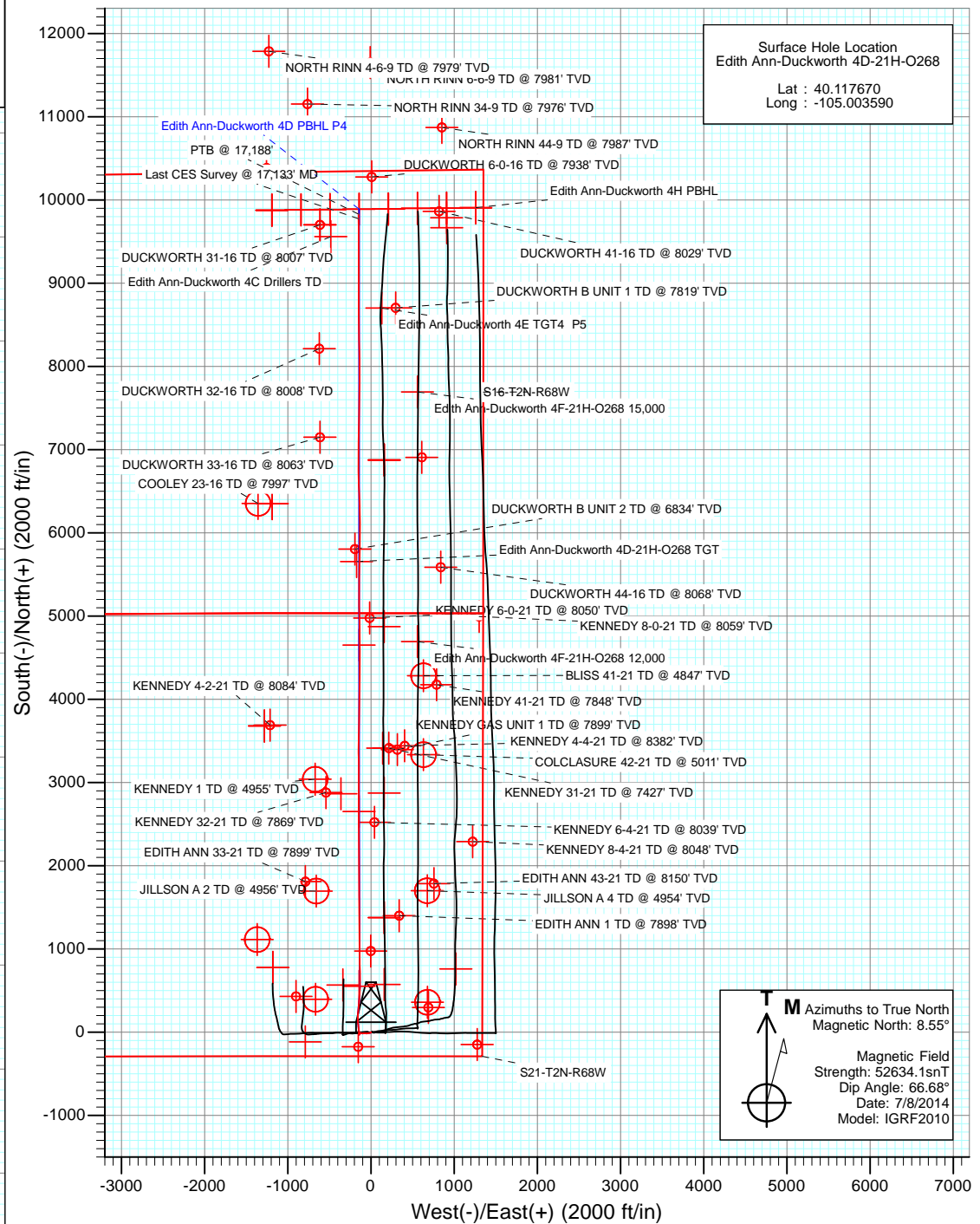
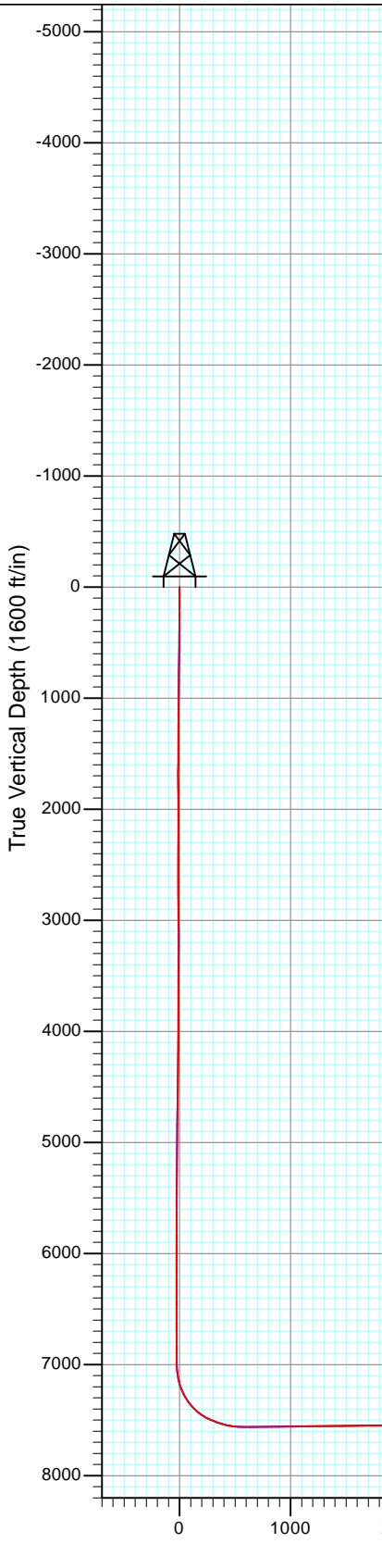




Project: DJ Wattenberg
Site: S21-T2N-R68W (Edith Ann-Duckworth)
Well: Edith Ann-Duckworth 4D-21H-O268
Wellbore: Hz
Design: FINAL



FINAL
Edith Ann-Duckworth 4D-21H-O268
305555 145101 306355 145209; LR
KB @ 4954.5ft (Patterson 272)
Ground Elevation @ 4926.0
North American Datum 1983
Well Edith Ann-Duckworth 4D-21H-O268, True North



Surface Hole Location
Edith Ann-Duckworth 4D-21H-O268
Lat : 40.117670
Long : -105.003590

M Azimuths to True North
Magnetic North: 8.55°
Magnetic Field
Strength: 52634.1nT
Dip Angle: 66.68°
Date: 7/8/2014
Model: IGRF2010

