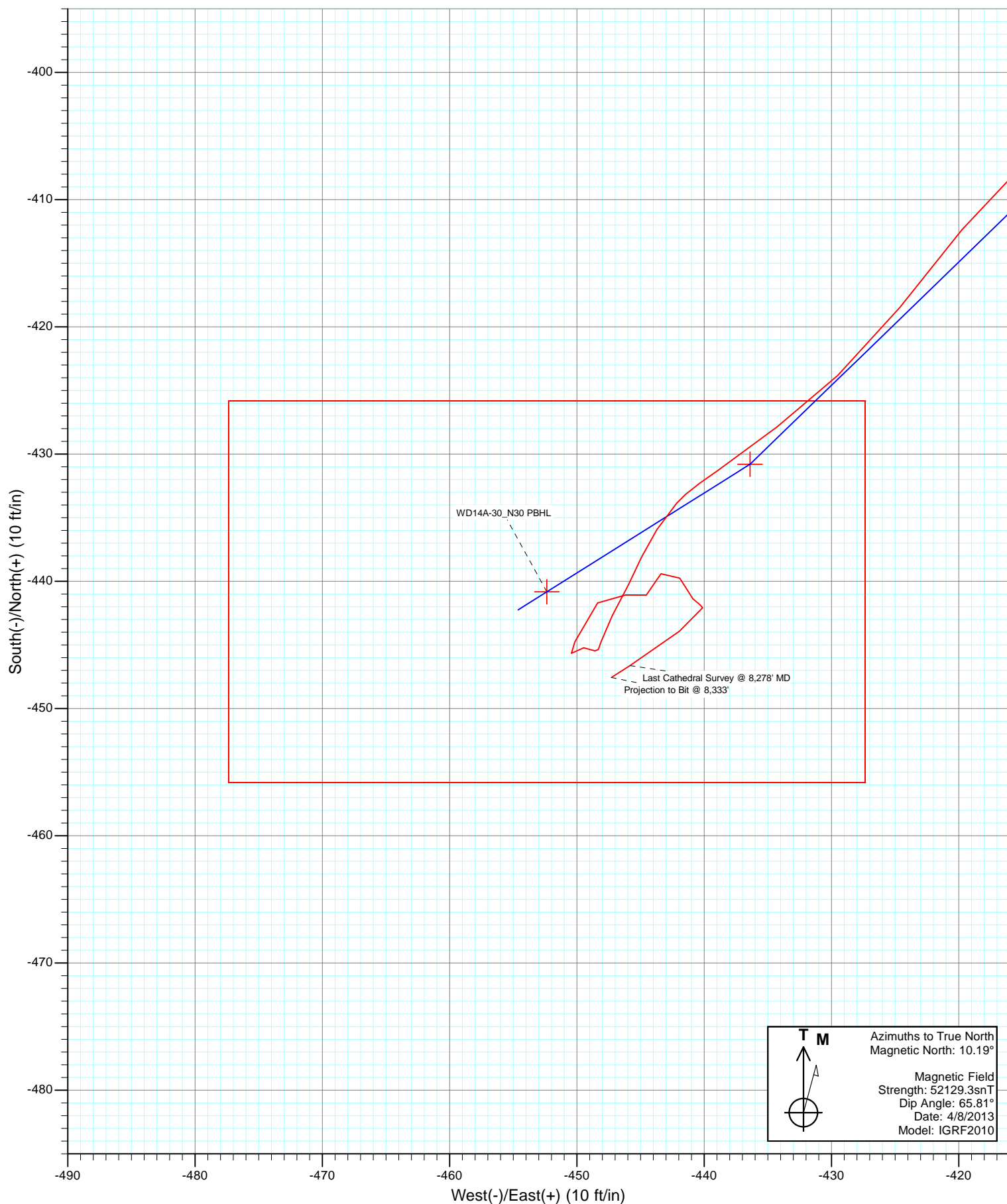




Project: Story Gulch
Site: N30 495
Well: WD14A-30_N30
Wellbore: DD
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well WD14A-30_N30
Project:	Story Gulch	TVD Reference:	WELL @ 8336.0ft (Patterson 306)
Site:	N30 495	MD Reference:	WELL @ 8336.0ft (Patterson 306)
Well:	WD14A-30_N30	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Project	Story Gulch		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		N30 495			
Site Position:		Northing:	1,679,450.30 ft	Latitude:	39° 40' 12.46 N
From:	Lat/Long	Easting:	2,268,163.89 ft	Longitude:	108° 6' 0.44 W
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.64 °

