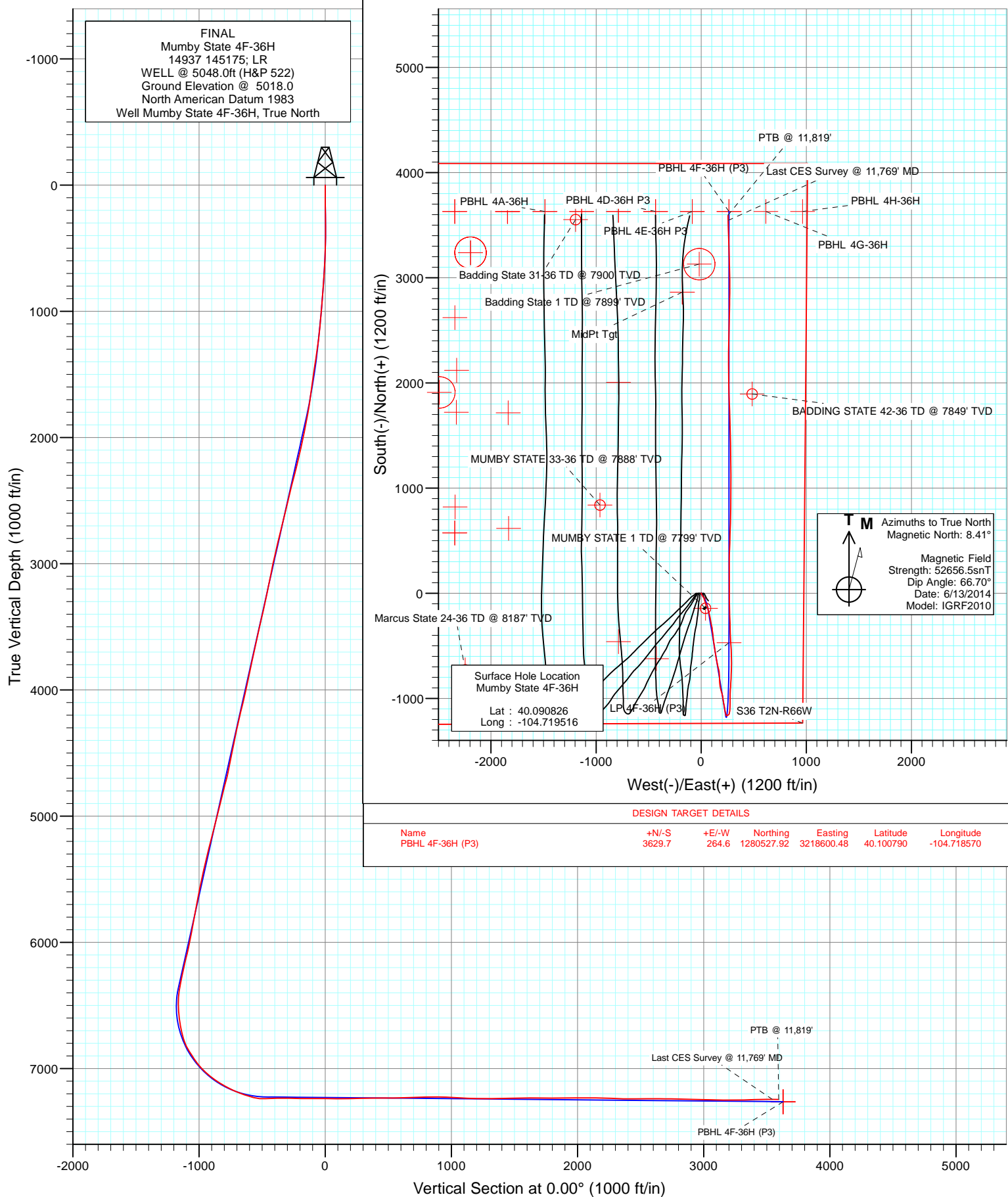


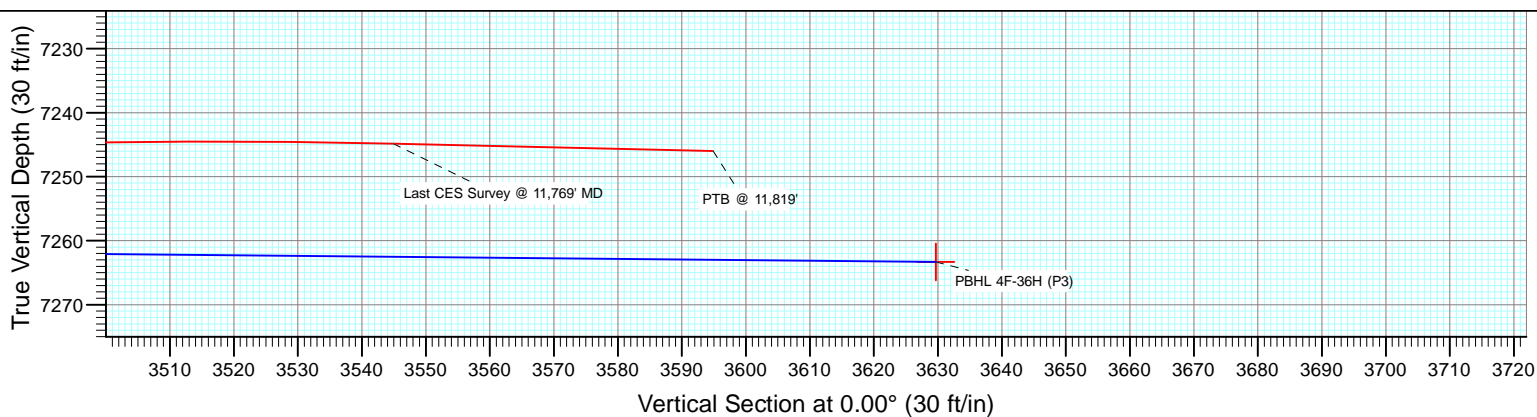
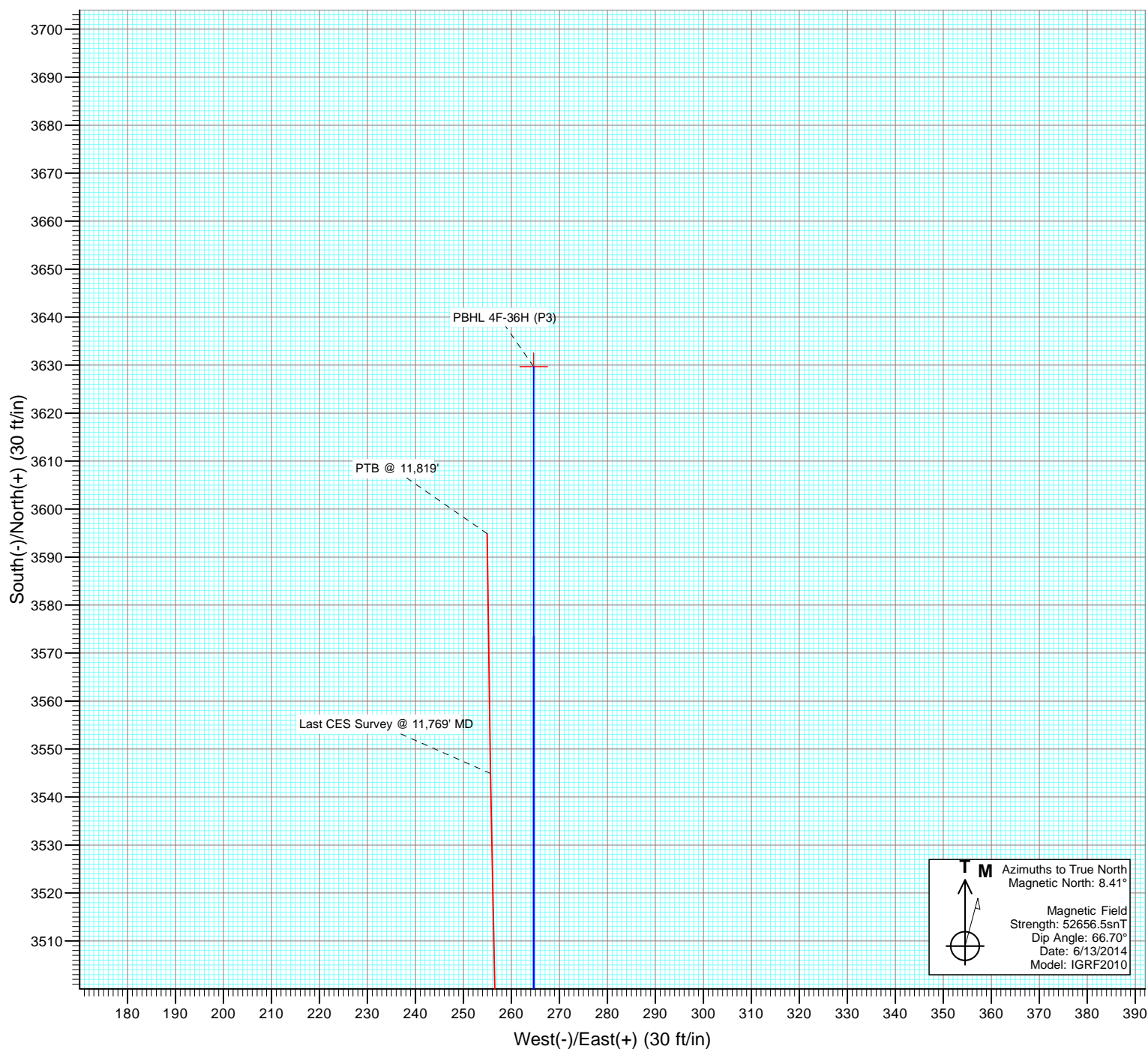


Project: DJ Wattenberg
 Site: S36 T2N-R66W (Marcus State, Mumby State)
 Well: Mumby State 4F-36H
 Wellbore: HZ
 Design: FINAL





Project: DJ Wattenberg
Site: S36 T2N-R66W (Marcus State, Mumby State)
Well: Mumby State 4F-36H
Wellbore: HZ
Design: FINAL



Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (H&P 522)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (H&P 522)
Well:	Mumby State 4F-36H	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		S36 T2N-R66W (Marcus State, Mumby State)			
Site Position:		Northing:	1,275,942.66 ft	Latitude:	40.088280
From:	Lat/Long	Easting:	3,215,403.58 ft	Longitude:	-104.730140
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.50 °

Well		Mumby State 4F-36H				
Well Position	+N/-S	0.0 ft	Northing:	1,276,896.05 ft	Latitude:	40.090826
	+E/-W	0.0 ft	Easting:	3,218,367.80 ft	Longitude:	-104.719516
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,018.0 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/13/2014	8.41	66.70	52,657

