 2,881.7 | 2,881.7 | 7.3 | 5.0 | 180.00 | 0.0 | 28.0 | 321.1 | 311.1 | 9.98 | 32.176 | |
| 3,000.0 | 2,980.8 | 2,980.8 | 2,980.8 | 7.6 | 5.2 | 180.00 | 0.0 | 28.0 | 334.3 | 324.0 | 10.33 | 32.372 | |
| 3,100.0 | 3,079.9 | 3,079.9 | 3,079.9 | 7.9 | 5.3 | 180.00 | 0.0 | 28.0 | 347.5 | 336.8 | 10.67 | 32.556 | |
| 3,200.0 | 3,179.1 | 3,179.1 | 3,179.1 | 8.1 | 5.5 | 180.00 | 0.0 | 28.0 | 360.7 | 349.7 | 11.02 | 32.729 | |
| 3,300.0 | 3,278.2 | 3,278.2 | 3,278.2 | 8.4 | 5.7 | 180.00 | 0.0 | 28.0 | 373.9 | 362.5 | 11.37 | 32.891 | |
| 3,400.0 | 3,377.3 | 3,377.3 | 3,377.3 | 8.7 | 5.9 | 180.00 | 0.0 | 28.0 | 387.1 | 375.4 | 11.71 | 33.043 | |
| 3,500.0 | 3,476.4 | 3,476.4 | 3,476.4 | 9.0 | 6.0 | 180.00 | 0.0 | 28.0 | 400.3 | 388.2 | 12.06 | 33.187 | |
| 3,600.0 | 3,575.6 | 3,575.6 | 3,575.6 | 9.3 | 6.2 | 180.00 | 0.0 | 28.0 | 413.5 | 401.1 | 12.41 | 33.322 | |
| 3,700.0 | 3,674.7 | 3,674.7 | 3,674.7 | 9.6 | 6.4 | 180.00 | 0.0 | 28.0 | 426.7 | 413.9 | 12.76 | 33.451 | |
| 3,800.0 | 3,773.8 | 3,773.8 | 3,773.8 | 9.9 | 6.5 | 180.00 | 0.0 | 28.0 | 439.9 | 426.8 | 13.10 | 33.572 | |
| 3,900.0 | 3,872.9 | 3,872.9 | 3,872.9 | 10.2 | 6.7 | 180.00 | 0.0 | 28.0 | 453.1 | 439.6 | 13.45 | 33.687 | |
| 4,000.0 | 3,972.1 | 3,972.1 | 3,972.1 | 10.5 | 6.9 | 180.00 | 0.0 | 28.0 | 466.3 | 452.5 | 13.80 | 33.797 | |
| 4,100.0 | 4,071.2 | 4,071.2 | 4,071.2 | 10.7 | 7.1 | 180.00 | 0.0 | 28.0 | 479.4 | 465.3 | 14.14 | 33.901 | |
| 4,200.0 | 4,170.3 | 4,170.3 | 4,170.3 | 11.0 | 7.2 | 180.00 | 0.0 | 28.0 | 492.6 | 478.2 | 14.49 | 34.000 | |

| | | | |
|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4F-21H-O268 - 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 | 90.05 | 0.0 | 39.2 | 39.2 | | | | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.1 | 0.1 | 90.05 | 0.0 | 39.2 | 39.2 | 38.9 | 0.26 | 148.566 | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | 90.05 | 0.0 | 39.2 | 39.2 | 38.5 | 0.61 | 63.913 | |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.5 | 0.5 | 90.05 | 0.0 | 39.2 | 39.2 | 38.2 | 0.96 | 40.714 | CC, ES |
| 400.0 | 400.0 | 401.0 | 401.0 | 0.7 | 0.7 | 179.94 | 0.0 | 39.2 | 40.0 | 38.7 | 1.31 | 30.541 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 0.8 | 0.8 | 179.95 | 0.0 | 40.0 | 43.5 | 41.9 | 1.66 | 26.261 | |
