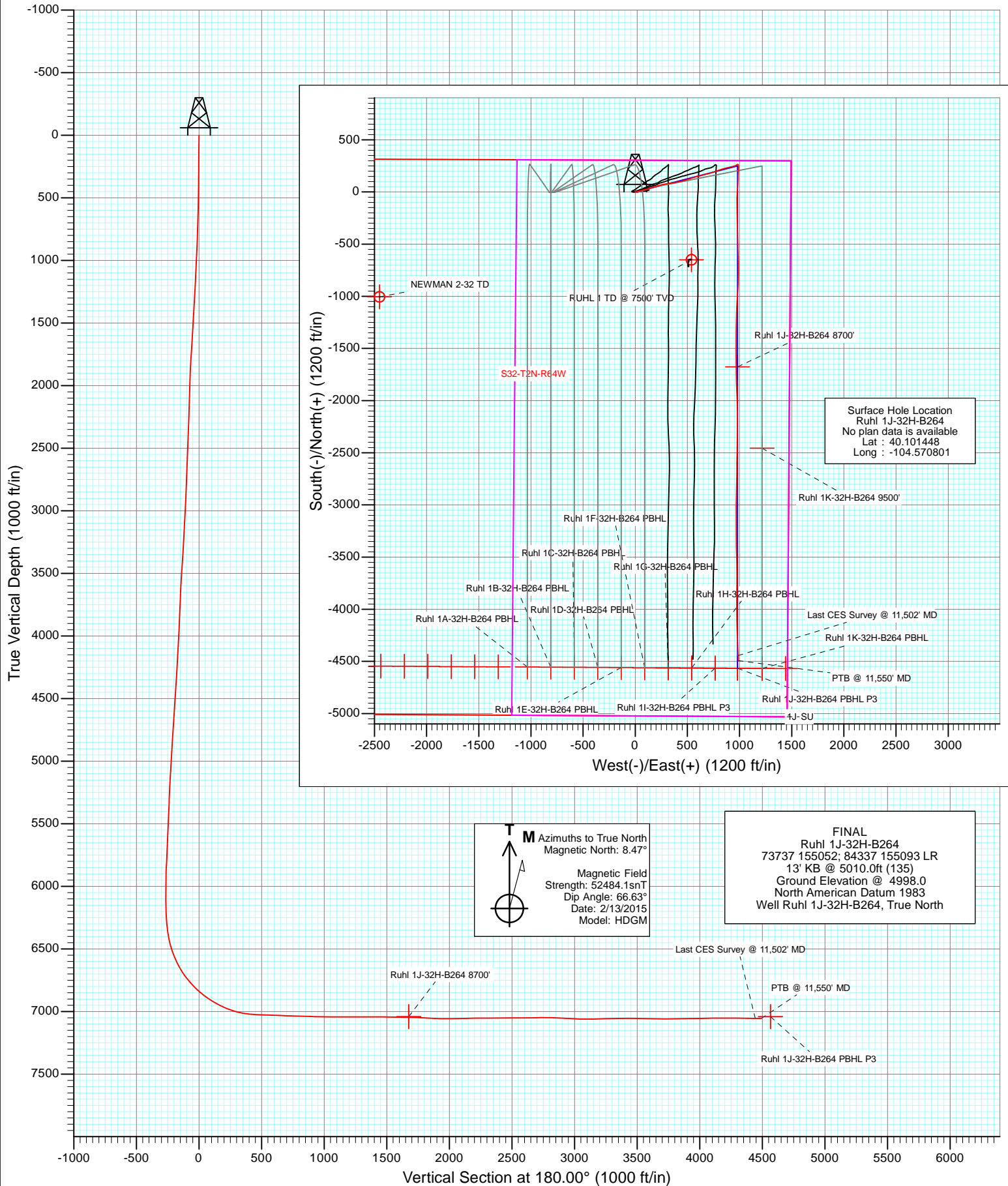




Project: DJ Wattenberg
Site: S32-T2N-R64W (Newman/Ruhl)
Well: Ruhl 1J-32H-B264
Wellbore: Hz
Design: FINAL



Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Ruhl 1J-32H-B264
Project:	DJ Wattenberg	TVD Reference:	13' KB @ 5010.0ft (135)
Site:	S32-T2N-R64W (Newman/Ruhl)	MD Reference:	13' KB @ 5010.0ft (135)
Well:	Ruhl 1J-32H-B264	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		S32-T2N-R64W (Newman/Ruhl)			
Site Position:		Northing:	1,281,150.65 ft	Latitude:	40.101468
From:	Lat/Long	Easting:	3,257,734.55 ft	Longitude:	-104.578660
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.60 °

