

Noble Energy

Garfield County, CO

Sec. 20-T7S-R94W

Long 20-13A

Plan #1

Plan: Plan #1 Proposal

Sperry Drilling Services

Proposal Report

21 January, 2009

Well Coordinates: 589,013.27 N, 1,317,864.03 E (39° 25' 32.69" N, 107° 54' 54.05" W)

Ground Level: 7,906.00 ft

Local Coordinate Origin:

Centered on Well Long 20-13A

Viewing Datum:

RKB 25' @ 7931.00ft (Original Well Elev)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 42

HALLIBURTON

Plan Report for Long 20-13A - Plan #1 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 (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.00	0.00	0.00	225.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kickoff at 225.00ft										
300.00	1.50	211.67	299.99	-0.84	-0.52	0.98	2.00	2.00	0.00	211.67
390.00	3.30	211.67	389.91	-4.04	-2.49	4.75	2.00	2.00	0.00	0.00
Build Rate = 2.00 °/100ft										
400.00	3.50	211.67	399.89	-4.55	-2.81	5.34	2.00	2.00	0.00	0.00
500.00	5.50	211.67	499.58	-11.22	-6.92	13.18	2.00	2.00	0.00	0.00
550.64	6.51	211.67	549.94	-15.73	-9.71	18.47	2.00	2.00	0.00	0.00
End Build at 550.64ft										
600.00	6.51	211.67	598.98	-20.50	-12.65	24.07	0.00	0.00	0.00	0.00
700.00	6.51	211.67	698.34	-30.15	-18.60	35.40	0.00	0.00	0.00	0.00
800.00	6.51	211.67	797.69	-39.81	-24.56	46.73	0.00	0.00	0.00	0.00
900.00	6.51	211.67	897.04	-49.46	-30.51	58.06	0.00	0.00	0.00	0.00
1,000.00	6.51	211.67	996.40	-59.11	-36.47	69.40	0.00	0.00	0.00	0.00
1,100.00	6.51	211.67	1,095.75	-68.77	-42.42	80.73	0.00	0.00	0.00	0.00
1,200.00	6.51	211.67	1,195.11	-78.42	-48.38	92.06	0.00	0.00	0.00	0.00
1,300.00	6.51	211.67	1,294.46	-88.07	-54.33	103.39	0.00	0.00	0.00	0.00
1,400.00	6.51	211.67	1,393.82	-97.72	-60.29	114.73	0.00	0.00	0.00	0.00
1,500.00	6.51	211.67	1,493.17	-107.38	-66.25	126.06	0.00	0.00	0.00	0.00
1,600.00	6.51	211.67	1,592.53	-117.03	-72.20	137.39	0.00	0.00	0.00	0.00
1,700.00	6.51	211.67	1,691.88	-126.68	-78.16	148.73	0.00	0.00	0.00	0.00
1,800.00	6.51	211.67	1,791.24	-136.34	-84.11	160.06	0.00	0.00	0.00	0.00
1,900.00	6.51	211.67	1,890.59	-145.99	-90.07	171.39	0.00	0.00	0.00	0.00
2,000.00	6.51	211.67	1,989.95	-155.64	-96.02	182.72	0.00	0.00	0.00	0.00
2,100.00	6.51	211.67	2,089.30	-165.30	-101.98	194.06	0.00	0.00	0.00	0.00
2,200.00	6.51	211.67	2,188.66	-174.95	-107.93	205.39	0.00	0.00	0.00	0.00
2,300.00	6.51	211.67	2,288.01	-184.60	-113.89	216.72	0.00	0.00	0.00	0.00
2,400.00	6.51	211.67	2,387.36	-194.26	-119.84	228.05	0.00	0.00	0.00	0.00
2,500.00	6.51	211.67	2,486.72	-203.91	-125.80	239.39	0.00	0.00	0.00	0.00
8 5/8" Casing Pt.										
2,600.00	6.51	211.67	2,586.07	-213.56	-131.76	250.72	0.00	0.00	0.00	0.00
2,700.00	6.51	211.67	2,685.43	-223.22	-137.71	262.05	0.00	0.00	0.00	0.00
2,800.00	6.51	211.67	2,784.78	-232.87	-143.67	273.39	0.00	0.00	0.00	0.00
2,900.00	6.51	211.67	2,884.14	-242.52	-149.62	284.72	0.00	0.00	0.00	0.00
3,000.00	6.51	211.67	2,983.49	-252.18	-155.58	296.05	0.00	0.00	0.00	0.00
3,100.00	6.51	211.67	3,082.85	-261.83	-161.53	307.38	0.00	0.00	0.00	0.00
3,200.00	6.51	211.67	3,182.20	-271.48	-167.49	318.72	0.00	0.00	0.00	0.00
3,300.00	6.51	211.67	3,281.56	-281.14	-173.44	330.05	0.00	0.00	0.00	0.00
6.51 Inclination										
3,400.00	6.51	211.67	3,380.91	-290.79	-179.40	341.38	0.00	0.00	0.00	0.00
3,500.00	6.51	211.67	3,480.27	-300.44	-185.35	352.71	0.00	0.00	0.00	0.00
3,600.00	6.51	211.67	3,579.62	-310.10	-191.31	364.05	0.00	0.00	0.00	0.00
3,700.00	6.51	211.67	3,678.98	-319.75	-197.27	375.38	0.00	0.00	0.00	0.00
3,800.00	6.51	211.67	3,778.33	-329.40	-203.22	386.71	0.00	0.00	0.00	0.00
3,900.00	6.51	211.67	3,877.68	-339.06	-209.18	398.05	0.00	0.00	0.00	0.00
4,000.00	6.51	211.67	3,977.04	-348.71	-215.13	409.38	0.00	0.00	0.00	0.00
4,100.00	6.51	211.67	4,076.39	-358.36	-221.09	420.71	0.00	0.00	0.00	0.00
4,200.00	6.51	211.67	4,175.75	-368.01	-227.04	432.04	0.00	0.00	0.00	0.00
4,300.00	6.51	211.67	4,275.10	-377.67	-233.00	443.38	0.00	0.00	0.00	0.00
4,400.00	6.51	211.67	4,374.46	-387.32	-238.95	454.71	0.00	0.00	0.00	0.00
4,500.00	6.51	211.67	4,473.81	-396.97	-244.91	466.04	0.00	0.00	0.00	0.00
4,600.00	6.51	211.67	4,573.17	-406.63	-250.86	477.37	0.00	0.00	0.00	0.00
4,700.00	6.51	211.67	4,672.52	-416.28	-256.82	488.71	0.00	0.00	0.00	0.00
4,800.00	6.51	211.67	4,771.88	-425.93	-262.78	500.04	0.00	0.00	0.00	0.00
4,900.00	6.51	211.67	4,871.23	-435.59	-268.73	511.37	0.00	0.00	0.00	0.00

