

Noble Energy

Weld County, CO (NAD 83)
Sec. 9-T4N-R64W (Alter 9 PAD)
Alter C16-29D - A1

Sidetrack #1

Plan: Plan B - Rev 0 Proposal

Sperry Drilling Services Proposal Report

06 February, 2012

Well Coordinates: 1,361,209.77 N, 3,261,346.59 E (40° 19' 16.07" N, 104° 33' 45.72" W)

Ground Level: 4,700.00 ft

Local Coordinate Origin: Centered on Well Alter C16-29D - Slot A1

Viewing Datum: KB @ 4724.00ft (H&P 322)

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Plan Report for Alter C16-29D - Plan B - Rev 0 Proposal

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
2,000.00	16.06	132.51	1,979.99	-115.83	138.25	180.20	0.00	0.00	0.00	0.00
Begin Lowside Sidetrack										
2,038.30	13.00	132.00	2,017.06	-122.29	145.36	189.81	8.00	-7.99	-1.32	-177.87
Begin 100.00ft Tangent at 2038.30ft										
2,100.00	13.00	132.00	2,077.18	-131.58	155.67	203.69	0.00	0.00	0.00	0.00
2,138.30	13.00	132.00	2,114.50	-137.34	162.07	212.31	0.00	0.00	0.00	0.00
Begin 2.0°/100ft Drop and Turn at 2138.30ft										
2,200.00	11.77	132.22	2,174.76	-146.21	171.89	225.54	2.00	-2.00	0.36	177.89
2,300.00	9.77	132.70	2,273.00	-158.82	185.68	244.22	2.00	-2.00	0.48	177.67
2,400.00	7.77	133.43	2,371.82	-169.22	196.82	259.46	2.00	-2.00	0.72	177.20
2,426.15	7.25	133.68	2,397.75	-171.58	199.30	262.88	2.00	-1.99	0.97	176.48
Begin 2258.78ft Tangent at 2426.15ft										
2,500.00	7.25	133.68	2,471.01	-178.01	206.04	272.20	0.00	0.00	0.00	0.00
2,600.00	7.25	133.68	2,570.21	-186.73	215.17	284.82	0.00	0.00	0.00	0.00
2,700.00	7.25	133.68	2,669.41	-195.45	224.30	297.43	0.00	0.00	0.00	0.00
2,800.00	7.25	133.68	2,768.61	-204.16	233.42	310.05	0.00	0.00	0.00	0.00
2,900.00	7.25	133.68	2,867.81	-212.88	242.55	322.67	0.00	0.00	0.00	0.00
3,000.00	7.25	133.68	2,967.01	-221.59	251.68	335.28	0.00	0.00	0.00	0.00
3,100.00	7.25	133.68	3,066.21	-230.31	260.80	347.90	0.00	0.00	0.00	0.00
3,200.00	7.25	133.68	3,165.41	-239.03	269.93	360.52	0.00	0.00	0.00	0.00
3,300.00	7.25	133.68	3,264.61	-247.74	279.06	373.13	0.00	0.00	0.00	0.00
3,400.00	7.25	133.68	3,363.81	-256.46	288.19	385.75	0.00	0.00	0.00	0.00
3,500.00	7.25	133.68	3,463.01	-265.17	297.31	398.37	0.00	0.00	0.00	0.00
3,600.00	7.25	133.68	3,562.21	-273.89	306.44	410.98	0.00	0.00	0.00	0.00
3,700.00	7.25	133.68	3,661.42	-282.61	315.57	423.60	0.00	0.00	0.00	0.00
3,800.00	7.25	133.68	3,760.62	-291.32	324.69	436.22	0.00	0.00	0.00	0.00
3,900.00	7.25	133.68	3,859.82	-300.04	333.82	448.83	0.00	0.00	0.00	0.00
4,000.00	7.25	133.68	3,959.02	-308.75	342.95	461.45	0.00	0.00	0.00	0.00
4,100.00	7.25	133.68	4,058.22	-317.47	352.07	474.07	0.00	0.00	0.00	0.00
4,200.00	7.25	133.68	4,157.42	-326.19	361.20	486.68	0.00	0.00	0.00	0.00
4,300.00	7.25	133.68	4,256.62	-334.90	370.33	499.30	0.00	0.00	0.00	0.00
4,400.00	7.25	133.68	4,355.82	-343.62	379.46	511.92	0.00	0.00	0.00	0.00
4,500.00	7.25	133.68	4,455.02	-352.33	388.58	524.53	0.00	0.00	0.00	0.00
4,600.00	7.25	133.68	4,554.22	-361.05	397.71	537.15	0.00	0.00	0.00	0.00
4,684.93	7.25	133.68	4,638.47	-368.45	405.46	547.87	0.00	0.00	0.00	0.00
Begin 2.0°/100ft Drop to Vertical at 4684.93ft										
4,700.00	6.95	133.68	4,653.42	-369.74	406.81	549.73	2.00	-2.00	0.00	180.00
4,800.00	4.95	133.68	4,752.88	-376.90	414.30	560.09	2.00	-2.00	0.00	180.00
4,900.00	2.95	133.68	4,852.64	-381.65	419.28	566.97	2.00	-2.00	0.00	180.00
5,000.00	0.95	133.68	4,952.58	-384.00	421.74	570.37	2.00	-2.00	0.00	180.00
5,047.43	0.00	0.00	5,000.00	-384.27	422.03	570.76	2.00	-2.00	0.00	-180.00
End of Drop at 5047.43ft										
5,100.00	0.00	0.00	5,052.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,152.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,252.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,352.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,452.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,552.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,652.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,752.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,852.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,952.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,052.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,152.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,252.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,352.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,452.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,552.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00

