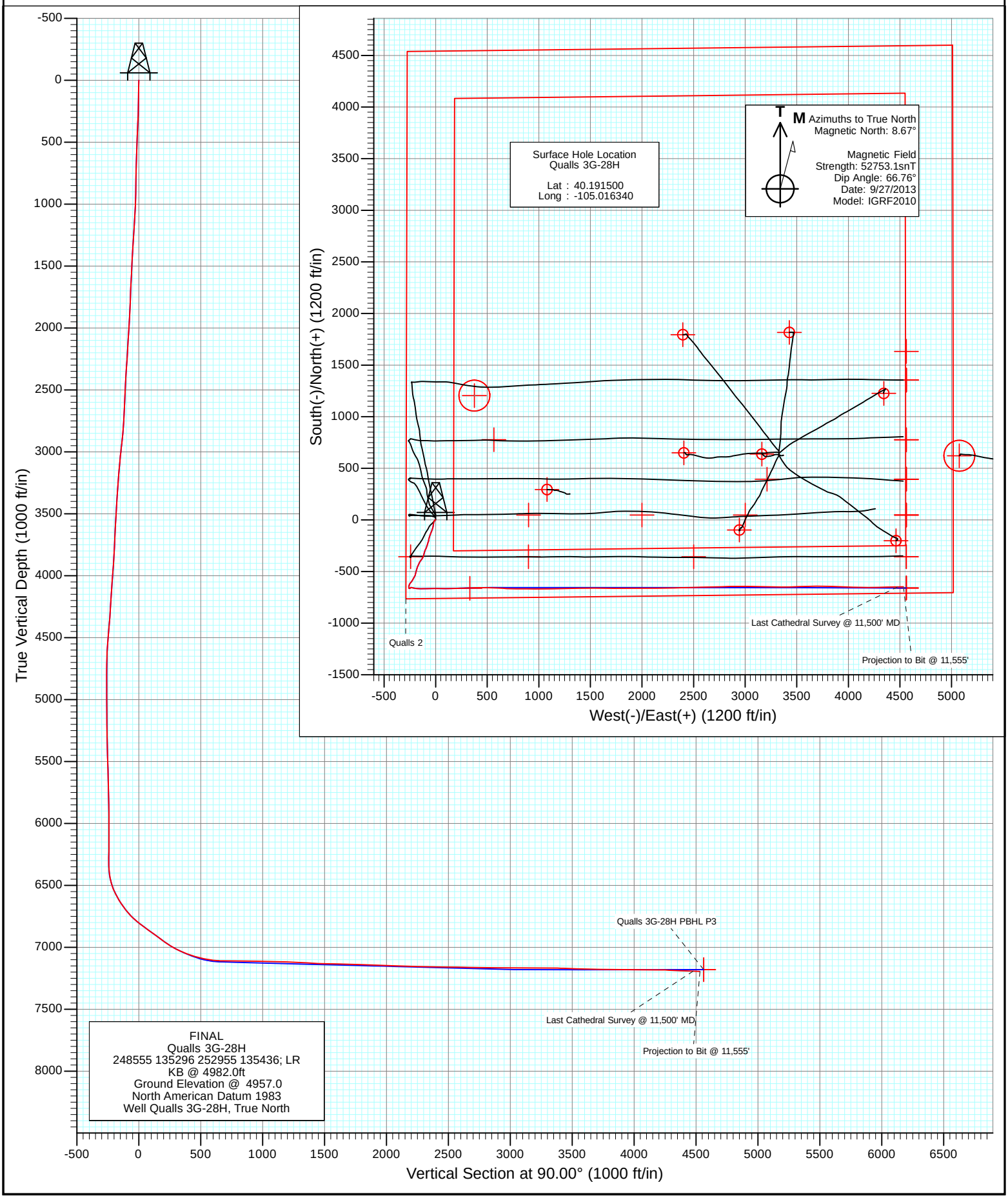
Project: DJ Wattenberg
Site: S28-T3N-R68W (Qualls)
Well: Qualls 3G-28H
Wellbore: Hz
Design: FINAL