| 600.0 | 599.9 | 599.1 | 599.1 | 1.0 | 1.0 | 179.95 | 0.0 | 42.6 | 50.5 | 48.5 | 2.00 | 25.198 | SF |
| 700.0 | 699.7 | 697.6 | 697.5 | 1.2 | 1.2 | 179.96 | 0.0 | 46.9 | 60.9 | 58.6 | 2.35 | 25.939 | |
| 800.0 | 799.4 | 795.5 | 795.2 | 1.4 | 1.4 | 179.97 | -0.1 | 52.8 | 74.8 | 72.1 | 2.69 | 27.787 | |
| 900.0 | 898.9 | 893.5 | 892.9 | 1.7 | 1.6 | 179.97 | -0.1 | 60.1 | 91.8 | 88.7 | 3.03 | 30.261 | |
| 1,000.0 | 998.3 | 991.7 | 990.8 | 1.9 | 1.8 | 179.98 | -0.1 | 67.6 | 110.6 | 107.3 | 3.37 | 32.797 | |
| 1,100.0 | 1,097.4 | 1,089.6 | 1,088.4 | 2.2 | 2.0 | 179.98 | -0.1 | 75.1 | 131.1 | 127.3 | 3.71 | 35.285 | |
| 1,200.0 | 1,196.5 | 1,187.4 | 1,186.0 | 2.4 | 2.2 | 179.98 | -0.1 | 82.5 | 151.8 | 147.7 | 4.06 | 37.402 | |
| 1,300.0 | 1,295.7 | 1,285.3 | 1,283.5 | 2.7 | 2.4 | 179.99 | -0.1 | 90.0 | 172.5 | 168.1 | 4.40 | 39.188 | |
| 1,400.0 | 1,394.8 | 1,383.1 | 1,381.1 | 3.0 | 2.6 | 179.99 | -0.1 | 97.4 | 193.2 | 188.5 | 4.75 | 40.716 | |
| 1,500.0 | 1,493.9 | 1,480.9 | 1,478.6 | 3.3 | 2.8 | 179.99 | -0.2 | 104.9 | 213.9 | 208.8 | 5.09 | 42.039 | |
| 1,600.0 | 1,593.1 | 1,578.7 | 1,576.2 | 3.6 | 3.0 | 179.99 | -0.2 | 112.4 | 234.6 | 229.2 | 5.43 | 43.194 | |
| 1,700.0 | 1,692.2 | 1,676.6 | 1,673.7 | 3.8 | 3.2 | 179.99 | -0.2 | 119.8 | 255.3 | 249.6 | 5.78 | 44.211 | |
| 1,800.0 | 1,791.3 | 1,774.4 | 1,771.3 | 4.1 | 3.4 | 179.99 | -0.2 | 127.3 | 276.1 | 269.9 | 6.12 | 45.115 | |
| 1,900.0 | 1,890.4 | 1,872.2 | 1,868.8 | 4.4 | 3.7 | 179.99 | -0.2 | 134.7 | 296.8 | 290.3 | 6.46 | 45.923 | |
| 2,000.0 | 1,989.6 | 1,970.1 | 1,966.4 | 4.7 | 3.9 | 179.99 | -0.2 | 142.2 | 317.5 | 310.7 | 6.81 | 46.649 | |
| 2,100.0 | 2,088.7 | 2,067.9 | 2,063.9 | 5.0 | 4.1 | 179.99 | -0.2 | 149.6 | 338.2 | 331.0 | 7.15 | 47.306 | |
| 2,200.0 | 2,187.8 | 2,165.7 | 2,161.4 | 5.3 | 4.3 | 179.99 | -0.3 | 157.1 | 358.9 | 351.4 | 7.49 | 47.902 | |
| 2,300.0 | 2,286.9 | 2,263.6 | 2,259.0 | 5.5 | 4.5 | 179.99 | -0.3 | 164.6 | 379.6 | 371.8 | 7.84 | 48.447 | |
| 2,400.0 | 2,386.1 | 2,361.4 | 2,356.5 | 5.8 | 4.7 | 179.99 | -0.3 | 172.0 | 400.3 | 392.2 | 8.18 | 48.945 | |
| 2,500.0 | 2,485.2 | 2,459.2 | 2,454.1 | 6.1 | 4.9 | 179.99 | -0.3 | 179.5 | 421.1 | 412.5 | 8.52 | 49.404 | |
| 2,600.0 | 2,584.3 | 2,557.1 | 2,551.6 | 6.4 | 5.2 | 179.99 | -0.3 | 186.9 | 441.8 | 432.9 | 8.87 | 49.827 | |