Well	Ruhl 1J-32H-B264					
Well Position	+N/-S	0.0 ft	Northing:	1,281,166.29 ft	Latitude:	40.101448
	+E/-W	0.0 ft	Easting:	3,259,932.96 ft	Longitude:	-104.570801
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,998.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2/13/2015	8.47	66.63	52,484

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	180.00	

Survey Program	Date	2/23/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
235.0	11,550.0	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		
235.0	0.70	332.00	235.0	1.3	-0.7	-1.3	0.30	0.30		
327.0	1.90	78.50	327.0	2.1	0.6	-2.1	2.40	1.30		
419.0	3.70	79.90	418.9	2.9	5.0	-2.9	1.96	1.96		
510.0	5.00	73.20	509.6	4.6	11.7	-4.6	1.53	1.43		
602.0	6.10	77.50	601.2	6.8	20.3	-6.8	1.28	1.20		
694.0	7.20	78.80	692.5	8.9	30.7	-8.9	1.21	1.20		
785.0	9.30	80.80	782.6	11.2	43.6	-11.2	2.33	2.31		
877.0	10.80	77.20	873.2	14.3	59.3	-14.3	1.77	1.63		
969.0	10.60	75.10	963.6	18.4	75.9	-18.4	0.48	-0.22		
1,061.0	10.30	74.00	1,054.1	22.9	92.0	-22.9	0.39	-0.33		
1,111.0	10.40	76.90	1,103.2	25.1	100.7	-25.1	1.06	0.20		
1,262.0	10.90	74.70	1,251.6	32.0	127.7	-32.0	0.43	0.33		

