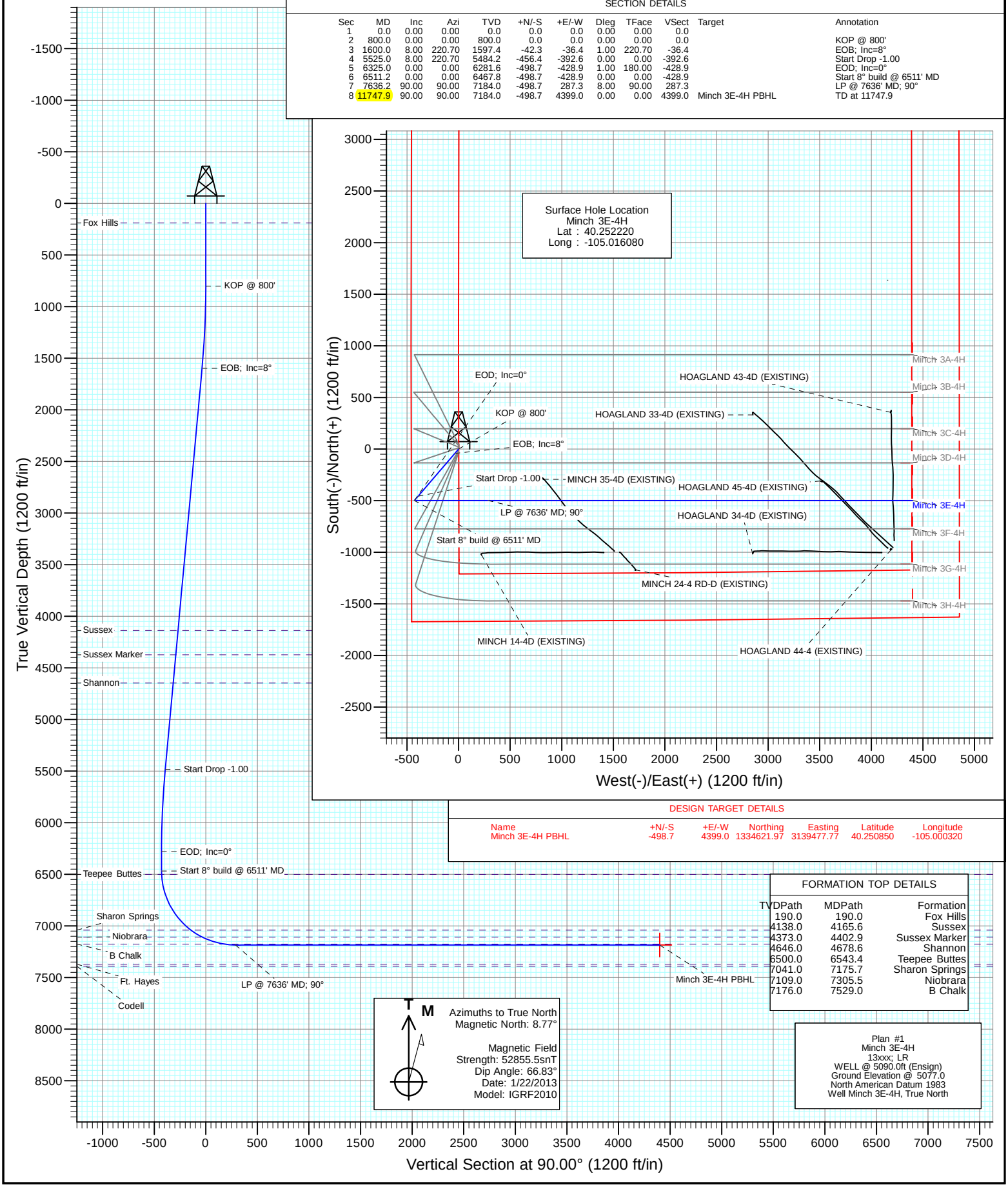
encana natural gas

Project: DJ Wattenberg
Site: S4-T3N-R68W (Minch)
Well: Minch 3E-4H
Wellbore: 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	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0		KOP @ 800'
3	1600.0	8.00	220.70	1597.4	-42.3	-36.4	1.00	220.70	-36.4		EOB; Inc=8°
4	5525.0	8.00	220.70	5484.2	-456.4	-392.6	0.00	0.00	-392.6		Start Drop -1.00
5	6325.0	0.00	0.00	6281.6	-498.7	-428.9	1.00	180.00	-428.9		EOD; Inc=0°
6	6511.2	0.00	0.00	6467.8	-498.7	-428.9	0.00	0.00	-428.9		Start 8° build @ 6511' MD
7	7636.2	90.00	90.00	7184.0	-498.7	287.3	8.00	90.00	287.3		LP @ 7636' MD; 90°
8	11747.9	90.00	90.00	7184.0	-498.7	4399.0	0.00	0.00	4399.0	Minch 3E-4H PBHL	TD at 11747.9



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Minch 3E-4H PBHL	-498.7	4399.0	1334621.97	3139477.77	40.250850	-105.000320

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
190.0	190.0	Fox Hills
4138.0	4165.6	Sussex
4373.0	4402.9	Sussex Marker
4646.0	4678.6	Shannon
6500.0	6543.4	Teepee Buttes
7041.0	7175.7	Sharon Springs
7109.0	7305.5	Niobrara
7176.0	7529.0	B Chalk

T M

Azimuths to True North
Magnetic North: 8.77°

Magnetic Field
Strength: 52855.5snT
Dip Angle: 66.83°
Date: 1/22/2013
Model: IGRF2010

Plan #1
Minch 3E-4H
13xxx; LR
WELL @ 5090.0ft (Ensign)
Ground Elevation @ 5077.0
North American Datum 1983
Well Minch 3E-4H, True North

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site:	S4-T3N-R68W (Minch)	**North Reference:**	True
Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch)

Site Position:		**Northing:**	1,334,165.55 ft	**Latitude:**	40.249600
From:	Lat/Long	**Easting:**	3,139,290.53 ft	**Longitude:**	-105.001000
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.32 °

Well Minch 3E-4H

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,335,096.62 ft	**Latitude:**	40.252220
	+E/-W	0.0 ft	**Easting:**	3,135,076.12 ft	**Longitude:**	-105.016080
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	5,077.0 ft

Wellbore Hz

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/22/2013	8.77	66.83	52,856

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	90.00

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	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,600.0	8.00	220.70	1,597.4	-42.3	-36.4	1.00	1.00	0.00	220.70	
5,525.0	8.00	220.70	5,484.2	-456.4	-392.6	0.00	0.00	0.00	0.00	
6,325.0	0.00	0.00	6,281.6	-498.7	-428.9	1.00	-1.00	0.00	180.00	
6,511.2	0.00	0.00	6,467.8	-498.7	-428.9	0.00	0.00	0.00	0.00	
7,636.2	90.00	90.00	7,184.0	-498.7	287.3	8.00	8.00	0.00	90.00	
11,747.9	90.00	90.00	7,184.0	-498.7	4,399.0	0.00	0.00	0.00	0.00	Minch 3E-4H PBHL

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site:	S4-T3N-R68W (Minch)	**North Reference:**	True
Well:	Minch 3E-4H	**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	
190.0	0.00	0.00	190.0	0.0	0.0	0.0	0.00	0.00	Fox Hills
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	KOP @ 800'
900.0	1.00	220.70	900.0	-0.7	-0.6	-0.6	1.00	1.00	
1,000.0	2.00	220.70	1,000.0	-2.6	-2.3	-2.3	1.00	1.00	
1,100.0	3.00	220.70	1,099.9	-6.0	-5.1	-5.1	1.00	1.00	
1,200.0	4.00	220.70	1,199.7	-10.6	-9.1	-9.1	1.00	1.00	
1,300.0	5.00	220.70	1,299.4	-16.5	-14.2	-14.2	1.00	1.00	
1,400.0	6.00	220.70	1,398.9	-23.8	-20.5	-20.5	1.00	1.00	
1,500.0	7.00	220.70	1,498.3	-32.4	-27.8	-27.8	1.00	1.00	
1,600.0	8.00	220.70	1,597.4	-42.3	-36.4	-36.4	1.00	1.00	EOB; Inc=8°
1,700.0	8.00	220.70	1,696.4	-52.8	-45.4	-45.4	0.00	0.00	
1,800.0	8.00	220.70	1,795.5	-63.4	-54.5	-54.5	0.00	0.00	
1,900.0	8.00	220.70	1,894.5	-73.9	-63.6	-63.6	0.00	0.00	
2,000.0	8.00	220.70	1,993.5	-84.5	-72.7	-72.7	0.00	0.00	
2,100.0	8.00	220.70	2,092.5	-95.0	-81.7	-81.7	0.00	0.00	
2,200.0	8.00	220.70	2,191.6	-105.6	-90.8	-90.8	0.00	0.00	
2,300.0	8.00	220.70	2,290.6	-116.1	-99.9	-99.9	0.00	0.00	
2,400.0	8.00	220.70	2,389.6	-126.7	-109.0	-109.0	0.00	0.00	
2,500.0	8.00	220.70	2,488.6	-137.2	-118.0	-118.0	0.00	0.00	
2,600.0	8.00	220.70	2,587.7	-147.8	-127.1	-127.1	0.00	0.00	
2,700.0	8.00	220.70	2,686.7	-158.3	-136.2	-136.2	0.00	0.00	
2,800.0	8.00	220.70	2,785.7	-168.9	-145.3	-145.3	0.00	0.00	
2,900.0	8.00	220.70	2,884.8	-179.4	-154.3	-154.3	0.00	0.00	
3,000.0	8.00	220.70	2,983.8	-190.0	-163.4	-163.4	0.00	0.00	
3,100.0	8.00	220.70	3,082.8	-200.5	-172.5	-172.5	0.00	0.00	
3,200.0	8.00	220.70	3,181.8	-211.1	-181.6	-181.6	0.00	0.00	
3,300.0	8.00	220.70	3,280.9	-221.6	-190.6	-190.6	0.00	0.00	
3,400.0	8.00	220.70	3,379.9	-232.2	-199.7	-199.7	0.00	0.00	
3,500.0	8.00	220.70	3,478.9	-242.7	-208.8	-208.8	0.00	0.00	
3,600.0	8.00	220.70	3,577.9	-253.3	-217.9	-217.9	0.00	0.00	
3,700.0	8.00	220.70	3,677.0	-263.8	-226.9	-226.9	0.00	0.00	
3,800.0	8.00	220.70	3,776.0	-274.4	-236.0	-236.0	0.00	0.00	
3,900.0	8.00	220.70	3,875.0	-285.0	-245.1	-245.1	0.00	0.00	
4,000.0	8.00	220.70	3,974.0	-295.5	-254.2	-254.2	0.00	0.00	
4,100.0	8.00	220.70	4,073.1	-306.1	-263.2	-263.2	0.00	0.00	
4,165.6	8.00	220.70	4,138.0	-313.0	-269.2	-269.2	0.00	0.00	Sussex
4,200.0	8.00	220.70	4,172.1	-316.6	-272.3	-272.3	0.00	0.00	
4,300.0	8.00	220.70	4,271.1	-327.2	-281.4	-281.4	0.00	0.00	
4,400.0	8.00	220.70	4,370.2	-337.7	-290.5	-290.5	0.00	0.00	
4,402.9	8.00	220.70	4,373.0	-338.0	-290.7	-290.7	0.00	0.00	Sussex Marker
4,500.0	8.00	220.70	4,469.2	-348.3	-299.5	-299.5	0.00	0.00	
4,600.0	8.00	220.70	4,568.2	-358.8	-308.6	-308.6	0.00	0.00	
4,678.6	8.00	220.70	4,646.0	-367.1	-315.8	-315.8	0.00	0.00	Shannon
4,700.0	8.00	220.70	4,667.2	-369.4	-317.7	-317.7	0.00	0.00	