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

Survey Program	Date	8/13/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
141.0	11,819.0	Survey #1 (HZ)	Geolink MWD	Geolink MWD	

Survey									
Measured	Vertical	Vertical	Dogleg	Build	Formations /				
Depth	Inclination	Azimuth	Rate	Rate	Comments	Depth	+N/-S	+E/-W	Section
(ft)	(°)	(°)	(°/100ft)	(°/100ft)		(ft)	(ft)	(ft)	(ft)
0.0	0.00	0.00	0.0	0.0		0.0	0.0	0.0	0.00
141.0	0.44	349.78	141.0	0.5		0.5	-0.1	0.31	0.31
233.0	0.62	337.30	233.0	1.3		1.3	-0.4	0.23	0.20
325.0	0.70	359.88	325.0	2.4		2.4	-0.5	0.29	0.09
417.0	0.83	133.83	417.0	2.5		2.5	-0.1	1.53	0.14
509.0	1.76	166.96	509.0	0.6		0.6	0.7	1.26	1.01
601.0	2.72	168.99	600.9	-2.9		-2.9	1.5	1.05	1.04
693.0	3.96	157.91	692.7	-8.0		-8.0	3.1	1.51	1.35
785.0	4.53	157.65	784.5	-14.3		-14.3	5.7	0.62	0.62
877.0	5.10	144.03	876.2	-21.0		-21.0	9.4	1.38	0.62
969.0	6.15	143.85	967.7	-28.2		-28.2	14.8	1.14	1.14
1,061.0	6.59	145.43	1,059.1	-36.6		-36.6	20.7	0.51	0.48
1,068.0	6.64	143.67	1,066.1	-37.2		-37.2	21.1	2.98	0.71