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Ruhl 1J-32H-B264
Project:	DJ Wattenberg	TVD Reference:	13' KB @ 5010.0ft (135)
Site:	S32-T2N-R64W (Newman/Ruhl)	MD Reference:	13' KB @ 5010.0ft (135)
Well:	Ruhl 1J-32H-B264	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
1,354.0	10.80	71.10	1,342.0	37.1	144.2	-37.1	0.74	-0.11	
1,446.0	10.50	69.60	1,432.4	42.8	160.3	-42.8	0.44	-0.33	
1,538.0	11.70	76.40	1,522.7	47.9	177.2	-47.9	1.93	1.30	
1,630.0	11.80	73.90	1,612.8	52.7	195.3	-52.7	0.56	0.11	
1,722.0	12.10	70.30	1,702.8	58.5	213.4	-58.5	0.87	0.33	
1,814.0	11.60	74.00	1,792.8	64.3	231.4	-64.3	0.99	-0.54	
1,906.0	10.90	75.30	1,883.1	69.1	248.7	-69.1	0.81	-0.76	
1,998.0	10.60	82.40	1,973.4	72.4	265.5	-72.4	1.47	-0.33	
2,090.0	10.50	78.50	2,063.9	75.2	282.1	-75.2	0.78	-0.11	
2,182.0	9.90	76.60	2,154.4	78.7	298.0	-78.7	0.75	-0.65	
2,273.0	10.00	82.40	2,244.1	81.6	313.4	-81.6	1.11	0.11	
2,365.0	11.50	83.10	2,334.5	83.7	330.5	-83.7	1.64	1.63	
2,457.0	10.90	82.10	2,424.7	86.0	348.2	-86.0	0.69	-0.65	
2,551.0	13.10	82.20	2,516.6	88.7	367.5	-88.7	2.34	2.34	
2,646.0	13.00	79.60	2,609.2	92.1	388.7	-92.1	0.63	-0.11	
2,741.0	12.40	77.60	2,701.9	96.2	409.2	-96.2	0.78	-0.63	
2,835.0	11.60	76.40	2,793.8	100.6	428.2	-100.6	0.89	-0.85	
2,930.0	10.40	76.70	2,887.1	104.8	445.9	-104.8	1.26	-1.26	
3,024.0	10.20	74.50	2,979.5	109.0	462.1	-109.0	0.47	-0.21	
3,119.0	10.00	73.20	3,073.1	113.6	478.1	-113.6	0.32	-0.21	
3,214.0	9.40	73.70	3,166.7	118.2	493.5	-118.2	0.64	-0.63	
3,308.0	10.90	73.70	3,259.2	122.8	509.4	-122.8	1.60	1.60	
3,402.0	11.70	71.70	3,351.4	128.3	527.0	-128.3	0.95	0.85	
3,497.0	10.90	69.40	3,444.6	134.5	544.5	-134.5	0.97	-0.84	
3,591.0	11.80	71.40	3,536.7	140.7	561.9	-140.7	1.04	0.96	
3,686.0	11.90	79.40	3,629.7	145.6	580.8	-145.6	1.73	0.11	
3,781.0	10.50	76.90	3,722.9	149.4	598.8	-149.4	1.56	-1.47	
3,875.0	9.30	74.70	3,815.5	153.3	614.5	-153.3	1.34	-1.28	
3,969.0	10.10	74.70	3,908.2	157.5	629.8	-157.5	0.85	0.85	
4,064.0	10.70	75.80	4,001.6	161.9	646.4	-161.9	0.67	0.63	
4,159.0	9.80	73.50	4,095.1	166.3	662.7	-166.3	1.04	-0.95	
4,253.0	13.00	76.30	4,187.2	171.1	680.6	-171.1	3.45	3.40	
4,348.0	12.90	75.10	4,279.8	176.4	701.2	-176.4	0.30	-0.11	
4,443.0	11.90	74.40	4,372.6	181.7	720.9	-181.7	1.06	-1.05	
4,537.0	11.40	72.50	4,464.6	187.1	739.1	-187.1	0.67	-0.53	
4,631.0	11.50	71.40	4,556.8	192.9	756.9	-192.9	0.26	0.11	
4,726.0	11.60	68.20	4,649.9	199.5	774.7	-199.5	0.68	0.11	
4,820.0	12.20	73.30	4,741.8	205.8	793.0	-205.8	1.29	0.64	
4,915.0	11.50	69.20	4,834.8	212.1	811.5	-212.1	1.15	-0.74	
5,010.0	11.50	73.10	4,927.9	218.2	829.4	-218.2	0.82	0.00	
5,104.0	12.00	76.50	5,019.9	223.2	847.8	-223.2	0.91	0.53	
5,199.0	10.20	71.80	5,113.2	228.1	865.4	-228.1	2.12	-1.89	
5,294.0	12.60	77.00	5,206.3	233.1	883.5	-233.1	2.75	2.53	
5,389.0	11.90	79.70	5,299.1	237.2	903.3	-237.2	0.95	-0.74	
5,483.0	10.20	77.90	5,391.4	240.6	920.9	-240.6	1.85	-1.81	
5,578.0	8.70	75.40	5,485.1	244.2	936.1	-244.2	1.64	-1.58	
5,672.0	7.20	69.90	5,578.2	248.0	948.5	-248.0	1.79	-1.60	
5,767.0	5.90	65.70	5,672.6	252.1	958.6	-252.1	1.46	-1.37	