DESIGN TARGET DETAILS

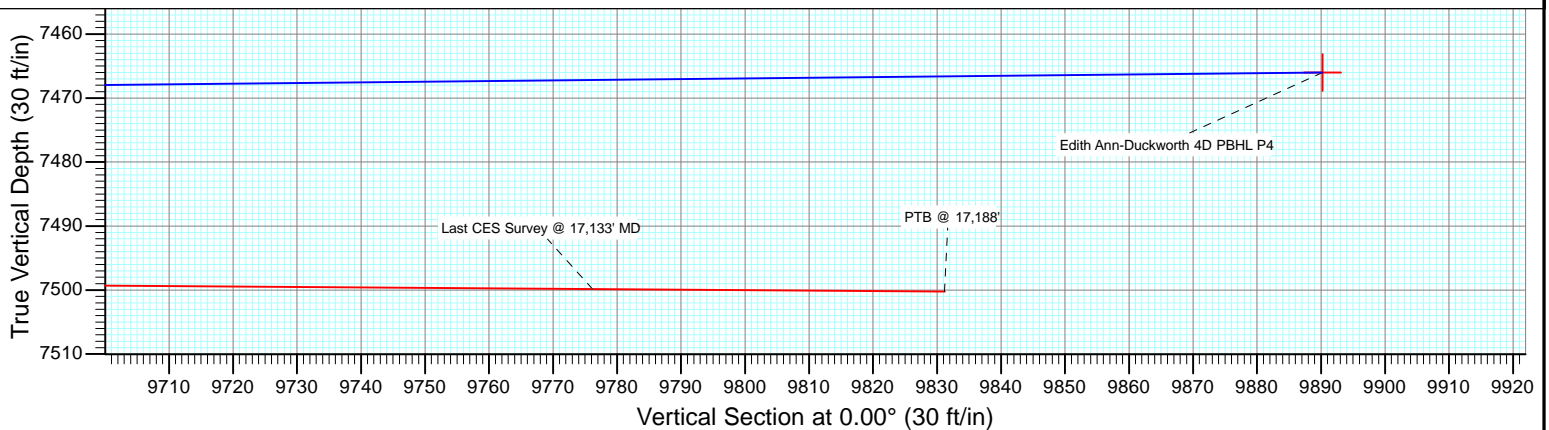
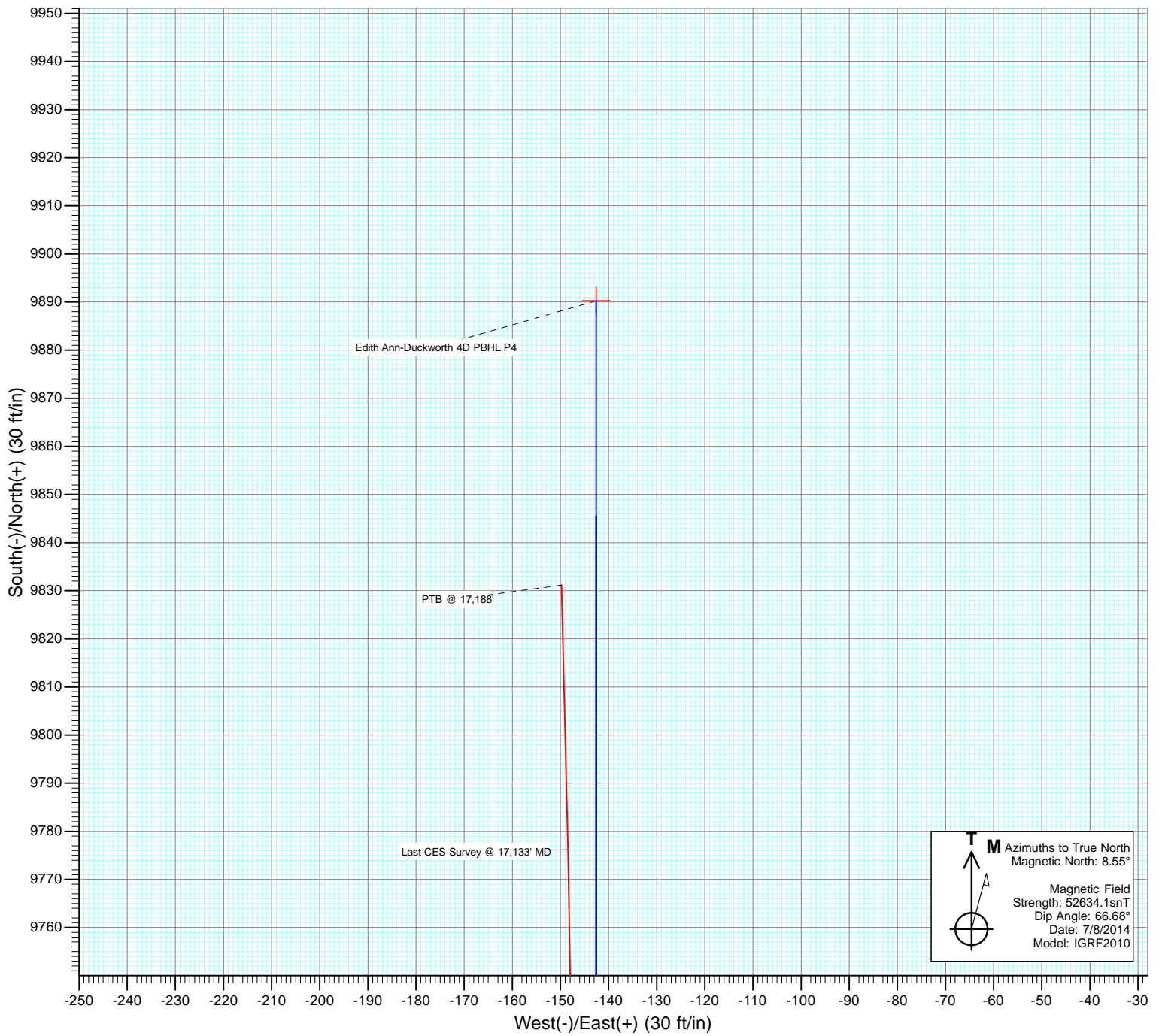
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Edith Ann-Duckworth 4D PBHL P4	9890.2	-142.6	1295991.63	3138638.70	40.144820	-105.004100

Edith Ann-Duckworth 4D PBHL P4
PTB @ 17,188'
Last CES Survey @ 17,133' MD

Vertical Section at 0.00° (1600 ft/in)



Project: DJ Wattenberg
Site: S21-T2N-R68W (Edith Ann-Duckworth)
Well: Edith Ann-Duckworth 4D-21H-O268
Wellbore: Hz
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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 4D-21H-O268					
Well Position	+N/-S	0.0 ft	Northing:	1,286,102.37 ft	Latitude:	40.117670
	+E/-W	0.0 ft	Easting:	3,138,836.64 ft	Longitude:	-105.003590
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	7/8/2014	8.56	66.68	52,634