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (H&P 522)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (H&P 522)
Well:	Mumby State 4F-36H	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
1,206.0	6.10	167.10	1,203.3	-50.8	27.5	-50.8	1.91	-0.39	
1,298.0	8.40	167.10	1,294.5	-62.1	30.1	-62.1	2.50	2.50	
1,390.0	9.60	154.80	1,385.4	-75.6	34.8	-75.6	2.46	1.30	
1,482.0	9.10	155.40	1,476.2	-89.2	41.1	-89.2	0.55	-0.54	
1,574.0	8.80	154.40	1,567.1	-102.1	47.2	-102.1	0.37	-0.33	
1,665.0	8.50	154.40	1,657.0	-114.5	53.1	-114.5	0.33	-0.33	
1,757.0	9.60	160.00	1,747.9	-127.8	58.7	-127.8	1.53	1.20	
1,849.0	10.50	170.10	1,838.5	-143.3	62.8	-143.3	2.15	0.98	
1,941.0	11.30	164.00	1,928.8	-160.2	66.7	-160.2	1.52	0.87	
2,033.0	12.80	168.50	2,018.8	-178.9	71.2	-178.9	1.92	1.63	
2,125.0	13.30	161.80	2,108.4	-198.9	76.5	-198.9	1.73	0.54	
2,217.0	13.60	168.60	2,197.9	-219.6	82.0	-219.6	1.75	0.33	
2,309.0	14.70	171.10	2,287.1	-241.7	85.9	-241.7	1.37	1.20	
2,401.0	14.70	169.50	2,376.1	-264.7	89.9	-264.7	0.44	0.00	
2,493.0	13.50	168.20	2,465.3	-286.7	94.2	-286.7	1.35	-1.30	
2,585.0	14.00	165.40	2,554.7	-308.0	99.2	-308.0	0.90	0.54	
2,677.0	13.80	175.40	2,644.0	-329.7	102.9	-329.7	2.62	-0.22	
2,769.0	13.70	173.70	2,733.4	-351.5	104.9	-351.5	0.45	-0.11	
2,861.0	13.60	171.80	2,822.8	-373.0	107.7	-373.0	0.50	-0.11	
2,953.0	13.60	170.90	2,912.2	-394.4	110.9	-394.4	0.23	0.00	
3,045.0	11.40	174.70	3,002.0	-414.1	113.5	-414.1	2.55	-2.39	
3,137.0	11.50	174.60	3,092.2	-432.3	115.2	-432.3	0.11	0.11	
3,228.0	11.20	173.90	3,181.4	-450.1	117.0	-450.1	0.36	-0.33	
3,323.0	12.70	171.00	3,274.3	-469.6	119.6	-469.6	1.70	1.58	
3,418.0	12.10	169.90	3,367.1	-489.7	123.0	-489.7	0.68	-0.63	
3,512.0	13.60	172.30	3,458.8	-510.4	126.2	-510.4	1.69	1.60	
3,607.0	13.20	172.20	3,551.2	-532.2	129.1	-532.2	0.42	-0.42	
3,701.0	12.50	171.40	3,642.8	-552.9	132.1	-552.9	0.77	-0.74	
3,796.0	12.20	170.20	3,735.6	-572.9	135.4	-572.9	0.42	-0.32	
3,890.0	11.40	169.50	3,827.6	-591.9	138.8	-591.9	0.86	-0.85	
3,985.0	12.30	169.70	3,920.6	-611.0	142.3	-611.0	0.95	0.95	
4,079.0	12.90	175.20	4,012.4	-631.4	144.9	-631.4	1.43	0.64	
4,174.0	13.80	167.20	4,104.8	-653.0	148.3	-653.0	2.16	0.95	
4,268.0	13.30	166.70	4,196.2	-674.4	153.3	-674.4	0.55	-0.53	
4,363.0	12.80	165.90	4,288.7	-695.3	158.4	-695.3	0.56	-0.53	
4,457.0	12.70	165.90	4,380.4	-715.4	163.4	-715.4	0.11	-0.11	
4,552.0	11.00	167.90	4,473.4	-734.4	167.9	-734.4	1.84	-1.79	
4,647.0	10.90	175.50	4,566.7	-752.2	170.5	-752.2	1.52	-0.11	
4,741.0	12.80	175.60	4,658.7	-771.4	172.0	-771.4	2.02	2.02	
4,836.0	14.80	178.10	4,750.9	-794.1	173.2	-794.1	2.20	2.11	
4,930.0	14.10	177.30	4,841.9	-817.5	174.1	-817.5	0.77	-0.74	
5,025.0	14.10	177.40	4,934.1	-840.6	175.2	-840.6	0.03	0.00	
5,119.0	14.50	173.00	5,025.2	-863.7	177.2	-863.7	1.23	0.43	
5,214.0	14.40	173.70	5,117.2	-887.3	179.9	-887.3	0.21	-0.11	
5,308.0	14.60	164.00	5,208.2	-910.3	184.5	-910.3	2.59	0.21	
5,402.0	14.10	164.30	5,299.2	-932.7	190.8	-932.7	0.54	-0.53	
5,496.0	13.60	164.80	5,390.5	-954.4	196.8	-954.4	0.55	-0.53	
5,591.0	12.70	165.00	5,483.0	-975.3	202.4	-975.3	0.95	-0.95	
5,685.0	11.40	174.80	5,575.0	-994.5	206.0	-994.5	2.57	-1.38	
5,780.0	10.80	175.10	5,668.2	-1,012.7	207.6	-1,012.7	0.63	-0.63	
5,874.0	11.00	168.80	5,760.5	-1,030.3	210.1	-1,030.3	1.28	0.21	
5,969.0	9.90	168.90	5,853.9	-1,047.2	213.4	-1,047.2	1.16	-1.16	
6,063.0	11.30	166.90	5,946.3	-1,064.1	217.0	-1,064.1	1.54	1.49	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (H&P 522)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (H&P 522)
Well:	Mumby State 4F-36H	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
6,158.0	12.40	172.20	6,039.3	-1,083.3	220.5	-1,083.3	1.63	1.16	
6,252.0	13.80	169.30	6,130.8	-1,104.3	224.0	-1,104.3	1.64	1.49	
6,347.0	12.70	168.10	6,223.3	-1,125.6	228.2	-1,125.6	1.19	-1.16	
6,441.0	11.60	166.70	6,315.2	-1,144.9	232.6	-1,144.9	1.21	-1.17	
6,488.0	10.90	164.10	6,361.3	-1,153.8	234.9	-1,153.8	1.84	-1.49	
6,536.0	7.30	149.80	6,408.7	-1,160.8	237.6	-1,160.8	8.80	-7.50	
6,583.0	4.60	94.30	6,455.5	-1,163.5	241.0	-1,163.5	12.82	-5.74	
6,630.0	6.90	76.70	6,502.2	-1,163.0	245.6	-1,163.0	6.11	4.89	
6,677.0	8.60	69.60	6,548.8	-1,161.2	251.7	-1,161.2	4.14	3.62	
6,725.0	10.50	54.20	6,596.1	-1,157.3	258.6	-1,157.3	6.60	3.96	
6,772.0	11.30	32.50	6,642.3	-1,151.0	264.6	-1,151.0	8.84	1.70	
6,819.0	11.10	5.50	6,688.4	-1,142.6	267.5	-1,142.6	11.07	-0.43	
6,866.0	14.30	8.50	6,734.3	-1,132.3	268.8	-1,132.3	6.95	6.81	
6,914.0	19.60	8.60	6,780.2	-1,118.5	270.8	-1,118.5	11.04	11.04	
6,961.0	26.10	4.70	6,823.5	-1,100.4	272.9	-1,100.4	14.19	13.83	
7,008.0	32.10	0.60	6,864.5	-1,077.5	273.8	-1,077.5	13.45	12.77	
7,055.0	34.40	0.60	6,903.8	-1,051.8	274.1	-1,051.8	4.89	4.89	
7,103.0	34.40	0.70	6,943.4	-1,024.7	274.4	-1,024.7	0.12	0.00	
7,150.0	40.40	0.20	6,980.8	-996.1	274.6	-996.1	12.78	12.77	
7,197.0	46.00	0.70	7,015.0	-964.0	274.9	-964.0	11.94	11.91	
7,244.0	49.00	5.10	7,046.8	-929.4	276.7	-929.4	9.40	6.38	
7,292.0	53.10	3.80	7,076.9	-892.2	279.6	-892.2	8.80	8.54	
7,339.0	57.20	1.90	7,103.8	-853.7	281.5	-853.7	9.33	8.72	
7,386.0	59.90	2.70	7,128.3	-813.6	283.1	-813.6	5.93	5.74	
7,433.0	62.10	2.50	7,151.1	-772.5	284.9	-772.5	4.70	4.68	
7,481.0	64.90	1.80	7,172.5	-729.6	286.5	-729.6	5.98	5.83	
7,528.0	68.00	1.50	7,191.3	-686.6	287.8	-686.6	6.62	6.60	
7,575.0	70.40	0.60	7,208.0	-642.6	288.6	-642.6	5.41	5.11	
7,654.0	76.10	356.70	7,230.7	-567.1	286.8	-567.1	8.63	7.22	
7,701.0	85.10	355.90	7,238.4	-520.8	283.8	-520.8	19.22	19.15	
7,749.0	93.80	356.30	7,238.9	-473.0	280.5	-473.0	18.14	18.12	
7,843.0	90.50	358.70	7,235.3	-379.2	276.4	-379.2	4.34	-3.51	
7,938.0	89.20	358.00	7,235.6	-284.2	273.7	-284.2	1.55	-1.37	
8,032.0	89.00	358.10	7,237.1	-190.3	270.5	-190.3	0.24	-0.21	
8,127.0	90.60	359.20	7,237.4	-95.3	268.2	-95.3	2.04	1.68	
8,222.0	89.00	359.60	7,237.7	-0.3	267.3	-0.3	1.74	-1.68	
8,316.0	89.00	0.10	7,239.4	93.7	267.0	93.7	0.53	0.00	
8,411.0	91.70	359.60	7,238.8	188.6	266.8	188.6	2.89	2.84	
8,506.0	91.30	0.10	7,236.3	283.6	266.5	283.6	0.67	-0.42	
8,600.0	91.10	2.00	7,234.3	377.6	268.2	377.6	2.03	-0.21	
8,695.0	89.90	1.30	7,233.5	472.5	271.0	472.5	1.46	-1.26	
8,790.0	91.50	2.10	7,232.3	567.5	273.8	567.5	1.88	1.68	
8,884.0	91.10	2.80	7,230.2	661.4	277.8	661.4	0.86	-0.43	
8,979.0	92.10	1.00	7,227.6	756.3	281.0	756.3	2.17	1.05	
9,073.0	90.50	0.50	7,225.4	850.2	282.2	850.2	1.78	-1.70	
9,168.0	87.90	359.70	7,226.8	945.2	282.3	945.2	2.86	-2.74	
9,262.0	86.50	359.80	7,231.3	1,039.1	281.9	1,039.1	1.49	-1.49	
9,357.0	87.80	359.50	7,236.1	1,134.0	281.4	1,134.0	1.40	1.37	
9,451.0	89.40	359.80	7,238.4	1,228.0	280.8	1,228.0	1.73	1.70	
9,546.0	90.70	359.80	7,238.3	1,323.0	280.5	1,323.0	1.37	1.37	
9,640.0	91.90	358.80	7,236.1	1,416.9	279.3	1,416.9	1.66	1.28	
9,735.0	89.50	358.90	7,235.0	1,511.9	277.4	1,511.9	2.53	-2.53	
9,829.0	90.80	357.60	7,234.7	1,605.8	274.5	1,605.8	1.96	1.38	