| 2,700.0 | 2,683.4 | 2,654.9 | 2,649.2 | 6.7 | 5.4 | 179.99 | -0.3 | 194.4 | 462.5 | 453.3 | 9.21 | 50.218 | |
| 2,800.0 | 2,782.6 | 2,752.7 | 2,746.7 | 7.0 | 5.6 | 180.00 | -0.3 | 201.9 | 483.2 | 473.6 | 9.55 | 50.582 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4G-21H-O268 - 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 | 90.05 | 0.0 | 50.3 | 50.3 | | | | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.1 | 0.1 | 90.05 | 0.0 | 50.3 | 50.3 | 50.1 | 0.26 | 191.014 | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | 90.05 | 0.0 | 50.3 | 50.3 | 49.7 | 0.61 | 82.174 | |
| 266.3 | 266.3 | 267.3 | 267.3 | 0.4 | 0.4 | 90.05 | 0.0 | 50.3 | 50.3 | 49.5 | 0.84 | 59.635 | CC |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.5 | 0.5 | 90.05 | 0.0 | 50.3 | 50.3 | 49.4 | 0.96 | 52.347 | ES |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.7 | 0.7 | 179.94 | 0.0 | 51.2 | 52.1 | 50.8 | 1.31 | 39.802 | |
| 500.0 | 500.0 | 499.0 | 499.0 | 0.8 | 0.8 | 179.94 | 0.0 | 53.8 | 57.3 | 55.7 | 1.66 | 34.621 | |
| 600.0 | 599.9 | 597.6 | 597.4 | 1.0 | 1.0 | 179.94 | 0.0 | 58.1 | 66.0 | 64.0 | 2.00 | 32.986 | SF |
| 700.0 | 699.7 | 695.6 | 695.3 | 1.2 | 1.2 | 179.95 | 0.0 | 64.0 | 78.1 | 75.8 | 2.34 | 33.325 | |
| 800.0 | 799.4 | 792.9 | 792.3 | 1.4 | 1.4 | 179.95 | 0.0 | 71.5 | 93.7 | 91.0 | 2.69 | 34.878 | |
| 900.0 | 898.9 | 889.4 | 888.3 | 1.7 | 1.6 | 179.95 | -0.1 | 80.6 | 112.6 | 109.6 | 3.02 | 37.234 | |
| 1,000.0 | 998.3 | 984.8 | 983.2 | 1.9 | 1.9 | 179.95 | -0.1 | 91.2 | 134.9 | 131.5 | 3.36 | 40.151 | |
| 1,100.0 | 1,097.4 | 1,080.1 | 1,077.7 | 2.2 | 2.1 | 179.95 | -0.1 | 103.2 | 160.2 | 156.5 | 3.70 | 43.354 | |
| 1,200.0 | 1,196.5 | 1,176.7 | 1,173.5 | 2.4 | 2.4 | 179.95 | -0.1 | 115.7 | 186.1 | 182.1 | 4.04 | 46.112 | |
| 1,300.0 | 1,295.7 | 1,273.3 | 1,269.3 | 2.7 | 2.6 | 179.95 | -0.1 | 128.2 | 212.0 | 207.6 | 4.38 | 48.442 | |
| 1,400.0 | 1,394.8 | 1,369.9 | 1,365.1 | 3.0 | 2.9 | 179.95 | -0.1 | 140.7 | 237.9 | 233.2 | 4.72 | 50.437 | |
| 1,500.0 | 1,493.9 | 1,466.5 | 1,460.8 | 3.3 | 3.2 | 179.95 | -0.1 | 153.2 | 263.8 | 258.7 | 5.06 | 52.163 | |
| 1,600.0 | 1,593.1 | 1,563.1 | 1,556.6 | 3.6 | 3.4 | 179.95 | -0.1 | 165.6 | 289.7 | 284.3 | 5.40 | 53.672 | |