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	0.00	

Survey Program	Date	7/21/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
167.0	17,188.0	Survey #1 (Hz)	Geolink MWD	Geolink MWD	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
167.0	0.40	156.00	167.0	-0.5	0.2	-0.5	0.24	0.24		
261.0	0.40	188.00	261.0	-1.2	0.3	-1.2	0.23	0.00		
355.0	0.40	195.70	355.0	-1.8	0.2	-1.8	0.06	0.00		
449.0	0.60	206.40	449.0	-2.6	-0.1	-2.6	0.23	0.21		
542.0	0.60	193.90	542.0	-3.5	-0.5	-3.5	0.14	0.00		
635.0	0.50	201.20	635.0	-4.3	-0.7	-4.3	0.13	-0.11		
729.0	2.10	254.60	729.0	-5.2	-2.5	-5.2	1.96	1.70		
823.0	2.30	253.50	822.9	-6.1	-6.0	-6.1	0.22	0.21		
899.0	2.30	250.00	898.8	-7.1	-8.9	-7.1	0.18	0.00		
1,018.0	2.60	249.80	1,017.7	-8.9	-13.7	-8.9	0.25	0.25		
1,111.0	3.60	266.40	1,110.6	-9.8	-18.6	-9.8	1.43	1.08		
1,204.0	3.40	266.70	1,203.4	-10.1	-24.2	-10.1	0.22	-0.22		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
1,298.0	3.30	264.40	1,297.2	-10.5	-29.7	-10.5	0.18	-0.11	
1,392.0	3.40	262.60	1,391.1	-11.2	-35.2	-11.2	0.15	0.11	
1,485.0	3.10	268.20	1,483.9	-11.6	-40.4	-11.6	0.47	-0.32	
1,580.0	2.80	266.10	1,578.8	-11.8	-45.3	-11.8	0.34	-0.32	
1,675.0	2.70	261.40	1,673.7	-12.3	-49.8	-12.3	0.26	-0.11	
1,771.0	3.80	279.60	1,769.5	-12.1	-55.2	-12.1	1.56	1.15	
1,866.0	3.60	276.60	1,864.4	-11.3	-61.3	-11.3	0.29	-0.21	
1,961.0	3.60	278.10	1,959.2	-10.5	-67.2	-10.5	0.10	0.00	
2,056.0	4.10	270.00	2,053.9	-10.1	-73.5	-10.1	0.78	0.53	
2,151.0	3.80	269.10	2,148.7	-10.1	-80.1	-10.1	0.32	-0.32	
2,246.0	3.20	265.70	2,243.5	-10.4	-85.9	-10.4	0.67	-0.63	
2,342.0	2.60	257.10	2,339.4	-11.1	-90.6	-11.1	0.77	-0.62	
2,437.0	2.60	256.60	2,434.3	-12.0	-94.8	-12.0	0.02	0.00	
2,532.0	2.60	266.80	2,529.2	-12.7	-99.1	-12.7	0.49	0.00	
2,627.0	4.00	279.90	2,624.1	-12.2	-104.5	-12.2	1.66	1.47	
2,722.0	3.90	278.10	2,718.8	-11.2	-111.0	-11.2	0.17	-0.11	
2,817.0	3.30	279.70	2,813.7	-10.3	-116.9	-10.3	0.64	-0.63	
2,913.0	3.40	275.30	2,909.5	-9.5	-122.4	-9.5	0.29	0.10	
3,008.0	3.50	276.70	3,004.3	-8.9	-128.1	-8.9	0.14	0.11	
3,103.0	3.20	275.90	3,099.2	-8.3	-133.6	-8.3	0.32	-0.32	
3,198.0	2.70	276.40	3,194.0	-7.8	-138.5	-7.8	0.53	-0.53	
3,293.0	1.40	235.50	3,289.0	-8.2	-141.7	-8.2	1.98	-1.37	
3,389.0	1.10	182.00	3,385.0	-9.8	-142.7	-9.8	1.20	-0.31	
3,484.0	0.50	191.30	3,479.9	-11.1	-142.8	-11.1	0.64	-0.63	
3,579.0	0.40	344.40	3,574.9	-11.2	-142.9	-11.2	0.92	-0.11	
3,674.0	0.30	25.70	3,669.9	-10.7	-142.9	-10.7	0.28	-0.11	
3,770.0	1.10	120.50	3,765.9	-10.9	-142.0	-10.9	1.21	0.83	
3,865.0	1.10	86.50	3,860.9	-11.3	-140.3	-11.3	0.68	0.00	
3,960.0	0.60	64.40	3,955.9	-11.0	-139.0	-11.0	0.62	-0.53	
4,055.0	0.70	239.90	4,050.9	-11.1	-139.0	-11.1	1.37	0.11	
4,151.0	1.00	250.60	4,146.9	-11.7	-140.3	-11.7	0.35	0.31	
4,246.0	0.80	235.10	4,241.9	-12.3	-141.7	-12.3	0.33	-0.21	
4,341.0	0.70	176.90	4,336.9	-13.3	-142.2	-13.3	0.77	-0.11	
4,436.0	0.80	167.90	4,431.9	-14.5	-142.0	-14.5	0.16	0.11	
4,531.0	0.80	187.40	4,526.9	-15.8	-141.9	-15.8	0.29	0.00	
4,627.0	0.80	188.00	4,622.8	-17.2	-142.1	-17.2	0.01	0.00	
4,722.0	1.00	210.00	4,717.8	-18.5	-142.6	-18.5	0.42	0.21	
4,817.0	1.10	212.50	4,812.8	-20.0	-143.5	-20.0	0.12	0.11	
4,912.0	1.20	216.20	4,907.8	-21.6	-144.6	-21.6	0.13	0.11	
5,007.0	1.20	225.50	5,002.8	-23.1	-145.9	-23.1	0.20	0.00	
5,102.0	1.10	241.10	5,097.8	-24.2	-147.4	-24.2	0.34	-0.11	
5,197.0	0.30	99.30	5,192.8	-24.7	-148.0	-24.7	1.42	-0.84	
5,292.0	0.30	154.20	5,287.8	-25.0	-147.6	-25.0	0.29	0.00	
5,387.0	0.30	119.10	5,382.8	-25.3	-147.3	-25.3	0.19	0.00	
5,483.0	0.10	177.70	5,478.8	-25.5	-147.1	-25.5	0.27	-0.21	
5,578.0	0.30	5.40	5,573.8	-25.4	-147.0	-25.4	0.42	0.21	
5,673.0	0.40	8.10	5,668.8	-24.8	-147.0	-24.8	0.11	0.11	
5,768.0	1.30	109.30	5,763.7	-24.8	-145.9	-24.8	1.51	0.95	
5,863.0	0.90	121.20	5,858.7	-25.6	-144.2	-25.6	0.48	-0.42	
5,958.0	0.60	129.50	5,953.7	-26.3	-143.2	-26.3	0.34	-0.32	
6,053.0	0.60	108.90	6,048.7	-26.7	-142.4	-26.7	0.23	0.00	
6,148.0	0.50	130.10	6,143.7	-27.2	-141.6	-27.2	0.24	-0.11	
6,243.0	0.40	94.90	6,238.7	-27.5	-140.9	-27.5	0.30	-0.11	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
6,338.0	0.20	140.70	6,333.7	-27.6	-140.5	-27.6	0.31	-0.21	
6,434.0	0.30	95.20	6,429.7	-27.8	-140.1	-27.8	0.22	0.10	
6,529.0	0.40	352.90	6,524.7	-27.5	-139.9	-27.5	0.58	0.11	
6,624.0	0.10	299.20	6,619.7	-27.1	-140.0	-27.1	0.37	-0.32	
6,719.0	0.30	349.10	6,714.7	-26.8	-140.2	-26.8	0.26	0.21	
6,814.0	0.40	352.90	6,809.7	-26.2	-140.3	-26.2	0.11	0.11	
6,909.0	0.30	330.50	6,904.7	-25.7	-140.4	-25.7	0.18	-0.11	
7,004.0	0.80	3.40	6,999.7	-24.8	-140.5	-24.8	0.60	0.53	
7,051.0	3.80	5.50	7,046.7	-22.9	-140.3	-22.9	6.38	6.38	
7,099.0	8.10	359.70	7,094.4	-18.0	-140.2	-18.0	9.03	8.96	
7,146.0	13.20	352.00	7,140.6	-9.3	-141.0	-9.3	11.24	10.85	
7,194.0	18.10	353.10	7,186.8	3.5	-142.6	3.5	10.23	10.21	
7,241.0	23.50	352.80	7,230.7	20.1	-144.7	20.1	11.49	11.49	
7,290.0	28.00	352.20	7,274.8	41.2	-147.5	41.2	9.20	9.18	
7,337.0	33.00	353.60	7,315.3	64.8	-150.4	64.8	10.74	10.64	
7,385.0	38.10	354.20	7,354.3	92.6	-153.3	92.6	10.65	10.62	
7,432.0	44.10	355.90	7,389.7	123.3	-156.0	123.3	12.98	12.77	
7,480.0	49.10	359.20	7,422.7	158.2	-157.4	158.2	11.55	10.42	
7,527.0	55.00	2.30	7,451.6	195.2	-156.9	195.2	13.59	12.55	
7,575.0	61.20	5.00	7,477.0	235.8	-154.3	235.8	13.77	12.92	
7,622.0	67.20	5.30	7,497.4	277.9	-150.5	277.9	12.78	12.77	
7,671.0	69.90	4.60	7,515.3	323.4	-146.6	323.4	5.67	5.51	
7,718.0	72.00	4.80	7,530.7	367.7	-142.9	367.7	4.49	4.47	
7,766.0	75.40	4.50	7,544.1	413.6	-139.2	413.6	7.11	7.08	
7,813.0	81.30	2.70	7,553.6	459.5	-136.3	459.5	13.10	12.55	
7,861.0	85.00	1.60	7,559.3	507.1	-134.5	507.1	8.04	7.71	
7,891.0	88.20	0.60	7,561.1	537.0	-133.9	537.0	11.17	10.67	
7,990.0	90.20	0.10	7,562.5	636.0	-133.3	636.0	2.08	2.02	
8,083.0	90.30	359.40	7,562.1	729.0	-133.7	729.0	0.76	0.11	
8,177.0	90.20	359.30	7,561.7	823.0	-134.8	823.0	0.15	-0.11	
8,270.0	91.10	0.00	7,560.6	916.0	-135.4	916.0	1.23	0.97	
8,364.0	90.70	359.50	7,559.2	1,010.0	-135.8	1,010.0	0.68	-0.43	
8,457.0	90.50	359.10	7,558.2	1,103.0	-136.9	1,103.0	0.48	-0.22	
8,551.0	90.40	358.60	7,557.4	1,197.0	-138.8	1,197.0	0.54	-0.11	
8,644.0	90.40	359.20	7,556.8	1,289.9	-140.6	1,289.9	0.65	0.00	
8,738.0	91.10	0.10	7,555.6	1,383.9	-141.2	1,383.9	1.21	0.74	
8,832.0	90.90	359.30	7,553.9	1,477.9	-141.7	1,477.9	0.88	-0.21	
8,926.0	90.80	0.50	7,552.5	1,571.9	-141.8	1,571.9	1.28	-0.11	
9,019.0	90.40	359.90	7,551.6	1,664.9	-141.5	1,664.9	0.78	-0.43	
9,113.0	90.00	358.80	7,551.2	1,758.9	-142.6	1,758.9	1.25	-0.43	
9,206.0	90.90	0.50	7,550.5	1,851.9	-143.1	1,851.9	2.07	0.97	
9,300.0	89.70	358.90	7,550.0	1,945.9	-143.6	1,945.9	2.13	-1.28	
9,393.0	90.80	0.40	7,549.6	2,038.9	-144.2	2,038.9	2.00	1.18	
9,487.0	90.90	359.90	7,548.2	2,132.8	-143.9	2,132.8	0.54	0.11	
9,580.0	89.90	359.90	7,547.6	2,225.8	-144.1	2,225.8	1.08	-1.08	
9,674.0	91.50	0.40	7,546.4	2,319.8	-143.9	2,319.8	1.78	1.70	
9,767.0	89.80	357.80	7,545.4	2,412.8	-145.3	2,412.8	3.34	-1.83	
9,861.0	90.80	359.90	7,544.9	2,506.8	-147.2	2,506.8	2.47	1.06	
9,954.0	91.00	1.10	7,543.4	2,599.8	-146.4	2,599.8	1.31	0.22	
10,048.0	90.90	0.50	7,541.8	2,693.7	-145.1	2,693.7	0.65	-0.11	
10,141.0	89.90	359.20	7,541.2	2,786.7	-145.3	2,786.7	1.76	-1.08	
10,235.0	89.80	359.90	7,541.4	2,880.7	-146.1	2,880.7	0.75	-0.11	
10,329.0	90.90	0.70	7,540.9	2,974.7	-145.6	2,974.7	1.45	1.17	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
10,422.0	91.30	0.60	7,539.1	3,067.7	-144.5	3,067.7	0.44	0.43	
10,516.0	90.40	359.90	7,537.7	3,161.7	-144.1	3,161.7	1.21	-0.96	
10,611.0	89.70	357.90	7,537.6	3,256.7	-145.9	3,256.7	2.23	-0.74	
10,705.0	89.30	358.80	7,538.4	3,350.6	-148.6	3,350.6	1.05	-0.43	
10,800.0	92.10	0.20	7,537.3	3,445.6	-149.5	3,445.6	3.30	2.95	
10,894.0	92.00	0.30	7,533.9	3,539.5	-149.1	3,539.5	0.15	-0.11	
10,989.0	90.80	1.30	7,531.6	3,634.5	-147.7	3,634.5	1.64	-1.26	
11,083.0	88.70	2.10	7,532.0	3,728.4	-144.9	3,728.4	2.39	-2.23	
11,177.0	88.90	2.10	7,534.0	3,822.4	-141.5	3,822.4	0.21	0.21	
11,272.0	89.40	2.20	7,535.4	3,917.3	-137.9	3,917.3	0.54	0.53	
11,367.0	87.40	1.20	7,538.0	4,012.2	-135.1	4,012.2	2.35	-2.11	
11,461.0	87.90	359.90	7,541.9	4,106.1	-134.2	4,106.1	1.48	0.53	
11,555.0	90.80	359.90	7,542.9	4,200.1	-134.4	4,200.1	3.09	3.09	
11,650.0	91.60	359.90	7,541.0	4,295.1	-134.5	4,295.1	0.84	0.84	
11,744.0	92.20	359.40	7,537.8	4,389.0	-135.1	4,389.0	0.83	0.64	
11,839.0	91.70	359.80	7,534.6	4,484.0	-135.8	4,484.0	0.67	-0.53	
11,934.0	91.30	0.60	7,532.1	4,578.9	-135.5	4,578.9	0.94	-0.42	
12,028.0	87.90	0.40	7,532.8	4,672.9	-134.6	4,672.9	3.62	-3.62	
12,122.0	89.90	359.80	7,534.6	4,766.9	-134.5	4,766.9	2.22	2.13	
12,217.0	90.70	359.20	7,534.1	4,861.9	-135.3	4,861.9	1.05	0.84	
12,311.0	91.80	359.40	7,532.0	4,955.9	-136.4	4,955.9	1.19	1.17	
12,406.0	90.90	358.80	7,529.8	5,050.8	-137.9	5,050.8	1.14	-0.95	
12,501.0	89.90	357.80	7,529.1	5,145.8	-140.8	5,145.8	1.49	-1.05	
12,595.0	91.10	359.00	7,528.3	5,239.7	-143.4	5,239.7	1.81	1.28	
12,690.0	91.60	0.30	7,526.1	5,334.7	-144.0	5,334.7	1.47	0.53	
12,785.0	90.90	0.60	7,524.0	5,429.7	-143.2	5,429.7	0.80	-0.74	
12,879.0	90.90	1.20	7,522.5	5,523.6	-141.7	5,523.6	0.64	0.00	
12,973.0	90.80	1.70	7,521.1	5,617.6	-139.4	5,617.6	0.54	-0.11	
13,068.0	90.90	1.20	7,519.7	5,712.6	-137.0	5,712.6	0.54	0.11	
13,162.0	89.60	1.10	7,519.3	5,806.5	-135.1	5,806.5	1.39	-1.38	
13,257.0	90.30	0.70	7,519.4	5,901.5	-133.6	5,901.5	0.85	0.74	
13,352.0	87.80	1.20	7,521.0	5,996.5	-132.0	5,996.5	2.68	-2.63	
13,447.0	86.50	359.50	7,525.7	6,091.4	-131.4	6,091.4	2.25	-1.37	
13,542.0	89.00	359.00	7,529.4	6,186.3	-132.7	6,186.3	2.68	2.63	
13,637.0	90.70	359.00	7,529.7	6,281.3	-134.3	6,281.3	1.79	1.79	
13,731.0	91.40	357.70	7,527.9	6,375.2	-137.0	6,375.2	1.57	0.74	
13,825.0	91.90	357.60	7,525.2	6,469.1	-140.9	6,469.1	0.54	0.53	
13,920.0	91.60	357.10	7,522.3	6,563.9	-145.3	6,563.9	0.61	-0.32	
14,014.0	87.90	358.10	7,522.7	6,657.8	-149.2	6,657.8	4.08	-3.94	
14,108.0	88.60	359.70	7,525.6	6,751.8	-151.0	6,751.8	1.86	0.74	
14,203.0	90.20	1.20	7,526.6	6,846.8	-150.3	6,846.8	2.31	1.68	
14,298.0	89.90	0.50	7,526.5	6,941.7	-148.9	6,941.7	0.80	-0.32	
14,392.0	91.60	0.50	7,525.3	7,035.7	-148.0	7,035.7	1.81	1.81	
14,487.0	91.70	0.80	7,522.6	7,130.7	-147.0	7,130.7	0.33	0.11	
14,581.0	90.30	1.10	7,520.9	7,224.7	-145.4	7,224.7	1.52	-1.49	
14,676.0	90.50	0.70	7,520.3	7,319.6	-143.9	7,319.6	0.47	0.21	
14,770.0	90.50	0.60	7,519.4	7,413.6	-142.8	7,413.6	0.11	0.00	
14,865.0	90.90	0.40	7,518.3	7,508.6	-142.0	7,508.6	0.47	0.42	
14,959.0	91.40	1.00	7,516.4	7,602.6	-140.9	7,602.6	0.83	0.53	
15,054.0	89.60	1.90	7,515.6	7,697.6	-138.5	7,697.6	2.12	-1.89	
15,149.0	89.60	0.40	7,516.2	7,792.5	-136.6	7,792.5	1.58	0.00	
15,243.0	89.90	359.90	7,516.6	7,886.5	-136.3	7,886.5	0.62	0.32	
15,338.0	90.10	0.20	7,516.6	7,981.5	-136.2	7,981.5	0.38	0.21	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
15,432.0	90.30	359.30	7,516.3	8,075.5	-136.6	8,075.5	0.98	0.21	
15,527.0	90.50	358.80	7,515.6	8,170.5	-138.2	8,170.5	0.57	0.21	
15,621.0	91.10	359.20	7,514.3	8,264.5	-139.8	8,264.5	0.77	0.64	
15,716.0	91.30	358.40	7,512.3	8,359.4	-141.8	8,359.4	0.87	0.21	
15,812.0	91.80	358.10	7,509.7	8,455.4	-144.8	8,455.4	0.61	0.52	
15,906.0	90.50	359.30	7,507.9	8,549.3	-146.9	8,549.3	1.88	-1.38	
16,001.0	90.00	0.50	7,507.4	8,644.3	-147.1	8,644.3	1.37	-0.53	
16,096.0	90.40	0.40	7,507.1	8,739.3	-146.3	8,739.3	0.43	0.42	
16,190.0	90.80	0.00	7,506.1	8,833.3	-146.0	8,833.3	0.60	0.43	
16,285.0	91.60	0.00	7,504.1	8,928.3	-146.0	8,928.3	0.84	0.84	
16,379.0	90.00	0.30	7,502.8	9,022.3	-145.7	9,022.3	1.73	-1.70	
16,473.0	90.50	359.70	7,502.4	9,116.3	-145.7	9,116.3	0.83	0.53	
16,567.0	90.90	359.70	7,501.3	9,210.3	-146.2	9,210.3	0.43	0.43	
16,662.0	91.30	359.20	7,499.4	9,305.2	-147.2	9,305.2	0.67	0.42	
16,756.0	91.20	0.20	7,497.4	9,399.2	-147.6	9,399.2	1.07	-0.11	
16,851.0	89.10	0.40	7,497.1	9,494.2	-147.1	9,494.2	2.22	-2.21	
16,945.0	89.40	0.20	7,498.4	9,588.2	-146.7	9,588.2	0.38	0.32	
17,040.0	89.60	359.50	7,499.2	9,683.2	-146.9	9,683.2	0.77	0.21	
17,133.0	89.60	358.60	7,499.9	9,776.2	-148.4	9,776.2	0.97	0.00	Last CES Survey @ 17,133' MD
17,188.0	89.60	358.60	7,500.2	9,831.2	-149.8	9,831.2	0.00	0.00	PTB @ 17,188'