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Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site:	S4-T3N-R68W (Minch)	**North Reference:**	True
Well:	Minch 3E-4H	**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	8.00	220.70	4,766.3	-379.9	-326.8	-326.8	0.00	0.00	
4,900.0	8.00	220.70	4,865.3	-390.5	-335.9	-335.9	0.00	0.00	
5,000.0	8.00	220.70	4,964.3	-401.0	-344.9	-344.9	0.00	0.00	
5,100.0	8.00	220.70	5,063.3	-411.6	-354.0	-354.0	0.00	0.00	
5,200.0	8.00	220.70	5,162.4	-422.1	-363.1	-363.1	0.00	0.00	
5,300.0	8.00	220.70	5,261.4	-432.7	-372.2	-372.2	0.00	0.00	
5,400.0	8.00	220.70	5,360.4	-443.2	-381.2	-381.2	0.00	0.00	
5,500.0	8.00	220.70	5,459.4	-453.8	-390.3	-390.3	0.00	0.00	
5,525.0	8.00	220.70	5,484.2	-456.4	-392.6	-392.6	0.00	0.00	Start Drop -1.00
5,600.0	7.25	220.70	5,558.5	-464.0	-399.1	-399.1	1.00	-1.00	
5,700.0	6.25	220.70	5,657.8	-472.9	-406.7	-406.7	1.00	-1.00	
5,800.0	5.25	220.70	5,757.3	-480.5	-413.3	-413.3	1.00	-1.00	
5,900.0	4.25	220.70	5,857.0	-486.7	-418.7	-418.7	1.00	-1.00	
6,000.0	3.25	220.70	5,956.8	-491.7	-422.9	-422.9	1.00	-1.00	
6,100.0	2.25	220.70	6,056.7	-495.3	-426.1	-426.1	1.00	-1.00	
6,200.0	1.25	220.70	6,156.6	-497.6	-428.0	-428.0	1.00	-1.00	
6,300.0	0.25	220.70	6,256.6	-498.6	-428.9	-428.9	1.00	-1.00	
6,325.0	0.00	0.00	6,281.6	-498.7	-428.9	-428.9	1.00	-1.00	EOD; Inc=0°
6,400.0	0.00	0.00	6,356.6	-498.7	-428.9	-428.9	0.00	0.00	
6,500.0	0.00	0.00	6,456.6	-498.7	-428.9	-428.9	0.00	0.00	
6,511.2	0.00	0.00	6,467.8	-498.7	-428.9	-428.9	0.00	0.00	Start 8° build @ 6511' MD
6,543.4	2.58	90.00	6,500.0	-498.7	-428.2	-428.2	8.00	8.00	Teepee Buttes
6,600.0	7.10	90.00	6,556.4	-498.7	-423.4	-423.4	8.00	8.00	
6,700.0	15.10	90.00	6,654.4	-498.7	-404.2	-404.2	8.00	8.00	
6,800.0	23.10	90.00	6,748.8	-498.7	-371.5	-371.5	8.00	8.00	
6,900.0	31.10	90.00	6,837.8	-498.7	-326.0	-326.0	8.00	8.00	
7,000.0	39.10	90.00	6,919.5	-498.7	-268.5	-268.5	8.00	8.00	
7,100.0	47.10	90.00	6,992.5	-498.7	-200.2	-200.2	8.00	8.00	
7,175.7	53.16	90.00	7,041.0	-498.7	-142.1	-142.1	8.00	8.00	Sharon Springs
7,200.0	55.10	90.00	7,055.2	-498.7	-122.5	-122.5	8.00	8.00	
7,300.0	63.10	90.00	7,106.5	-498.7	-36.7	-36.7	8.00	8.00	
7,305.5	63.54	90.00	7,109.0	-498.7	-31.8	-31.8	8.00	8.00	Niobrara
7,400.0	71.10	90.00	7,145.4	-498.7	55.3	55.3	8.00	8.00	
7,500.0	79.10	90.00	7,171.1	-498.7	151.9	151.9	8.00	8.00	
7,529.0	81.43	90.00	7,176.0	-498.7	180.5	180.5	8.00	8.00	B Chalk
7,600.0	87.10	90.00	7,183.1	-498.7	251.1	251.1	8.00	8.00	
7,636.2	90.00	90.00	7,184.0	-498.7	287.3	287.3	8.00	8.00	LP @ 7636' MD; 90°
7,700.0	90.00	90.00	7,184.0	-498.7	351.1	351.1	0.00	0.00	
7,800.0	90.00	90.00	7,184.0	-498.7	451.1	451.1	0.00	0.00	
7,900.0	90.00	90.00	7,184.0	-498.7	551.1	551.1	0.00	0.00	
8,000.0	90.00	90.00	7,184.0	-498.7	651.1	651.1	0.00	0.00	
8,100.0	90.00	90.00	7,184.0	-498.7	751.1	751.1	0.00	0.00	
8,200.0	90.00	90.00	7,184.0	-498.7	851.1	851.1	0.00	0.00	
8,300.0	90.00	90.00	7,184.0	-498.7	951.1	951.1	0.00	0.00	
8,400.0	90.00	90.00	7,184.0	-498.7	1,051.1	1,051.1	0.00	0.00	
8,500.0	90.00	90.00	7,184.0	-498.7	1,151.1	1,151.1	0.00	0.00	
8,600.0	90.00	90.00	7,184.0	-498.7	1,251.1	1,251.1	0.00	0.00	
8,700.0	90.00	90.00	7,184.0	-498.7	1,351.1	1,351.1	0.00	0.00	
8,800.0	90.00	90.00	7,184.0	-498.7	1,451.1	1,451.1	0.00	0.00	
8,900.0	90.00	90.00	7,184.0	-498.7	1,551.1	1,551.1	0.00	0.00	
9,000.0	90.00	90.00	7,184.0	-498.7	1,651.1	1,651.1	0.00	0.00	
9,100.0	90.00	90.00	7,184.0	-498.7	1,751.1	1,751.1	0.00	0.00	

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Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site:	S4-T3N-R68W (Minch)	**North Reference:**	True
Well:	Minch 3E-4H	**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
9,200.0	90.00	90.00	7,184.0	-498.7	1,851.1	1,851.1	0.00	0.00	
9,300.0	90.00	90.00	7,184.0	-498.7	1,951.1	1,951.1	0.00	0.00	
9,400.0	90.00	90.00	7,184.0	-498.7	2,051.1	2,051.1	0.00	0.00	
9,500.0	90.00	90.00	7,184.0	-498.7	2,151.1	2,151.1	0.00	0.00	
9,600.0	90.00	90.00	7,184.0	-498.7	2,251.1	2,251.1	0.00	0.00	
9,700.0	90.00	90.00	7,184.0	-498.7	2,351.1	2,351.1	0.00	0.00	
9,800.0	90.00	90.00	7,184.0	-498.7	2,451.1	2,451.1	0.00	0.00	
9,900.0	90.00	90.00	7,184.0	-498.7	2,551.1	2,551.1	0.00	0.00	
10,000.0	90.00	90.00	7,184.0	-498.7	2,651.1	2,651.1	0.00	0.00	
10,100.0	90.00	90.00	7,184.0	-498.7	2,751.1	2,751.1	0.00	0.00	
10,200.0	90.00	90.00	7,184.0	-498.7	2,851.1	2,851.1	0.00	0.00	
10,300.0	90.00	90.00	7,184.0	-498.7	2,951.1	2,951.1	0.00	0.00	
10,400.0	90.00	90.00	7,184.0	-498.7	3,051.1	3,051.1	0.00	0.00	
10,500.0	90.00	90.00	7,184.0	-498.7	3,151.1	3,151.1	0.00	0.00	
10,600.0	90.00	90.00	7,184.0	-498.7	3,251.1	3,251.1	0.00	0.00	
10,700.0	90.00	90.00	7,184.0	-498.7	3,351.1	3,351.1	0.00	0.00	
10,800.0	90.00	90.00	7,184.0	-498.7	3,451.1	3,451.1	0.00	0.00	
10,900.0	90.00	90.00	7,184.0	-498.7	3,551.1	3,551.1	0.00	0.00	
11,000.0	90.00	90.00	7,184.0	-498.7	3,651.1	3,651.1	0.00	0.00	
11,100.0	90.00	90.00	7,184.0	-498.7	3,751.1	3,751.1	0.00	0.00	
11,200.0	90.00	90.00	7,184.0	-498.7	3,851.1	3,851.1	0.00	0.00	
11,300.0	90.00	90.00	7,184.0	-498.7	3,951.1	3,951.1	0.00	0.00	
11,400.0	90.00	90.00	7,184.0	-498.7	4,051.1	4,051.1	0.00	0.00	
11,500.0	90.00	90.00	7,184.0	-498.7	4,151.1	4,151.1	0.00	0.00	
11,600.0	90.00	90.00	7,184.0	-498.7	4,251.1	4,251.1	0.00	0.00	
11,700.0	90.00	90.00	7,184.0	-498.7	4,351.1	4,351.1	0.00	0.00	
11,747.9	90.00	90.00	7,184.0	-498.7	4,399.0	4,399.0	0.00	0.00	TD at 11747.9 - Minch 3E-4H PBHL

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
Minch 3E-4H PBHL - plan hits target center - Point	0.00	0.00	7,184.0	-498.7	4,399.0	1,334,621.97	3,139,477.77	40.250850	-105.000320

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Project:	DJ Wattenberg	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site:	S4-T3N-R68W (Minch)	**North Reference:**	True
Well:	Minch 3E-4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
190.0	190.0	Fox Hills			
4,165.6	4,138.0	Sussex			
4,402.9	4,373.0	Sussex Marker			
4,678.6	4,646.0	Shannon			
6,543.4	6,500.0	Teepee Buttes			
7,175.7	7,041.0	Sharon Springs			
7,305.5	7,109.0	Niobrara			
7,529.0	7,176.0	B Chalk			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
800.0	800.0	0.0	0.0	KOP @ 800'
1,600.0	1,597.4	-42.3	-36.4	EOB; Inc=8°
5,525.0	5,484.2	-456.4	-392.6	Start Drop -1.00
6,325.0	6,281.6	-498.7	-428.9	EOD; Inc=0°
6,511.2	6,467.8	-498.7	-428.9	Start 8° build @ 6511' MD
7,636.2	7,184.0	-498.7	287.3	LP @ 7636' MD; 90°
11,747.9	7,184.0	-498.7	4,399.0	TD at 11747.9

EnCana Oil & Gas (USA) Inc

DJ Wattenberg
S4-T3N-R68W (Minch)
Minch 3E-4H
Hz
Plan #1

Anticollision Report

23 January, 2013

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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** 1/23/2013

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,747.4	Plan #1 (Hz)	MWD	Geolink MWD

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
S4-T3N-R68W (Minch)						
HOAGLAND 33-4D (EXISTING) - Existing - Existing						Out of range
HOAGLAND 34-4D (EXISTING) - Existing - Existing	10,205.7	7,290.7	498.7	397.9	4.950	CC, ES, SF
HOAGLAND 43-4D (EXISTING) - Existing - Existing						Out of range
HOAGLAND 44-4 (EXISTING) - Existing - Existing						Out of range
HOAGLAND 45-4D (EXISTING) - Existing - Existing	10,870.2	7,215.6	181.4	73.8	1.686	CC, ES, SF
MINCH 14-4D (EXISTING) - Existing - Existing						Out of range
MINCH 24-4 RD-D (EXISTING) - Existing - Existing						Out of range
MINCH 35-4D (EXISTING) - Existing - Existing	8,159.9	7,277.5	213.8	170.1	4.898	CC, ES
MINCH 35-4D (EXISTING) - Existing - Existing	8,200.0	7,278.7	217.5	173.0	4.886	SF
Minch 3A-4H - Hz - Plan #1	200.0	200.0	40.2	39.5	61.537	CC, ES
Minch 3A-4H - Hz - Plan #1	700.0	695.8	59.9	57.5	24.929	SF
Minch 3B-4H - Hz - Plan #1	400.0	400.0	29.3	27.9	21.672	CC, ES
Minch 3B-4H - Hz - Plan #1	800.0	797.9	40.3	37.5	14.669	SF
Minch 3C-4H - Hz - Plan #1	600.0	600.0	18.4	16.4	8.993	CC
Minch 3C-4H - Hz - Plan #1	700.0	699.9	18.7	16.3	7.778	ES
Minch 3C-4H - Hz - Plan #1	800.0	799.8	19.5	16.8	7.113	SF
Minch 3D-4H - Hz - Plan #1	399.3	399.3	10.4	9.0	7.666	CC
Minch 3D-4H - Hz - Plan #1	400.0	400.0	10.4	9.0	7.651	ES
Minch 3D-4H - Hz - Plan #1	11,747.9	11,948.9	418.0	218.6	2.096	SF
Minch 3F-4H - Hz - Plan #1	600.0	600.0	10.9	8.9	5.334	CC, ES
Minch 3F-4H - Hz - Plan #1	11,747.9	11,978.5	341.6	157.9	1.860	SF
Minch 3G-4H - Hz - Plan #1	400.0	400.0	18.2	16.9	13.483	CC, ES
Minch 3G-4H - Hz - Plan #1	600.0	599.3	21.5	19.4	10.461	SF
Minch 3H-4H - Hz - Plan #1	200.0	200.0	29.1	28.5	44.646	CC, ES
Minch 3H-4H - Hz - Plan #1	600.0	597.4	42.6	40.5	20.534	SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - HOAGLAND 34-4D (EXISTING) - Existing - Existing