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Site: S28-T3N-R68W (Qualls)
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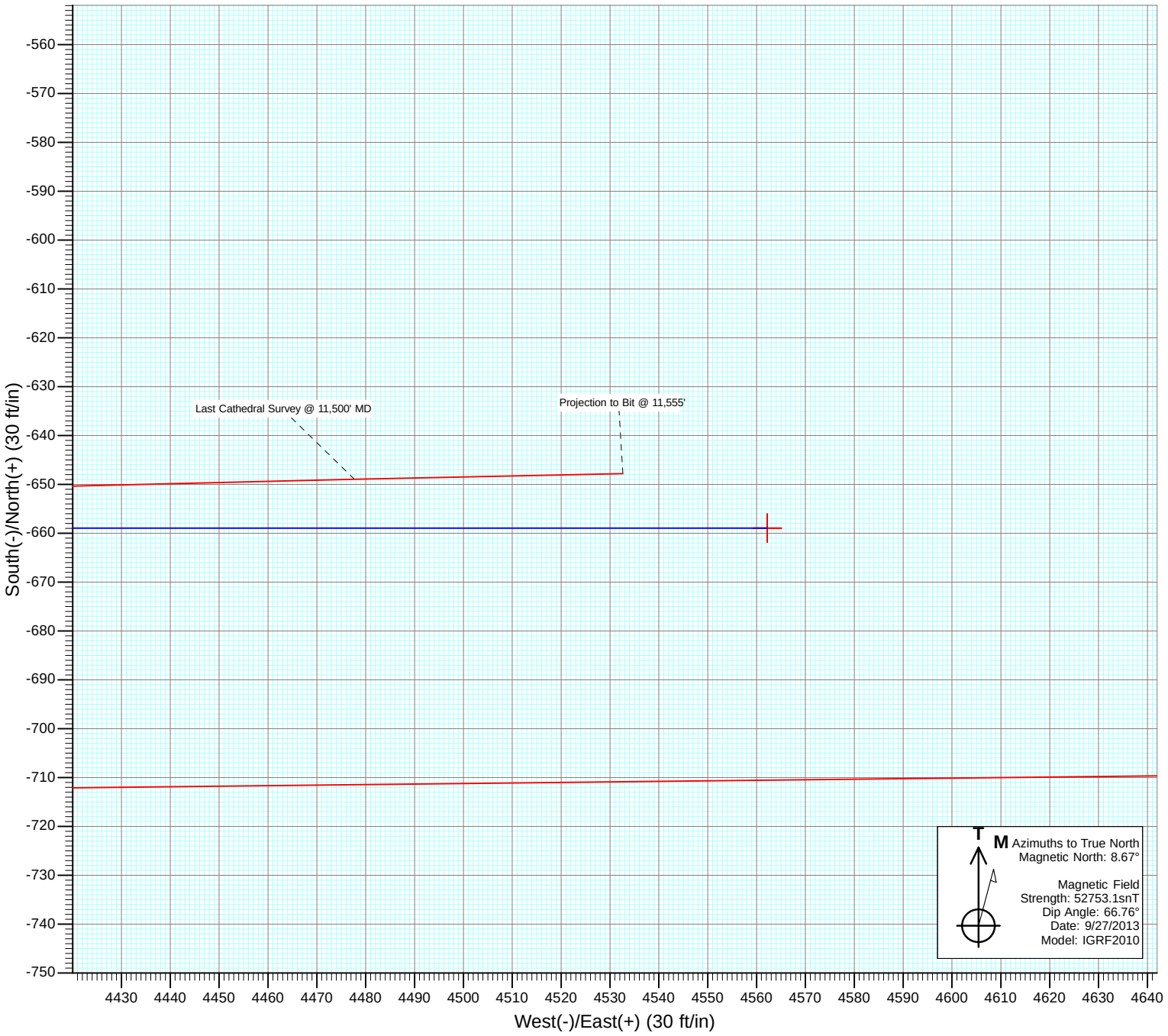