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Edith Ann-Duckworth 4D	0.00	0.00	7,466.0	9,890.2	-142.6	1,295,991.63	3,138,638.70	40.144820	-105.004100
- actual wellpath misses target center by 68.6ft at 17188.0ft MD (7500.2 TVD, 9831.2 N, -149.8 E)									
- Point									
Edith Ann-Duckworth 4D	0.00	0.00	7,539.0	2,653.5	-142.6	1,288,755.02	3,138,679.19	40.124954	-105.004100
- actual wellpath misses target center by 4.6ft at 10007.8ft MD (7542.5 TVD, 2653.6 N, -145.5 E)									
- Point									
Edith Ann-Duckworth 4D	0.00	0.00	7,519.0	4,653.5	-142.6	1,290,754.99	3,138,667.99	40.130444	-105.004100
- actual wellpath misses target center by 15.3ft at 12008.4ft MD (7532.2 TVD, 4653.3 N, -134.8 E)									
- Point									
Edith Ann-Duckworth 4D	0.00	0.00	7,569.5	9,890.2	-142.6	1,295,991.63	3,138,638.70	40.144820	-105.004100
- actual wellpath misses target center by 91.3ft at 17188.0ft MD (7500.2 TVD, 9831.2 N, -149.8 E)									
- Point									
Edith Ann-Duckworth 4D	0.00	0.00	7,560.0	553.5	-142.6	1,286,655.06	3,138,690.94	40.119189	-105.004100
- actual wellpath misses target center by 9.0ft at 7907.4ft MD (7561.6 TVD, 553.4 N, -133.8 E)									
- Point									
Edith Ann-Duckworth 4D	0.00	0.00	7,569.5	5,656.6	-172.6	1,291,757.87	3,138,632.36	40.133198	-105.004207
- actual wellpath misses target center by 59.8ft at 13010.4ft MD (7520.6 TVD, 5655.0 N, -138.3 E)									
- Point									