Offset Site Error: 0.0 ft

Survey Program: 1451-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
10,200.0	7,184.0	7,290.7	7,114.9	76.4	24.5	89.41	-997.3	2,856.8	498.7	398.1	100.61	4.957	
10,205.7	7,184.0	7,290.7	7,114.8	76.5	24.5	89.40	-997.3	2,856.8	498.7	397.9	100.75	4.950	CC, ES, SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - HOAGLAND 45-4D (EXISTING) - Existing - Existing

Offset Site Error: 0.0 ft

Survey Program: 1388-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
10,500.0	7,184.0	7,228.3	7,131.0	83.7	18.9	-93.46	-317.2	3,520.9	412.1	313.8	98.32	4.191	
10,600.0	7,184.0	7,224.7	7,127.4	86.1	18.8	-92.35	-317.2	3,521.0	325.3	224.5	100.86	3.225	
10,700.0	7,184.0	7,221.3	7,124.0	88.5	18.8	-91.26	-317.3	3,521.1	248.7	145.3	103.37	2.406	
10,800.0	7,184.0	7,217.9	7,120.6	91.0	18.8	-90.19	-317.3	3,521.2	194.5	88.6	105.84	1.837	
10,870.2	7,184.0	7,215.6	7,118.3	92.7	18.8	-89.46	-317.3	3,521.3	181.4	73.8	107.56	1.686	CC, ES, SF
10,900.0	7,184.0	7,214.6	7,117.3	93.4	18.8	-89.15	-317.3	3,521.3	183.8	75.5	108.28	1.697	
11,000.0	7,184.0	7,211.4	7,114.1	95.9	18.8	-88.13	-317.4	3,521.4	223.0	112.3	110.69	2.014	
11,100.0	7,184.0	7,208.2	7,110.9	98.3	18.8	-87.12	-317.4	3,521.6	292.6	179.5	113.07	2.588	
11,200.0	7,184.0	7,205.1	7,107.8	100.8	18.8	-86.15	-317.4	3,521.7	376.2	260.8	115.41	3.260	
11,300.0	7,184.0	7,202.0	7,104.7	103.2	18.8	-85.19	-317.4	3,521.8	466.2	348.5	117.72	3.961	

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 Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - MINCH 35-4D (EXISTING) - Existing - Existing