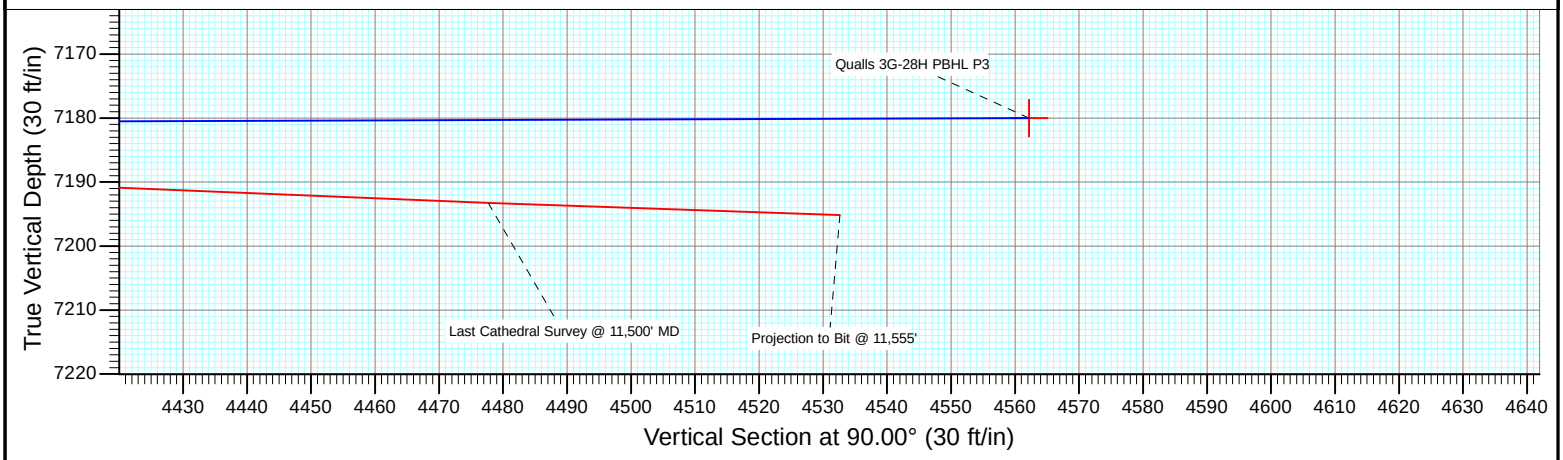

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Qualls 3G-28H
Project:	DJ Wattenberg	**TVD Reference:**	KB @ 4982.0ft
Site:	S28-T3N-R68W (Qualls)	**MD Reference:**	KB @ 4982.0ft
Well:	Qualls 3G-28H	**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 S28-T3N-R68W (Qualls)

Site Position:		**Northing:**	1,313,038.99 ft	**Latitude:**	40.191670
From:	Lat/Long	**Easting:**	3,135,104.30 ft	**Longitude:**	-105.016410
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.31 °

Well Qualls 3G-28H

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,312,977.16 ft	**Latitude:**	40.191500
	+E/-W	0.0 ft	**Easting:**	3,135,124.20 ft	**Longitude:**	-105.016340
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,957.0 ft