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
17,133.0	7,499.9	9,776.2	-148.4	Last CES Survey @ 17,133' MD
17,188.0	7,500.2	9,831.2	-149.8	PTB @ 17,188'

Checked By: _____ Approved By: _____ Date: _____

EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S21-T2N-R68W (Edith Ann-Duckworth)

Edith Ann-Duckworth 4D-21H-O268

Hz

Design: FINAL

Survey Report - Geographic

21 July, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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:	1,290,455.49 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 4D-21H-O268					
Well Position	+N/-S	0.0 ft	Northing:	1,286,102.36 ft	Latitude:	40.117670
	+E/-W	0.0 ft	Easting:	3,138,836.64 ft	Longitude:	-105.003590
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	7/8/2014	8.56	66.68	52,634

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	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	

Survey Program	Date	7/21/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
167.0	17,188.0	Survey #1 (Hz)	Geolink MWD	Geolink MWD	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,286,102.36	3,138,836.64	40.117670	-105.003590
167.0	0.40	156.00	167.0	-0.5	0.2	1,286,101.83	3,138,836.88	40.117669	-105.003589
261.0	0.40	188.00	261.0	-1.2	0.3	1,286,101.21	3,138,836.97	40.117667	-105.003589
355.0	0.40	195.70	355.0	-1.8	0.2	1,286,100.57	3,138,836.84	40.117665	-105.003590
449.0	0.60	206.40	449.0	-2.6	-0.1	1,286,099.81	3,138,836.54	40.117663	-105.003591
542.0	0.60	193.90	542.0	-3.5	-0.5	1,286,098.90	3,138,836.21	40.117661	-105.003592
635.0	0.50	201.20	635.0	-4.3	-0.7	1,286,098.05	3,138,835.95	40.117658	-105.003593
729.0	2.10	254.60	729.0	-5.2	-2.5	1,286,097.20	3,138,834.14	40.117656	-105.003599
823.0	2.30	253.50	822.9	-6.1	-6.0	1,286,096.18	3,138,830.68	40.117653	-105.003612
899.0	2.30	250.00	898.8	-7.1	-8.9	1,286,095.21	3,138,827.79	40.117651	-105.003622
1,018.0	2.60	249.80	1,017.7	-8.9	-13.7	1,286,093.44	3,138,823.02	40.117646	-105.003639
1,111.0	3.60	266.40	1,110.6	-9.8	-18.6	1,286,092.50	3,138,818.14	40.117643	-105.003657