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (H&P 522)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (H&P 522)
Well:	Mumby State 4F-36H	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
9,924.0	90.20	357.80	7,233.9	1,700.8	270.7	1,700.8	0.67	-0.63	
10,018.0	89.60	357.70	7,234.1	1,794.7	267.0	1,794.7	0.65	-0.64	
10,114.0	91.00	358.50	7,233.6	1,890.6	263.8	1,890.6	1.68	1.46	
10,209.0	90.20	359.40	7,232.6	1,985.6	262.1	1,985.6	1.27	-0.84	
10,304.0	90.00	358.70	7,232.4	2,080.6	260.5	2,080.6	0.77	-0.21	
10,398.0	88.50	0.30	7,233.6	2,174.6	259.7	2,174.6	2.33	-1.60	
10,493.0	87.60	359.90	7,236.9	2,269.5	259.9	2,269.5	1.04	-0.95	
10,587.0	88.40	1.10	7,240.2	2,363.4	260.7	2,363.4	1.53	0.85	
10,682.0	91.00	1.50	7,240.7	2,458.4	262.8	2,458.4	2.77	2.74	
10,776.0	90.10	1.70	7,239.8	2,552.4	265.5	2,552.4	0.98	-0.96	
10,871.0	89.90	1.20	7,239.8	2,647.3	267.9	2,647.3	0.57	-0.21	
10,965.0	88.70	1.30	7,240.9	2,741.3	269.9	2,741.3	1.28	-1.28	
11,060.0	89.10	0.10	7,242.7	2,836.3	271.1	2,836.3	1.33	0.42	
11,154.0	88.00	0.00	7,245.1	2,930.2	271.2	2,930.2	1.18	-1.17	
11,249.0	88.60	359.20	7,247.9	3,025.2	270.5	3,025.2	1.05	0.63	
11,343.0	89.40	358.40	7,249.6	3,119.2	268.5	3,119.2	1.20	0.85	
11,438.0	90.00	358.30	7,250.1	3,214.1	265.8	3,214.1	0.64	0.63	
11,532.0	91.20	357.90	7,249.1	3,308.1	262.7	3,308.1	1.35	1.28	
11,627.0	91.70	358.10	7,246.7	3,403.0	259.4	3,403.0	0.57	0.53	
11,721.0	90.80	358.50	7,244.6	3,496.9	256.6	3,496.9	1.05	-0.96	
11,769.0	88.70	359.20	7,244.8	3,544.9	255.6	3,544.9	4.61	-4.37	Last CES Survey @ 11,769' MD
11,819.0	88.70	359.20	7,246.0	3,594.9	254.9	3,594.9	0.00	0.00	PTB @ 11,819'

Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude Longitude
PBHL 4F-36H (P3)	- actual wellpath misses target center by 40.1ft at 11819.0ft MD (7246.0 TVD, 3594.9 N, 254.9 E)	0.00	0.00	7,263.3	3,629.7	264.6	1,280,527.92	3,218,600.48	40.100790 -104.718570
PBHL 4F-36H	- actual wellpath misses target center by 44.5ft at 11819.0ft MD (7246.0 TVD, 3594.9 N, 254.9 E)	0.00	0.00	7,220.0	3,629.7	264.6	1,280,527.92	3,218,600.48	40.100790 -104.718570
LP 4F-36H (P3)	- actual wellpath misses target center by 20.8ft at 7752.9ft MD (7238.6 TVD, -469.1 N, 280.3 E)	0.00	0.00	7,225.0	-470.3	264.6	1,276,428.09	3,218,636.57	40.089535 -104.718570

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
11,769.0	7,244.8	3,544.9	255.6	Last CES Survey @ 11,769' MD
11,819.0	7,246.0	3,594.9	254.9	PTB @ 11,819'

Checked By: _____	Approved By: _____	Date: _____
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EnCana Oil & Gas (USA) Inc

DJ Wattenberg

S36 T2N-R66W (Marcus State, Mumby State)

Mumby State 4F-36H

HZ

Design: FINAL

Survey Report - Geographic

13 August, 2014

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (H&P 522)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (H&P 522)
Well:	Mumby State 4F-36H	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		S36 T2N-R66W (Marcus State, Mumby State)			
Site Position:		Northing:	1,275,942.66 ft	Latitude:	40.088280
From:	Lat/Long	Easting:	3,215,403.58 ft	Longitude:	-104.730140
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.50 °

Well	Mumby State 4F-36H					
Well Position	+N/-S	0.0 ft	Northing:	1,276,896.04 ft	Latitude:	40.090826
	+E/-W	0.0 ft	Easting:	3,218,367.81 ft	Longitude:	-104.719516
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,018.0 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	6/13/2014	8.41	66.70	52,657

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

Survey Program	Date	8/13/2014			
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
141.0	11,819.0	Survey #1 (HZ)	Geolink MWD	Geolink MWD	

Survey										
Measured	Vertical	+N/-S	+E/-W	Map	Map	Latitude	Longitude			
Depth	Depth	(ft)	(ft)	Northing	Easting					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)					
0.0	0.0	0.0	0.0	1,276,896.04	3,218,367.81	40.090826	-104.719516			
141.0	0.44	349.78	141.0	0.5	-0.1	1,276,896.58	3,218,367.71	40.090828	-104.719517	
233.0	0.62	337.30	233.0	1.3	-0.4	1,276,897.38	3,218,367.44	40.090830	-104.719518	
325.0	0.70	359.88	325.0	2.4	-0.5	1,276,898.40	3,218,367.24	40.090833	-104.719518	
417.0	0.83	133.83	417.0	2.5	-0.1	1,276,898.51	3,218,367.72	40.090833	-104.719516	
509.0	1.76	166.96	509.0	0.6	0.7	1,276,896.67	3,218,368.54	40.090828	-104.719514	
601.0	2.72	168.99	600.9	-2.9	1.5	1,276,893.16	3,218,369.30	40.090818	-104.719511	
693.0	3.96	157.91	692.7	-8.0	3.1	1,276,888.09	3,218,370.96	40.090804	-104.719505	
785.0	4.53	157.65	784.5	-14.3	5.7	1,276,881.81	3,218,373.59	40.090787	-104.719496	
877.0	5.10	144.03	876.2	-21.0	9.4	1,276,875.17	3,218,377.43	40.090769	-104.719483	
969.0	6.15	143.85	967.7	-28.2	14.8	1,276,867.93	3,218,382.81	40.090749	-104.719464	
1,061.0	6.59	145.43	1,059.1	-36.6	20.7	1,276,859.66	3,218,388.78	40.090726	-104.719442	