| 1,700.0 | 1,692.2 | 1,659.7 | 1,652.4 | 3.8 | 3.7 | 179.95 | -0.1 | 178.1 | 315.6 | 309.8 | 5.74 | 55.002 | |
| 1,800.0 | 1,791.3 | 1,756.2 | 1,748.2 | 4.1 | 4.0 | 179.95 | -0.1 | 190.6 | 341.5 | 335.4 | 6.08 | 56.184 | |
| 1,900.0 | 1,890.4 | 1,852.8 | 1,844.0 | 4.4 | 4.2 | 179.95 | -0.1 | 203.1 | 367.3 | 360.9 | 6.42 | 57.240 | |
| 2,000.0 | 1,989.6 | 1,949.4 | 1,939.7 | 4.7 | 4.5 | 179.95 | -0.1 | 215.6 | 393.2 | 386.5 | 6.76 | 58.191 | |
| 2,100.0 | 2,088.7 | 2,046.0 | 2,035.5 | 5.0 | 4.8 | 179.95 | -0.1 | 228.1 | 419.1 | 412.0 | 7.10 | 59.050 | |
| 2,200.0 | 2,187.8 | 2,142.6 | 2,131.3 | 5.3 | 5.1 | 179.95 | -0.1 | 240.5 | 445.0 | 437.6 | 7.44 | 59.831 | |
| 2,300.0 | 2,286.9 | 2,239.2 | 2,227.1 | 5.5 | 5.3 | 179.95 | -0.1 | 253.0 | 470.9 | 463.1 | 7.78 | 60.544 | |
| 2,400.0 | 2,386.1 | 2,335.8 | 2,322.9 | 5.8 | 5.6 | 179.95 | -0.1 | 265.5 | 496.8 | 488.7 | 8.12 | 61.197 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - Edith Ann-Duckworth 4H-21H-O268 - 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 | 90.05 | -0.1 | 58.7 | 58.7 | | | | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.1 | 0.1 | 90.05 | -0.1 | 58.7 | 58.7 | 58.5 | 0.26 | 222.850 | |
| 166.3 | 166.3 | 167.3 | 167.3 | 0.2 | 0.2 | 90.05 | -0.1 | 58.7 | 58.7 | 58.2 | 0.50 | 118.629 | CC |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 0.3 | 90.05 | -0.1 | 58.7 | 58.7 | 58.1 | 0.61 | 95.871 | ES |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.5 | 0.5 | 90.05 | -0.1 | 59.6 | 59.6 | 58.7 | 0.96 | 62.038 | |
| 400.0 | 400.0 | 398.8 | 398.8 | 0.7 | 0.7 | 179.94 | -0.1 | 62.2 | 63.1 | 61.8 | 1.31 | 48.279 | |
| 500.0 | 500.0 | 497.5 | 497.3 | 0.8 | 0.8 | 179.94 | -0.1 | 66.5 | 70.0 | 68.4 | 1.65 | 42.374 | |
| 600.0 | 599.9 | 595.6 | 595.3 | 1.0 | 1.0 | 179.94 | -0.1 | 72.4 | 80.4 | 78.4 | 2.00 | 40.269 | SF |
| 700.0 | 699.7 | 693.2 | 692.6 | 1.2 | 1.2 | 179.95 | -0.1 | 79.9 | 94.2 | 91.9 | 2.34 | 40.281 | |
| 800.0 | 799.4 | 790.0 | 788.9 | 1.4 | 1.5 | 179.95 | -0.1 | 89.1 | 111.5 | 108.8 | 2.68 | 41.598 | |
| 900.0 | 898.9 | 885.8 | 884.1 | 1.7 | 1.7 | 179.95 | -0.1 | 99.7 | 132.1 | 129.0 | 3.02 | 43.776 | |
| 1,000.0 | 998.3 | 980.5 | 978.1 | 1.9 | 2.0 | 179.95 | -0.1 | 111.8 | 156.0 | 152.6 | 3.35 | 46.555 | |