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
1,204.0	3.40	266.70	1,203.4	-10.1	-24.2	1,286,092.12	3,138,812.47	40.117642	-105.003677	
1,298.0	3.30	264.40	1,297.2	-10.5	-29.7	1,286,091.67	3,138,807.00	40.117641	-105.003696	
1,392.0	3.40	262.60	1,391.1	-11.2	-35.2	1,286,091.02	3,138,801.54	40.117639	-105.003716	
1,485.0	3.10	268.20	1,483.9	-11.6	-40.4	1,286,090.55	3,138,796.30	40.117638	-105.003735	
1,580.0	2.80	266.10	1,578.8	-11.8	-45.3	1,286,090.29	3,138,791.42	40.117638	-105.003752	
1,675.0	2.70	261.40	1,673.7	-12.3	-49.8	1,286,089.77	3,138,786.89	40.117636	-105.003768	
1,771.0	3.80	279.60	1,769.5	-12.1	-55.2	1,286,089.93	3,138,781.52	40.117637	-105.003788	
1,866.0	3.60	276.60	1,864.4	-11.3	-61.3	1,286,090.76	3,138,775.45	40.117639	-105.003809	
1,961.0	3.60	278.10	1,959.2	-10.5	-67.2	1,286,091.49	3,138,769.53	40.117641	-105.003830	
2,056.0	4.10	270.00	2,053.9	-10.1	-73.5	1,286,091.88	3,138,763.18	40.117642	-105.003853	
2,151.0	3.80	269.10	2,148.7	-10.1	-80.1	1,286,091.79	3,138,756.63	40.117642	-105.003877	
2,246.0	3.20	265.70	2,243.5	-10.4	-85.9	1,286,091.51	3,138,750.84	40.117642	-105.003897	
2,342.0	2.60	257.10	2,339.4	-11.1	-90.6	1,286,090.80	3,138,746.05	40.117640	-105.003914	
2,437.0	2.60	256.60	2,434.3	-12.0	-94.8	1,286,089.79	3,138,741.86	40.117637	-105.003929	
2,532.0	2.60	266.80	2,529.2	-12.7	-99.1	1,286,089.15	3,138,737.62	40.117635	-105.003945	
2,627.0	4.00	279.90	2,624.1	-12.2	-104.5	1,286,089.57	3,138,732.20	40.117637	-105.003964	
2,722.0	3.90	278.10	2,718.8	-11.2	-111.0	1,286,090.56	3,138,725.73	40.117639	-105.003987	
2,817.0	3.30	279.70	2,813.7	-10.3	-116.9	1,286,091.44	3,138,719.83	40.117642	-105.004008	
2,913.0	3.40	275.30	2,909.5	-9.5	-122.4	1,286,092.14	3,138,714.27	40.117644	-105.004028	
3,008.0	3.50	276.70	3,004.3	-8.9	-128.1	1,286,092.71	3,138,708.58	40.117646	-105.004048	
3,103.0	3.20	275.90	3,099.2	-8.3	-133.6	1,286,093.29	3,138,703.06	40.117647	-105.004068	
3,198.0	2.70	276.40	3,194.0	-7.8	-138.5	1,286,093.78	3,138,698.20	40.117649	-105.004085	
3,293.0	1.40	235.50	3,289.0	-8.2	-141.7	1,286,093.36	3,138,695.02	40.117647	-105.004097	
3,389.0	1.10	182.00	3,385.0	-9.8	-142.7	1,286,091.76	3,138,694.03	40.117643	-105.004100	
3,484.0	0.50	191.30	3,479.9	-11.1	-142.8	1,286,090.45	3,138,693.92	40.117640	-105.004101	
3,579.0	0.40	344.40	3,574.9	-11.2	-142.9	1,286,090.36	3,138,693.75	40.117639	-105.004101	
3,674.0	0.30	25.70	3,669.9	-10.7	-142.9	1,286,090.90	3,138,693.77	40.117641	-105.004101	
3,770.0	1.10	120.50	3,765.9	-10.9	-142.0	1,286,090.67	3,138,694.67	40.117640	-105.004098	
3,865.0	1.10	86.50	3,860.9	-11.3	-140.3	1,286,090.27	3,138,696.37	40.117639	-105.004092	
3,960.0	0.60	64.40	3,955.9	-11.0	-139.0	1,286,090.55	3,138,697.73	40.117640	-105.004087	
4,055.0	0.70	239.90	4,050.9	-11.1	-139.0	1,286,090.47	3,138,697.68	40.117640	-105.004087	
4,151.0	1.00	250.60	4,146.9	-11.7	-140.3	1,286,089.89	3,138,696.38	40.117638	-105.004092	
4,246.0	0.80	235.10	4,241.9	-12.3	-141.7	1,286,089.23	3,138,695.06	40.117636	-105.004097	
4,341.0	0.70	176.90	4,336.9	-13.3	-142.2	1,286,088.27	3,138,694.55	40.117634	-105.004099	
4,436.0	0.80	167.90	4,431.9	-14.5	-142.0	1,286,087.04	3,138,694.73	40.117630	-105.004098	
4,531.0	0.80	187.40	4,526.9	-15.8	-141.9	1,286,085.73	3,138,694.79	40.117627	-105.004098	
4,627.0	0.80	188.00	4,622.8	-17.2	-142.1	1,286,084.40	3,138,694.62	40.117623	-105.004098	
4,722.0	1.00	210.00	4,717.8	-18.5	-142.6	1,286,083.03	3,138,694.12	40.117619	-105.004100	
4,817.0	1.10	212.50	4,812.8	-20.0	-143.5	1,286,081.53	3,138,693.22	40.117615	-105.004103	
4,912.0	1.20	216.20	4,907.8	-21.6	-144.6	1,286,079.96	3,138,692.15	40.117611	-105.004107	
5,007.0	1.20	225.50	5,002.8	-23.1	-145.9	1,286,078.45	3,138,690.87	40.117607	-105.004112	
5,102.0	1.10	241.10	5,097.8	-24.2	-147.4	1,286,077.30	3,138,689.36	40.117604	-105.004117	
5,197.0	0.30	99.30	5,192.8	-24.7	-148.0	1,286,076.82	3,138,688.81	40.117602	-105.004119	
5,292.0	0.30	154.20	5,287.8	-25.0	-147.6	1,286,076.56	3,138,689.17	40.117601	-105.004118	
5,387.0	0.30	119.10	5,382.8	-25.3	-147.3	1,286,076.21	3,138,689.50	40.117601	-105.004117	
5,483.0	0.10	177.70	5,478.8	-25.5	-147.1	1,286,076.01	3,138,689.72	40.117600	-105.004116	
5,578.0	0.30	5.40	5,573.8	-25.4	-147.0	1,286,076.17	3,138,689.75	40.117600	-105.004116	
5,673.0	0.40	8.10	5,668.8	-24.8	-147.0	1,286,076.75	3,138,689.81	40.117602	-105.004116	
5,768.0	1.30	109.30	5,763.7	-24.8	-145.9	1,286,076.73	3,138,690.88	40.117602	-105.004112	
5,863.0	0.90	121.20	5,858.7	-25.6	-144.2	1,286,076.00	3,138,692.54	40.117600	-105.004106	
5,958.0	0.60	129.50	5,953.7	-26.3	-143.2	1,286,075.30	3,138,693.56	40.117598	-105.004102	
6,053.0	0.60	108.90	6,048.7	-26.7	-142.4	1,286,074.83	3,138,694.42	40.117597	-105.004099	
6,148.0	0.50	130.10	6,143.7	-27.2	-141.6	1,286,074.40	3,138,695.21	40.117595	-105.004097	
6,243.0	0.40	94.90	6,238.7	-27.5	-140.9	1,286,074.11	3,138,695.86	40.117595	-105.004094	
6,338.0	0.20	140.70	6,333.7	-27.6	-140.5	1,286,073.96	3,138,696.30	40.117594	-105.004093	