Wellbore Hz

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/27/2013	8.67	66.76	52,753

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	90.00

Survey Program **Date** 10/11/2013

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
143.0	11,555.0	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	
143.0	1.10	250.60	143.0	-0.5	-1.3	-1.3	0.77	0.77	
235.0	1.60	244.40	235.0	-1.3	-3.3	-3.3	0.57	0.54	
327.0	2.90	235.20	326.9	-3.2	-6.4	-6.4	1.46	1.41	
419.0	3.69	222.50	418.7	-6.7	-10.3	-10.3	1.16	0.86	
511.0	4.79	209.88	510.5	-12.2	-14.2	-14.2	1.56	1.20	
603.0	5.80	197.90	602.1	-20.0	-17.5	-17.5	1.62	1.10	
695.0	6.99	190.81	693.5	-29.9	-20.0	-20.0	1.55	1.29	
800.0	8.09	187.82	797.6	-43.5	-22.2	-22.2	1.11	1.05	
920.0	8.20	188.10	916.4	-60.3	-24.6	-24.6	0.10	0.09	
1,012.0	8.80	191.70	1,007.4	-73.7	-26.9	-26.9	0.87	0.65	
1,104.0	11.30	201.20	1,098.0	-89.0	-31.6	-31.6	3.25	2.72	
1,196.0	10.20	201.20	1,188.4	-105.0	-37.8	-37.8	1.20	-1.20	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Qualls 3G-28H
Project:	DJ Wattenberg	**TVD Reference:**	KB @ 4982.0ft
Site:	S28-T3N-R68W (Qualls)	**MD Reference:**	KB @ 4982.0ft
Well:	Qualls 3G-28H	**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
1,288.0	9.20	202.00	1,279.1	-119.4	-43.5	-43.5	1.10	-1.09	
1,380.0	8.20	199.40	1,370.0	-132.4	-48.4	-48.4	1.17	-1.09	
1,472.0	9.10	201.90	1,460.9	-145.4	-53.3	-53.3	1.06	0.98	
1,564.0	8.30	196.10	1,551.9	-158.5	-57.9	-57.9	1.29	-0.87	
1,656.0	11.00	198.00	1,642.6	-173.2	-62.4	-62.4	2.95	2.93	
1,747.0	9.50	188.40	1,732.1	-188.9	-66.2	-66.2	2.49	-1.65	
1,839.0	10.00	195.20	1,822.8	-204.1	-69.4	-69.4	1.36	0.54	
1,931.0	11.40	200.40	1,913.2	-220.4	-74.7	-74.7	1.85	1.52	
2,026.0	10.90	192.90	2,006.4	-237.9	-80.0	-80.0	1.61	-0.53	
2,120.0	9.70	203.50	2,098.9	-253.9	-85.1	-85.1	2.38	-1.28	
2,215.0	9.00	199.40	2,192.6	-268.2	-90.8	-90.8	1.02	-0.74	
2,309.0	10.50	205.20	2,285.3	-282.9	-96.9	-96.9	1.91	1.60	
2,404.0	9.80	200.40	2,378.8	-298.3	-103.4	-103.4	1.16	-0.74	
2,499.0	9.20	196.30	2,472.5	-313.2	-108.3	-108.3	0.95	-0.63	
2,593.0	8.40	192.40	2,565.4	-327.1	-111.9	-111.9	1.06	-0.85	
2,688.0	9.70	199.70	2,659.2	-341.4	-116.1	-116.1	1.82	1.37	
2,783.0	8.90	198.60	2,753.0	-355.9	-121.1	-121.1	0.86	-0.84	
2,877.0	10.00	211.30	2,845.7	-369.8	-127.7	-127.7	2.50	1.17	
2,972.0	11.60	217.30	2,939.0	-384.4	-137.8	-137.8	2.06	1.68	
3,067.0	9.60	214.60	3,032.4	-398.5	-148.0	-148.0	2.17	-2.11	
3,161.0	11.00	206.10	3,124.9	-413.0	-156.4	-156.4	2.19	1.49	
3,256.0	9.40	207.90	3,218.4	-428.0	-164.1	-164.1	1.72	-1.68	
3,350.0	10.30	203.30	3,311.0	-442.5	-171.0	-171.0	1.27	0.96	
3,445.0	9.50	201.20	3,404.6	-457.6	-177.2	-177.2	0.92	-0.84	
3,540.0	11.50	197.10	3,498.0	-474.0	-182.8	-182.8	2.25	2.11	
3,634.0	11.70	195.30	3,590.1	-492.2	-188.1	-188.1	0.44	0.21	
3,729.0	11.30	193.50	3,683.1	-510.5	-192.8	-192.8	0.57	-0.42	
3,824.0	9.60	190.10	3,776.6	-527.3	-196.3	-196.3	1.90	-1.79	
3,918.0	9.60	207.30	3,869.3	-542.0	-201.3	-201.3	3.04	0.00	
4,013.0	8.50	209.00	3,963.1	-555.2	-208.4	-208.4	1.19	-1.16	
4,108.0	8.40	208.80	4,057.1	-567.4	-215.1	-215.1	0.11	-0.11	
4,202.0	7.40	212.60	4,150.2	-578.6	-221.7	-221.7	1.20	-1.06	
4,297.0	6.90	210.00	4,244.4	-588.6	-227.8	-227.8	0.63	-0.53	
4,392.0	6.90	214.20	4,338.7	-598.3	-233.9	-233.9	0.53	0.00	
4,486.0	7.60	228.00	4,432.0	-607.1	-241.7	-241.7	1.99	0.74	