| 1,100.0 | 1,097.4 | 1,074.0 | 1,070.6 | 2.2 | 2.2 | 179.95 | -0.1 | 125.3 | 183.0 | 179.3 | 3.68 | 49.700 | |
| 1,200.0 | 1,196.5 | 1,166.6 | 1,162.0 | 2.4 | 2.5 | 179.95 | -0.1 | 140.1 | 211.9 | 207.9 | 4.02 | 52.770 | |
| 1,300.0 | 1,295.7 | 1,260.6 | 1,254.7 | 2.7 | 2.9 | 179.95 | -0.1 | 156.3 | 242.0 | 237.6 | 4.35 | 55.623 | |
| 1,400.0 | 1,394.8 | 1,356.0 | 1,348.5 | 3.0 | 3.2 | 179.95 | -0.1 | 172.9 | 272.2 | 267.5 | 4.69 | 58.066 | |
| 1,500.0 | 1,493.9 | 1,451.3 | 1,442.4 | 3.3 | 3.5 | 179.95 | -0.1 | 189.4 | 302.4 | 297.4 | 5.02 | 60.181 | |
| 1,600.0 | 1,593.1 | 1,546.6 | 1,536.3 | 3.6 | 3.8 | 179.95 | -0.1 | 206.0 | 332.6 | 327.2 | 5.36 | 62.031 | |
| 1,700.0 | 1,692.2 | 1,642.0 | 1,630.2 | 3.8 | 4.1 | 179.95 | -0.1 | 222.5 | 362.8 | 357.1 | 5.70 | 63.663 | |
| 1,800.0 | 1,791.3 | 1,737.3 | 1,724.1 | 4.1 | 4.5 | 179.95 | -0.1 | 239.1 | 393.0 | 387.0 | 6.04 | 65.113 | |
| 1,900.0 | 1,890.4 | 1,832.6 | 1,817.9 | 4.4 | 4.8 | 179.95 | -0.2 | 255.6 | 423.2 | 416.9 | 6.37 | 66.410 | |
| 2,000.0 | 1,989.6 | 1,927.9 | 1,911.8 | 4.7 | 5.1 | 179.95 | -0.2 | 272.2 | 453.4 | 446.7 | 6.71 | 67.578 | |
| 2,100.0 | 2,088.7 | 2,023.3 | 2,005.7 | 5.0 | 5.5 | 179.95 | -0.2 | 288.7 | 483.7 | 476.6 | 7.05 | 68.633 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - JILLSON A 1 (EXISTING) - FOUNDATION WELL - NO SURVE

**Offset Site Error:** 0.0 ft

**Survey Program:** 4979-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3,600.0 | 3,575.6 | 3,524.6 | 3,524.6 | 9.3 | 6.2 | 57.38 | 418.9 | -654.4 | 497.2 | 482.5 | 14.67 | 33.902 | |
| 3,700.0 | 3,674.7 | 3,623.7 | 3,623.7 | 9.6 | 6.3 | 58.67 | 418.9 | -654.4 | 490.2 | 475.0 | 15.16 | 32.336 | |
| 3,800.0 | 3,773.8 | 3,722.8 | 3,722.8 | 9.9 | 6.5 | 60.00 | 418.9 | -654.4 | 483.4 | 467.8 | 15.66 | 30.877 | |
| 3,900.0 | 3,872.9 | 3,821.9 | 3,821.9 | 10.2 | 6.7 | 61.36 | 418.9 | -654.4 | 476.9 | 460.7 | 16.16 | 29.517 | |
| 4,000.0 | 3,972.1 | 3,921.1 | 3,921.1 | 10.5 | 6.8 | 62.76 | 418.9 | -654.4 | 470.7 | 454.0 | 16.66 | 28.251 | |
| 4,100.0 | 4,071.2 | 4,020.2 | 4,020.2 | 10.7 | 7.0 | 64.20 | 418.9 | -654.4 | 464.7 | 447.6 | 17.17 | 27.070 | |
| 4,200.0 | 4,170.3 | 4,119.3 | 4,119.3 | 11.0 | 7.2 | 65.67 | 418.9 | -654.4 | 459.1 | 441.4 | 17.68 | 25.971 | |