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
6,434.0	0.30	95.20	6,429.7	-27.8	-140.1	1,286,073.81	3,138,696.65	40.117594	-105.004091
6,529.0	0.40	352.90	6,524.7	-27.5	-139.9	1,286,074.11	3,138,696.86	40.117595	-105.004091
6,624.0	0.10	299.20	6,619.7	-27.1	-140.0	1,286,074.48	3,138,696.74	40.117596	-105.004091
6,719.0	0.30	349.10	6,714.7	-26.8	-140.2	1,286,074.77	3,138,696.62	40.117596	-105.004091
6,814.0	0.40	352.90	6,809.7	-26.2	-140.3	1,286,075.34	3,138,696.53	40.117598	-105.004092
6,909.0	0.30	330.50	6,904.7	-25.7	-140.4	1,286,075.88	3,138,696.36	40.117600	-105.004092
7,004.0	0.80	3.40	6,999.7	-24.8	-140.5	1,286,076.76	3,138,696.28	40.117602	-105.004093
7,051.0	3.80	5.50	7,046.7	-22.9	-140.3	1,286,078.64	3,138,696.43	40.117607	-105.004092
7,099.0	8.10	359.70	7,094.4	-18.0	-140.2	1,286,083.61	3,138,696.54	40.117621	-105.004092
7,146.0	13.20	352.00	7,140.6	-9.3	-141.0	1,286,092.24	3,138,695.73	40.117644	-105.004094
7,194.0	18.10	353.10	7,186.8	3.5	-142.6	1,286,105.06	3,138,694.00	40.117680	-105.004100
7,241.0	23.50	352.80	7,230.7	20.1	-144.7	1,286,121.61	3,138,691.85	40.117725	-105.004108
7,290.0	28.00	352.20	7,274.8	41.2	-147.5	1,286,142.69	3,138,688.95	40.117783	-105.004118
7,337.0	33.00	353.60	7,315.3	64.8	-150.4	1,286,166.34	3,138,685.89	40.117848	-105.004128
7,385.0	38.10	354.20	7,354.3	92.6	-153.3	1,286,194.06	3,138,682.78	40.117924	-105.004139
7,432.0	44.10	355.90	7,389.7	123.3	-156.0	1,286,224.82	3,138,679.97	40.118009	-105.004148
7,480.0	49.10	359.20	7,422.7	158.2	-157.4	1,286,259.63	3,138,678.32	40.118104	-105.004153
7,527.0	55.00	2.30	7,451.6	195.2	-156.9	1,286,296.67	3,138,678.64	40.118206	-105.004151
7,575.0	61.20	5.00	7,477.0	235.8	-154.3	1,286,337.32	3,138,681.04	40.118317	-105.004142
7,622.0	67.20	5.30	7,497.4	277.9	-150.5	1,286,379.47	3,138,684.60	40.118433	-105.004128
7,671.0	69.90	4.60	7,515.3	323.4	-146.6	1,286,424.92	3,138,688.28	40.118558	-105.004114
7,718.0	72.00	4.80	7,530.7	367.7	-142.9	1,286,469.21	3,138,691.67	40.118679	-105.004101
7,766.0	75.40	4.50	7,544.1	413.6	-139.2	1,286,515.15	3,138,695.15	40.118805	-105.004088
7,813.0	81.30	2.70	7,553.6	459.5	-136.3	1,286,561.08	3,138,697.77	40.118931	-105.004078
7,861.0	85.00	1.60	7,559.3	507.1	-134.5	1,286,608.71	3,138,699.29	40.119062	-105.004071
7,891.0	88.20	0.60	7,561.1	537.0	-133.9	1,286,638.65	3,138,699.70	40.119144	-105.004069
7,990.0	90.20	0.10	7,562.5	636.0	-133.3	1,286,737.63	3,138,699.75	40.119416	-105.004067
8,083.0	90.30	359.40	7,562.1	729.0	-133.7	1,286,830.62	3,138,698.82	40.119671	-105.004068
8,177.0	90.20	359.30	7,561.7	823.0	-134.8	1,286,924.61	3,138,697.23	40.119929	-105.004072
8,270.0	91.10	0.00	7,560.6	916.0	-135.4	1,287,017.60	3,138,696.14	40.120185	-105.004074
8,364.0	90.70	359.50	7,559.2	1,010.0	-135.8	1,287,111.58	3,138,695.21	40.120443	-105.004076
8,457.0	90.50	359.10	7,558.2	1,103.0	-136.9	1,287,204.56	3,138,693.55	40.120698	-105.004080
8,551.0	90.40	358.60	7,557.4	1,197.0	-138.8	1,287,298.53	3,138,691.14	40.120956	-105.004087
8,644.0	90.40	359.20	7,556.8	1,289.9	-140.6	1,287,391.49	3,138,688.83	40.121211	-105.004093
8,738.0	91.10	0.10	7,555.6	1,383.9	-141.2	1,287,485.48	3,138,687.73	40.121469	-105.004095
8,832.0	90.90	359.30	7,553.9	1,477.9	-141.7	1,287,579.46	3,138,686.71	40.121727	-105.004097
8,926.0	90.80	0.50	7,552.5	1,571.9	-141.8	1,287,673.44	3,138,686.02	40.121985	-105.004097
9,019.0	90.40	359.90	7,551.6	1,664.9	-141.5	1,287,766.44	3,138,685.83	40.122240	-105.004096
9,113.0	90.00	358.80	7,551.2	1,758.9	-142.6	1,287,860.42	3,138,684.23	40.122498	-105.004100
9,206.0	90.90	0.50	7,550.5	1,851.9	-143.1	1,287,953.41	3,138,683.14	40.122754	-105.004102
9,300.0	89.70	358.90	7,550.0	1,945.9	-143.6	1,288,047.40	3,138,682.13	40.123012	-105.004104
9,393.0	90.80	0.40	7,549.6	2,038.9	-144.2	1,288,140.38	3,138,681.04	40.123267	-105.004106
9,487.0	90.90	359.90	7,548.2	2,132.8	-143.9	1,288,234.37	3,138,680.76	40.123525	-105.004105
9,580.0	89.90	359.90	7,547.6	2,225.8	-144.1	1,288,327.37	3,138,680.07	40.123780	-105.004106
9,674.0	91.50	0.40	7,546.4	2,319.8	-143.9	1,288,421.36	3,138,679.79	40.124038	-105.004105
9,767.0	89.80	357.80	7,545.4	2,412.8	-145.3	1,288,514.32	3,138,677.81	40.124294	-105.004110
9,861.0	90.80	359.90	7,544.9	2,506.8	-147.2	1,288,608.28	3,138,675.40	40.124552	-105.004117
9,954.0	91.00	1.10	7,543.4	2,599.8	-146.4	1,288,701.27	3,138,675.69	40.124807	-105.004114
10,048.0	90.90	0.50	7,541.8	2,693.7	-145.1	1,288,795.25	3,138,676.48	40.125065	-105.004109
10,141.0	89.90	359.20	7,541.2	2,786.7	-145.3	1,288,888.24	3,138,675.71	40.125320	-105.004110
10,235.0	89.80	359.90	7,541.4	2,880.7	-146.1	1,288,982.23	3,138,674.45	40.125578	-105.004113
10,329.0	90.90	0.70	7,540.9	2,974.7	-145.6	1,289,076.23	3,138,674.42	40.125836	-105.004111
10,422.0	91.30	0.60	7,539.1	3,067.7	-144.5	1,289,169.21	3,138,674.95	40.126091	-105.004107
10,516.0	90.40	359.90	7,537.7	3,161.7	-144.1	1,289,263.20	3,138,674.83	40.126349	-105.004106
10,611.0	89.70	357.90	7,537.6	3,256.7	-145.9	1,289,358.16	3,138,672.48	40.126610	-105.004112