Well	WD14A-30_N30					
Well Position	+N/-S	0.0 ft	Northing:	1,679,409.26 ft	Latitude:	39° 40' 12.05 N
	+E/-W	0.0 ft	Easting:	2,268,120.13 ft	Longitude:	108° 6' 0.99 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	8,312.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/8/2013	10.19	65.81	52,129

Design	DD				
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	225.74	

Survey Program	Date	4/15/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
179.0	2,950.0	Survey #1 (DD)	MWD	Geolink MWD	
3,072.0	8,333.0	Survey #2 (DD)	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	
2,950.0	7.70	221.00	2,935.1	-185.3	-185.9	262.5	0.00	0.00		
3,072.0	7.00	227.60	3,056.1	-196.5	-196.8	278.1	0.90	-0.57		
3,167.0	5.40	210.00	3,150.5	-204.3	-203.3	288.2	2.60	-1.68		
3,262.0	7.20	213.70	3,244.9	-213.1	-208.8	298.3	1.94	1.89		
3,357.0	7.20	224.40	3,339.2	-222.3	-216.3	310.1	1.41	0.00		
3,452.0	6.80	220.20	3,433.5	-230.9	-224.1	321.6	0.68	-0.42		
3,547.0	7.30	223.20	3,527.8	-239.6	-231.9	333.3	0.65	0.53		
3,642.0	7.30	233.10	3,622.0	-247.6	-240.8	345.3	1.32	0.00		
3,737.0	6.20	228.20	3,716.3	-254.6	-249.5	356.4	1.31	-1.16		
3,831.0	5.40	225.60	3,809.8	-261.1	-256.4	365.9	0.90	-0.85		
3,926.0	5.80	223.40	3,904.4	-267.7	-262.9	375.1	0.48	0.42		
4,021.0	5.30	230.40	3,999.0	-274.0	-269.6	384.3	0.88	-0.53		