| 4,300.0 | 4,269.4 | 4,218.4 | 4,218.4 | 11.3 | 7.4 | 67.18 | 418.9 | -654.4 | 453.8 | 435.6 | 18.19 | 24.948 | |
| 4,400.0 | 4,368.6 | 4,317.6 | 4,317.6 | 11.6 | 7.5 | 68.72 | 418.9 | -654.4 | 448.8 | 430.1 | 18.70 | 23.996 | |
| 4,500.0 | 4,467.7 | 4,416.7 | 4,416.7 | 11.9 | 7.7 | 70.29 | 418.9 | -654.4 | 444.1 | 424.9 | 19.22 | 23.112 | |
| 4,600.0 | 4,566.8 | 4,515.8 | 4,515.8 | 12.2 | 7.9 | 71.90 | 418.9 | -654.4 | 439.8 | 420.1 | 19.73 | 22.291 | |
| 4,700.0 | 4,665.9 | 4,614.9 | 4,614.9 | 12.5 | 8.1 | 73.54 | 418.9 | -654.4 | 435.9 | 415.6 | 20.25 | 21.530 | |
| 4,800.0 | 4,765.1 | 4,714.1 | 4,714.1 | 12.8 | 8.2 | 75.20 | 418.9 | -654.4 | 432.3 | 411.5 | 20.76 | 20.826 | |
| 4,900.0 | 4,864.2 | 4,813.2 | 4,813.2 | 13.1 | 8.4 | 76.89 | 418.9 | -654.4 | 429.1 | 407.8 | 21.27 | 20.175 | |
| 5,000.0 | 4,963.3 | 4,912.3 | 4,912.3 | 13.4 | 8.6 | 78.60 | 418.9 | -654.4 | 426.3 | 404.5 | 21.78 | 19.576 | |
| 5,076.8 | 5,039.5 | 4,979.0 | 4,979.0 | 13.6 | 8.7 | 79.77 | 418.9 | -654.4 | 424.5 | 402.3 | 22.14 | 19.171 | CC, ES |
| 5,100.0 | 5,062.4 | 4,979.0 | 4,979.0 | 13.6 | 8.7 | 79.77 | 418.9 | -654.4 | 425.1 | 402.9 | 22.21 | 19.141 | SF |
| 5,200.0 | 5,161.6 | 4,979.0 | 4,979.0 | 13.9 | 8.7 | 79.77 | 418.9 | -654.4 | 441.8 | 419.4 | 22.50 | 19.642 | |
| 5,300.0 | 5,260.7 | 4,979.0 | 4,979.0 | 14.2 | 8.7 | 79.77 | 418.9 | -654.4 | 479.3 | 456.6 | 22.78 | 21.040 | |

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 Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - KENNEDY 32-21 (EXISTING) - ENCANA WELL - NO SURVE

**Offset Site Error:** 0.0 ft

**Survey Program:** 8072-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 | 7,566.0 | 7,507.0 | 7,507.0 | 53.4 | 13.1 | 90.00 | 2,891.3 | -424.5 | 498.0 | 434.0 | 64.04 | 7.777 | |
| 10,200.0 | 7,566.0 | 7,507.0 | 7,507.0 | 55.1 | 13.1 | 90.00 | 2,891.3 | -424.5 | 472.7 | 406.9 | 65.74 | 7.190 | |
| 10,273.0 | 7,566.0 | 7,507.0 | 7,507.0 | 56.2 | 13.1 | 90.00 | 2,891.3 | -424.5 | 467.0 | 400.0 | 66.98 | 6.972 | CC, ES |
| 10,300.0 | 7,566.0 | 7,507.0 | 7,507.0 | 56.7 | 13.1 | 90.00 | 2,891.3 | -424.5 | 467.8 | 400.3 | 67.44 | 6.936 | SF |
| 10,400.0 | 7,566.0 | 7,507.0 | 7,507.0 | 58.3 | 13.1 | 90.00 | 2,891.3 | -424.5 | 484.0 | 414.8 | 69.15 | 6.999 | |