Plan Report for Long 20-13A - Plan #1 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 (°)
5,000.00	6.51	211.67	4,970.59	-445.24	-274.69	522.71	0.00	0.00	0.00	0.00
5,100.00	6.51	211.67	5,069.94	-454.89	-280.64	534.04	0.00	0.00	0.00	0.00
5,200.00	6.51	211.67	5,169.29	-464.55	-286.60	545.37	0.00	0.00	0.00	0.00
5,300.00	6.51	211.67	5,268.65	-474.20	-292.55	556.70	0.00	0.00	0.00	0.00
5,400.00	6.51	211.67	5,368.00	-483.85	-298.51	568.04	0.00	0.00	0.00	0.00
5,500.00	6.51	211.67	5,467.36	-493.51	-304.46	579.37	0.00	0.00	0.00	0.00
5,600.00	6.51	211.67	5,566.71	-503.16	-310.42	590.70	0.00	0.00	0.00	0.00
5,700.00	6.51	211.67	5,666.07	-512.81	-316.37	602.03	0.00	0.00	0.00	0.00
5,800.00	6.51	211.67	5,765.42	-522.47	-322.33	613.37	0.00	0.00	0.00	0.00
5,900.00	6.51	211.67	5,864.78	-532.12	-328.29	624.70	0.00	0.00	0.00	0.00
6,000.00	6.51	211.67	5,964.13	-541.77	-334.24	636.03	0.00	0.00	0.00	0.00
6,004.65	6.51	211.67	5,968.75	-542.22	-334.52	636.56	0.00	0.00	0.00	0.00
Begin Drop at 6004.65ft										
6,100.00	5.08	211.67	6,063.61	-550.42	-339.57	646.18	1.50	-1.50	0.00	180.00
6,200.00	3.58	211.67	6,163.32	-556.85	-343.54	653.73	1.50	-1.50	0.00	180.00
6,215.00	3.36	211.67	6,178.30	-557.62	-344.02	654.64	1.50	-1.50	0.00	-180.00
Drop Rate = 1.50°/100ft										
6,300.00	2.08	211.67	6,263.20	-561.05	-346.14	658.67	1.50	-1.50	0.00	180.00
6,400.00	0.58	211.67	6,363.17	-563.03	-347.36	660.99	1.50	-1.50	0.00	180.00
6,438.83	0.00	0.00	6,402.00	-563.20	-347.46	661.19	1.50	-1.50	0.00	180.00
End Drop at 6438.83ft - Williams Fork - Long 20-13A Plan #1 Driller's Tgt										
6,500.00	0.05	243.43	6,463.17	-563.21	-347.48	661.21	0.08	0.08	0.00	243.43
6,600.00	0.13	243.43	6,563.17	-563.28	-347.62	661.35	0.08	0.08	0.00	0.00
6,700.00	0.21	243.43	6,663.17	-563.41	-347.89	661.60	0.08	0.08	0.00	0.00
6,800.00	0.29	243.43	6,763.17	-563.61	-348.27	661.98	0.08	0.08	0.00	0.00
6,900.00	0.37	243.43	6,863.16	-563.86	-348.79	662.48	0.08	0.08	0.00	0.00
7,000.00	0.45	243.43	6,963.16	-564.18	-349.43	663.10	0.08	0.08	0.00	0.00
7,100.00	0.53	243.43	7,063.16	-564.56	-350.19	663.85	0.08	0.08	0.00	0.00