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
10,705.0	89.30	358.80	7,538.4	3,350.6	-148.6	1,289,452.10	3,138,669.25	40.126868	-105.004122
10,800.0	92.10	0.20	7,537.3	3,445.6	-149.5	1,289,547.07	3,138,667.88	40.127129	-105.004125
10,894.0	92.00	0.30	7,533.9	3,539.5	-149.1	1,289,641.01	3,138,667.77	40.127387	-105.004123
10,989.0	90.80	1.30	7,531.6	3,634.5	-147.7	1,289,735.98	3,138,668.56	40.127647	-105.004119
11,083.0	88.70	2.10	7,532.0	3,728.4	-144.9	1,289,829.94	3,138,670.83	40.127905	-105.004109
11,177.0	88.90	2.10	7,534.0	3,822.4	-141.5	1,289,923.88	3,138,673.74	40.128163	-105.004096
11,272.0	89.40	2.20	7,535.4	3,917.3	-137.9	1,290,018.82	3,138,676.78	40.128424	-105.004084
11,367.0	87.40	1.20	7,538.0	4,012.2	-135.1	1,290,113.75	3,138,679.06	40.128684	-105.004073
11,461.0	87.90	359.90	7,541.9	4,106.1	-134.2	1,290,207.67	3,138,679.44	40.128942	-105.004070
11,555.0	90.80	359.90	7,542.9	4,200.1	-134.4	1,290,301.65	3,138,678.75	40.129200	-105.004071
11,650.0	91.60	359.90	7,541.0	4,295.1	-134.5	1,290,396.62	3,138,678.05	40.129461	-105.004071
11,744.0	92.20	359.40	7,537.8	4,389.0	-135.1	1,290,490.56	3,138,676.95	40.129719	-105.004073
11,839.0	91.70	359.80	7,534.6	4,484.0	-135.8	1,290,585.50	3,138,675.76	40.129979	-105.004076
11,934.0	91.30	0.60	7,532.1	4,578.9	-135.5	1,290,680.47	3,138,675.56	40.130240	-105.004075
12,028.0	87.90	0.40	7,532.8	4,672.9	-134.6	1,290,774.45	3,138,675.85	40.130498	-105.004072
12,122.0	89.90	359.80	7,534.6	4,766.9	-134.5	1,290,868.43	3,138,675.49	40.130756	-105.004071
12,217.0	90.70	359.20	7,534.1	4,861.9	-135.3	1,290,963.42	3,138,674.13	40.131017	-105.004074
12,311.0	91.80	359.40	7,532.0	4,955.9	-136.4	1,291,057.38	3,138,672.45	40.131275	-105.004078
12,406.0	90.90	358.80	7,529.8	5,050.8	-137.9	1,291,152.33	3,138,670.43	40.131535	-105.004084
12,501.0	89.90	357.80	7,529.1	5,145.8	-140.8	1,291,247.26	3,138,667.08	40.131796	-105.004094
12,595.0	91.10	359.00	7,528.3	5,239.7	-143.4	1,291,341.20	3,138,663.93	40.132054	-105.004103
12,690.0	91.60	0.30	7,526.1	5,334.7	-144.0	1,291,436.17	3,138,662.82	40.132315	-105.004105
12,785.0	90.90	0.60	7,524.0	5,429.7	-143.2	1,291,531.14	3,138,663.03	40.132575	-105.004102
12,879.0	90.90	1.20	7,522.5	5,523.6	-141.7	1,291,625.13	3,138,663.98	40.132833	-105.004097
12,973.0	90.80	1.70	7,521.1	5,617.6	-139.4	1,291,719.10	3,138,665.83	40.133091	-105.004089
13,068.0	90.90	1.20	7,519.7	5,712.6	-137.0	1,291,814.07	3,138,667.71	40.133352	-105.004080
13,162.0	89.60	1.10	7,519.3	5,806.5	-135.1	1,291,908.06	3,138,669.07	40.133610	-105.004073
13,257.0	90.30	0.70	7,519.4	5,901.5	-133.6	1,292,003.05	3,138,670.03	40.133871	-105.004068
13,352.0	87.80	1.20	7,521.0	5,996.5	-132.0	1,292,098.02	3,138,671.07	40.134131	-105.004062
13,447.0	86.50	359.50	7,525.7	6,091.4	-131.4	1,292,192.90	3,138,671.12	40.134392	-105.004060
13,542.0	89.00	359.00	7,529.4	6,186.3	-132.7	1,292,287.80	3,138,669.34	40.134652	-105.004065
13,637.0	90.70	359.00	7,529.7	6,281.3	-134.3	1,292,382.78	3,138,667.16	40.134913	-105.004071
13,731.0	91.40	357.70	7,527.9	6,375.2	-137.0	1,292,476.70	3,138,663.92	40.135171	-105.004080
13,825.0	91.90	357.60	7,525.2	6,469.1	-140.9	1,292,570.56	3,138,659.55	40.135429	-105.004094
13,920.0	91.60	357.10	7,522.3	6,563.9	-145.3	1,292,665.39	3,138,654.62	40.135689	-105.004110
14,014.0	87.90	358.10	7,522.7	6,657.8	-149.2	1,292,759.26	3,138,650.16	40.135947	-105.004124
14,108.0	88.60	359.70	7,525.6	6,751.8	-151.0	1,292,853.19	3,138,647.83	40.136205	-105.004130
14,203.0	90.20	1.20	7,526.6	6,846.8	-150.3	1,292,948.18	3,138,648.05	40.136465	-105.004128
14,298.0	89.90	0.50	7,526.5	6,941.7	-148.9	1,293,043.17	3,138,648.93	40.136726	-105.004123
14,392.0	91.60	0.50	7,525.3	7,035.7	-148.0	1,293,137.16	3,138,649.22	40.136984	-105.004120
14,487.0	91.70	0.80	7,522.6	7,130.7	-147.0	1,293,232.12	3,138,649.77	40.137245	-105.004116
14,581.0	90.30	1.10	7,520.9	7,224.7	-145.4	1,293,326.10	3,138,650.80	40.137503	-105.004110
14,676.0	90.50	0.70	7,520.3	7,319.6	-143.9	1,293,421.09	3,138,651.76	40.137764	-105.004105
14,770.0	90.50	0.60	7,519.4	7,413.6	-142.8	1,293,515.08	3,138,652.30	40.138022	-105.004101
14,865.0	90.90	0.40	7,518.3	7,508.6	-142.0	1,293,610.07	3,138,652.60	40.138282	-105.004098
14,959.0	91.40	1.00	7,516.4	7,602.6	-140.9	1,293,704.05	3,138,653.22	40.138540	-105.004094
15,054.0	89.60	1.90	7,515.6	7,697.6	-138.5	1,293,799.03	3,138,655.09	40.138801	-105.004085
15,149.0	89.60	0.40	7,516.2	7,792.5	-136.6	1,293,894.01	3,138,656.46	40.139062	-105.004079
15,243.0	89.90	359.90	7,516.6	7,886.5	-136.3	1,293,988.01	3,138,656.18	40.139320	-105.004078
15,338.0	90.10	0.20	7,516.6	7,981.5	-136.2	1,294,083.01	3,138,655.74	40.139580	-105.004078
15,432.0	90.30	359.30	7,516.3	8,075.5	-136.6	1,294,177.00	3,138,654.80	40.139839	-105.004079
15,527.0	90.50	358.80	7,515.6	8,170.5	-138.2	1,294,271.98	3,138,652.69	40.140099	-105.004085
15,621.0	91.10	359.20	7,514.3	8,264.5	-139.8	1,294,365.94	3,138,650.53	40.140357	-105.004090
15,716.0	91.30	358.40	7,512.3	8,359.4	-141.8	1,294,460.89	3,138,648.01	40.140618	-105.004098
15,812.0	91.80	358.10	7,509.7	8,455.4	-144.8	1,294,556.79	3,138,644.54	40.140881	-105.004108

Cathedral Energy Services

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Edith Ann-Duckworth 4D-21H-O268
Project:	DJ Wattenberg	TVD Reference:	KB @ 4954.5ft (Patterson 272)
Site:	S21-T2N-R68W (Edith Ann-Duckworth)	MD Reference:	KB @ 4954.5ft (Patterson 272)
Well:	Edith Ann-Duckworth 4D-21H-O268	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
15,906.0	90.50	359.30	7,507.9	8,549.3	-146.9	1,294,650.73	3,138,641.88	40.141139	-105.004116
16,001.0	90.00	0.50	7,507.4	8,644.3	-147.1	1,294,745.72	3,138,641.18	40.141400	-105.004116
16,096.0	90.40	0.40	7,507.1	8,739.3	-146.3	1,294,840.72	3,138,641.40	40.141661	-105.004114
16,190.0	90.80	0.00	7,506.1	8,833.3	-146.0	1,294,934.72	3,138,641.20	40.141919	-105.004112
16,285.0	91.60	0.00	7,504.1	8,928.3	-146.0	1,295,029.69	3,138,640.67	40.142179	-105.004112
16,379.0	90.00	0.30	7,502.8	9,022.3	-145.7	1,295,123.68	3,138,640.39	40.142437	-105.004112
16,473.0	90.50	359.70	7,502.4	9,116.3	-145.7	1,295,217.68	3,138,639.86	40.142695	-105.004112
16,567.0	90.90	359.70	7,501.3	9,210.3	-146.2	1,295,311.66	3,138,638.84	40.142954	-105.004113
16,662.0	91.30	359.20	7,499.4	9,305.2	-147.2	1,295,406.63	3,138,637.40	40.143214	-105.004117
16,756.0	91.20	0.20	7,497.4	9,399.2	-147.6	1,295,500.61	3,138,636.38	40.143472	-105.004118
16,851.0	89.10	0.40	7,497.1	9,494.2	-147.1	1,295,595.63	3,138,636.35	40.143733	-105.004117
16,945.0	89.40	0.20	7,498.4	9,588.2	-146.7	1,295,689.63	3,138,636.31	40.143991	-105.004115
17,040.0	89.60	359.50	7,499.2	9,683.2	-146.9	1,295,784.62	3,138,635.53	40.144252	-105.004116
17,133.0	89.60	358.60	7,499.9	9,776.2	-148.4	1,295,877.56	3,138,633.47	40.144507	-105.004121
Last CES Survey @ 17,133' MD									
17,188.0	89.60	358.60	7,500.2	9,831.2	-149.8	1,295,932.53	3,138,631.82	40.144658	-105.004126
PTB @ 17,188'									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Edith Ann-Duckworth 4D	0.00	0.00	7,466.0	9,890.2	-142.6	1,295,991.63	3,138,638.70	40.144820	-105.004100
- actual wellpath misses target center by 68.6ft at 17188.0ft MD (7500.2 TVD, 9831.2 N, -149.8 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
17,133.0	7,499.9	9,776.2	-148.4	Last CES Survey @ 17,133' MD	
17,188.0	7,500.2	9,831.2	-149.8	PTB @ 17,188'	

Checked By: _____ Approved By: _____ Date: _____