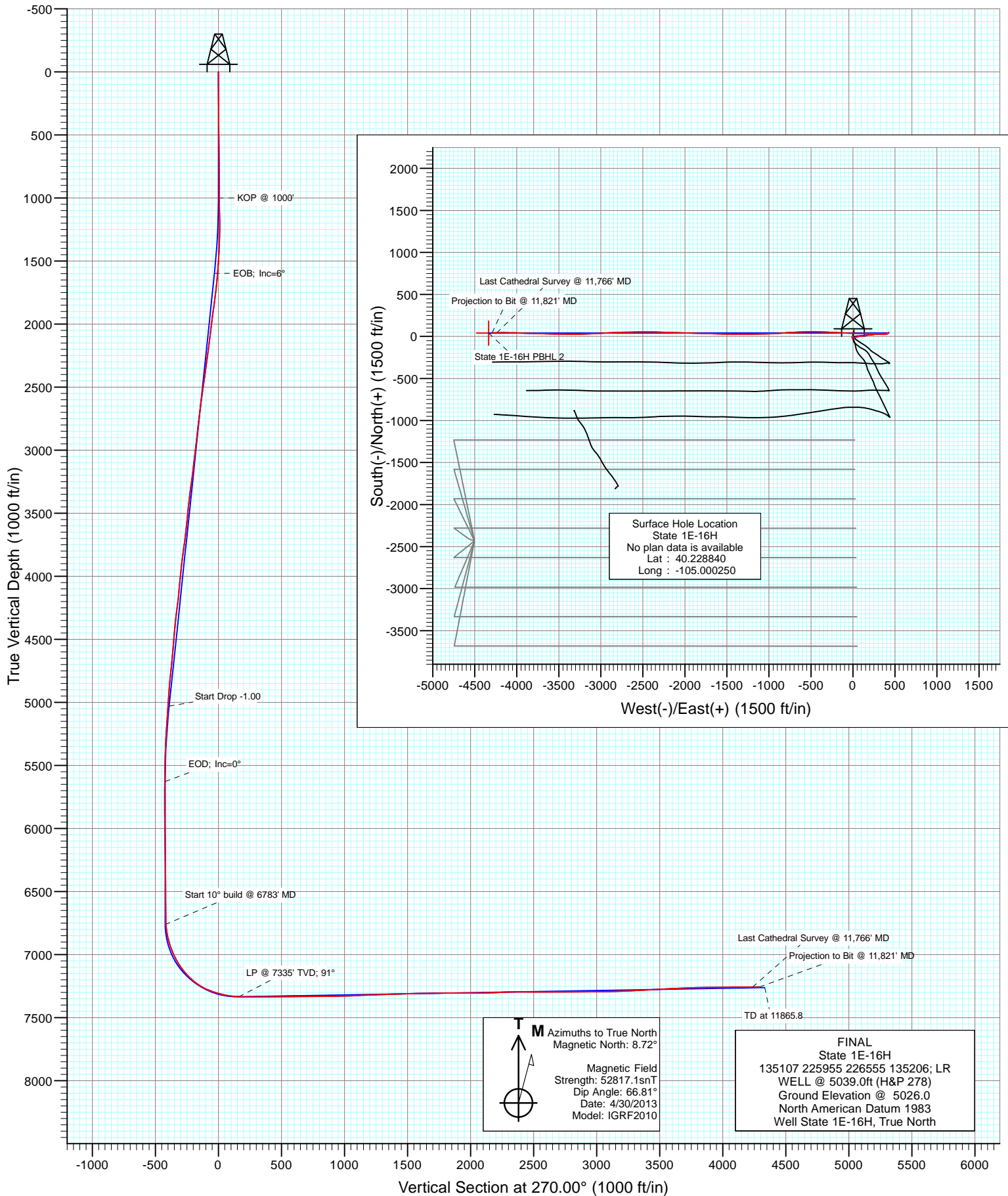




Project: DJ Wattenberg  
Site: S16-T3N-R68W (State)  
Well: State 1E-16H  
Wellbore: Hz  
Design: FINAL





# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well State 1E-16H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5039.0ft (H&P 278)
<b>Site:</b>	S16-T3N-R68W (State)	<b>MD Reference:</b>	WELL @ 5039.0ft (H&P 278)
<b>Well:</b>	State 1E-16H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

<b>Project</b>	DJ Wattenberg		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		S16-T3N-R68W (State)			
Site Position:		Northing:	1,326,575.12 ft	Latitude:	40.228760
From:	Lat/Long	Easting:	3,139,542.66 ft	Longitude:	-105.000250
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.32 °

Well	State 1E-16H					
Well Position	+N/-S	0.0 ft	Northing:	1,326,604.25 ft	Latitude:	40.228840
	+E/-W	0.0 ft	Easting:	3,139,542.49 ft	Longitude:	-105.000250
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,026.0 ft

<b>Wellbore</b>	Hz				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	4/30/2013	8.72	66.81	52,817

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	270.00

<b>Survey Program</b>	<b>Date</b>	5/11/2013			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
123.0	11,821.0	Survey #1 (Hz)	MWD	Geolink MWD	

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Formations / Comments</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
123.0	0.90	228.50	123.0	-0.6	-0.7	0.7	0.73	0.73	
215.0	0.40	241.10	215.0	-1.3	-1.5	1.5	0.56	-0.54	
307.0	0.48	270.50	307.0	-1.4	-2.2	2.2	0.26	0.09	
399.0	0.40	261.90	399.0	-1.5	-2.9	2.9	0.11	-0.09	
491.0	0.62	278.74	491.0	-1.4	-3.7	3.7	0.29	0.24	
583.0	0.44	312.30	583.0	-1.1	-4.5	4.5	0.38	-0.20	
675.0	0.62	306.34	675.0	-0.6	-5.1	5.1	0.20	0.20	
767.0	0.44	298.87	767.0	-0.1	-5.9	5.9	0.21	-0.20	
799.0	0.44	287.88	799.0	0.0	-6.1	6.1	0.26	0.00	
913.0	0.40	259.50	913.0	0.0	-6.9	6.9	0.18	-0.04	
1,005.0	1.80	182.20	1,004.9	-1.5	-7.3	7.3	1.91	1.52	
1,098.0	2.70	213.80	1,097.9	-4.7	-8.5	8.5	1.61	0.97	