5,862.0	5.50	58.00	5,767.1	256.5	966.9	-256.5	0.91	-0.42	
5,956.0	4.50	50.00	5,860.7	261.3	973.5	-261.3	1.29	-1.06	
6,051.0	3.10	72.60	5,955.5	264.4	978.8	-264.4	2.13	-1.47	
6,145.0	1.60	137.30	6,049.5	264.2	982.1	-264.2	3.00	-1.60	
6,240.0	1.50	100.80	6,144.4	263.0	984.3	-263.0	1.03	-0.11	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Ruhl 1J-32H-B264
Project:	DJ Wattenberg	TVD Reference:	13' KB @ 5010.0ft (135)
Site:	S32-T2N-R64W (Newman/Ruhl)	MD Reference:	13' KB @ 5010.0ft (135)
Well:	Ruhl 1J-32H-B264	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
6,335.0	3.10	156.70	6,239.4	260.4	986.5	-260.4	2.71	1.68	
6,382.0	3.70	163.30	6,286.3	257.8	987.4	-257.8	1.52	1.28	
6,429.0	6.50	175.40	6,333.1	253.7	988.1	-253.7	6.35	5.96	
6,476.0	8.20	170.00	6,379.7	247.8	988.9	-247.8	3.90	3.62	
6,524.0	12.30	172.10	6,426.9	239.3	990.2	-239.3	8.58	8.54	
6,571.0	16.20	180.90	6,472.5	227.8	990.8	-227.8	9.47	8.30	
6,618.0	19.20	188.10	6,517.2	213.6	989.6	-213.6	7.89	6.38	
6,665.0	22.80	187.20	6,561.1	196.9	987.4	-196.9	7.69	7.66	
6,713.0	26.10	184.00	6,604.8	177.1	985.4	-177.1	7.41	6.87	
6,760.0	28.80	180.60	6,646.5	155.5	984.6	-155.5	6.64	5.74	
6,808.0	32.10	180.40	6,687.9	131.2	984.4	-131.2	6.88	6.87	
6,855.0	36.90	181.70	6,726.6	104.6	983.9	-104.6	10.33	10.21	
6,902.0	41.70	182.50	6,763.0	74.8	982.8	-74.8	10.27	10.21	
6,949.0	44.20	185.00	6,797.4	42.9	980.7	-42.9	6.44	5.32	
6,996.0	47.30	183.50	6,830.2	9.3	978.2	-9.3	6.98	6.60	
7,043.0	51.30	181.30	6,860.8	-26.3	976.7	26.3	9.22	8.51	
7,091.0	55.20	180.70	6,889.5	-64.7	976.1	64.7	8.19	8.12	
7,138.0	57.90	180.30	6,915.4	-103.9	975.7	103.9	5.79	5.74	
7,186.0	61.30	178.90	6,939.7	-145.3	976.0	145.3	7.52	7.08	
7,233.0	65.20	178.50	6,960.9	-187.3	977.0	187.3	8.33	8.30	
7,280.0	69.10	179.20	6,979.1	-230.6	977.8	230.6	8.41	8.30	
7,327.0	72.20	179.90	6,994.7	-274.9	978.2	274.9	6.74	6.60	
7,375.0	76.40	179.60	7,007.7	-321.1	978.4	321.1	8.77	8.75	
7,422.0	81.60	178.50	7,016.6	-367.2	979.2	367.2	11.30	11.06	
7,470.0	84.40	178.60	7,022.5	-414.9	980.4	414.9	5.84	5.83	
7,531.0	87.90	178.50	7,026.6	-475.7	981.9	475.7	5.74	5.74	
7,572.0	88.40	178.30	7,027.9	-516.7	983.0	516.7	1.31	1.22	
7,666.0	87.90	177.30	7,030.9	-610.5	986.7	610.5	1.19	-0.53	
7,711.0	87.60	177.80	7,032.7	-655.5	988.6	655.5	1.30	-0.67	
7,758.0	88.10	180.20	7,034.5	-702.4	989.4	702.4	5.21	1.06	
7,852.0	88.70	180.60	7,037.1	-796.4	988.7	796.4	0.77	0.64	
7,947.0	87.80	184.10	7,040.0	-891.2	984.8	891.2	3.80	-0.95	
8,042.0	89.80	183.00	7,042.0	-986.0	979.0	986.0	2.40	2.11	
8,136.0	88.50	182.10	7,043.4	-1,079.9	974.8	1,079.9	1.68	-1.38	
8,231.0	90.30	182.00	7,044.4	-1,174.8	971.4	1,174.8	1.90	1.89	
8,325.0	90.50	181.00	7,043.7	-1,268.8	968.9	1,268.8	1.08	0.21	
8,420.0	90.50	181.00	7,042.9	-1,363.8	967.3	1,363.8	0.00	0.00	
8,515.0	89.30	180.60	7,043.1	-1,458.8	965.9	1,458.8	1.33	-1.26	
8,609.0	88.90	179.50	7,044.5	-1,552.8	965.9	1,552.8	1.25	-0.43	
8,703.0	89.10	178.90	7,046.2	-1,646.7	967.2	1,646.7	0.67	0.21	
8,798.0	88.00	178.80	7,048.6	-1,741.7	969.1	1,741.7	1.16	-1.16	
8,892.0	86.60	178.40	7,053.0	-1,835.6	971.4	1,835.6	1.55	-1.49	