7,200.00	0.61	243.43	7,163.15	-565.01	-351.08	664.71	0.08	0.08	0.00	0.00
7,256.85	0.65	243.43	7,220.00	-565.29	-351.64	665.26	0.08	0.08	0.00	0.00
Top of Gas										
7,300.00	0.69	243.43	7,263.15	-565.52	-352.09	665.70	0.08	0.08	0.00	0.00
7,400.00	0.77	243.43	7,363.14	-566.08	-353.23	666.81	0.08	0.08	0.00	0.00
7,500.00	0.85	243.43	7,463.13	-566.72	-354.49	668.04	0.08	0.08	0.00	0.00
7,600.00	0.93	243.43	7,563.12	-567.41	-355.88	669.39	0.08	0.08	0.00	0.00
7,700.00	1.01	243.43	7,663.10	-568.17	-357.39	670.86	0.08	0.08	0.00	0.00
7,800.00	1.09	243.43	7,763.09	-568.98	-359.03	672.46	0.08	0.08	0.00	0.00
7,900.00	1.17	243.43	7,863.07	-569.87	-360.79	674.18	0.08	0.08	0.00	0.00
8,000.00	1.25	243.43	7,963.04	-570.81	-362.68	676.01	0.08	0.08	0.00	0.00
8,100.00	1.33	243.43	8,063.02	-571.82	-364.69	677.97	0.08	0.08	0.00	0.00
8,200.00	1.41	243.43	8,162.99	-572.88	-366.83	680.06	0.08	0.08	0.00	0.00
8,300.00	1.49	243.43	8,262.96	-574.01	-369.09	682.26	0.08	0.08	0.00	0.00
8,400.00	1.57	243.43	8,362.92	-575.21	-371.47	684.58	0.08	0.08	0.00	0.00
8,466.50	1.62	243.43	8,429.40	-576.04	-373.13	686.20	0.08	0.08	0.00	0.00
8,500.00	1.59	243.43	8,462.88	-576.46	-373.97	687.02	0.08	-0.08	0.00	-180.00
8,600.00	1.51	243.43	8,562.85	-577.67	-376.39	689.38	0.08	-0.08	0.00	180.00
8,700.00	1.43	243.43	8,662.81	-578.81	-378.68	691.61	0.08	-0.08	0.00	180.00
8,800.00	1.34	243.43	8,762.79	-579.89	-380.84	693.71	0.08	-0.08	0.00	180.00
8,900.00	1.26	243.43	8,862.76	-580.91	-382.87	695.68	0.08	-0.08	0.00	180.00
9,000.00	1.17	243.43	8,962.74	-581.85	-384.76	697.53	0.08	-0.08	0.00	-180.00
9,030.27	1.15	243.43	8,993.00	-582.13	-385.31	698.06	0.08	-0.08	0.00	180.00
Cameo										
9,100.00	1.09	243.43	9,062.72	-582.73	-386.53	699.25	0.08	-0.08	0.00	-180.00
9,200.00	1.00	243.43	9,162.70	-583.55	-388.16	700.84	0.08	-0.08	0.00	-180.00
9,300.00	0.92	243.43	9,262.69	-584.30	-389.66	702.30	0.08	-0.08	0.00	180.00
9,400.00	0.83	243.43	9,362.68	-584.98	-391.03	703.63	0.08	-0.08	0.00	-180.00
9,490.33	0.76	243.43	9,453.00	-585.55	-392.15	704.72	0.08	-0.08	0.00	-180.00
Rollins										
9,500.00	0.75	243.43	9,462.67	-585.60	-392.26	704.84	0.08	-0.08	0.00	180.00