4,581.0	7.90	212.00	4,526.1	-616.9	-249.8	-249.8	2.29	0.32	
4,675.0	7.10	198.30	4,619.3	-627.9	-255.0	-255.0	2.08	-0.85	
4,770.0	6.00	198.60	4,713.7	-638.2	-258.5	-258.5	1.16	-1.16	
4,864.0	5.30	172.20	4,807.3	-647.1	-259.5	-259.5	2.84	-0.74	
4,959.0	4.00	175.10	4,902.0	-654.8	-258.6	-258.6	1.39	-1.37	
5,054.0	3.30	175.60	4,996.8	-660.8	-258.1	-258.1	0.74	-0.74	
5,148.0	0.90	121.60	5,090.7	-663.9	-257.2	-257.2	3.05	-2.55	
5,243.0	0.20	136.50	5,185.7	-664.4	-256.5	-256.5	0.75	-0.74	
5,338.0	0.30	27.10	5,280.7	-664.3	-256.3	-256.3	0.43	0.11	
5,432.0	1.50	72.60	5,374.7	-663.7	-255.0	-255.0	1.39	1.28	
5,527.0	3.00	73.00	5,469.6	-662.6	-251.4	-251.4	1.58	1.58	
5,622.0	1.80	59.70	5,564.5	-661.1	-247.8	-247.8	1.38	-1.26	
5,716.0	1.00	25.50	5,658.5	-659.6	-246.1	-246.1	1.20	-0.85	
5,810.0	1.80	86.90	5,752.5	-658.8	-244.3	-244.3	1.69	0.85	
5,905.0	1.20	79.80	5,847.4	-658.6	-241.8	-241.8	0.66	-0.63	
5,999.0	0.50	72.50	5,941.4	-658.3	-240.5	-240.5	0.75	-0.74	
6,094.0	0.40	350.40	6,036.4	-657.8	-240.1	-240.1	0.63	-0.11	
6,189.0	0.70	338.50	6,131.4	-656.9	-240.4	-240.4	0.34	0.32	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Qualls 3G-28H
Project:	DJ Wattenberg	**TVD Reference:**	KB @ 4982.0ft
Site:	S28-T3N-R68W (Qualls)	**MD Reference:**	KB @ 4982.0ft
Well:	Qualls 3G-28H	**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
6,283.0	0.70	317.90	6,225.4	-656.0	-241.0	-241.0	0.27	0.00	
6,346.0	0.70	307.10	6,288.4	-655.5	-241.6	-241.6	0.21	0.00	
6,378.0	0.90	296.50	6,320.4	-655.2	-241.9	-241.9	0.77	0.62	
6,409.0	1.30	79.80	6,351.4	-655.1	-241.8	-241.8	6.75	1.29	
6,441.0	5.30	94.50	6,383.3	-655.1	-240.0	-240.0	12.67	12.50	
6,472.0	8.70	103.70	6,414.1	-655.8	-236.3	-236.3	11.51	10.97	
6,504.0	12.50	102.50	6,445.6	-657.1	-230.5	-230.5	11.89	11.87	
6,536.0	15.60	100.40	6,476.6	-658.6	-222.9	-222.9	9.82	9.69	
6,567.0	19.70	99.00	6,506.1	-660.2	-213.7	-213.7	13.30	13.23	
6,599.0	23.60	99.40	6,535.9	-662.1	-202.0	-202.0	12.20	12.19	
6,630.0	26.30	97.90	6,564.0	-664.1	-189.1	-189.1	8.94	8.71	
6,662.0	27.90	93.80	6,592.5	-665.5	-174.6	-174.6	7.68	5.00	
6,693.0	30.70	90.40	6,619.5	-666.1	-159.4	-159.4	10.50	9.03	
6,725.0	33.70	88.50	6,646.6	-665.9	-142.4	-142.4	9.89	9.37	
6,756.0	36.10	89.20	6,672.0	-665.5	-124.7	-124.7	7.85	7.74	
6,788.0	37.40	89.50	6,697.6	-665.3	-105.5	-105.5	4.10	4.06	
6,819.0	40.90	90.10	6,721.7	-665.3	-85.9	-85.9	11.36	11.29	
6,851.0	43.60	90.90	6,745.4	-665.4	-64.4	-64.4	8.60	8.44	
6,882.0	47.10	88.70	6,767.1	-665.4	-42.4	-42.4	12.37	11.29	
6,914.0	50.10	88.50	6,788.3	-664.8	-18.4	-18.4	9.39	9.37	
6,945.0	51.90	89.90	6,807.8	-664.4	5.7	5.7	6.78	5.81	
6,960.0	52.90	90.50	6,817.0	-664.5	17.6	17.6	7.38	6.67	
7,046.0	53.70	90.10	6,868.4	-664.8	86.5	86.5	1.00	0.93	
7,141.0	55.20	89.00	6,923.6	-664.2	163.8	163.8	1.84	1.58	
7,172.0	53.10	88.70	6,941.7	-663.7	188.9	188.9	6.82	-6.77	
7,203.0	53.90	88.70	6,960.2	-663.2	213.9	213.9	2.58	2.58	
7,235.0	56.40	87.90	6,978.5	-662.4	240.1	240.1	8.08	7.81	
7,267.0	59.60	87.20	6,995.4	-661.2	267.2	267.2	10.17	10.00	
7,298.0	62.20	86.80	7,010.5	-659.8	294.3	294.3	8.46	8.39	
7,330.0	64.60	88.30	7,024.8	-658.6	322.8	322.8	8.59	7.50	
7,361.0	66.90	89.40	7,037.6	-658.0	351.1	351.1	8.09	7.42	
7,393.0	68.10	89.40	7,049.8	-657.7	380.7	380.7	3.75	3.75	
7,424.0	70.60	89.60	7,060.7	-657.4	409.7	409.7	8.09	8.06	
7,456.0	73.50	90.00	7,070.6	-657.3	440.1	440.1	9.14	9.06	