Offset Site Error: 0.0 ft

Survey Program: 1512-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
7,800.0	7,184.0	7,267.0	7,155.0	21.1	20.2	-88.66	-284.7	810.7	418.5	382.3	36.19	11.563	
7,900.0	7,184.0	7,269.9	7,157.8	23.0	20.2	-89.42	-284.8	810.8	336.5	298.3	38.16	8.816	
8,000.0	7,184.0	7,272.8	7,160.7	25.0	20.2	-90.20	-284.8	810.8	266.9	226.7	40.22	6.636	
8,100.0	7,184.0	7,275.7	7,163.7	27.1	20.2	-90.98	-284.9	810.9	222.0	179.7	42.35	5.243	
8,159.9	7,184.0	7,277.5	7,165.4	28.4	20.2	-91.45	-285.0	811.0	213.8	170.1	43.65	4.898	CC, ES
8,200.0	7,184.0	7,278.7	7,166.6	29.2	20.2	-91.77	-285.0	811.0	217.5	173.0	44.52	4.886	SF
8,300.0	7,184.0	7,281.6	7,169.6	31.4	20.2	-92.57	-285.1	811.1	255.6	208.8	46.72	5.470	
8,400.0	7,184.0	7,284.7	7,172.6	33.6	20.2	-93.38	-285.1	811.2	321.4	272.4	48.95	6.566	
8,500.0	7,184.0	7,287.7	7,175.6	35.9	20.2	-94.19	-285.2	811.3	401.6	350.4	51.19	7.844	
8,600.0	7,184.0	7,290.8	7,178.7	38.2	20.2	-95.02	-285.3	811.4	489.1	435.6	53.44	9.151	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3A-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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	3.98	40.1	2.8	40.2				
100.0	100.0	100.0	100.0	0.2	0.2	3.98	40.1	2.8	40.2	39.9	0.30	132.270	
200.0	200.0	200.0	200.0	0.3	0.3	3.98	40.1	2.8	40.2	39.5	0.65	61.537	CC, ES
300.0	300.0	299.4	299.4	0.5	0.5	3.38	40.8	2.4	40.9	39.9	1.00	40.888	
400.0	400.0	398.7	398.7	0.7	0.7	1.68	43.2	1.3	43.2	41.9	1.35	32.024	
500.0	500.0	497.9	497.8	0.8	0.9	-0.78	47.0	-0.6	47.1	45.4	1.70	27.726	
600.0	600.0	597.0	596.6	1.0	1.1	-3.60	52.4	-3.3	52.6	50.6	2.05	25.687	
700.0	700.0	695.8	695.1	1.2	1.3	-6.45	59.3	-6.7	59.9	57.5	2.40	24.929	SF
800.0	800.0	794.2	793.2	1.4	1.5	-9.11	67.7	-10.9	68.9	66.1	2.76	24.956	
900.0	900.0	892.4	890.7	1.5	1.7	128.24	77.5	-15.7	80.2	77.1	3.10	25.885	
1,000.0	1,000.0	989.9	987.4	1.7	2.0	127.32	88.8	-21.3	94.3	90.8	3.45	27.340	
1,100.0	1,099.9	1,086.8	1,083.3	1.9	2.3	127.10	101.5	-27.6	111.0	107.2	3.80	29.205	
1,200.0	1,199.7	1,183.0	1,178.1	2.1	2.6	127.32	115.5	-34.5	130.4	126.2	4.16	31.346	
1,300.0	1,299.4	1,278.2	1,271.9	2.3	2.9	127.78	130.8	-42.0	152.4	147.9	4.53	33.670	
1,400.0	1,398.9	1,372.5	1,364.3	2.5	3.3	128.35	147.3	-50.2	177.0	172.1	4.90	36.107	
1,500.0	1,498.3	1,465.7	1,455.5	2.7	3.7	128.98	164.9	-58.9	204.2	198.9	5.29	38.605	
1,600.0	1,597.4	1,557.8	1,545.1	3.0	4.0	129.60	183.6	-68.2	234.0	228.4	5.69	41.122	
1,700.0	1,696.4	1,648.7	1,633.4	3.2	4.4	130.30	203.4	-77.9	265.9	259.8	6.11	43.531	
1,800.0	1,795.5	1,740.7	1,722.3	3.5	4.9	130.78	224.5	-88.4	299.0	292.5	6.53	45.776	
1,900.0	1,894.5	1,835.0	1,813.3	3.8	5.3	131.16	246.4	-99.2	332.4	325.4	6.97	47.715	
2,000.0	1,993.5	1,929.2	1,904.3	4.0	5.8	131.47	268.3	-110.0	365.8	358.4	7.40	49.400	
2,100.0	2,092.5	2,023.5	1,995.4	4.3	6.2	131.73	290.1	-120.8	399.2	391.3	7.85	50.874	
2,200.0	2,191.6	2,117.7	2,086.4	4.6	6.6	131.95	312.0	-131.6	432.6	424.3	8.29	52.174	
2,300.0	2,290.6	2,212.0	2,177.4	4.9	7.1	132.13	333.9	-142.4	466.0	457.2	8.74	53.326	
2,400.0	2,389.6	2,306.2	2,268.5	5.2	7.5	132.30	355.8	-153.2	499.4	490.2	9.19	54.354	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3B-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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	5.47	29.1	2.8	29.3				
100.0	100.0	100.0	100.0	0.2	0.2	5.47	29.1	2.8	29.3	29.0	0.30	96.403	
200.0	200.0	200.0	200.0	0.3	0.3	5.47	29.1	2.8	29.3	28.6	0.65	44.851	
300.0	300.0	300.0	300.0	0.5	0.5	5.47	29.1	2.8	29.3	28.3	1.00	29.223	
400.0	400.0	400.0	400.0	0.7	0.7	5.47	29.1	2.8	29.3	27.9	1.35	21.672	CC, ES
500.0	500.0	499.6	499.6	0.8	0.8	4.29	29.8	2.2	29.9	28.2	1.70	17.591	
600.0	600.0	599.2	599.2	1.0	1.0	1.02	31.8	0.6	31.8	29.8	2.05	15.536	
700.0	700.0	698.7	698.5	1.2	1.2	-3.60	35.1	-2.2	35.2	32.8	2.40	14.694	
800.0	800.0	797.9	797.6	1.4	1.4	-8.71	39.7	-6.1	40.3	37.5	2.74	14.669	SF
900.0	900.0	896.9	896.3	1.5	1.6	126.48	45.6	-11.1	47.6	44.5	3.10	15.338	
1,000.0	1,000.0	995.6	994.5	1.7	1.8	124.18	52.8	-17.1	57.7	54.2	3.46	16.678	
1,100.0	1,099.9	1,093.8	1,092.1	1.9	2.1	123.16	61.3	-24.2	70.3	66.5	3.82	18.418	
1,200.0	1,199.7	1,191.4	1,188.9	2.1	2.3	122.93	70.9	-32.3	85.4	81.3	4.18	20.418	
1,300.0	1,299.4	1,288.4	1,284.9	2.3	2.6	123.15	81.8	-41.4	103.0	98.5	4.56	22.585	
1,400.0	1,398.9	1,384.7	1,379.8	2.5	2.9	123.60	93.8	-51.5	123.1	118.1	4.95	24.850	
1,500.0	1,498.3	1,480.0	1,473.7	2.7	3.2	124.15	106.9	-62.4	145.6	140.2	5.36	27.159	
1,600.0	1,597.4	1,574.5	1,566.3	3.0	3.6	124.73	121.0	-74.3	170.5	164.7	5.79	29.472	
1,700.0	1,696.4	1,670.2	1,660.0	3.2	3.9	125.38	136.2	-87.1	197.0	190.8	6.23	31.625	
1,800.0	1,795.5	1,766.6	1,754.2	3.5	4.3	125.88	151.6	-100.0	223.6	216.9	6.68	33.457	
1,900.0	1,894.5	1,863.0	1,848.5	3.8	4.6	126.27	166.9	-112.8	250.1	243.0	7.14	35.029	
2,000.0	1,993.5	1,959.4	1,942.8	4.0	5.0	126.58	182.3	-125.7	276.7	269.1	7.60	36.388	
2,100.0	2,092.5	2,055.8	2,037.1	4.3	5.4	126.84	197.7	-138.6	303.3	295.2	8.07	37.573	
2,200.0	2,191.6	2,152.2	2,131.4	4.6	5.8	127.06	213.0	-151.5	329.8	321.3	8.54	38.613	
2,300.0	2,290.6	2,248.6	2,225.7	4.9	6.1	127.24	228.4	-164.4	356.4	347.4	9.02	39.532	
2,400.0	2,389.6	2,345.0	2,320.0	5.2	6.5	127.40	243.7	-177.3	383.0	373.5	9.49	40.350	
2,500.0	2,488.6	2,441.4	2,414.3	5.4	6.9	127.54	259.1	-190.1	409.6	399.6	9.97	41.080	
2,600.0	2,587.7	2,537.8	2,508.6	5.7	7.3	127.67	274.4	-203.0	436.2	425.8	10.45	41.737	
2,700.0	2,686.7	2,634.2	2,602.8	6.0	7.7	127.77	289.8	-215.9	462.8	451.9	10.93	42.331	
2,800.0	2,785.7	2,730.6	2,697.1	6.3	8.1	127.87	305.1	-228.8	489.4	478.0	11.42	42.869	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3C-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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	8.71	18.2	2.8	18.4				
100.0	100.0	100.0	100.0	0.2	0.2	8.71	18.2	2.8	18.4	18.1	0.30	60.677	
200.0	200.0	200.0	200.0	0.3	0.3	8.71	18.2	2.8	18.4	17.8	0.65	28.230	
300.0	300.0	300.0	300.0	0.5	0.5	8.71	18.2	2.8	18.4	17.4	1.00	18.394	
400.0	400.0	400.0	400.0	0.7	0.7	8.71	18.2	2.8	18.4	17.1	1.35	13.641	
500.0	500.0	500.0	500.0	0.8	0.8	8.71	18.2	2.8	18.4	16.7	1.70	10.840	
600.0	600.0	600.0	600.0	1.0	1.0	8.71	18.2	2.8	18.4	16.4	2.05	8.993	CC
700.0	700.0	699.9	699.9	1.2	1.2	6.11	18.5	2.0	18.7	16.3	2.40	7.778	ES
800.0	800.0	799.8	799.7	1.4	1.4	-1.26	19.5	-0.4	19.5	16.8	2.75	7.113	SF
900.0	900.0	899.5	899.4	1.5	1.6	129.20	21.2	-4.5	22.2	19.1	3.10	7.153	
1,000.0	1,000.0	999.1	998.8	1.7	1.7	122.62	23.5	-10.1	27.3	23.8	3.46	7.886	
1,100.0	1,099.9	1,098.4	1,097.8	1.9	1.9	118.57	26.4	-17.3	34.6	30.8	3.83	9.055	
1,200.0	1,199.7	1,197.5	1,196.4	2.1	2.2	116.37	30.0	-26.0	44.1	39.9	4.20	10.494	
1,300.0	1,299.4	1,296.2	1,294.5	2.3	2.4	115.32	34.2	-36.3	55.6	51.0	4.60	12.095	
1,400.0	1,398.9	1,394.5	1,392.0	2.5	2.6	114.91	39.1	-48.1	69.0	64.0	5.01	13.784	
1,500.0	1,498.3	1,492.4	1,488.8	2.7	2.9	114.86	44.5	-61.4	84.4	79.0	5.44	15.508	
1,600.0	1,597.4	1,589.8	1,584.8	3.0	3.2	115.00	50.6	-76.1	101.8	95.9	5.91	17.226	
1,700.0	1,696.4	1,687.9	1,681.5	3.2	3.5	115.26	57.0	-91.9	120.2	113.8	6.39	18.811	
1,800.0	1,795.5	1,786.2	1,778.3	3.5	3.8	115.45	63.5	-107.7	138.6	131.8	6.88	20.143	
1,900.0	1,894.5	1,884.5	1,875.1	3.8	4.1	115.59	70.0	-123.4	157.1	149.7	7.38	21.273	
2,000.0	1,993.5	1,982.8	1,971.9	4.0	4.5	115.71	76.5	-139.2	175.5	167.6	7.89	22.241	
2,100.0	2,092.5	2,081.1	2,068.7	4.3	4.8	115.80	82.9	-155.0	193.9	185.5	8.40	23.077	
2,200.0	2,191.6	2,179.3	2,165.5	4.6	5.1	115.88	89.4	-170.8	212.4	203.5	8.92	23.804	
2,300.0	2,290.6	2,277.6	2,262.3	4.9	5.5	115.94	95.9	-186.6	230.8	221.4	9.44	24.442	
2,400.0	2,389.6	2,375.9	2,359.0	5.2	5.8	115.99	102.4	-202.4	249.3	239.3	9.97	25.005	
2,500.0	2,488.6	2,474.2	2,455.8	5.4	6.1	116.04	108.8	-218.2	267.7	257.2	10.50	25.506	
2,600.0	2,587.7	2,572.5	2,552.6	5.7	6.5	116.08	115.3	-234.0	286.1	275.1	11.03	25.952	
2,700.0	2,686.7	2,670.8	2,649.4	6.0	6.8	116.12	121.8	-249.8	304.6	293.0	11.56	26.354	
2,800.0	2,785.7	2,769.0	2,746.2	6.3	7.1	116.15	128.3	-265.6	323.0	310.9	12.09	26.716	
2,900.0	2,884.8	2,867.3	2,843.0	6.6	7.5	116.18	134.8	-281.4	341.5	328.8	12.63	27.044	
3,000.0	2,983.8	2,965.6	2,939.8	6.9	7.8	116.20	141.2	-297.1	359.9	346.7	13.16	27.343	
3,100.0	3,082.8	3,063.9	3,036.6	7.2	8.2	116.23	147.7	-312.9	378.3	364.6	13.70	27.616	
3,200.0	3,181.8	3,162.2	3,133.4	7.5	8.5	116.25	154.2	-328.7	396.8	382.5	14.24	27.866	
3,300.0	3,280.9	3,260.5	3,230.2	7.8	8.8	116.27	160.7	-344.5	415.2	400.4	14.78	28.097	
3,400.0	3,379.9	3,361.5	3,329.7	8.1	9.2	116.31	167.2	-360.5	433.5	418.2	15.32	28.297	
3,500.0	3,478.9	3,465.6	3,432.6	8.4	9.5	116.49	173.4	-375.5	450.7	434.8	15.86	28.418	
3,600.0	3,577.9	3,570.2	3,536.1	8.7	9.8	116.84	178.8	-388.9	466.6	450.2	16.39	28.471	
3,700.0	3,677.0	3,675.0	3,640.2	8.9	10.1	117.33	183.6	-400.5	481.3	464.4	16.91	28.465	
3,800.0	3,776.0	3,780.1	3,744.8	9.2	10.3	117.95	187.7	-410.4	494.8	477.4	17.42	28.409	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3D-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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	0.00	10.9	0.0	10.9				
100.0	100.0	100.0	100.0	0.2	0.2	0.00	10.9	0.0	10.9	10.6	0.30	35.986	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	10.9	0.0	10.9	10.3	0.65	16.742	
300.0	300.0	300.1	300.0	0.5	0.5	-4.45	10.7	-0.8	10.7	9.7	1.00	10.655	
399.3	399.3	399.3	399.3	0.7	0.7	-18.49	9.8	-3.3	10.4	9.0	1.35	7.666	CC
400.0	400.0	400.0	400.0	0.7	0.7	-18.63	9.8	-3.3	10.4	9.0	1.35	7.651	ES
500.0	500.0	499.9	499.8	0.8	0.9	-41.41	8.4	-7.4	11.3	9.5	1.70	6.606	
600.0	600.0	599.6	599.3	1.0	1.1	-63.77	6.5	-13.2	14.7	12.7	2.05	7.197	
700.0	700.0	699.0	698.4	1.2	1.3	-78.91	4.0	-20.6	21.0	18.6	2.40	8.772	
800.0	800.0	798.2	797.1	1.4	1.5	-88.01	1.0	-29.6	29.7	27.0	2.76	10.772	
900.0	900.0	897.1	895.3	1.5	1.8	46.55	-2.5	-40.2	39.9	36.8	3.11	12.839	
1,000.0	1,000.0	995.7	993.2	1.7	2.0	44.64	-6.6	-52.3	50.7	47.2	3.46	14.644	
1,100.0	1,099.9	1,094.1	1,090.5	1.9	2.3	44.13	-11.2	-66.0	61.8	58.0	3.81	16.212	
1,200.0	1,199.7	1,192.3	1,187.4	2.1	2.6	44.39	-16.3	-81.3	73.4	69.3	4.18	17.580	
1,300.0	1,299.4	1,291.6	1,285.1	2.3	3.0	45.23	-21.7	-97.6	84.8	80.2	4.55	18.613	
1,400.0	1,398.9	1,391.0	1,383.1	2.5	3.3	46.62	-27.2	-114.0	94.9	90.0	4.95	19.181	
1,500.0	1,498.3	1,490.6	1,481.1	2.7	3.6	48.45	-32.7	-130.4	104.0	98.6	5.37	19.368	
1,600.0	1,597.4	1,590.2	1,579.2	3.0	4.0	50.67	-38.2	-146.8	112.0	106.2	5.82	19.243	
1,700.0	1,696.4	1,689.8	1,677.3	3.2	4.3	52.97	-43.7	-163.2	119.7	113.4	6.30	18.993	
1,800.0	1,795.5	1,789.4	1,775.3	3.5	4.7	54.99	-49.2	-179.6	127.5	120.7	6.80	18.755	
1,900.0	1,894.5	1,889.0	1,873.4	3.8	5.0	56.78	-54.7	-196.0	135.5	128.1	7.31	18.531	
2,000.0	1,993.5	1,988.6	1,971.5	4.0	5.4	58.37	-60.1	-212.4	143.5	135.7	7.83	18.322	
2,100.0	2,092.5	2,088.2	2,069.6	4.3	5.7	59.79	-65.6	-228.8	151.7	143.4	8.37	18.129	
2,200.0	2,191.6	2,187.8	2,167.7	4.6	6.1	61.06	-71.1	-245.2	160.0	151.1	8.91	17.952	
2,300.0	2,290.6	2,287.3	2,265.8	4.9	6.4	62.21	-76.6	-261.6	168.3	158.9	9.46	17.788	
2,400.0	2,389.6	2,386.9	2,363.8	5.2	6.7	63.25	-82.1	-278.0	176.7	166.7	10.02	17.639	
2,500.0	2,488.6	2,486.5	2,461.9	5.4	7.1	64.19	-87.6	-294.4	185.2	174.6	10.58	17.502	
2,600.0	2,587.7	2,586.1	2,560.0	5.7	7.4	65.05	-93.1	-310.8	193.7	182.5	11.15	17.376	
2,700.0	2,686.7	2,685.7	2,658.1	6.0	7.8	65.84	-98.6	-327.2	202.2	190.5	11.71	17.260	
2,800.0	2,785.7	2,785.3	2,756.2	6.3	8.1	66.57	-104.0	-343.6	210.8	198.5	12.29	17.154	
2,900.0	2,884.8	2,886.7	2,856.0	6.6	8.5	67.29	-109.5	-360.0	219.1	206.3	12.87	17.033	
3,000.0	2,983.8	2,989.5	2,957.6	6.9	8.8	68.22	-114.6	-375.2	226.3	212.8	13.46	16.815	
3,100.0	3,082.8	3,092.5	3,059.6	7.2	9.1	69.39	-119.1	-388.6	232.1	218.0	14.06	16.504	
3,200.0	3,181.8	3,195.5	3,161.9	7.5	9.4	70.78	-123.0	-400.2	236.6	221.9	14.68	16.118	
3,300.0	3,280.9	3,298.4	3,264.3	7.8	9.6	72.41	-126.3	-410.1	239.9	224.6	15.31	15.672	
3,400.0	3,379.9	3,401.3	3,366.8	8.1	9.8	74.29	-129.0	-418.3	242.1	226.1	15.94	15.181	
3,500.0	3,478.9	3,504.0	3,469.3	8.4	10.0	76.44	-131.2	-424.7	243.2	226.6	16.59	14.661	
3,600.0	3,577.9	3,606.4	3,571.6	8.7	10.2	78.88	-132.7	-429.4	243.5	226.3	17.24	14.127	
3,700.0	3,677.0	3,708.6	3,673.7	8.9	10.3	81.64	-133.7	-432.3	243.1	225.2	17.89	13.594	
3,800.0	3,776.0	3,810.4	3,775.5	9.2	10.4	84.73	-134.1	-433.5	242.2	223.7	18.52	13.077	
3,900.0	3,875.0	3,909.9	3,875.0	9.5	10.6	88.00	-134.1	-433.5	241.4	222.2	19.14	12.611	
3,961.2	3,935.6	3,970.5	3,935.6	9.7	10.6	90.00	-134.1	-433.5	241.2	221.7	19.50	12.369	
4,000.0	3,974.0	4,008.9	3,974.0	9.8	10.7	91.27	-134.1	-433.5	241.3	221.5	19.72	12.232	
4,100.0	4,073.1	4,108.0	4,073.1	10.1	10.8	94.53	-134.1	-433.5	242.0	221.7	20.28	11.933	
4,200.0	4,172.1	4,207.0	4,172.1	10.4	10.9	97.77	-134.1	-433.5	243.5	222.7	20.80	11.708	
4,300.0	4,271.1	4,306.0	4,271.1	10.7	11.0	100.96	-134.1	-433.5	245.8	224.5	21.28	11.551	
4,400.0	4,370.2	4,405.1	4,370.2	11.0	11.1	104.07	-134.1	-433.5	248.8	227.1	21.72	11.455	
4,500.0	4,469.2	4,504.1	4,469.2	11.3	11.2	107.11	-134.1	-433.5	252.6	230.5	22.13	11.415	
4,600.0	4,568.2	4,603.1	4,568.2	11.6	11.4	110.05	-134.1	-433.5	257.1	234.6	22.50	11.424	
4,700.0	4,667.2	4,702.1	4,667.2	11.9	11.5	112.89	-134.1	-433.5	262.2	239.4	22.84	11.478	
4,800.0	4,766.3	4,801.2	4,766.3	12.2	11.6	115.61	-134.1	-433.5	268.0	244.8	23.16	11.571	
4,900.0	4,865.3	4,900.2	4,865.3	12.5	11.7	118.21	-134.1	-433.5	274.3	250.9	23.45	11.699	