## Cathedral Energy Services

### Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well State 1E-16H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5039.0ft (H&P 278)
<b>Site:</b>	S16-T3N-R68W (State)	<b>MD Reference:</b>	WELL @ 5039.0ft (H&P 278)
<b>Well:</b>	State 1E-16H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
1,190.0	3.40	194.10	1,189.7	-9.2	-10.4	10.4	1.36	0.76	
1,283.0	3.60	160.60	1,282.6	-14.6	-10.1	10.1	2.18	0.22	
1,375.0	2.90	116.10	1,374.5	-18.4	-7.1	7.1	2.77	-0.76	
1,467.0	3.50	80.90	1,466.3	-19.0	-2.2	2.2	2.19	0.65	
1,562.0	3.70	71.20	1,561.1	-17.5	3.6	-3.6	0.67	0.21	
1,657.0	5.50	81.30	1,655.8	-15.8	11.0	-11.0	2.07	1.89	
1,752.0	7.30	78.30	1,750.2	-13.9	21.4	-21.4	1.93	1.89	
1,847.0	7.80	70.10	1,844.4	-10.5	33.4	-33.4	1.25	0.53	
1,942.0	8.50	69.50	1,938.4	-5.8	46.0	-46.0	0.74	0.74	
2,037.0	7.70	71.60	2,032.5	-1.4	58.6	-58.6	0.90	-0.84	
2,131.0	7.20	77.40	2,125.7	1.9	70.3	-70.3	0.96	-0.53	
2,226.0	7.00	81.30	2,220.0	4.1	81.9	-81.9	0.55	-0.21	
2,321.0	8.20	81.30	2,314.1	6.0	94.3	-94.3	1.26	1.26	
2,415.0	8.30	93.50	2,407.2	6.6	107.7	-107.7	1.86	0.11	
2,510.0	8.20	96.10	2,501.2	5.4	121.3	-121.3	0.41	-0.11	
2,605.0	7.40	81.10	2,595.3	5.7	134.1	-134.1	2.29	-0.84	
2,699.0	7.60	73.60	2,688.5	8.3	146.0	-146.0	1.06	0.21	
2,794.0	6.90	72.80	2,782.8	11.8	157.5	-157.5	0.74	-0.74	
2,888.0	6.80	76.50	2,876.1	14.8	168.3	-168.3	0.48	-0.11	
2,983.0	6.40	79.60	2,970.5	17.0	179.0	-179.0	0.56	-0.42	
3,078.0	6.40	80.40	3,064.9	18.9	189.4	-189.4	0.09	0.00	
3,172.0	7.60	81.10	3,158.2	20.7	200.7	-200.7	1.28	1.28	
3,267.0	7.60	87.90	3,252.3	21.9	213.2	-213.2	0.95	0.00	
3,361.0	7.20	83.80	3,345.5	22.8	225.2	-225.2	0.70	-0.43	