7,487.0	75.80	90.10	7,078.8	-657.4	470.0	470.0	7.43	7.42	
7,519.0	76.20	89.70	7,086.5	-657.3	501.0	501.0	1.74	1.25	
7,550.0	77.50	91.00	7,093.6	-657.5	531.2	531.2	5.85	4.19	
7,582.0	80.20	92.30	7,099.8	-658.4	562.6	562.6	9.33	8.44	
7,614.0	83.10	93.60	7,104.4	-660.0	594.2	594.2	9.91	9.06	
7,645.0	86.00	93.00	7,107.4	-661.8	625.0	625.0	9.55	9.35	
7,677.0	88.00	92.80	7,109.1	-663.4	656.9	656.9	6.28	6.25	
7,708.0	89.30	92.30	7,109.8	-664.8	687.9	687.9	4.49	4.19	
7,803.0	89.40	91.00	7,110.9	-667.5	782.9	782.9	1.37	0.11	
7,898.0	88.90	90.00	7,112.3	-668.4	877.8	877.8	1.18	-0.53	
7,992.0	89.00	90.40	7,114.0	-668.7	971.8	971.8	0.44	0.11	
8,087.0	88.80	89.00	7,115.8	-668.2	1,066.8	1,066.8	1.49	-0.21	
8,181.0	89.00	89.60	7,117.6	-667.0	1,160.8	1,160.8	0.67	0.21	
8,276.0	87.40	88.50	7,120.6	-665.5	1,255.7	1,255.7	2.04	-1.68	
8,371.0	86.00	88.70	7,126.1	-663.2	1,350.5	1,350.5	1.49	-1.47	
8,465.0	87.40	88.90	7,131.5	-661.2	1,444.3	1,444.3	1.50	1.49	
8,560.0	89.10	90.80	7,134.4	-660.9	1,539.3	1,539.3	2.68	1.79	
8,654.0	89.40	90.80	7,135.6	-662.3	1,633.3	1,633.3	0.32	0.32	
8,749.0	87.90	90.80	7,137.9	-663.6	1,728.2	1,728.2	1.58	-1.58	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Qualls 3G-28H
Project:	DJ Wattenberg	**TVD Reference:**	KB @ 4982.0ft
Site:	S28-T3N-R68W (Qualls)	**MD Reference:**	KB @ 4982.0ft
Well:	Qualls 3G-28H	**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
8,844.0	87.40	88.70	7,141.8	-663.2	1,823.2	1,823.2	2.27	-0.53	
8,938.0	88.50	89.60	7,145.1	-661.8	1,917.1	1,917.1	1.51	1.17	
9,033.0	88.70	90.90	7,147.4	-662.2	2,012.0	2,012.0	1.38	0.21	
9,128.0	87.70	90.00	7,150.4	-662.9	2,107.0	2,107.0	1.42	-1.05	
9,222.0	87.60	87.90	7,154.3	-661.2	2,200.9	2,200.9	2.23	-0.11	
9,317.0	89.30	88.80	7,156.8	-658.5	2,295.8	2,295.8	2.02	1.79	
9,412.0	89.10	88.70	7,158.2	-656.4	2,390.8	2,390.8	0.24	-0.21	
9,506.0	89.50	89.10	7,159.3	-654.6	2,484.8	2,484.8	0.60	0.43	
9,601.0	89.00	88.60	7,160.6	-652.7	2,579.7	2,579.7	0.74	-0.53	
9,696.0	88.90	88.10	7,162.3	-650.0	2,674.7	2,674.7	0.54	-0.11	
9,790.0	89.00	88.90	7,164.0	-647.5	2,768.6	2,768.6	0.86	0.11	
9,885.0	89.10	89.00	7,165.6	-645.8	2,863.6	2,863.6	0.15	0.11	
9,980.0	90.10	89.00	7,166.3	-644.1	2,958.6	2,958.6	1.05	1.05	
10,074.0	89.40	90.80	7,166.7	-643.9	3,052.6	3,052.6	2.05	-0.74	
10,169.0	89.60	91.30	7,167.5	-645.7	3,147.6	3,147.6	0.57	0.21	
10,263.0	89.80	91.70	7,168.0	-648.1	3,241.5	3,241.5	0.48	0.21	
10,358.0	89.90	91.30	7,168.2	-650.6	3,336.5	3,336.5	0.43	0.11	
10,453.0	88.10	88.30	7,169.9	-650.3	3,431.5	3,431.5	3.68	-1.89	
10,547.0	87.50	87.20	7,173.5	-646.6	3,525.3	3,525.3	1.33	-0.64	
10,642.0	89.00	88.80	7,176.4	-643.3	3,620.2	3,620.2	2.31	1.58	
10,736.0	88.80	89.80	7,178.2	-642.1	3,714.2	3,714.2	1.08	-0.21	
10,831.0	89.20	91.70	7,179.9	-643.4	3,809.2	3,809.2	2.04	0.42	
10,926.0	89.40	92.00	7,181.0	-646.5	3,904.1	3,904.1	0.38	0.21	
11,020.0	89.80	91.80	7,181.7	-649.6	3,998.0	3,998.0	0.48	0.43	
11,115.0	90.00	92.10	7,181.9	-652.8	4,093.0	4,093.0	0.38	0.21	
11,210.0	89.20	90.40	7,182.5	-654.9	4,188.0	4,188.0	1.98	-0.84	
11,304.0	87.70	88.50	7,185.1	-654.0	4,281.9	4,281.9	2.57	-1.60	
11,399.0	87.40	88.40	7,189.1	-651.4	4,376.8	4,376.8	0.33	-0.32	
11,500.0	87.90	88.80	7,193.3	-648.9	4,477.7	4,477.7	0.63	0.50	**Last Cathedral Survey @ 11,500' MD**
11,555.0	88.20	88.80	7,195.1	-647.8	4,532.6	4,532.6	0.55	0.55	**Projection to Bit @ 11,555'**