Plan Report for Long 20-13A - Plan #1 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 (°)
9,600.00	0.67	243.43	9,562.66	-586.16	-393.37	705.91	0.08	-0.08	0.00	180.00
9,700.00	0.58	243.43	9,662.65	-586.64	-394.34	706.86	0.08	-0.08	0.00	180.00
9,800.00	0.50	243.43	9,762.65	-587.06	-395.18	707.68	0.08	-0.08	0.00	180.00
9,829.35	0.47	243.43	9,792.00	-587.17	-395.40	707.89	0.08	-0.08	0.00	180.00
Cozzette										
9,900.00	0.41	243.43	9,862.64	-587.42	-395.89	708.37	0.08	-0.08	0.00	-180.00
10,000.00	0.33	243.43	9,962.64	-587.71	-396.47	708.93	0.08	-0.08	0.00	180.00
10,100.00	0.24	243.43	10,062.64	-587.93	-396.91	709.37	0.08	-0.08	0.00	-180.00
10,108.36	0.24	243.43	10,071.00	-587.94	-396.95	709.40	0.08	-0.08	0.00	180.00
Corcoran										
10,200.00	0.16	243.43	10,162.64	-588.09	-397.23	709.67	0.08	-0.08	0.00	-180.00
10,238.36	0.13	243.43	10,201.00	-588.13	-397.31	709.76	0.08	-0.08	0.00	-180.00
Mancos										
10,300.00	0.07	243.43	10,262.64	-588.18	-397.41	709.85	0.08	-0.08	0.00	180.00
10,388.36	0.00	0.00	10,351.00	-588.20	-397.46	709.90	0.08	-0.08	0.00	180.00
Long 20-13A Plan #1 BH Tgt										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
225.00	225.00	0.00	0.00	Kickoff at 225.00ft
390.00	389.91	-4.04	-2.49	Build Rate = 2.00°/100ft
550.64	549.94	-15.73	-9.71	End Build at 550.64ft
3,300.00	3,281.56	-281.14	-173.44	6.51 Inclination
6,004.65	5,968.75	-542.22	-334.52	Begin Drop at 6004.65ft
6,215.00	6,178.30	-557.62	-344.02	Drop Rate = 1.50°/100ft
6,438.83	6,402.00	-563.20	-347.46	End Drop at 6438.83ft
10,388.36	10,351.00	-588.20	-397.46	Total Depth = 10388.36ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Long 20-13A Plan #1 BH Tgt	214.05	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	10,387.88	Plan #1 Proposal	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
2,500.00	2,486.72	8 5/8" Casing Pt.	8-5/8	11