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (H&P 522)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (H&P 522)
Well:	Mumby State 4F-36H	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		
1,068.0	6.64	143.67	1,066.1	-37.2	21.1	1,276,859.00	3,218,389.25	40.090724	-104.719441	
1,206.0	6.10	167.10	1,203.3	-50.8	27.5	1,276,845.48	3,218,395.74	40.090687	-104.719418	
1,298.0	8.40	167.10	1,294.5	-62.1	30.1	1,276,834.19	3,218,398.43	40.090656	-104.719409	
1,390.0	9.60	154.80	1,385.4	-75.6	34.8	1,276,820.74	3,218,403.32	40.090618	-104.719392	
1,482.0	9.10	155.40	1,476.2	-89.2	41.1	1,276,807.24	3,218,409.73	40.090581	-104.719369	
1,574.0	8.80	154.40	1,567.1	-102.1	47.2	1,276,794.33	3,218,415.91	40.090546	-104.719348	
1,665.0	8.50	154.40	1,657.0	-114.5	53.1	1,276,782.04	3,218,421.94	40.090512	-104.719326	
1,757.0	9.60	160.00	1,747.9	-127.8	58.7	1,276,768.75	3,218,427.61	40.090475	-104.719307	
1,849.0	10.50	170.10	1,838.5	-143.3	62.8	1,276,753.32	3,218,431.82	40.090433	-104.719292	
1,941.0	11.30	164.00	1,928.8	-160.2	66.7	1,276,736.43	3,218,435.89	40.090386	-104.719278	
2,033.0	12.80	168.50	2,018.8	-178.9	71.2	1,276,717.82	3,218,440.57	40.090335	-104.719262	
2,125.0	13.30	161.80	2,108.4	-198.9	76.5	1,276,697.82	3,218,446.08	40.090280	-104.719243	
2,217.0	13.60	168.60	2,197.9	-219.6	82.0	1,276,677.22	3,218,451.71	40.090223	-104.719223	
2,309.0	14.70	171.10	2,287.1	-241.7	85.9	1,276,655.11	3,218,455.85	40.090163	-104.719209	
2,401.0	14.70	169.50	2,376.1	-264.7	89.9	1,276,632.14	3,218,459.98	40.090099	-104.719195	
2,493.0	13.50	168.20	2,465.3	-286.7	94.2	1,276,610.19	3,218,464.50	40.090039	-104.719180	
2,585.0	14.00	165.40	2,554.7	-308.0	99.2	1,276,588.95	3,218,469.69	40.089981	-104.719162	
2,677.0	13.80	175.40	2,644.0	-329.7	102.9	1,276,567.28	3,218,473.57	40.089921	-104.719149	
2,769.0	13.70	173.70	2,733.4	-351.5	104.9	1,276,545.53	3,218,475.83	40.089861	-104.719141	
2,861.0	13.60	171.80	2,822.8	-373.0	107.7	1,276,524.02	3,218,478.76	40.089802	-104.719131	
2,953.0	13.60	170.90	2,912.2	-394.4	110.9	1,276,502.66	3,218,482.20	40.089743	-104.719120	
3,045.0	11.40	174.70	3,002.0	-414.1	113.5	1,276,482.95	3,218,484.93	40.089689	-104.719111	
3,137.0	11.50	174.60	3,092.2	-432.3	115.2	1,276,464.78	3,218,486.79	40.089639	-104.719105	
3,228.0	11.20	173.90	3,181.4	-450.1	117.0	1,276,446.98	3,218,488.74	40.089590	-104.719098	
3,323.0	12.70	171.00	3,274.3	-469.6	119.6	1,276,427.51	3,218,491.52	40.089537	-104.719089	
3,418.0	12.10	169.90	3,367.1	-489.7	123.0	1,276,407.43	3,218,495.08	40.089482	-104.719077	
3,512.0	13.60	172.30	3,458.8	-510.4	126.2	1,276,386.80	3,218,498.47	40.089425	-104.719065	
3,607.0	13.20	172.20	3,551.2	-532.2	129.1	1,276,365.02	3,218,501.63	40.089365	-104.719055	
3,701.0	12.50	171.40	3,642.8	-552.9	132.1	1,276,344.35	3,218,504.79	40.089308	-104.719044	
3,796.0	12.20	170.20	3,735.6	-572.9	135.4	1,276,324.32	3,218,508.21	40.089253	-104.719032	
3,890.0	11.40	169.50	3,827.6	-591.9	138.8	1,276,305.43	3,218,511.76	40.089201	-104.719020	
3,985.0	12.30	169.70	3,920.6	-611.0	142.3	1,276,286.28	3,218,515.45	40.089149	-104.719008	
4,079.0	12.90	175.20	4,012.4	-631.4	144.9	1,276,265.99	3,218,518.30	40.089093	-104.718998	
4,174.0	13.80	167.20	4,104.8	-653.0	148.3	1,276,244.40	3,218,521.89	40.089034	-104.718986	
4,268.0	13.30	166.70	4,196.2	-674.4	153.3	1,276,222.99	3,218,527.05	40.088975	-104.718968	
4,363.0	12.80	165.90	4,288.7	-695.3	158.4	1,276,202.20	3,218,532.31	40.088917	-104.718950	
4,457.0	12.70	165.90	4,380.4	-715.4	163.4	1,276,182.12	3,218,537.54	40.088862	-104.718932	
4,552.0	11.00	167.90	4,473.4	-734.4	167.9	1,276,163.17	3,218,542.15	40.088810	-104.718916	
4,647.0	10.90	175.50	4,566.7	-752.2	170.5	1,276,145.38	3,218,544.91	40.088761	-104.718907	
4,741.0	12.80	175.60	4,658.7	-771.4	172.0	1,276,126.15	3,218,546.58	40.088708	-104.718902	
4,836.0	14.80	178.10	4,750.9	-794.1	173.2	1,276,103.54	3,218,547.99	40.088646	-104.718897	
4,930.0	14.10	177.30	4,841.9	-817.5	174.1	1,276,080.11	3,218,549.13	40.088582	-104.718894	
5,025.0	14.10	177.40	4,934.1	-840.6	175.2	1,276,057.00	3,218,550.40	40.088518	-104.718890	
5,119.0	14.50	173.00	5,025.2	-863.7	177.2	1,276,033.90	3,218,552.56	40.088455	-104.718883	
5,214.0	14.40	173.70	5,117.2	-887.3	179.9	1,276,010.38	3,218,555.51	40.088390	-104.718873	
5,308.0	14.60	164.00	5,208.2	-910.3	184.5	1,275,987.41	3,218,560.27	40.088327	-104.718857	
5,402.0	14.10	164.30	5,299.2	-932.7	190.8	1,275,965.06	3,218,566.83	40.088266	-104.718834	
5,496.0	13.60	164.80	5,390.5	-954.4	196.8	1,275,943.42	3,218,573.01	40.088206	-104.718813	
5,591.0	12.70	165.00	5,483.0	-975.3	202.4	1,275,922.61	3,218,578.83	40.088149	-104.718793	
5,685.0	11.40	174.80	5,575.0	-994.5	206.0	1,275,903.40	3,218,582.51	40.088096	-104.718780	
5,780.0	10.80	175.10	5,668.2	-1,012.7	207.6	1,275,885.20	3,218,584.29	40.088046	-104.718774	
5,874.0	11.00	168.80	5,760.5	-1,030.3	210.1	1,275,867.65	3,218,586.93	40.087998	-104.718765	
5,969.0	9.90	168.90	5,853.9	-1,047.2	213.4	1,275,850.77	3,218,590.42	40.087951	-104.718754	
6,063.0	11.30	166.90	5,946.3	-1,064.1	217.0	1,275,833.91	3,218,594.21	40.087905	-104.718741	
6,158.0	12.40	172.20	6,039.3	-1,083.3	220.5	1,275,814.77	3,218,597.87	40.087852	-104.718728	