3,456.0	5.90	85.60	3,439.9	23.8	236.0	-236.0	1.39	-1.37	
3,551.0	5.50	88.20	3,534.5	24.3	245.5	-245.5	0.50	-0.42	
3,645.0	6.30	84.10	3,628.0	25.0	255.1	-255.1	0.96	0.85	
3,740.0	8.00	79.30	3,722.2	26.8	266.8	-266.8	1.90	1.79	
3,834.0	8.10	84.50	3,815.3	28.6	279.8	-279.8	0.78	0.11	
3,929.0	6.20	86.20	3,909.6	29.6	291.6	-291.6	2.01	-2.00	
4,024.0	5.50	91.40	4,004.1	29.8	301.2	-301.2	0.92	-0.74	
4,118.0	5.30	90.50	4,097.6	29.7	310.1	-310.1	0.23	-0.21	
4,213.0	6.30	88.40	4,192.2	29.8	319.7	-319.7	1.08	1.05	
4,307.0	7.60	84.70	4,285.5	30.5	331.0	-331.0	1.46	1.38	
4,402.0	6.00	84.60	4,379.8	31.5	342.2	-342.2	1.68	-1.68	
4,497.0	4.80	81.80	4,474.4	32.6	351.1	-351.1	1.29	-1.26	
4,591.0	4.80	80.70	4,568.0	33.8	358.9	-358.9	0.10	0.00	
4,686.0	5.40	83.70	4,662.7	34.9	367.2	-367.2	0.69	0.63	
4,780.0	6.40	88.20	4,756.2	35.6	376.9	-376.9	1.17	1.06	
4,876.0	5.00	86.30	4,851.7	36.0	386.4	-386.4	1.47	-1.46	
4,970.0	4.10	84.90	4,945.4	36.6	393.8	-393.8	0.96	-0.96	
5,055.0	4.20	74.10	5,030.2	37.7	399.9	-399.9	0.93	0.12	
5,150.0	3.30	71.20	5,125.0	39.5	405.8	-405.8	0.97	-0.95	
5,244.0	4.20	75.30	5,218.8	41.3	411.7	-411.7	1.00	0.96	
5,339.0	2.90	71.10	5,313.6	42.9	417.3	-417.3	1.39	-1.37	
5,433.0	1.80	64.60	5,407.5	44.3	420.9	-420.9	1.20	-1.17	
5,528.0	1.30	52.30	5,502.5	45.6	423.1	-423.1	0.63	-0.53	
5,623.0	1.10	135.70	5,597.4	45.6	424.6	-424.6	1.69	-0.21	
5,717.0	0.60	151.00	5,691.4	44.6	425.5	-425.5	0.58	-0.53	
5,812.0	0.70	180.70	5,786.4	43.5	425.7	-425.7	0.37	0.11	
5,906.0	0.80	209.20	5,880.4	42.4	425.4	-425.4	0.41	0.11	
6,001.0	1.10	228.90	5,975.4	41.2	424.4	-424.4	0.46	0.32	
6,096.0	1.80	236.20	6,070.4	39.8	422.4	-422.4	0.76	0.74	