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 Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3D-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,000.0	4,964.3	4,999.2	4,964.3	12.8	11.9	120.69	-134.1	-433.5	281.2	257.5	23.72	11.857	
5,100.0	5,063.3	5,098.2	5,063.3	13.1	12.0	123.05	-134.1	-433.5	288.6	264.6	23.97	12.042	
5,200.0	5,162.4	5,197.3	5,162.4	13.4	12.1	125.29	-134.1	-433.5	296.5	272.3	24.20	12.250	
5,300.0	5,261.4	5,296.3	5,261.4	13.7	12.3	127.41	-134.1	-433.5	304.8	280.4	24.43	12.477	
5,400.0	5,360.4	5,395.3	5,360.4	14.0	12.4	129.42	-134.1	-433.5	313.5	288.8	24.65	12.720	
5,500.0	5,459.4	5,494.4	5,459.4	14.3	12.5	131.32	-134.1	-433.5	322.6	297.7	24.86	12.976	
5,600.0	5,558.5	5,593.4	5,558.5	14.6	12.6	133.11	-134.1	-433.5	331.6	306.6	25.07	13.231	
5,700.0	5,657.8	5,692.7	5,657.8	14.8	12.8	134.61	-134.1	-433.5	339.8	314.5	25.28	13.443	
5,800.0	5,757.3	5,792.2	5,757.3	15.1	12.9	135.83	-134.1	-433.5	346.9	321.4	25.50	13.607	
5,900.0	5,857.0	5,891.9	5,857.0	15.3	13.1	136.81	-134.1	-433.5	352.9	327.2	25.73	13.719	
6,000.0	5,956.8	5,991.7	5,956.8	15.5	13.2	137.56	-134.1	-433.5	357.7	331.8	25.96	13.778	
6,100.0	6,056.7	6,091.6	6,056.7	15.6	13.3	138.09	-134.1	-433.5	361.3	335.1	26.21	13.783	
6,200.0	6,156.6	6,191.5	6,156.6	15.8	13.5	138.43	-134.1	-433.5	363.6	337.1	26.47	13.736	
6,300.0	6,256.6	6,291.5	6,256.6	15.9	13.6	138.57	-134.1	-433.5	364.5	337.8	26.74	13.635	
6,400.0	6,356.6	6,391.5	6,356.6	16.0	13.7	-0.72	-134.1	-433.5	364.6	339.1	25.49	14.304	
6,500.0	6,456.6	6,491.5	6,456.6	16.2	13.9	-0.72	-134.1	-433.5	364.6	338.8	25.80	14.132	
6,500.1	6,456.7	6,491.6	6,456.7	16.2	13.9	-0.72	-134.1	-433.5	364.6	338.8	25.80	14.132	
6,600.0	6,556.4	6,591.3	6,556.4	16.2	14.0	-91.57	-134.1	-433.5	364.7	337.1	27.61	13.209	
6,700.0	6,654.4	6,689.3	6,654.4	16.2	14.2	-94.44	-134.1	-433.5	365.7	337.8	27.96	13.081	
6,800.0	6,748.8	6,790.6	6,755.5	16.0	14.2	-98.62	-134.1	-428.7	369.1	340.9	28.16	13.107	
6,900.0	6,837.8	6,897.3	6,860.2	15.8	14.2	-102.72	-134.1	-408.6	374.5	346.5	27.97	13.387	
7,000.0	6,919.5	7,009.2	6,965.4	15.6	14.0	-106.57	-134.1	-371.0	381.5	354.0	27.43	13.908	
7,100.0	6,992.5	7,126.5	7,068.2	15.5	13.7	-110.07	-134.1	-314.5	389.5	362.8	26.66	14.608	
7,200.0	7,055.2	7,249.6	7,164.4	15.4	13.5	-113.13	-134.1	-238.1	397.7	371.8	25.92	15.347	
7,300.0	7,106.5	7,378.1	7,249.5	15.4	13.3	-115.66	-134.1	-142.0	405.5	379.9	25.57	15.857	
7,400.0	7,145.4	7,511.6	7,318.2	15.7	13.7	-117.58	-134.1	-27.8	411.9	385.9	26.03	15.823	
7,500.0	7,171.1	7,648.9	7,365.5	16.5	14.8	-118.82	-134.2	100.9	416.3	388.7	27.61	15.077	
7,600.0	7,183.1	7,788.4	7,387.6	17.8	16.7	-119.34	-134.2	238.4	418.2	387.8	30.38	13.763	
7,700.0	7,184.0	7,901.1	7,389.0	19.3	18.5	-119.35	-134.2	351.1	418.2	384.7	33.46	12.499	
7,800.0	7,184.0	8,001.1	7,389.0	21.1	20.3	-119.35	-134.2	451.1	418.2	381.6	36.59	11.430	
7,900.0	7,184.0	8,101.1	7,389.0	23.0	22.2	-119.35	-134.2	551.1	418.2	378.3	39.94	10.471	
8,000.0	7,184.0	8,201.1	7,389.0	25.0	24.3	-119.35	-134.2	651.1	418.2	374.7	43.46	9.623	
8,100.0	7,184.0	8,301.1	7,389.0	27.1	26.4	-119.35	-134.2	751.1	418.2	371.1	47.11	8.876	
8,200.0	7,184.0	8,401.1	7,389.0	29.2	28.6	-119.35	-134.2	851.1	418.2	367.3	50.87	8.221	
8,300.0	7,184.0	8,501.1	7,389.0	31.4	30.8	-119.36	-134.2	951.1	418.2	363.5	54.71	7.643	
8,400.0	7,184.0	8,601.1	7,389.0	33.6	33.0	-119.36	-134.2	1,051.1	418.2	359.6	58.62	7.134	
8,500.0	7,184.0	8,701.1	7,389.0	35.9	35.3	-119.36	-134.2	1,151.1	418.2	355.6	62.58	6.682	
8,600.0	7,184.0	8,801.1	7,389.0	38.2	37.6	-119.36	-134.2	1,251.1	418.2	351.6	66.58	6.280	
8,700.0	7,184.0	8,901.1	7,389.0	40.5	39.9	-119.36	-134.2	1,351.1	418.2	347.5	70.63	5.921	
8,800.0	7,184.0	9,001.1	7,389.0	42.8	42.3	-119.36	-134.2	1,451.1	418.2	343.5	74.70	5.598	
8,900.0	7,184.0	9,101.1	7,389.0	45.2	44.6	-119.36	-134.2	1,551.1	418.1	339.3	78.80	5.307	
9,000.0	7,184.0	9,201.1	7,389.0	47.5	47.0	-119.36	-134.2	1,651.1	418.1	335.2	82.92	5.043	
9,100.0	7,184.0	9,301.1	7,389.0	49.9	49.4	-119.36	-134.2	1,751.1	418.1	331.1	87.06	4.803	
9,200.0	7,184.0	9,401.1	7,389.0	52.3	51.8	-119.36	-134.2	1,851.1	418.1	326.9	91.21	4.584	
9,300.0	7,184.0	9,501.1	7,389.0	54.6	54.1	-119.36	-134.3	1,951.1	418.1	322.7	95.38	4.384	
9,400.0	7,184.0	9,601.1	7,389.0	57.0	56.6	-119.36	-134.3	2,051.1	418.1	318.6	99.57	4.199	
9,500.0	7,184.0	9,701.1	7,389.0	59.4	59.0	-119.36	-134.3	2,151.1	418.1	314.4	103.76	4.030	
9,600.0	7,184.0	9,801.1	7,389.0	61.8	61.4	-119.36	-134.3	2,251.1	418.1	310.1	107.97	3.873	
9,700.0	7,184.0	9,901.1	7,389.0	64.3	63.8	-119.36	-134.3	2,351.1	418.1	305.9	112.18	3.727	
9,800.0	7,184.0	10,001.1	7,389.0	66.7	66.2	-119.36	-134.3	2,451.1	418.1	301.7	116.40	3.592	
9,900.0	7,184.0	10,101.1	7,389.0	69.1	68.6	-119.36	-134.3	2,551.1	418.1	297.5	120.62	3.466	
10,000.0	7,184.0	10,201.1	7,389.0	71.5	71.1	-119.36	-134.3	2,651.1	418.1	293.2	124.86	3.349	