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (H&P 522)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (H&P 522)
Well:	Mumby State 4F-36H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey										
Measured			Vertical				Map	Map		
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Northing	Easting		Latitude	Longitude
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)			
6,252.0	13.80	169.30	6,130.8	-1,104.3	224.0	1,275,793.78	3,218,601.51		40.087795	-104.718716
6,347.0	12.70	168.10	6,223.3	-1,125.6	228.2	1,275,772.47	3,218,605.95		40.087736	-104.718700
6,441.0	11.60	166.70	6,315.2	-1,144.9	232.6	1,275,753.20	3,218,610.43		40.087683	-104.718685
6,488.0	10.90	164.10	6,361.3	-1,153.8	234.9	1,275,744.34	3,218,612.81		40.087659	-104.718677
6,536.0	7.30	149.80	6,408.7	-1,160.8	237.6	1,275,737.37	3,218,615.65		40.087639	-104.718667
6,583.0	4.60	94.30	6,455.5	-1,163.5	241.0	1,275,734.67	3,218,619.06		40.087632	-104.718655
6,630.0	6.90	76.70	6,502.2	-1,163.0	245.6	1,275,735.22	3,218,623.68		40.087633	-104.718638
6,677.0	8.60	69.60	6,548.8	-1,161.2	251.7	1,275,737.15	3,218,629.70		40.087638	-104.718617
6,725.0	10.50	54.20	6,596.1	-1,157.3	258.6	1,275,741.02	3,218,636.58		40.087649	-104.718592
6,772.0	11.30	32.50	6,642.3	-1,151.0	264.6	1,275,747.46	3,218,642.48		40.087667	-104.718571
6,819.0	11.10	5.50	6,688.4	-1,142.6	267.5	1,275,755.88	3,218,645.31		40.087690	-104.718560
6,866.0	14.30	8.50	6,734.3	-1,132.3	268.8	1,275,766.14	3,218,646.52		40.087718	-104.718556
6,914.0	19.60	8.60	6,780.2	-1,118.5	270.8	1,275,779.99	3,218,648.47		40.087756	-104.718548
6,961.0	26.10	4.70	6,823.5	-1,100.4	272.9	1,275,798.13	3,218,650.34		40.087805	-104.718541
7,008.0	32.10	0.60	6,864.5	-1,077.5	273.8	1,275,820.95	3,218,651.12		40.087868	-104.718538
7,055.0	34.40	0.60	6,903.8	-1,051.8	274.1	1,275,846.71	3,218,651.16		40.087939	-104.718537
7,103.0	34.40	0.70	6,943.4	-1,024.7	274.4	1,275,873.83	3,218,651.23		40.088013	-104.718535
7,150.0	40.40	0.20	6,980.8	-996.1	274.6	1,275,902.37	3,218,651.20		40.088092	-104.718535
7,197.0	46.00	0.70	7,015.0	-964.0	274.9	1,275,934.53	3,218,651.17		40.088180	-104.718534
7,244.0	49.00	5.10	7,046.8	-929.4	276.7	1,275,969.13	3,218,652.65		40.088275	-104.718527
7,292.0	53.10	3.80	7,076.9	-892.2	279.6	1,276,006.36	3,218,655.21		40.088377	-104.718517
7,339.0	57.20	1.90	7,103.8	-853.7	281.5	1,276,044.89	3,218,656.77		40.088483	-104.718510
7,386.0	59.90	2.70	7,128.3	-813.6	283.1	1,276,084.96	3,218,658.03		40.088593	-104.718505
7,433.0	62.10	2.50	7,151.1	-772.5	284.9	1,276,126.04	3,218,659.54		40.088705	-104.718498
7,481.0	64.90	1.80	7,172.5	-729.6	286.5	1,276,168.97	3,218,660.77		40.088823	-104.718492
7,528.0	68.00	1.50	7,191.3	-686.6	287.8	1,276,212.04	3,218,661.63		40.088941	-104.718488
7,575.0	70.40	0.60	7,208.0	-642.6	288.6	1,276,255.97	3,218,662.04		40.089062	-104.718485
7,654.0	76.10	356.70	7,230.7	-567.1	286.8	1,276,331.52	3,218,659.56		40.089269	-104.718491
7,701.0	85.10	355.90	7,238.4	-520.8	283.8	1,276,377.71	3,218,656.16		40.089396	-104.718502
7,749.0	93.80	356.30	7,238.9	-473.0	280.5	1,276,425.52	3,218,652.47		40.089528	-104.718514
7,843.0	90.50	358.70	7,235.3	-379.2	276.4	1,276,519.31	3,218,647.55		40.089785	-104.718528
7,938.0	89.20	358.00	7,235.6	-284.2	273.7	1,276,614.24	3,218,643.98		40.090046	-104.718538
8,032.0	89.00	358.10	7,237.1	-190.3	270.5	1,276,708.14	3,218,639.96		40.090304	-104.718549
8,127.0	90.60	359.20	7,237.4	-95.3	268.2	1,276,803.09	3,218,636.89		40.090564	-104.718557
8,222.0	89.00	359.60	7,237.7	-0.3	267.3	1,276,898.07	3,218,635.05		40.090825	-104.718561
8,316.0	89.00	0.10	7,239.4	93.7	267.0	1,276,992.04	3,218,633.98		40.091083	-104.718562
8,411.0	91.70	359.60	7,238.8	188.6	266.8	1,277,087.03	3,218,632.90		40.091344	-104.718563
8,506.0	91.30	0.10	7,236.3	283.6	266.5	1,277,181.99	3,218,631.81		40.091605	-104.718564
8,600.0	91.10	2.00	7,234.3	377.6	268.2	1,277,275.96	3,218,632.71		40.091863	-104.718558
8,695.0	89.90	1.30	7,233.5	472.5	271.0	1,277,370.93	3,218,634.61		40.092123	-104.718548
8,790.0	91.50	2.10	7,232.3	567.5	273.8	1,277,465.90	3,218,636.59		40.092384	-104.718538
8,884.0	91.10	2.80	7,230.2	661.4	277.8	1,277,559.82	3,218,639.78		40.092642	-104.718523
8,979.0	92.10	1.00	7,227.6	756.3	281.0	1,277,654.75	3,218,642.09		40.092902	-104.718512
9,073.0	90.50	0.50	7,225.4	850.2	282.2	1,277,748.74	3,218,642.50		40.093160	-104.718508
9,168.0	87.90	359.70	7,226.8	945.2	282.3	1,277,843.72	3,218,641.83		40.093421	-104.718507
9,262.0	86.50	359.80	7,231.3	1,039.1	281.9	1,277,937.60	3,218,640.59		40.093679	-104.718509
9,357.0	87.80	359.50	7,236.1	1,134.0	281.4	1,278,032.47	3,218,639.17		40.093939	-104.718511
9,451.0	89.40	359.80	7,238.4	1,228.0	280.8	1,278,126.43	3,218,637.77		40.094197	-104.718513
9,546.0	90.70	359.80	7,238.3	1,323.0	280.5	1,278,221.42	3,218,636.61		40.094458	-104.718514
9,640.0	91.90	358.80	7,236.1	1,416.9	279.3	1,278,315.37	3,218,634.63		40.094716	-104.718518
9,735.0	89.50	358.90	7,235.0	1,511.9	277.4	1,278,410.32	3,218,631.89		40.094976	-104.718525
9,829.0	90.80	357.60	7,234.7	1,605.8	274.5	1,278,504.24	3,218,628.19		40.095234	-104.718535
9,924.0	90.20	357.80	7,233.9	1,700.8	270.7	1,278,599.12	3,218,623.54		40.095495	-104.718549
10,018.0	89.60	357.70	7,234.1	1,794.7	267.0	1,278,693.01	3,218,619.03		40.095753	-104.718562
10,114.0	91.00	358.50	7,233.6	1,890.6	263.8	1,278,788.91	3,218,615.00		40.096016	-104.718573