## Cathedral Energy Services

### Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well State 1E-16H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5039.0ft (H&P 278)
<b>Site:</b>	S16-T3N-R68W (State)	<b>MD Reference:</b>	WELL @ 5039.0ft (H&P 278)
<b>Well:</b>	State 1E-16H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
6,190.0	0.30	331.40	6,164.4	39.2	421.1	-421.1	1.97	-1.60	
6,285.0	0.50	230.90	6,259.4	39.1	420.6	-420.6	0.66	0.21	
6,380.0	0.80	221.40	6,354.4	38.4	419.9	-419.9	0.33	0.32	
6,474.0	1.10	241.50	6,448.3	37.5	418.7	-418.7	0.47	0.32	
6,569.0	0.50	147.10	6,543.3	36.7	418.1	-418.1	1.31	-0.63	
6,664.0	1.00	206.70	6,638.3	35.6	417.9	-417.9	0.91	0.53	
6,758.0	1.80	234.60	6,732.3	34.0	416.4	-416.4	1.09	0.85	
6,790.0	3.40	240.10	6,764.3	33.2	415.1	-415.1	5.05	5.00	
6,821.0	6.70	252.30	6,795.1	32.2	412.6	-412.6	11.14	10.65	
6,853.0	9.80	252.70	6,826.8	30.8	408.2	-408.2	9.69	9.69	
6,884.0	13.10	253.80	6,857.2	29.1	402.3	-402.3	10.67	10.65	
6,916.0	15.60	259.40	6,888.2	27.3	394.6	-394.6	8.93	7.81	
6,947.0	17.50	268.30	6,917.9	26.4	385.9	-385.9	10.20	6.13	
6,979.0	20.20	272.20	6,948.2	26.4	375.5	-375.5	9.31	8.44	
7,010.0	22.40	274.20	6,977.1	27.1	364.3	-364.3	7.47	7.10	
7,042.0	24.30	276.50	7,006.4	28.3	351.7	-351.7	6.58	5.94	
7,074.0	27.20	275.90	7,035.3	29.8	337.8	-337.8	9.10	9.06	
7,105.0	30.30	273.70	7,062.4	31.0	323.0	-323.0	10.57	10.00	
7,137.0	34.10	271.60	7,089.5	31.8	306.0	-306.0	12.38	11.87	
7,168.0	38.20	272.00	7,114.5	32.3	287.7	-287.7	13.25	13.23	
7,200.0	41.10	272.00	7,139.2	33.1	267.3	-267.3	9.06	9.06	
7,231.0	43.60	272.20	7,162.1	33.8	246.4	-246.4	8.08	8.06	
7,263.0	46.40	272.70	7,184.7	34.8	223.8	-223.8	8.82	8.75	
7,294.0	48.70	272.10	7,205.6	35.8	201.0	-201.0	7.56	7.42	
7,326.0	52.10	271.00	7,226.0	36.4	176.3	-176.3	10.95	10.62	
7,357.0	56.60	270.00	7,244.1	36.6	151.1	-151.1	14.75	14.52	
7,389.0	61.30	269.80	7,260.6	36.6	123.7	-123.7	14.70	14.69	
7,420.0	65.10	270.20	7,274.6	36.6	96.1	-96.1	12.31	12.26	
7,452.0	69.30	271.00	7,287.0	36.9	66.6	-66.6	13.33	13.12	
7,484.0	72.50	271.20	7,297.4	37.5	36.3	-36.3	10.02	10.00	
7,515.0	74.40	271.00	7,306.3	38.0	6.6	-6.6	6.16	6.13	
7,547.0	75.10	270.80	7,314.7	38.5	-24.2	24.2	2.27	2.19	
7,578.0	77.40	271.30	7,322.0	39.1	-54.3	54.3	7.58	7.42	
7,610.0	81.90	272.30	7,327.8	40.1	-85.8	85.8	14.39	14.06	
7,641.0	86.00	272.50	7,331.1	41.4	-116.6	116.6	13.24	13.23	
7,665.0	86.70	272.50	7,332.6	42.4	-140.5	140.5	2.92	2.92	
7,722.0	88.20	272.80	7,335.1	45.0	-197.4	197.4	2.68	2.63	
7,754.0	88.80	273.60	7,336.0	46.8	-229.3	229.3	3.12	1.87	
7,785.0	89.80	273.20	7,336.3	48.7	-260.3	260.3	3.47	3.23	
7,817.0	90.10	273.10	7,336.4	50.4	-292.2	292.2	0.99	0.94	
7,911.0	90.50	272.00	7,335.9	54.6	-386.1	386.1	1.25	0.43	
8,006.0	91.00	270.40	7,334.6	56.6	-481.1	481.1	1.76	0.53	
8,101.0	90.10	268.10	7,333.7	55.3	-576.1	576.1	2.60	-0.95	
8,195.0	90.20	266.70	7,333.5	51.1	-670.0	670.0	1.49	0.11	
8,290.0	90.30	266.10	7,333.1	45.1	-764.8	764.8	0.64	0.11	
8,384.0	91.00	265.80	7,332.0	38.5	-858.6	858.6	0.81	0.74	
8,479.0	91.40	267.60	7,330.0	33.0	-953.4	953.4	1.94	0.42	
8,574.0	92.00	268.50	7,327.2	29.8	-1,048.3	1,048.3	1.14	0.63	
8,668.0	92.50	268.70	7,323.5	27.5	-1,142.2	1,142.2	0.57	0.53	
8,763.0	92.00	269.50	7,319.8	26.0	-1,237.1	1,237.1	0.99	-0.53	
8,857.0	92.50	270.70	7,316.1	26.2	-1,331.0	1,331.0	1.38	0.53	
8,952.0	91.20	271.20	7,313.0	27.7	-1,425.9	1,425.9	1.47	-1.37	
9,046.0	91.50	271.50	7,310.8	29.9	-1,519.9	1,519.9	0.45	0.32	