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 Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3D-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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	7,184.0	10,301.1	7,389.0	73.9	73.5	-119.36	-134.3	2,751.1	418.1	289.0	129.10	3.239	
10,200.0	7,184.0	10,401.1	7,389.0	76.4	75.9	-119.36	-134.3	2,851.1	418.1	284.7	133.34	3.135	
10,300.0	7,184.0	10,501.1	7,389.0	78.8	78.4	-119.36	-134.3	2,951.1	418.1	280.5	137.59	3.039	
10,400.0	7,184.0	10,601.1	7,389.0	81.2	80.8	-119.36	-134.3	3,051.1	418.1	276.2	141.84	2.948	
10,500.0	7,184.0	10,701.1	7,389.0	83.7	83.3	-119.36	-134.3	3,151.1	418.1	272.0	146.10	2.862	
10,600.0	7,184.0	10,801.1	7,389.0	86.1	85.7	-119.36	-134.3	3,251.1	418.1	267.7	150.35	2.781	
10,700.0	7,184.0	10,901.1	7,389.0	88.5	88.1	-119.36	-134.3	3,351.1	418.1	263.4	154.62	2.704	
10,800.0	7,184.0	11,001.1	7,389.0	91.0	90.6	-119.36	-134.3	3,451.1	418.1	259.2	158.88	2.631	
10,900.0	7,184.0	11,101.1	7,389.0	93.4	93.0	-119.37	-134.3	3,551.1	418.0	254.9	163.15	2.562	
11,000.0	7,184.0	11,201.1	7,389.0	95.9	95.5	-119.37	-134.3	3,651.1	418.0	250.6	167.42	2.497	
11,100.0	7,184.0	11,301.1	7,389.0	98.3	97.9	-119.37	-134.3	3,751.1	418.0	246.3	171.69	2.435	
11,200.0	7,184.0	11,401.1	7,389.0	100.8	100.4	-119.37	-134.4	3,851.1	418.0	242.1	175.97	2.376	
11,300.0	7,184.0	11,501.1	7,389.0	103.2	102.8	-119.37	-134.4	3,951.1	418.0	237.8	180.25	2.319	
11,400.0	7,184.0	11,601.1	7,389.0	105.7	105.3	-119.37	-134.4	4,051.1	418.0	233.5	184.52	2.265	
11,500.0	7,184.0	11,701.1	7,389.0	108.1	107.8	-119.37	-134.4	4,151.1	418.0	229.2	188.81	2.214	
11,600.0	7,184.0	11,801.1	7,389.0	110.6	110.2	-119.37	-134.4	4,251.1	418.0	224.9	193.09	2.165	
11,700.0	7,184.0	11,901.1	7,389.0	113.0	112.7	-119.37	-134.4	4,351.1	418.0	220.6	197.37	2.118	
11,736.9	7,184.0	11,938.1	7,389.0	113.9	113.6	-119.37	-134.4	4,388.0	418.0	219.1	198.95	2.101	
11,747.9	7,184.0	11,948.9	7,389.0	114.2	113.8	-119.37	-134.4	4,398.9	418.0	218.6	199.42	2.096	SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3F-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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	180.00	-10.9	0.0	10.9				
100.0	100.0	100.0	100.0	0.2	0.2	180.00	-10.9	0.0	10.9	10.6	0.30	35.986	
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-10.9	0.0	10.9	10.3	0.65	16.742	
300.0	300.0	300.0	300.0	0.5	0.5	180.00	-10.9	0.0	10.9	9.9	1.00	10.909	
400.0	400.0	400.0	400.0	0.7	0.7	180.00	-10.9	0.0	10.9	9.6	1.35	8.090	
500.0	500.0	500.0	500.0	0.8	0.8	180.00	-10.9	0.0	10.9	9.2	1.70	6.429	
600.0	600.0	600.0	600.0	1.0	1.0	180.00	-10.9	0.0	10.9	8.9	2.05	5.334	CC, ES
700.0	700.0	699.8	699.8	1.2	1.2	-177.92	-11.7	-0.4	11.7	9.3	2.40	4.878	
800.0	800.0	799.6	799.5	1.4	1.4	-173.08	-14.0	-1.7	14.1	11.3	2.75	5.120	
900.0	900.0	899.3	899.1	1.5	1.6	-29.93	-17.7	-3.8	17.4	14.3	3.10	5.625	
1,000.0	1,000.0	998.9	998.6	1.7	1.7	-28.22	-23.0	-6.8	20.9	17.5	3.45	6.076	
1,100.0	1,099.9	1,098.4	1,097.8	1.9	1.9	-27.76	-29.8	-10.6	24.6	20.8	3.80	6.477	
1,200.0	1,199.7	1,197.9	1,196.8	2.1	2.2	-28.08	-38.1	-15.2	28.4	24.2	4.15	6.835	
1,300.0	1,299.4	1,297.3	1,295.6	2.3	2.4	-28.88	-47.9	-20.7	32.3	27.8	4.51	7.158	
1,400.0	1,398.9	1,396.7	1,394.1	2.5	2.6	-30.02	-59.2	-27.0	36.3	31.4	4.88	7.448	
1,500.0	1,498.3	1,496.0	1,492.3	2.7	2.9	-31.37	-72.0	-34.1	40.5	35.3	5.25	7.709	
1,600.0	1,597.4	1,595.2	1,590.2	3.0	3.2	-32.85	-86.2	-42.1	44.9	39.2	5.65	7.940	
1,700.0	1,696.4	1,695.0	1,688.5	3.2	3.5	-34.25	-101.3	-50.5	49.4	43.3	6.06	8.145	
1,800.0	1,795.5	1,794.9	1,786.9	3.5	3.8	-35.41	-116.5	-59.0	54.0	47.5	6.49	8.315	
1,900.0	1,894.5	1,894.8	1,885.3	3.8	4.2	-36.39	-131.6	-67.4	58.5	51.6	6.92	8.456	
2,000.0	1,993.5	1,994.7	1,983.6	4.0	4.5	-37.22	-146.7	-75.9	63.1	55.8	7.36	8.574	
2,100.0	2,092.5	2,094.6	2,082.0	4.3	4.8	-37.95	-161.9	-84.4	67.7	59.9	7.81	8.673	
2,200.0	2,191.6	2,194.5	2,180.4	4.6	5.2	-38.58	-177.0	-92.8	72.3	64.1	8.26	8.756	
2,300.0	2,290.6	2,294.4	2,278.8	4.9	5.5	-39.13	-192.2	-101.3	77.0	68.2	8.72	8.826	
2,400.0	2,389.6	2,394.3	2,377.1	5.2	5.8	-39.62	-207.3	-109.8	81.6	72.4	9.18	8.886	
2,500.0	2,488.6	2,494.2	2,475.5	5.4	6.2	-40.06	-222.5	-118.2	86.2	76.6	9.65	8.938	
2,600.0	2,587.7	2,594.1	2,573.9	5.7	6.5	-40.46	-237.6	-126.7	90.9	80.7	10.12	8.982	
2,700.0	2,686.7	2,693.9	2,672.3	6.0	6.8	-40.81	-252.7	-135.1	95.5	84.9	10.59	9.020	
2,800.0	2,785.7	2,793.8	2,770.6	6.3	7.2	-41.14	-267.9	-143.6	100.1	89.1	11.06	9.053	
2,900.0	2,884.8	2,893.7	2,869.0	6.6	7.5	-41.43	-283.0	-152.1	104.8	93.3	11.54	9.082	
3,000.0	2,983.8	2,993.6	2,967.4	6.9	7.9	-41.70	-298.2	-160.5	109.4	97.4	12.02	9.108	
3,100.0	3,082.8	3,093.5	3,065.8	7.2	8.2	-41.95	-313.3	-169.0	114.1	101.6	12.50	9.130	
3,200.0	3,181.8	3,193.4	3,164.1	7.5	8.6	-42.18	-328.4	-177.5	118.7	105.8	12.98	9.150	
3,300.0	3,280.9	3,293.3	3,262.5	7.8	8.9	-42.39	-343.6	-185.9	123.4	109.9	13.46	9.167	
3,400.0	3,379.9	3,393.2	3,360.9	8.1	9.3	-42.58	-358.7	-194.4	128.1	114.1	13.95	9.183	
3,500.0	3,478.9	3,493.1	3,459.2	8.4	9.6	-42.76	-373.9	-202.8	132.7	118.3	14.43	9.196	
3,600.0	3,577.9	3,593.0	3,557.6	8.7	9.9	-42.93	-389.0	-211.3	137.4	122.5	14.92	9.209	
3,700.0	3,677.0	3,692.9	3,656.0	8.9	10.3	-43.09	-404.1	-219.8	142.0	126.6	15.41	9.220	
3,800.0	3,776.0	3,792.7	3,754.4	9.2	10.6	-43.24	-419.3	-228.2	146.7	130.8	15.89	9.230	
3,900.0	3,875.0	3,892.6	3,852.7	9.5	11.0	-43.38	-434.4	-236.7	151.4	135.0	16.38	9.239	
4,000.0	3,974.0	3,992.5	3,951.1	9.8	11.3	-43.51	-449.6	-245.2	156.0	139.2	16.87	9.247	
4,100.0	4,073.1	4,092.4	4,049.5	10.1	11.7	-43.63	-464.7	-253.6	160.7	143.3	17.36	9.254	
4,200.0	4,172.1	4,192.3	4,147.9	10.4	12.0	-43.75	-479.9	-262.1	165.4	147.5	17.86	9.261	
4,300.0	4,271.1	4,292.2	4,246.2	10.7	12.4	-43.86	-495.0	-270.5	170.0	151.7	18.35	9.267	
4,400.0	4,370.2	4,392.1	4,344.6	11.0	12.7	-43.96	-510.1	-279.0	174.7	155.9	18.84	9.273	
4,500.0	4,469.2	4,492.0	4,443.0	11.3	13.1	-44.06	-525.3	-287.5	179.4	160.0	19.33	9.278	
4,600.0	4,568.2	4,591.9	4,541.3	11.6	13.4	-44.16	-540.4	-295.9	184.0	164.2	19.83	9.282	
4,700.0	4,667.2	4,691.8	4,639.7	11.9	13.8	-44.25	-555.6	-304.4	188.7	168.4	20.32	9.286	
4,800.0	4,766.3	4,791.6	4,738.1	12.2	14.1	-44.33	-570.7	-312.8	193.4	172.6	20.81	9.290	
4,900.0	4,865.3	4,891.5	4,836.5	12.5	14.5	-44.41	-585.8	-321.3	198.0	176.7	21.31	9.294	
5,000.0	4,964.3	4,991.4	4,934.8	12.8	14.8	-44.49	-601.0	-329.8	202.7	180.9	21.80	9.297	
5,100.0	5,063.3	5,091.3	5,033.2	13.1	15.2	-44.56	-616.1	-338.2	207.4	185.1	22.30	9.300	

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

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3F-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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	5,162.4	5,191.2	5,131.6	13.4	15.5	-44.63	-631.3	-346.7	212.0	189.2	22.79	9.303	
5,300.0	5,261.4	5,291.1	5,230.0	13.7	15.9	-44.70	-646.4	-355.2	216.7	193.4	23.29	9.305	
5,400.0	5,360.4	5,391.0	5,328.3	14.0	16.2	-44.76	-661.6	-363.6	221.4	197.6	23.79	9.308	
5,500.0	5,459.4	5,490.9	5,426.7	14.3	16.5	-44.83	-676.7	-372.1	226.1	201.8	24.28	9.310	
5,600.0	5,558.5	5,590.8	5,525.1	14.6	16.9	-44.83	-691.8	-380.5	231.1	206.3	24.76	9.334	
5,700.0	5,657.8	5,690.6	5,623.3	14.8	17.2	-44.56	-707.0	-389.0	237.3	212.1	25.16	9.433	
5,800.0	5,757.3	5,790.2	5,721.5	15.1	17.6	-44.02	-722.1	-397.4	244.8	219.3	25.48	9.606	
5,900.0	5,857.0	5,891.4	5,821.2	15.3	17.9	-43.26	-737.3	-406.0	253.5	227.7	25.74	9.847	
6,000.0	5,956.8	5,999.3	5,927.9	15.5	18.3	-42.53	-751.3	-413.8	261.3	235.3	25.98	10.059	
6,100.0	6,056.7	6,107.7	6,035.6	15.6	18.5	-41.99	-761.7	-419.6	267.3	241.0	26.23	10.191	
6,200.0	6,156.6	6,216.5	6,144.1	15.8	18.7	-41.64	-768.6	-423.4	271.2	244.8	26.48	10.245	
6,300.0	6,256.6	6,325.4	6,252.9	15.9	18.8	-41.46	-771.9	-425.3	273.3	246.5	26.73	10.222	
6,400.0	6,356.6	6,429.1	6,356.6	16.0	18.9	179.27	-772.2	-425.4	273.5	242.1	31.43	8.701	
6,500.0	6,456.6	6,529.1	6,456.6	16.2	19.0	179.27	-772.2	-425.4	273.5	241.8	31.68	8.632	
6,575.1	6,531.6	6,604.1	6,531.6	16.2	19.1	90.00	-772.2	-425.4	273.5	246.2	27.31	10.014	
6,600.0	6,556.4	6,628.9	6,556.4	16.2	19.2	90.42	-772.2	-425.4	273.5	246.2	27.27	10.027	
6,700.0	6,654.4	6,726.9	6,654.4	16.2	19.3	94.29	-772.2	-425.4	274.3	247.7	26.59	10.318	
6,800.0	6,748.8	6,827.2	6,754.5	16.0	19.3	99.86	-772.2	-420.8	277.9	252.4	25.57	10.871	
6,900.0	6,837.8	6,932.5	6,857.9	15.8	19.3	105.28	-772.2	-401.1	284.3	259.6	24.68	11.519	
7,000.0	6,919.5	7,042.9	6,961.9	15.6	19.2	110.31	-772.2	-364.5	292.9	268.9	24.05	12.181	
7,100.0	6,992.5	7,158.6	7,063.6	15.5	19.0	114.81	-772.1	-309.4	302.9	279.2	23.71	12.779	
7,200.0	7,055.2	7,280.1	7,159.3	15.4	18.8	118.69	-772.1	-234.9	313.4	289.7	23.69	13.230	
7,300.0	7,106.5	7,407.1	7,244.4	15.4	18.7	121.87	-772.1	-140.8	323.4	299.4	24.05	13.447	
7,400.0	7,145.4	7,539.3	7,313.9	15.7	18.7	124.30	-772.1	-28.6	332.0	307.1	24.86	13.351	
7,500.0	7,171.1	7,675.6	7,362.7	16.5	19.1	125.94	-772.1	98.5	338.1	311.9	26.26	12.877	
7,600.0	7,183.1	7,814.7	7,386.8	17.8	20.1	126.77	-772.1	235.3	341.4	313.1	28.23	12.091	
7,700.0	7,184.0	7,930.6	7,389.0	19.3	21.4	126.86	-772.1	351.1	341.7	310.9	30.85	11.076	
7,800.0	7,184.0	8,030.6	7,389.0	21.1	22.9	126.86	-772.1	451.1	341.7	308.0	33.78	10.118	
7,900.0	7,184.0	8,130.6	7,389.0	23.0	24.5	126.86	-772.1	551.1	341.7	304.8	36.90	9.262	
8,000.0	7,184.0	8,230.6	7,389.0	25.0	26.4	126.86	-772.1	651.1	341.7	301.6	40.16	8.508	
8,100.0	7,184.0	8,330.6	7,389.0	27.1	28.3	126.86	-772.1	751.1	341.7	298.2	43.55	7.847	
8,200.0	7,184.0	8,430.6	7,389.0	29.2	30.4	126.86	-772.1	851.1	341.7	294.7	47.03	7.267	
8,300.0	7,184.0	8,530.6	7,389.0	31.4	32.5	126.86	-772.1	951.1	341.7	291.1	50.57	6.757	
8,400.0	7,184.0	8,630.6	7,389.0	33.6	34.6	126.86	-772.1	1,051.1	341.7	287.5	54.18	6.307	
8,500.0	7,184.0	8,730.6	7,389.0	35.9	36.8	126.86	-772.1	1,151.1	341.7	283.9	57.83	5.909	
8,600.0	7,184.0	8,830.6	7,389.0	38.2	39.1	126.86	-772.1	1,251.1	341.7	280.2	61.53	5.554	
8,700.0	7,184.0	8,930.6	7,389.0	40.5	41.3	126.87	-772.1	1,351.1	341.7	276.5	65.25	5.237	
8,800.0	7,184.0	9,030.6	7,389.0	42.8	43.6	126.87	-772.1	1,451.1	341.7	272.7	69.00	4.952	
8,900.0	7,184.0	9,130.6	7,389.0	45.2	45.9	126.87	-772.0	1,551.1	341.7	268.9	72.77	4.695	
9,000.0	7,184.0	9,230.6	7,389.0	47.5	48.2	126.87	-772.0	1,651.1	341.7	265.1	76.57	4.463	
9,100.0	7,184.0	9,330.6	7,389.0	49.9	50.6	126.87	-772.0	1,751.1	341.7	261.3	80.38	4.251	
9,200.0	7,184.0	9,430.6	7,389.0	52.3	52.9	126.87	-772.0	1,851.1	341.7	257.5	84.20	4.058	
9,300.0	7,184.0	9,530.6	7,389.0	54.6	55.3	126.87	-772.0	1,951.1	341.7	253.6	88.04	3.881	
9,400.0	7,184.0	9,630.6	7,389.0	57.0	57.6	126.87	-772.0	2,051.1	341.7	249.8	91.89	3.718	
9,500.0	7,184.0	9,730.6	7,389.0	59.4	60.0	126.87	-772.0	2,151.1	341.7	245.9	95.74	3.569	
9,600.0	7,184.0	9,830.6	7,389.0	61.8	62.4	126.87	-772.0	2,251.1	341.7	242.1	99.61	3.430	
9,700.0	7,184.0	9,930.6	7,389.0	64.3	64.8	126.87	-772.0	2,351.1	341.7	238.2	103.48	3.302	
9,800.0	7,184.0	10,030.6	7,389.0	66.7	67.2	126.87	-772.0	2,451.1	341.7	234.3	107.36	3.182	
9,900.0	7,184.0	10,130.6	7,389.0	69.1	69.6	126.87	-772.0	2,551.1	341.7	230.4	111.25	3.071	
10,000.0	7,184.0	10,230.6	7,389.0	71.5	72.0	126.87	-772.0	2,651.1	341.6	226.5	115.14	2.967	
10,100.0	7,184.0	10,330.6	7,389.0	73.9	74.4	126.87	-772.0	2,751.1	341.6	222.6	119.03	2.870	
10,200.0	7,184.0	10,430.6	7,389.0	76.4	76.8	126.87	-772.0	2,851.1	341.6	218.7	122.93	2.779	