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|---|---|---|---|
| **Company:** | EnCana Oil & Gas (USA) Inc | **Local Co-ordinate Reference:** | Well Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

**Offset Design** S21-T2N-R68W (Edith Ann-Duckworth) - KENNEDY 4-2-21 (EXISTING) - ENCANA WELL - SURVEYS

**Offset Site Error:** 0.0 ft

**Survey Program:** 833-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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,700.0 | 7,566.0 | 7,592.2 | 7,514.9 | 63.3 | 20.4 | -89.79 | 3,707.9 | -1,198.8 | 495.4 | 416.5 | 78.94 | 6.276 | |
| 10,800.0 | 7,566.0 | 7,592.5 | 7,515.2 | 64.9 | 20.4 | -89.85 | 3,707.9 | -1,198.8 | 422.9 | 342.3 | 80.66 | 5.244 | |
| 10,900.0 | 7,566.0 | 7,592.9 | 7,515.5 | 66.6 | 20.4 | -89.92 | 3,708.0 | -1,198.8 | 363.7 | 281.4 | 82.37 | 4.416 | |
| 11,000.0 | 7,566.0 | 7,593.2 | 7,515.9 | 68.3 | 20.4 | -89.98 | 3,708.0 | -1,198.8 | 325.2 | 241.1 | 84.09 | 3.867 | |
| 11,082.8 | 7,566.0 | 7,593.5 | 7,516.2 | 69.7 | 20.4 | -90.03 | 3,708.0 | -1,198.8 | 314.5 | 228.9 | 85.52 | 3.677 | CC, ES |
| 11,100.0 | 7,566.0 | 7,593.6 | 7,516.2 | 69.9 | 20.4 | -90.04 | 3,708.0 | -1,198.8 | 314.9 | 229.1 | 85.82 | 3.670 | SF |
| 11,200.0 | 7,566.0 | 7,593.9 | 7,516.6 | 71.6 | 20.4 | -90.11 | 3,708.0 | -1,198.8 | 335.6 | 248.0 | 87.54 | 3.833 | |
| 11,300.0 | 7,566.0 | 7,594.2 | 7,516.9 | 73.3 | 20.4 | -90.17 | 3,708.0 | -1,198.8 | 382.1 | 292.9 | 89.27 | 4.281 | |
| 11,400.0 | 7,566.0 | 7,594.6 | 7,517.3 | 75.0 | 20.4 | -90.23 | 3,708.0 | -1,198.8 | 446.6 | 355.6 | 90.99 | 4.908 | |

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 Edith Ann-Duckworth 4B-21H-O268 |
| **Project:** | DJ Wattenberg | **TVD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Reference Site:** | S21-T2N-R68W (Edith Ann-Duckworth) | **MD Reference:** | WELL @ 4951.0ft (Original Well Elev) |
| **Site Error:** | 0.0ft | **North Reference:** | True |
| **Reference Well:** | Edith Ann-Duckworth 4B-21H-O268 | **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 #1 | **Offset TVD Reference:** | Offset Datum |

Reference Depths are relative to WELL @ 4951.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Edith Ann-Duckworth 4B-21H-O268
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.32°