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well State 1E-16H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5039.0ft (H&P 278)
<b>Site:</b>	S16-T3N-R68W (State)	<b>MD Reference:</b>	WELL @ 5039.0ft (H&P 278)
<b>Well:</b>	State 1E-16H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	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
9,141.0	91.70	271.90	7,308.1	32.8	-1,614.8	1,614.8	0.47	0.21	
9,236.0	90.30	270.90	7,306.5	35.1	-1,709.8	1,709.8	1.81	-1.47	
9,330.0	90.10	271.60	7,306.2	37.1	-1,803.7	1,803.7	0.77	-0.21	
9,425.0	90.10	271.70	7,306.0	39.9	-1,898.7	1,898.7	0.11	0.00	
9,519.0	89.90	271.30	7,306.0	42.3	-1,992.7	1,992.7	0.48	-0.21	
9,614.0	90.10	270.80	7,306.0	44.1	-2,087.7	2,087.7	0.57	0.21	
9,708.0	93.00	272.50	7,303.4	46.8	-2,181.6	2,181.6	3.58	3.09	
9,803.0	92.50	271.80	7,298.9	50.3	-2,276.4	2,276.4	0.90	-0.53	
9,898.0	90.70	270.90	7,296.2	52.6	-2,371.3	2,371.3	2.12	-1.89	
9,992.0	89.00	270.60	7,296.5	53.8	-2,465.3	2,465.3	1.84	-1.81	
10,087.0	89.20	269.50	7,298.0	53.9	-2,560.3	2,560.3	1.18	0.21	
10,181.0	90.70	268.20	7,298.1	52.0	-2,654.3	2,654.3	2.11	1.60	
10,276.0	91.20	268.80	7,296.5	49.5	-2,749.2	2,749.2	0.82	0.53	
10,371.0	90.20	266.90	7,295.3	46.0	-2,844.1	2,844.1	2.26	-1.05	
10,465.0	89.90	267.60	7,295.2	41.4	-2,938.0	2,938.0	0.81	-0.32	
10,560.0	90.40	266.70	7,295.0	36.7	-3,032.9	3,032.9	1.08	0.53	
10,654.0	90.90	267.40	7,293.9	31.9	-3,126.8	3,126.8	0.92	0.53	
10,749.0	93.20	268.30	7,290.5	28.3	-3,221.7	3,221.7	2.60	2.42	
10,844.0	93.50	269.70	7,285.0	26.7	-3,316.5	3,316.5	1.50	0.32	
10,938.0	93.00	271.10	7,279.6	27.3	-3,410.3	3,410.3	1.58	-0.53	
11,033.0	92.20	271.00	7,275.3	29.1	-3,505.2	3,505.2	0.85	-0.84	
11,127.0	93.00	270.80	7,271.1	30.5	-3,599.1	3,599.1	0.88	0.85	
11,222.0	92.90	271.00	7,266.2	32.0	-3,694.0	3,694.0	0.24	-0.11	
11,317.0	91.40	272.30	7,262.6	34.8	-3,788.8	3,788.8	2.09	-1.58	
11,411.0	90.50	272.20	7,261.1	38.4	-3,882.8	3,882.8	0.96	-0.96	
11,506.0	90.60	272.20	7,260.1	42.1	-3,977.7	3,977.7	0.11	0.11	
11,601.0	91.20	271.10	7,258.7	44.8	-4,072.6	4,072.6	1.32	0.63	
11,695.0	89.60	269.40	7,258.0	45.2	-4,166.6	4,166.6	2.48	-1.70	
11,766.0	90.10	269.40	7,258.2	44.5	-4,237.6	4,237.6	0.70	0.70	Last Cathedral Survey @ 11,766' MD Projection to Bit @ 11,821' MD
11,821.0	90.50	269.40	7,257.9	43.9	-4,292.6	4,292.6	0.73	0.73	



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>Local Co-ordinate Reference:</b>	Well State 1E-16H
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	WELL @ 5039.0ft (H&P 278)
<b>Site:</b>	S16-T3N-R68W (State)	<b>MD Reference:</b>	WELL @ 5039.0ft (H&P 278)
<b>Well:</b>	State 1E-16H	<b>North Reference:</b>	True
<b>Wellbore:</b>	Hz	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
State 1E-16H PBHL	0.00	0.00	7,257.4	40.5	-4,333.4	1,326,620.29	3,135,208.94	40.228950	-105.015770
- survey misses target center by 40.9ft at 11821.0ft MD (7257.9 TVD, 43.9 N, -4292.6 E)									
- Point									
State 1E-16H PBHL 2	0.00	0.00	7,262.2	40.5	-4,333.4	1,326,620.29	3,135,208.94	40.228950	-105.015770
- survey misses target center by 41.2ft at 11821.0ft MD (7257.9 TVD, 43.9 N, -4292.6 E)									
- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
11,766.0	7,258.2	44.5	-4,237.6	Last Cathedral Survey @ 11,766' MD
11,821.0	7,257.9	43.9	-4,292.6	Projection to Bit @ 11,821' MD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_