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Qualls 3G-28H
Project:	DJ Wattenberg	**TVD Reference:**	KB @ 4982.0ft
Site:	S28-T3N-R68W (Qualls)	**MD Reference:**	KB @ 4982.0ft
Well:	Qualls 3G-28H	**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 - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Qualls 3G-28H LP	0.00	0.00	7,070.0	-662.4	331.7	1,312,316.54	3,135,459.48	40.189681	-105.015153
- actual wellpath misses target center by 37.7ft at 7356.5ft MD (7035.8 TVD, -658.1 N, 347.0 E)									
- Point									
Qualls 3G-28H PBHL P3	0.00	0.00	7,180.0	-658.9	4,562.2	1,312,343.13	3,139,689.92	40.189690	-105.000010
- actual wellpath misses target center by 35.0ft at 11555.0ft MD (7195.1 TVD, -647.8 N, 4532.6 E)									
- Point									
Qualls 3G-28H PBHL P4	0.00	0.00	7,180.0	-658.9	4,562.2	1,312,343.13	3,139,689.92	40.189690	-105.000010
- actual wellpath misses target center by 35.0ft at 11555.0ft MD (7195.1 TVD, -647.8 N, 4532.6 E)									
- Point									
Qualls 3G-28H PBHL	0.00	0.00	7,098.0	-658.9	4,562.2	1,312,343.13	3,139,689.92	40.189690	-105.000010
- actual wellpath misses target center by 102.1ft at 11555.0ft MD (7195.1 TVD, -647.8 N, 4532.6 E)									
- Point									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
11,500.0	7,193.3	-648.9	4,477.7	Last Cathedral Survey @ 11,500' MD
11,555.0	7,195.1	-647.8	4,532.6	Projection to Bit @ 11,555'

Checked By: _____ Approved By: _____ Date: _____