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well WD14A-30_N30
Project:	Story Gulch	TVD Reference:	WELL @ 8336.0ft (Patterson 306)
Site:	N30 495	MD Reference:	WELL @ 8336.0ft (Patterson 306)
Well:	WD14A-30_N30	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	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
4,116.0	6.80	229.80	4,093.4	-280.4	-277.3	394.3	1.58	1.58	
4,211.0	7.90	228.30	4,187.6	-288.4	-286.4	406.4	1.18	1.16	
4,305.0	6.70	226.90	4,280.9	-296.5	-295.3	418.4	1.29	-1.28	
4,400.0	7.60	227.80	4,375.1	-304.5	-304.0	430.2	0.95	0.95	
4,495.0	7.30	223.80	4,469.3	-313.0	-312.8	442.5	0.63	-0.32	
4,590.0	7.40	227.00	4,563.6	-321.6	-321.4	454.6	0.44	0.11	
4,685.0	6.70	223.90	4,657.8	-329.7	-329.8	466.3	0.84	-0.74	
4,779.0	7.00	223.10	4,751.2	-337.9	-337.5	477.5	0.33	0.32	
4,874.0	6.70	223.70	4,845.5	-346.1	-345.3	488.8	0.32	-0.32	
4,969.0	7.30	232.60	4,939.8	-353.8	-353.9	500.4	1.30	0.63	
5,064.0	6.60	230.90	5,034.1	-360.9	-362.9	511.8	0.77	-0.74	
5,159.0	6.10	229.20	5,128.5	-367.6	-371.0	522.3	0.56	-0.53	
5,254.0	6.00	226.80	5,223.0	-374.3	-378.4	532.3	0.29	-0.11	
5,349.0	5.70	224.00	5,317.5	-381.1	-385.3	541.9	0.44	-0.32	
5,444.0	6.50	231.30	5,411.9	-387.9	-392.8	552.0	1.17	0.84	
5,539.0	6.10	230.80	5,506.4	-394.4	-400.9	562.4	0.42	-0.42	
5,634.0	5.30	227.20	5,600.9	-400.6	-408.0	571.8	0.92	-0.84	
5,729.0	5.00	225.70	5,695.5	-406.5	-414.2	580.3	0.35	-0.32	
5,824.0	4.80	220.50	5,790.2	-412.4	-419.8	588.4	0.51	-0.21	
5,919.0	4.60	216.80	5,884.8	-418.5	-424.6	596.2	0.38	-0.21	
6,014.0	4.20	228.40	5,979.6	-423.8	-429.5	603.4	1.02	-0.42	
6,106.0	3.60	231.20	6,071.4	-427.9	-434.3	609.6	0.68	-0.65	
6,200.0	3.50	236.20	6,165.2	-431.3	-439.0	615.4	0.35	-0.11	
6,295.0	1.50	220.30	6,260.1	-433.9	-442.2	619.5	2.21	-2.11	
6,390.0	1.60	213.20	6,355.0	-435.9	-443.7	622.0	0.23	0.11	
6,485.0	1.40	204.70	6,450.0	-438.1	-444.9	624.4	0.31	-0.21	
6,580.0	1.50	206.00	6,545.0	-440.3	-445.9	626.6	0.11	0.11	
6,675.0	1.80	209.10	6,639.9	-442.7	-447.2	629.2	0.33	0.32	
6,769.0	1.00	192.00	6,733.9	-444.8	-448.1	631.3	0.95	-0.85	
6,864.0	0.40	293.40	6,828.9	-445.5	-448.6	632.2	1.21	-0.63	
6,959.0	0.70	280.50	6,923.9	-445.2	-449.5	632.6	0.34	0.32	
7,054.0	0.80	216.80	7,018.9	-445.7	-450.4	633.6	0.84	0.11	
7,148.0	1.90	25.00	7,112.9	-444.8	-450.2	632.8	2.86	1.17	
7,243.0	2.40	34.30	7,207.8	-441.7	-448.4	629.4	0.64	0.53	
7,338.0	1.80	133.60	7,302.8	-441.1	-446.2	627.4	3.39	-0.63	
7,433.0	1.40	27.80	7,397.8	-441.1	-444.5	626.2	2.70	-0.42	
7,527.0	1.10	42.70	7,491.7	-439.4	-443.4	624.2	0.47	-0.32	
7,622.0	1.60	139.50	7,586.7	-439.7	-441.9	623.4	2.15	0.53	
7,717.0	0.80	163.80	7,681.7	-441.4	-440.9	623.8	0.98	-0.84	
7,812.0	0.50	69.10	7,776.7	-441.9	-440.3	623.7	1.03	-0.32	
7,907.0	0.50	209.60	7,871.7	-442.1	-440.1	623.7	0.99	0.00	
8,278.0	1.80	237.50	8,242.6	-446.6	-445.8	631.0	0.37	0.35	Last Cathedral Survey @ 8,278' MD Projection to Bit @ 8,333'
8,333.0	1.80	237.50	8,297.6	-447.6	-447.3	632.7	0.00	0.00	

Cathedral Energy Services

Survey Report

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Project:	Story Gulch	TVD Reference:	WELL @ 8336.0ft (Patterson 306)
Site:	N30 495	MD Reference:	WELL @ 8336.0ft (Patterson 306)
Well:	WD14A-30_N30	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	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									
WD14A-30_N30 PBHL	0.00	0.00	8,383.4	-440.8	-452.4	1,678,981.56	2,267,655.35	39° 40' 7.69 N	108° 6' 6.77 W
- survey misses target center by 86.2ft at 8333.0ft MD (8297.6 TVD, -447.6 N, -447.3 E)									
- Rectangle (sides W30.0 H50.0 D0.0)									
WD14A-30_N30 TGT	0.00	0.00	6,158.4	-430.8	-436.4	1,678,991.12	2,267,671.58	39° 40' 7.79 N	108° 6' 6.57 W
- survey misses target center by 2.2ft at 6193.1ft MD (6158.3 TVD, -431.1 N, -438.6 E)									
- Point									

Survey Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	Comment	
8,278.0	8,242.6	-446.6	-445.8	Last Cathedral Survey @ 8,278' MD	
8,333.0	8,297.6	-447.6	-447.3	Projection to Bit @ 8,333'	

Checked By: _____ Approved By: _____ Date: _____