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 Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3F-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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
10,300.0	7,184.0	10,530.6	7,389.0	78.8	79.2	126.87	-772.0	2,951.1	341.6	214.8	126.84	2.693	
10,400.0	7,184.0	10,630.6	7,389.0	81.2	81.7	126.87	-772.0	3,051.1	341.6	210.9	130.75	2.613	
10,500.0	7,184.0	10,730.6	7,389.0	83.7	84.1	126.88	-772.0	3,151.1	341.6	207.0	134.66	2.537	
10,600.0	7,184.0	10,830.6	7,389.0	86.1	86.5	126.88	-771.9	3,251.1	341.6	203.1	138.57	2.465	
10,700.0	7,184.0	10,930.6	7,389.0	88.5	88.9	126.88	-771.9	3,351.1	341.6	199.1	142.49	2.398	
10,800.0	7,184.0	11,030.6	7,389.0	91.0	91.4	126.88	-771.9	3,451.1	341.6	195.2	146.41	2.333	
10,900.0	7,184.0	11,130.6	7,389.0	93.4	93.8	126.88	-771.9	3,551.1	341.6	191.3	150.33	2.272	
11,000.0	7,184.0	11,230.6	7,389.0	95.9	96.2	126.88	-771.9	3,651.1	341.6	187.4	154.25	2.215	
11,100.0	7,184.0	11,330.6	7,389.0	98.3	98.7	126.88	-771.9	3,751.1	341.6	183.4	158.18	2.160	
11,200.0	7,184.0	11,430.6	7,389.0	100.8	101.1	126.88	-771.9	3,851.1	341.6	179.5	162.11	2.107	
11,300.0	7,184.0	11,530.6	7,389.0	103.2	103.6	126.88	-771.9	3,951.1	341.6	175.6	166.04	2.057	
11,400.0	7,184.0	11,630.6	7,389.0	105.7	106.0	126.88	-771.9	4,051.1	341.6	171.6	169.97	2.010	
11,500.0	7,184.0	11,730.6	7,389.0	108.1	108.4	126.88	-771.9	4,151.1	341.6	167.7	173.90	1.964	
11,600.0	7,184.0	11,830.6	7,389.0	110.6	110.9	126.88	-771.9	4,251.1	341.6	163.7	177.83	1.921	
11,700.0	7,184.0	11,930.6	7,389.0	113.0	113.3	126.88	-771.9	4,351.1	341.6	159.8	181.77	1.879	
11,747.9	7,184.0	11,978.5	7,389.0	114.2	114.5	126.88	-771.9	4,399.0	341.6	157.9	183.65	1.860	SF

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3G-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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	180.00	-18.2	0.0	18.2				
100.0	100.0	100.0	100.0	0.2	0.2	180.00	-18.2	0.0	18.2	17.9	0.30	59.977	
200.0	200.0	200.0	200.0	0.3	0.3	180.00	-18.2	0.0	18.2	17.6	0.65	27.904	
300.0	300.0	300.0	300.0	0.5	0.5	180.00	-18.2	0.0	18.2	17.2	1.00	18.181	
400.0	400.0	400.0	400.0	0.7	0.7	180.00	-18.2	0.0	18.2	16.9	1.35	13.483	CC, ES
500.0	500.0	499.7	499.7	0.8	0.8	-178.97	-19.0	-0.3	19.0	17.3	1.70	11.187	
600.0	600.0	599.3	599.3	1.0	1.0	-176.33	-21.4	-1.4	21.5	19.4	2.05	10.461	SF
700.0	700.0	698.9	698.7	1.2	1.2	-173.07	-25.4	-3.1	25.6	23.2	2.41	10.637	
800.0	800.0	798.2	797.9	1.4	1.4	-169.96	-30.9	-5.5	31.5	28.7	2.77	11.378	
900.0	900.0	897.4	896.7	1.5	1.6	-28.62	-38.0	-8.5	38.3	35.2	3.09	12.392	
1,000.0	1,000.0	996.4	995.3	1.7	1.8	-27.83	-46.7	-12.3	45.4	42.0	3.44	13.187	
1,100.0	1,099.9	1,095.3	1,093.6	1.9	2.1	-27.78	-56.9	-16.7	52.6	48.8	3.79	13.872	
1,200.0	1,199.7	1,194.1	1,191.5	2.1	2.3	-28.22	-68.7	-21.7	60.0	55.9	4.15	14.469	
1,300.0	1,299.4	1,292.7	1,289.1	2.3	2.6	-28.97	-81.9	-27.5	67.5	63.0	4.50	14.991	
1,400.0	1,398.9	1,391.2	1,386.3	2.5	2.9	-29.93	-96.8	-33.9	75.2	70.4	4.87	15.449	
1,500.0	1,498.3	1,489.7	1,483.1	2.7	3.2	-31.04	-113.1	-40.9	83.1	77.9	5.25	15.846	
1,600.0	1,597.4	1,589.4	1,581.0	3.0	3.6	-32.43	-130.3	-48.3	90.3	84.7	5.64	16.008	
1,700.0	1,696.4	1,689.1	1,679.0	3.2	3.9	-33.94	-147.5	-55.7	96.8	90.7	6.05	15.988	
1,800.0	1,795.5	1,788.9	1,777.0	3.5	4.3	-35.26	-164.7	-63.1	103.3	96.9	6.48	15.953	
1,900.0	1,894.5	1,888.7	1,875.0	3.8	4.6	-36.42	-181.9	-70.6	109.9	103.0	6.91	15.906	
2,000.0	1,993.5	1,988.4	1,973.0	4.0	5.0	-37.44	-199.1	-78.0	116.6	109.2	7.36	15.850	
2,100.0	2,092.5	2,088.2	2,071.0	4.3	5.3	-38.36	-216.3	-85.4	123.2	115.4	7.81	15.789	
2,200.0	2,191.6	2,187.9	2,168.9	4.6	5.7	-39.18	-233.5	-92.8	129.9	121.7	8.26	15.725	
2,300.0	2,290.6	2,287.7	2,266.9	4.9	6.1	-39.93	-250.7	-100.2	136.7	127.9	8.73	15.659	
2,400.0	2,389.6	2,387.4	2,364.9	5.2	6.4	-40.60	-267.9	-107.7	143.4	134.2	9.20	15.593	
2,500.0	2,488.6	2,487.2	2,462.9	5.4	6.8	-41.21	-285.2	-115.1	150.2	140.5	9.67	15.527	
2,600.0	2,587.7	2,587.0	2,560.9	5.7	7.2	-41.77	-302.4	-122.5	157.0	146.8	10.15	15.462	
2,700.0	2,686.7	2,686.7	2,658.9	6.0	7.5	-42.28	-319.6	-129.9	163.7	153.1	10.63	15.399	
2,800.0	2,785.7	2,786.5	2,756.8	6.3	7.9	-42.75	-336.8	-137.3	170.5	159.4	11.12	15.338	
2,900.0	2,884.8	2,886.2	2,854.8	6.6	8.3	-43.19	-354.0	-144.7	177.4	165.7	11.61	15.279	
3,000.0	2,983.8	2,986.0	2,952.8	6.9	8.6	-43.59	-371.2	-152.2	184.2	172.1	12.10	15.222	
3,100.0	3,082.8	3,085.8	3,050.8	7.2	9.0	-43.97	-388.4	-159.6	191.0	178.4	12.59	15.167	
3,200.0	3,181.8	3,185.5	3,148.8	7.5	9.4	-44.32	-405.6	-167.0	197.8	184.8	13.09	15.114	
3,300.0	3,280.9	3,285.3	3,246.8	7.8	9.7	-44.64	-422.8	-174.4	204.7	191.1	13.59	15.063	
3,400.0	3,379.9	3,385.0	3,344.7	8.1	10.1	-44.95	-440.0	-181.8	211.5	197.5	14.09	15.015	
3,500.0	3,478.9	3,484.8	3,442.7	8.4	10.5	-45.23	-457.2	-189.2	218.4	203.8	14.59	14.968	
3,600.0	3,577.9	3,584.6	3,540.7	8.7	10.8	-45.50	-474.4	-196.7	225.3	210.2	15.09	14.924	
3,700.0	3,677.0	3,684.3	3,638.7	8.9	11.2	-45.75	-491.7	-204.1	232.1	216.5	15.60	14.881	
3,800.0	3,776.0	3,784.1	3,736.7	9.2	11.6	-45.99	-508.9	-211.5	239.0	222.9	16.11	14.840	
3,900.0	3,875.0	3,883.8	3,834.7	9.5	11.9	-46.21	-526.1	-218.9	245.9	229.3	16.61	14.801	
4,000.0	3,974.0	3,983.6	3,932.6	9.8	12.3	-46.42	-543.3	-226.3	252.8	235.6	17.12	14.763	
4,100.0	4,073.1	4,083.3	4,030.6	10.1	12.7	-46.63	-560.5	-233.8	259.6	242.0	17.63	14.727	
4,200.0	4,172.1	4,183.1	4,128.6	10.4	13.0	-46.82	-577.7	-241.2	266.5	248.4	18.14	14.693	
4,300.0	4,271.1	4,282.9	4,226.6	10.7	13.4	-47.00	-594.9	-248.6	273.4	254.8	18.65	14.660	
4,400.0	4,370.2	4,382.6	4,324.6	11.0	13.8	-47.17	-612.1	-256.0	280.3	261.1	19.16	14.628	
4,500.0	4,469.2	4,482.4	4,422.6	11.3	14.2	-47.33	-629.3	-263.4	287.2	267.5	19.67	14.597	
4,600.0	4,568.2	4,582.1	4,520.5	11.6	14.5	-47.49	-646.5	-270.8	294.1	273.9	20.19	14.568	
4,700.0	4,667.2	4,681.9	4,618.5	11.9	14.9	-47.64	-663.7	-278.3	301.0	280.3	20.70	14.540	
4,800.0	4,766.3	4,781.7	4,716.5	12.2	15.3	-47.78	-681.0	-285.7	307.9	286.7	21.21	14.512	
4,900.0	4,865.3	4,881.4	4,814.5	12.5	15.6	-47.92	-698.2	-293.1	314.8	293.1	21.73	14.486	
5,000.0	4,964.3	4,981.2	4,912.5	12.8	16.0	-48.05	-715.4	-300.5	321.7	299.4	22.24	14.461	
5,100.0	5,063.3	5,080.9	5,010.4	13.1	16.4	-48.17	-732.6	-307.9	328.6	305.8	22.76	14.437	