Survey Report - Geographic

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Mumby State 4F-36H
Project:	DJ Wattenberg	TVD Reference:	WELL @ 5048.0ft (H&P 522)
Site:	S36 T2N-R66W (Marcus State, Mumby State)	MD Reference:	WELL @ 5048.0ft (H&P 522)
Well:	Mumby State 4F-36H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey										
Measured			Vertical			Map	Map			
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Northing	Easting		Latitude	Longitude
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)			
10,209.0	90.20	359.40	7,232.6	1,985.6	262.1	1,278,883.86	3,218,612.42		40.096277	-104.718579
10,304.0	90.00	358.70	7,232.4	2,080.6	260.5	1,278,978.83	3,218,610.01		40.096538	-104.718585
10,398.0	88.50	0.30	7,233.6	2,174.6	259.7	1,279,072.80	3,218,608.37		40.096796	-104.718588
10,493.0	87.60	359.90	7,236.9	2,269.5	259.9	1,279,167.75	3,218,607.70		40.097056	-104.718587
10,587.0	88.40	1.10	7,240.2	2,363.4	260.7	1,279,261.69	3,218,607.69		40.097314	-104.718584
10,682.0	91.00	1.50	7,240.7	2,458.4	262.8	1,279,356.67	3,218,609.01		40.097575	-104.718577
10,776.0	90.10	1.70	7,239.8	2,552.4	265.5	1,279,450.64	3,218,610.81		40.097833	-104.718567
10,871.0	89.90	1.20	7,239.8	2,647.3	267.9	1,279,545.63	3,218,612.37		40.098093	-104.718559
10,965.0	88.70	1.30	7,240.9	2,741.3	269.9	1,279,639.61	3,218,613.60		40.098351	-104.718551
11,060.0	89.10	0.10	7,242.7	2,836.3	271.1	1,279,734.59	3,218,613.92		40.098612	-104.718547
11,154.0	88.00	0.00	7,245.1	2,930.2	271.2	1,279,828.56	3,218,613.18		40.098870	-104.718547
11,249.0	88.60	359.20	7,247.9	3,025.2	270.5	1,279,923.51	3,218,611.68		40.099131	-104.718549
11,343.0	89.40	358.40	7,249.6	3,119.2	268.5	1,280,017.45	3,218,608.88		40.099389	-104.718556
11,438.0	90.00	358.30	7,250.1	3,214.1	265.8	1,280,112.38	3,218,605.31		40.099649	-104.718566
11,532.0	91.20	357.90	7,249.1	3,308.1	262.7	1,280,206.29	3,218,601.37		40.099907	-104.718577
11,627.0	91.70	358.10	7,246.7	3,403.0	259.4	1,280,301.17	3,218,597.22		40.100168	-104.718589
11,721.0	90.80	358.50	7,244.6	3,496.9	256.6	1,280,395.07	3,218,593.60		40.100426	-104.718599
11,769.0	88.70	359.20	7,244.8	3,544.9	255.6	1,280,443.05	3,218,592.22		40.100557	-104.718602
Last CES Survey @ 11,769' MD										
11,819.0	88.70	359.20	7,246.0	3,594.9	254.9	1,280,493.03	3,218,591.08		40.100695	-104.718605
PTB @ 11,819'										

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting		
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	Latitude	Longitude
PBHL 4F-36H (P3)	0.00	0.00	7,263.3	3,629.7	264.6	1,280,527.92	3,218,600.48	40.100790	-104.718570
- actual wellpath misses target center by 40.1ft at 11819.0ft MD (7246.0 TVD, 3594.9 N, 254.9 E)									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)		Comment
11,769.0	7,244.8	3,544.9	255.6		Last CES Survey @ 11,769' MD
11,819.0	7,246.0	3,594.9	254.9		PTB @ 11,819'

Checked By: _____	Approved By: _____	Date: _____
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