8,987.0	88.40	178.00	7,057.1	-1,930.4	974.4	1,930.4	1.94	1.89	
9,081.0	91.10	177.90	7,057.6	-2,024.3	977.7	2,024.3	2.87	2.87	
9,176.0	91.90	180.80	7,055.1	-2,119.3	978.8	2,119.3	3.17	0.84	
9,271.0	90.50	180.50	7,053.1	-2,214.3	977.7	2,214.3	1.51	-1.47	
9,365.0	89.50	178.80	7,053.1	-2,308.3	978.3	2,308.3	2.10	-1.06	
9,460.0	91.20	181.20	7,052.5	-2,403.2	978.3	2,403.2	3.10	1.79	
9,554.0	89.90	181.10	7,051.6	-2,497.2	976.4	2,497.2	1.39	-1.38	
9,649.0	90.60	180.40	7,051.2	-2,592.2	975.2	2,592.2	1.04	0.74	
9,744.0	90.80	180.60	7,050.0	-2,687.2	974.3	2,687.2	0.30	0.21	
9,838.0	90.10	181.70	7,049.3	-2,781.2	972.4	2,781.2	1.39	-0.74	
9,933.0	87.00	180.70	7,051.7	-2,876.1	970.5	2,876.1	3.43	-3.26	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Ruhl 1J-32H-B264
Project:	DJ Wattenberg	TVD Reference:	13' KB @ 5010.0ft (135)
Site:	S32-T2N-R64W (Newman/Ruhl)	MD Reference:	13' KB @ 5010.0ft (135)
Well:	Ruhl 1J-32H-B264	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
10,027.0	86.20	181.30	7,057.3	-2,969.9	968.8	2,969.9	1.06	-0.85	
10,122.0	89.30	180.70	7,061.0	-3,064.8	967.2	3,064.8	3.32	3.26	
10,217.0	91.80	179.40	7,060.1	-3,159.8	967.1	3,159.8	2.97	2.63	
10,311.0	91.30	179.20	7,057.5	-3,253.8	968.2	3,253.8	0.57	-0.53	
10,406.0	91.30	179.80	7,055.4	-3,348.7	969.1	3,348.7	0.63	0.00	
10,501.0	89.20	178.10	7,055.0	-3,443.7	970.8	3,443.7	2.84	-2.21	
10,595.0	88.80	178.50	7,056.6	-3,537.7	973.6	3,537.7	0.60	-0.43	
10,690.0	89.50	179.90	7,058.0	-3,632.6	974.9	3,632.6	1.65	0.74	
10,785.0	89.30	180.10	7,059.0	-3,727.6	974.9	3,727.6	0.30	-0.21	
10,879.0	91.10	180.70	7,058.7	-3,821.6	974.3	3,821.6	2.02	1.91	
10,974.0	91.00	180.30	7,056.9	-3,916.6	973.4	3,916.6	0.43	-0.11	
11,068.0	91.10	180.10	7,055.2	-4,010.6	973.1	4,010.6	0.24	0.11	
11,163.0	90.40	178.40	7,054.0	-4,105.6	974.3	4,105.6	1.94	-0.74	
11,258.0	90.30	178.50	7,053.4	-4,200.5	976.9	4,200.5	0.15	-0.11	
11,352.0	89.50	178.00	7,053.6	-4,294.5	979.8	4,294.5	1.00	-0.85	
11,447.0	89.10	177.60	7,054.7	-4,389.4	983.4	4,389.4	0.60	-0.42	
11,502.0	89.70	177.10	7,055.3	-4,444.4	986.0	4,444.4	1.42	1.09	Last CES Survey @ 11,502' MD
11,550.0	89.70	177.10	7,055.5	-4,492.3	988.4	4,492.3	0.00	0.00	PTB @ 11,550' MD

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
Ruhl 1J-32H-B264 PBHI - actual wellpath misses target center by 74.6ft at 11550.0ft MD (7055.5 TVD, -4492.3 N, 988.4 E) - Point	0.00	0.00	7,041.0	-4,565.1	980.7	1,276,611.72	3,260,961.40	40.088916	-104.567296
Ruhl 1J-32H-B264 8700 - actual wellpath misses target center by 14.1ft at 8731.8ft MD (7046.7 TVD, -1675.6 N, 967.7 E) - Point	0.00	0.00	7,041.0	-1,675.4	980.7	1,279,501.21	3,260,931.12	40.096849	-104.567296
Ruhl 1J-32H-B264 PBHI - actual wellpath misses target center by 74.0ft at 11550.0ft MD (7055.5 TVD, -4492.3 N, 988.4 E) - Point	0.00	0.00	7,045.0	-4,565.1	980.7	1,276,611.72	3,260,961.40	40.088916	-104.567296

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
11,502.0	7,055.3	-4,444.4	986.0	Last CES Survey @ 11,502' MD
11,550.0	7,055.5	-4,492.3	988.4	PTB @ 11,550' MD

Checked By: _____ Approved By: _____ Date: _____