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 Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3G-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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	5,162.4	5,180.7	5,108.4	13.4	16.7	-48.29	-749.8	-315.4	335.5	312.2	23.28	14.413	
5,300.0	5,261.4	5,280.5	5,206.4	13.7	17.1	-48.40	-767.0	-322.8	342.4	318.6	23.79	14.391	
5,400.0	5,360.4	5,380.2	5,304.4	14.0	17.5	-48.51	-784.2	-330.2	349.3	325.0	24.31	14.369	
5,500.0	5,459.4	5,480.0	5,402.4	14.3	17.8	-48.62	-801.4	-337.6	356.2	331.4	24.83	14.348	
5,600.0	5,558.5	5,579.7	5,500.3	14.6	18.2	-48.71	-818.6	-345.0	363.4	338.1	25.33	14.350	
5,700.0	5,657.8	5,679.4	5,598.2	14.8	18.6	-48.61	-835.8	-352.4	371.8	346.0	25.77	14.428	
5,800.0	5,757.3	5,778.9	5,696.0	15.1	19.0	-48.34	-853.0	-359.8	381.3	355.1	26.15	14.582	
5,900.0	5,857.0	5,878.2	5,793.6	15.3	19.3	-47.90	-870.1	-367.2	392.0	365.5	26.47	14.807	
6,000.0	5,956.8	5,977.4	5,891.0	15.5	19.7	-47.32	-887.2	-374.6	403.9	377.1	26.74	15.103	
6,100.0	6,056.7	6,076.4	5,988.2	15.6	20.1	-46.60	-904.3	-382.0	417.0	390.0	26.96	15.469	
6,200.0	6,156.6	6,175.1	6,085.1	15.8	20.4	-45.78	-921.3	-389.3	431.4	404.3	27.13	15.903	
6,300.0	6,256.6	6,273.6	6,181.8	15.9	20.8	-44.87	-938.3	-396.6	447.1	419.9	27.26	16.405	
6,400.0	6,356.6	6,371.8	6,278.3	16.0	21.2	176.86	-955.3	-403.9	463.9	430.4	33.47	13.860	
6,500.0	6,456.6	6,470.0	6,374.8	16.2	21.5	177.86	-972.2	-411.2	480.9	446.7	34.14	14.083	
6,600.0	6,556.4	6,567.2	6,470.3	16.2	21.9	88.02	-989.0	-417.1	497.8	470.1	27.68	17.982	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 S4-T3N-R68W (Minch) - Minch 3H-4H - Hz - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-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	-180.00	-29.1	0.0	29.1				
100.0	100.0	100.0	100.0	0.2	0.2	-180.00	-29.1	0.0	29.1	28.8	0.30	95.964	
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-29.1	0.0	29.1	28.5	0.65	44.646	CC, ES
300.0	300.0	299.5	299.5	0.5	0.5	-179.49	-30.0	-0.3	30.0	29.0	1.00	29.921	
400.0	400.0	399.0	398.9	0.7	0.7	-178.11	-32.4	-1.1	32.5	31.1	1.35	23.988	
500.0	500.0	498.3	498.2	0.8	0.9	-176.24	-36.5	-2.4	36.7	34.9	1.71	21.435	
600.0	600.0	597.4	597.1	1.0	1.1	-174.24	-42.2	-4.3	42.6	40.5	2.07	20.534	SF
700.0	700.0	696.3	695.7	1.2	1.3	-172.37	-49.6	-6.6	50.2	47.8	2.44	20.555	
800.0	800.0	795.0	793.9	1.4	1.5	-170.73	-58.5	-9.5	59.6	56.8	2.82	21.129	
900.0	900.0	893.3	891.6	1.5	1.8	-30.37	-69.0	-13.0	69.9	66.9	3.09	22.644	
1,000.0	1,000.0	991.5	989.0	1.7	2.0	-30.03	-81.0	-16.9	80.5	77.1	3.44	23.425	
1,100.0	1,099.9	1,089.4	1,085.9	1.9	2.3	-30.16	-94.7	-21.3	91.3	87.5	3.79	24.101	
1,200.0	1,199.7	1,187.2	1,182.3	2.1	2.6	-30.61	-109.8	-26.2	102.2	98.1	4.14	24.689	
1,300.0	1,299.4	1,284.8	1,278.3	2.3	3.0	-31.29	-126.5	-31.7	113.3	108.8	4.50	25.199	
1,400.0	1,398.9	1,382.1	1,373.7	2.5	3.3	-32.13	-144.7	-37.6	124.7	119.8	4.86	25.635	
1,500.0	1,498.3	1,479.2	1,468.6	2.7	3.7	-33.08	-164.4	-44.0	136.2	131.0	5.24	25.999	
1,600.0	1,597.4	1,577.9	1,564.7	3.0	4.1	-34.16	-185.5	-50.9	147.7	142.0	5.64	26.200	
1,700.0	1,696.4	1,677.2	1,661.5	3.2	4.5	-35.33	-206.9	-57.8	158.5	152.4	6.05	26.200	
1,800.0	1,795.5	1,776.6	1,758.3	3.5	4.9	-36.35	-228.3	-64.8	169.3	162.9	6.47	26.168	
1,900.0	1,894.5	1,876.0	1,855.1	3.8	5.4	-37.24	-249.6	-71.7	180.3	173.4	6.90	26.114	
2,000.0	1,993.5	1,975.3	1,951.9	4.0	5.8	-38.03	-271.0	-78.7	191.2	183.9	7.34	26.044	
2,100.0	2,092.5	2,074.7	2,048.7	4.3	6.2	-38.74	-292.4	-85.6	202.2	194.4	7.79	25.963	
2,200.0	2,191.6	2,174.1	2,145.5	4.6	6.6	-39.37	-313.7	-92.6	213.2	205.0	8.24	25.874	
2,300.0	2,290.6	2,273.4	2,242.3	4.9	7.0	-39.94	-335.1	-99.5	224.2	215.5	8.70	25.782	
2,400.0	2,389.6	2,372.8	2,339.1	5.2	7.5	-40.46	-356.5	-106.5	235.3	226.1	9.16	25.688	
2,500.0	2,488.6	2,472.2	2,435.9	5.4	7.9	-40.93	-377.8	-113.4	246.4	236.8	9.63	25.593	
2,600.0	2,587.7	2,571.5	2,532.7	5.7	8.3	-41.36	-399.2	-120.3	257.5	247.4	10.10	25.499	
2,700.0	2,686.7	2,670.9	2,629.4	6.0	8.7	-41.76	-420.6	-127.3	268.6	258.0	10.57	25.407	
2,800.0	2,785.7	2,770.3	2,726.2	6.3	9.2	-42.12	-442.0	-134.2	279.7	268.6	11.05	25.317	
2,900.0	2,884.8	2,869.6	2,823.0	6.6	9.6	-42.46	-463.3	-141.2	290.8	279.3	11.53	25.230	
3,000.0	2,983.8	2,969.0	2,919.8	6.9	10.0	-42.77	-484.7	-148.1	301.9	289.9	12.01	25.145	
3,100.0	3,082.8	3,068.4	3,016.6	7.2	10.4	-43.06	-506.1	-155.1	313.1	300.6	12.49	25.063	
3,200.0	3,181.8	3,167.7	3,113.4	7.5	10.9	-43.32	-527.4	-162.0	324.2	311.3	12.98	24.984	
3,300.0	3,280.9	3,267.1	3,210.2	7.8	11.3	-43.58	-548.8	-169.0	335.4	321.9	13.47	24.908	
3,400.0	3,379.9	3,366.5	3,307.0	8.1	11.7	-43.81	-570.2	-175.9	346.6	332.6	13.95	24.835	
3,500.0	3,478.9	3,465.8	3,403.8	8.4	12.1	-44.03	-591.5	-182.9	357.7	343.3	14.44	24.765	
3,600.0	3,577.9	3,565.2	3,500.6	8.7	12.6	-44.24	-612.9	-189.8	368.9	354.0	14.94	24.698	
3,700.0	3,677.0	3,664.5	3,597.4	8.9	13.0	-44.43	-634.3	-196.8	380.1	364.6	15.43	24.633	
3,800.0	3,776.0	3,763.9	3,694.1	9.2	13.4	-44.62	-655.6	-203.7	391.3	375.3	15.92	24.571	
3,900.0	3,875.0	3,863.3	3,790.9	9.5	13.9	-44.79	-677.0	-210.7	402.4	386.0	16.42	24.511	
4,000.0	3,974.0	3,962.6	3,887.7	9.8	14.3	-44.95	-698.4	-217.6	413.6	396.7	16.91	24.454	
4,100.0	4,073.1	4,062.0	3,984.5	10.1	14.7	-45.11	-719.7	-224.6	424.8	407.4	17.41	24.399	
4,200.0	4,172.1	4,161.4	4,081.3	10.4	15.1	-45.26	-741.1	-231.5	436.0	418.1	17.91	24.346	
4,300.0	4,271.1	4,260.7	4,178.1	10.7	15.6	-45.40	-762.5	-238.5	447.2	428.8	18.41	24.295	
4,400.0	4,370.2	4,360.1	4,274.9	11.0	16.0	-45.53	-783.8	-245.4	458.4	439.5	18.91	24.246	
4,500.0	4,469.2	4,459.5	4,371.7	11.3	16.4	-45.66	-805.2	-252.4	469.6	450.2	19.41	24.199	
4,600.0	4,568.2	4,558.8	4,468.5	11.6	16.9	-45.78	-826.6	-259.3	480.8	460.9	19.91	24.153	
4,700.0	4,667.2	4,658.2	4,565.3	11.9	17.3	-45.89	-847.9	-266.3	492.0	471.6	20.41	24.110	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Minch 3E-4H
Project:	DJ Wattenberg	**TVD Reference:**	WELL @ 5090.0ft (Ensign)
Reference Site:	S4-T3N-R68W (Minch)	**MD Reference:**	WELL @ 5090.0ft (Ensign)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Minch 3E-4H	**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 @ 5090.0ft (Ensign)	Coordinates are relative to: Minch 3E-4H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 °	Grid Convergence at Surface is: 0.31°