Plan Report for Long 20-13A - Plan #1 Proposal

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,438.83	6,402.00	Williams Fork		0.00	
7,256.85	7,220.00	Top of Gas		0.00	
9,030.27	8,993.00	Cameo		0.00	
9,490.33	9,453.00	Rollins		0.00	
9,829.35	9,792.00	Cozzette		0.00	
10,108.36	10,071.00	Corcoran		0.00	
10,238.36	10,201.00	Mancos		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Long 20-13A Plan #1 BH Tgt	10,351.00	-588.20	-397.46	Point
Long 20-13A Hardline	0.00	0.00	0.00	Polygon
Long 20-13A Plan #1 Zone Tgt	7,220.00	-588.20	-397.46	Rectangle
Long 20-13A Plan #1 Driller's Tgt	6,402.00	-563.20	-347.46	Rectangle

North Reference Sheet for Sec. 20-T7S-R94W - Long 20-13A - Plan #1

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB 25' @ 7931.00ft (Original Well Elev). Northing and Easting are relative to Long 20-13A

Coordinate System is US State Plane 1927 (Exact solution), Colorado Central 502 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:39° 45' 0.000 N°

False Easting: 2,000,000.00ft, False Northing: 0.00ft, Scale Reduction: 0.99995193

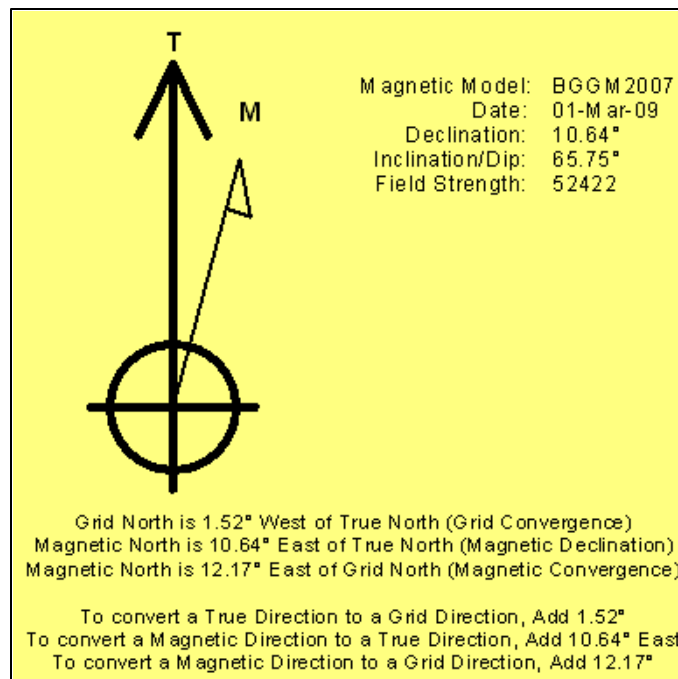
Grid Coordinates of Well: 589,013.27 ft N, 1,317,864.03 ft E

Geographical Coordinates of Well: 39° 25' 32.69" N, 107° 54' 54.05" W

Grid Convergence at Surface is: -1.52°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,388.36ft
the Bottom Hole Displacement is 709.90ft in the Direction of 214.05° (True).

Magnetic Convergence at surface is: -12.17° (1 March 2009, , BGGM2007)



HALLIBURTON

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
6402.00	6438.83	Williams Fork
7220.00	7256.85	Top of Gas
8993.00	9030.27	Cameo
9453.00	9490.33	Rollins
9792.00	9829.35	Cozzette
10071.00	10108.36	Corcoran
10201.00	10238.36	Mancos