Plan Report for Alter C16-29D - Plan B - Rev 0 Proposal

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
6,646.43	0.00	0.00	6,599.00	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
Niobrara										
6,700.00	0.00	0.00	6,652.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,752.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,852.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
6,936.43	0.00	0.00	6,889.00	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
Codell										
7,000.00	0.00	0.00	6,952.57	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
7,086.43	0.00	0.00	7,039.00	-384.27	422.03	570.76	0.00	0.00	0.00	0.00
Total Depth at 7086.43ft										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,000.00	1,979.99	-115.83	138.25	Begin Lowside Sidetrack
2,038.30	2,017.06	-122.29	145.36	Begin 100.00ft Tangent at 2038.30ft
2,138.30	2,114.50	-137.34	162.07	Begin 2.0°/100ft Drop and Turn at 2138.30ft
2,426.15	2,397.75	-171.58	199.30	Begin 2258.78ft Tangent at 2426.15ft
4,684.93	4,638.47	-368.45	405.46	Begin 2.0°/100ft Drop to Vertical at 4684.93ft
5,047.43	5,000.00	-384.27	422.03	End of Drop at 5047.43ft
7,086.43	7,039.00	-384.27	422.03	Total Depth at 7086.43ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Alter C16-29D_PlanB - Rev0_BHL Tgt	132.32	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
250.00	2,000.00	Original Wellbore MWD Surveys	MWD
2,000.00	7,086.43	Plan B - Rev 0 Proposal	MWD

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,646.43	6,599.00	Niobrara		0.00	
6,936.43	6,889.00	Codell		0.00	

Plan Report for Alter C16-29D - Plan B - Rev 0 Proposal

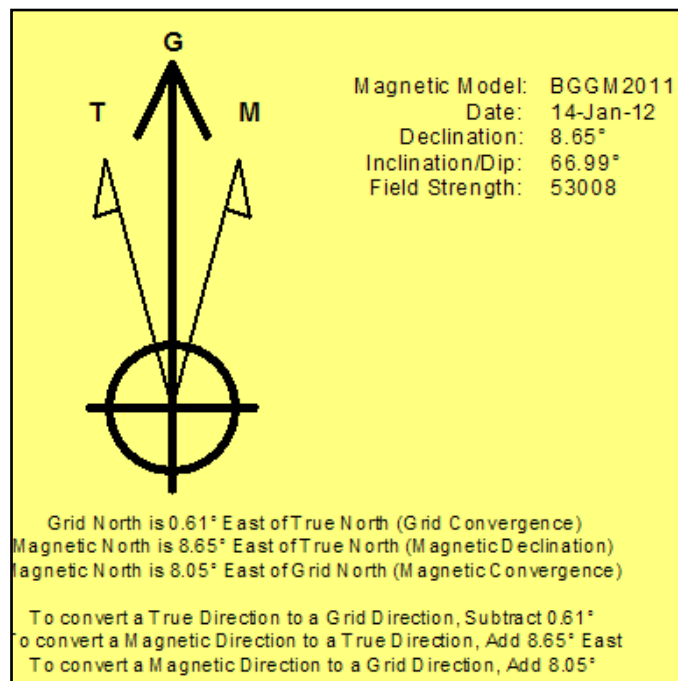
Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Alter C16-29D_Sec. 16 460' Setbacks	0.00	0.00	0.00	Polygon
Alter C16-29D_Sec. 16 Lines	0.00	0.00	0.00	Polygon
Alter C16-29D_PlanB - Rev0_BHL Tgt	7,039.00	-384.27	422.03	Point
Alter C16-29D_Sec. 9 Lines	0.00	0.00	0.00	Polygon
Alter C16-29D_Sec. 9 460' Setbacks	0.00	0.00	0.00	Polygon
Alter C16-29D_PlanB - Rev0_Vert Tgt	5,000.00	-384.27	422.03	Circle

North Reference Sheet for Sec. 9-T4N-R64W (Alter 9 PAD) - Alter C16-29D - Sidetrack #1

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.
 Vertical Depths are relative to KB @ 4724.00ft (H&P 322). Northing and Easting are relative to Alter C16-29D - Slot A1
 Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980
 Projection method is Lambert Conformal Conic (2 parallel)
 Central Meridian is -105.50°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°
 False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995760
 Grid Coordinates of Well: 1,361,209.77 ft N, 3,261,346.59 ft E
 Geographical Coordinates of Well: 40° 19' 16.07" N, 104° 33' 45.72" W
 Grid Convergence at Surface is: 0.61°

Based upon Minimum Curvature type calculations, at a Measured Depth of 7,086.43ft
 the Bottom Hole Displacement is 570.76ft in the Direction of 132.32° (Grid).
 Magnetic Convergence at surface is: -8.05° (14 January 2012, , BGGM2011)



Plan: Plan B - Rev 0 Proposal (Alter C16-29D/Sidetrack #1)
Created By: Jay Lantz Date: 16:04, February 06 2012
Approved: Date: