

Noble Energy (Rockies)

Garfield County, CO

Sec. 35-T7S-R95W (SGV 35L PAD)

BM 35-23B - A 1

Wellbore #1

Plan: Plan #1

Sperry Drilling Services

Proposal Report

12 November, 2009

Well Coordinates: 577,356.04 N, 1,301,623.26 E (39° 23' 33.19" N, 107° 58' 16.91" W)

Ground Level: 9,203.00 ft

Local Coordinate Origin:

Centered on Well BM 35-23B - Slot A 1

Viewing Datum:

RKB - 24' @ 9227.00ft

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 BM 35-23B - Plan #1

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	92.02	299.99	-0.03	0.98	0.98	2.00	2.00	0.00	92.02
400.00	3.50	92.02	399.89	-0.19	5.34	5.34	2.00	2.00	0.00	0.00
500.00	5.50	92.02	499.58	-0.47	13.18	13.19	2.00	2.00	0.00	0.00
560.00	6.70	92.02	559.24	-0.69	19.55	19.56	2.00	2.00	0.00	0.00
Build Rate = 2.00°/100ft										
600.00	7.50	92.02	598.93	-0.87	24.49	24.50	2.00	2.00	0.00	0.00
700.00	9.50	92.02	697.83	-1.39	39.26	39.28	2.00	2.00	0.00	0.00
800.00	11.50	92.02	796.15	-2.03	57.48	57.50	2.00	2.00	0.00	0.00
878.38	13.07	92.02	872.73	-2.62	74.14	74.17	2.00	2.00	0.00	0.00
End Build at 878.38ft										
900.00	13.07	92.02	893.79	-2.79	79.03	79.06	0.00	0.00	0.00	0.00
1,000.00	13.07	92.02	991.20	-3.59	101.62	101.67	0.00	0.00	0.00	0.00
1,100.00	13.07	92.02	1,088.61	-4.39	124.22	124.27	0.00	0.00	0.00	0.00
1,200.00	13.07	92.02	1,186.02	-5.19	146.81	146.88	0.00	0.00	0.00	0.00
1,300.00	13.07	92.02	1,283.43	-5.98	169.41	169.48	0.00	0.00	0.00	0.00
1,400.00	13.07	92.02	1,380.84	-6.78	192.01	192.09	0.00	0.00	0.00	0.00
1,500.00	13.07	92.02	1,478.25	-7.58	214.60	214.69	0.00	0.00	0.00	0.00
8 5/8" Casing Pt.										
1,600.00	13.07	92.02	1,575.66	-8.38	237.20	237.30	0.00	0.00	0.00	0.00
1,700.00	13.07	92.02	1,673.07	-9.18	259.79	259.90	0.00	0.00	0.00	0.00
1,800.00	13.07	92.02	1,770.48	-9.97	282.39	282.51	0.00	0.00	0.00	0.00
1,900.00	13.07	92.02	1,867.89	-10.77	304.98	305.12	0.00	0.00	0.00	0.00
2,000.00	13.07	92.02	1,965.30	-11.57	327.58	327.72	0.00	0.00	0.00	0.00
2,100.00	13.07	92.02	2,062.72	-12.37	350.18	350.33	0.00	0.00	0.00	0.00
2,200.00	13.07	92.02	2,160.13	-13.17	372.77	372.93	0.00	0.00	0.00	0.00
2,300.00	13.07	92.02	2,257.54	-13.96	395.37	395.54	0.00	0.00	0.00	0.00
2,400.00	13.07	92.02	2,354.95	-14.76	417.96	418.14	0.00	0.00	0.00	0.00
2,500.00	13.07	92.02	2,452.36	-15.56	440.56	440.75	0.00	0.00	0.00	0.00
2,600.00	13.07	92.02	2,549.77	-16.36	463.16	463.35	0.00	0.00	0.00	0.00
2,700.00	13.07	92.02	2,647.18	-17.16	485.75	485.96	0.00	0.00	0.00	0.00
2,800.00	13.07	92.02	2,744.59	-17.96	508.35	508.57	0.00	0.00	0.00	0.00
2,900.00	13.07	92.02	2,842.00	-18.75	530.94	531.17	0.00	0.00	0.00	0.00
3,000.00	13.07	92.02	2,939.41	-19.55	553.54	553.78	0.00	0.00	0.00	0.00
3,100.00	13.07	92.02	3,036.82	-20.35	576.14	576.38	0.00	0.00	0.00	0.00
3,200.00	13.07	92.02	3,134.23	-21.15	598.73	598.99	0.00	0.00	0.00	0.00
3,300.00	13.07	92.02	3,231.64	-21.95	621.33	621.59	0.00	0.00	0.00	0.00
3,400.00	13.07	92.02	3,329.05	-22.74	643.92	644.20	0.00	0.00	0.00	0.00
3,500.00	13.07	92.02	3,426.46	-23.54	666.52	666.80	0.00	0.00	0.00	0.00
3,600.00	13.07	92.02	3,523.87	-24.34	689.12	689.41	0.00	0.00	0.00	0.00
13.07 Inclination										
3,700.00	13.07	92.02	3,621.28	-25.14	711.71	712.02	0.00	0.00	0.00	0.00
3,800.00	13.07	92.02	3,718.69	-25.94	734.31	734.62	0.00	0.00	0.00	0.00
3,900.00	13.07	92.02	3,816.10	-26.73	756.90	757.23	0.00	0.00	0.00	0.00
4,000.00	13.07	92.02	3,913.51	-27.53	779.50	779.83	0.00	0.00	0.00	0.00
4,100.00	13.07	92.02	4,010.92	-28.33	802.10	802.44	0.00	0.00	0.00	0.00
4,200.00	13.07	92.02	4,108.33	-29.13	824.69	825.04	0.00	0.00	0.00	0.00
4,300.00	13.07	92.02	4,205.74	-29.93	847.29	847.65	0.00	0.00	0.00	0.00
4,400.00	13.07	92.02	4,303.15	-30.73	869.88	870.26	0.00	0.00	0.00	0.00
4,500.00	13.07	92.02	4,400.56	-31.52	892.48	892.86	0.00	0.00	0.00	0.00
4,600.00	13.07	92.02	4,497.98	-32.32	915.08	915.47	0.00	0.00	0.00	0.00
4,700.00	13.07	92.02	4,595.39	-33.12	937.67	938.07	0.00	0.00	0.00	0.00
4,800.00	13.07	92.02	4,692.80	-33.92	960.27	960.68	0.00	0.00	0.00	0.00
4,900.00	13.07	92.02	4,790.21	-34.72	982.86	983.28	0.00	0.00	0.00	0.00

Plan Report for BM 35-23B - Plan #1

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	13.07	92.02	4,887.62	-35.51	1,005.46	1,005.89	0.00	0.00	0.00	0.00
5,100.00	13.07	92.02	4,985.03	-36.31	1,028.05	1,028.49	0.00	0.00	0.00	0.00
5,200.00	13.07	92.02	5,082.44	-37.11	1,050.65	1,051.10	0.00	0.00	0.00	0.00
5,300.00	13.07	92.02	5,179.85	-37.91	1,073.25	1,073.71	0.00	0.00	0.00	0.00
5,400.00	13.07	92.02	5,277.26	-38.71	1,095.84	1,096.31	0.00	0.00	0.00	0.00
5,500.00	13.07	92.02	5,374.67	-39.50	1,118.44	1,118.92	0.00	0.00	0.00	0.00
5,600.00	13.07	92.02	5,472.08	-40.30	1,141.03	1,141.52	0.00	0.00	0.00	0.00
5,700.00	13.07	92.02	5,569.49	-41.10	1,163.63	1,164.13	0.00	0.00	0.00	0.00
5,800.00	13.07	92.02	5,666.90	-41.90	1,186.23	1,186.73	0.00	0.00	0.00	0.00
5,900.00	13.07	92.02	5,764.31	-42.70	1,208.82	1,209.34	0.00	0.00	0.00	0.00
6,000.00	13.07	92.02	5,861.72	-43.50	1,231.42	1,231.94	0.00	0.00	0.00	0.00
6,100.00	13.07	92.02	5,959.13	-44.29	1,254.01	1,254.55	0.00	0.00	0.00	0.00
6,200.00	13.07	92.02	6,056.54	-45.09	1,276.61	1,277.16	0.00	0.00	0.00	0.00
6,300.00	13.07	92.02	6,153.95	-45.89	1,299.21	1,299.76	0.00	0.00	0.00	0.00
6,308.63	13.07	92.02	6,162.36	-45.96	1,301.16	1,301.71	0.00	0.00	0.00	0.00
Begin Drop at 6308.63ft										
6,400.00	11.70	92.02	6,251.60	-46.65	1,320.74	1,321.30	1.50	-1.50	0.00	180.00
6,500.00	10.20	92.02	6,349.78	-47.32	1,339.71	1,340.29	1.50	-1.50	0.00	180.00
6,600.00	8.70	92.02	6,448.42	-47.90	1,356.12	1,356.70	1.50	-1.50	0.00	180.00
6,700.00	7.20	92.02	6,547.46	-48.39	1,369.93	1,370.52	1.50	-1.50	0.00	180.00
6,800.00	5.70	92.02	6,646.82	-48.78	1,381.15	1,381.75	1.50	-1.50	0.00	180.00
Drop Rate = 1.50°/100ft										
6,900.00	4.20	92.02	6,746.45	-49.09	1,389.77	1,390.37	1.50	-1.50	0.00	-180.00
7,000.00	2.70	92.02	6,846.26	-49.30	1,395.78	1,396.38	1.50	-1.50	0.00	180.00
7,100.00	1.20	92.02	6,946.20	-49.42	1,399.18	1,399.78	1.50	-1.50	0.00	180.00
7,179.29	0.01	92.02	7,025.49	-49.45	1,400.01	1,400.61	1.50	-1.50	0.00	-180.00
BM 35-23B Plan #1 Zone Tgt										
7,179.80	0.00	360.00	7,026.00	-49.45	1,400.01	1,400.61	1.50	-1.50	0.00	-180.00
End Drop at 7179.80ft - Williams Fork - BM 35-23B Plan #1 Driller's Tgt										
7,200.00	0.02	243.44	7,046.20	-49.45	1,400.01	1,400.61	0.09	0.09	0.00	243.44
7,300.00	0.11	243.44	7,146.20	-49.50	1,399.91	1,400.51	0.09	0.09	0.00	0.00
7,400.00	0.20	243.44	7,246.20	-49.62	1,399.67	1,400.28	0.09	0.09	0.00	0.00
7,500.00	0.29	243.44	7,346.19	-49.81	1,399.29	1,399.91	0.09	0.09	0.00	0.00
7,600.00	0.38	243.44	7,446.19	-50.07	1,398.77	1,399.40	0.09	0.09	0.00	0.00
7,700.00	0.47	243.44	7,546.19	-50.40	1,398.11	1,398.76	0.09	0.09	0.00	0.00
7,800.00	0.56	243.44	7,646.19	-50.80	1,397.31	1,397.99	0.09	0.09	0.00	0.00
7,900.00	0.65	243.44	7,746.18	-51.27	1,396.37	1,397.07	0.09	0.09	0.00	0.00
8,000.00	0.74	243.44	7,846.17	-51.81	1,395.28	1,396.02	0.09	0.09	0.00	0.00
8,100.00	0.83	243.44	7,946.16	-52.42	1,394.06	1,394.83	0.09	0.09	0.00	0.00
8,200.00	0.92	243.44	8,046.15	-53.11	1,392.70	1,393.51	0.09	0.09	0.00	0.00
8,268.86	0.98	243.44	8,115.00	-53.62	1,391.68	1,392.52	0.09	0.09	0.00	0.00
Top of Gas										
8,300.00	1.01	243.44	8,146.14	-53.86	1,391.20	1,392.05	0.09	0.09	0.00	0.00
8,400.00	1.10	243.44	8,246.12	-54.68	1,389.55	1,390.45	0.09	0.09	0.00	0.00
8,500.00	1.19	243.44	8,346.10	-55.57	1,387.77	1,388.72	0.09	0.09	0.00	0.00
8,600.00	1.28	243.44	8,446.08	-56.53	1,385.84	1,386.85	0.09	0.09	0.00	0.00
8,700.00	1.37	243.44	8,546.05	-57.57	1,383.78	1,384.85	0.09	0.09	0.00	0.00
8,800.00	1.46	243.44	8,646.02	-58.67	1,381.57	1,382.70	0.09	0.09	0.00	0.00
8,900.00	1.55	243.44	8,745.99	-59.84	1,379.22	1,380.43	0.09	0.09	0.00	0.00
9,000.00	1.64	243.44	8,845.95	-61.09	1,376.74	1,378.01	0.09	0.09	0.00	0.00
9,046.27	1.68	243.44	8,892.20	-61.68	1,375.54	1,376.85	0.09	0.09	0.00	0.00
9,100.00	1.63	243.44	8,945.91	-62.38	1,374.15	1,375.50	0.09	-0.09	0.00	180.00
9,200.00	1.55	243.44	9,045.87	-63.62	1,371.67	1,373.09	0.09	-0.09	0.00	180.00
9,300.00	1.46	243.44	9,145.83	-64.79	1,369.32	1,370.81	0.09	-0.09	0.00	-180.00
9,400.00	1.37	243.44	9,245.80	-65.90	1,367.11	1,368.66	0.09	-0.09	0.00	180.00
9,500.00	1.29	243.44	9,345.78	-66.94	1,365.03	1,366.64	0.09	-0.09	0.00	180.00
9,585.25	1.21	243.44	9,431.00	-67.77	1,363.36	1,365.03	0.09	-0.09	0.00	-180.00
Cameo										
9,600.00	1.20	243.44	9,445.75	-67.91	1,363.08	1,364.76	0.09	-0.09	0.00	180.00

Plan Report for BM 35-23B - Plan #1

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 (°)
9,700.00	1.12	243.44	9,545.73	-68.82	1,361.28	1,363.00	0.09	-0.09	0.00	-180.00
9,800.00	1.03	243.44	9,645.71	-69.65	1,359.60	1,361.37	0.09	-0.09	0.00	180.00
9,900.00	0.94	243.44	9,745.70	-70.42	1,358.06	1,359.88	0.09	-0.09	0.00	180.00
10,000.00	0.86	243.44	9,845.69	-71.13	1,356.66	1,358.51	0.09	-0.09	0.00	180.00
10,066.32	0.80	243.44	9,912.00	-71.55	1,355.80	1,357.68	0.09	-0.09	0.00	-180.00
Rollins										
10,100.00	0.77	243.44	9,945.68	-71.76	1,355.39	1,357.28	0.09	-0.09	0.00	180.00
10,200.00	0.68	243.44	10,045.67	-72.33	1,354.25	1,356.18	0.09	-0.09	0.00	180.00
10,300.00	0.60	243.44	10,145.66	-72.83	1,353.25	1,355.21	0.09	-0.09	0.00	180.00
10,372.34	0.54	243.44	10,218.00	-73.15	1,352.61	1,354.58	0.09	-0.09	0.00	-180.00
Cozzette										
10,400.00	0.51	243.44	10,245.66	-73.26	1,352.38	1,354.36	0.09	-0.09	0.00	180.00
10,500.00	0.43	243.44	10,345.65	-73.63	1,351.65	1,353.65	0.09	-0.09	0.00	180.00
10,600.00	0.34	243.44	10,445.65	-73.93	1,351.05	1,353.07	0.09	-0.09	0.00	180.00
10,611.35	0.33	243.44	10,457.00	-73.96	1,350.99	1,353.02	0.09	-0.09	0.00	-180.00
Corcora										
10,700.00	0.25	243.44	10,545.65	-74.16	1,350.59	1,352.63	0.09	-0.09	0.00	180.00
10,743.35	0.22	243.44	10,589.00	-74.24	1,350.43	1,352.47	0.09	-0.09	0.00	180.00
Mancos										
10,800.00	0.17	243.44	10,645.65	-74.32	1,350.26	1,352.31	0.09	-0.09	0.00	-180.00
10,900.00	0.08	243.44	10,745.65	-74.42	1,350.07	1,352.12	0.09	-0.09	0.00	-180.00
10,993.35	0.00	0.00	10,839.00	-74.45	1,350.01	1,352.06	0.09	-0.09	0.00	180.00
Total Depth = 10993.35ft - BM 35-23B 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
560.00	559.24	-0.69	19.55	Build Rate = 2.00°/100ft
878.38	872.73	-2.62	74.14	End Build at 878.38ft
3,600.00	3,523.87	-24.34	689.12	13.07 Inclination
6,308.63	6,162.36	-45.96	1,301.16	Begin Drop at 6308.63ft
6,800.00	6,646.82	-48.78	1,381.15	Drop Rate = 1.50°/100ft
7,179.80	7,026.00	-49.45	1,400.01	End Drop at 7179.80ft
10,993.35	10,839.00	-74.45	1,350.01	Total Depth = 10993.35ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	BM 35-23B Plan #1 BH Tgt	93.16	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	10,993.35	Plan #1	MWD

Plan Report for BM 35-23B - Plan #1

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,500.00	1,478.25	8 5/8" Casing Pt.	8-5/8	11

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,179.80	7,026.00	Williams Fork		0.00	
8,268.86	8,115.00	Top of Gas		0.00	
9,585.25	9,431.00	Cameo		0.00	
10,066.32	9,912.00	Rollins		0.00	
10,372.34	10,218.00	Cozzette		0.00	
10,611.35	10,457.00	Corcora		0.00	
10,743.35	10,589.00	Mancos		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
BM 35-23B Plan #1 Driller's Tgt	7,026.00	-49.45	1,400.01	Rectangle
BM 35-23B Plan #1 BH Tgt	10,839.00	-74.45	1,350.01	Point
BM 35-23B Plan #1 Zone Tgt	7,026.00	-74.45	1,350.01	Rectangle

North Reference Sheet for Sec. 35-T7S-R95W (SGV 35L PAD) - BM 35-23B - Wellbore #1

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

Vertical Depths are relative to RKB - 24' @ 9227.00ft. Northing and Easting are relative to BM 35-23B - Slot A 1

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: 0.99994882

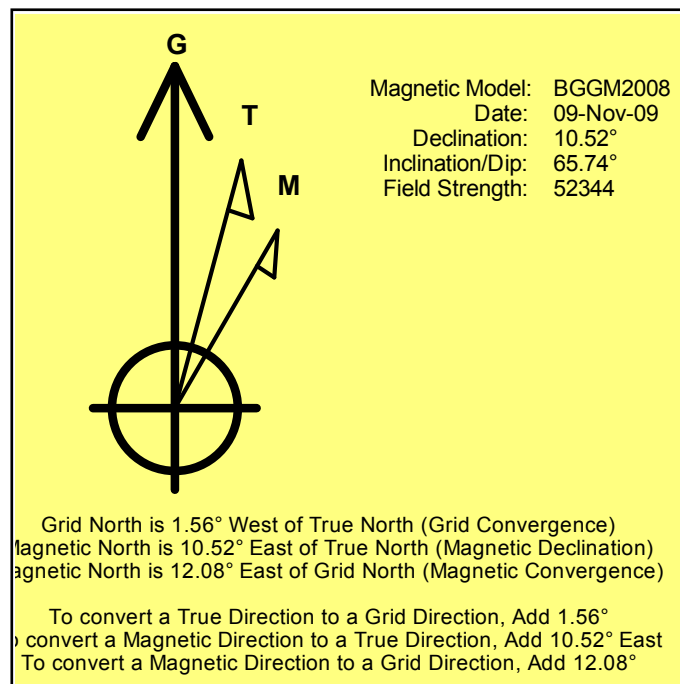
Grid Coordinates of Well: 577,356.04 ft N, 1,301,623.26 ft E

Geographical Coordinates of Well: 39° 23' 33.19" N, 107° 58' 16.91" W

Grid Convergence at Surface is: -1.56°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,993.35ft
the Bottom Hole Displacement is 1,352.06ft in the Direction of 93.16° (Grid).

Magnetic Convergence at surface is: -12.08° (9 November 2009, , BGGM2008)



Project: Garfield County, CO
Site: Sec. 35-T7S-R95W (SGV 35L PAD)
Well: BM 35-23B
Wellbore: Wellbore #1
Plan: Plan #1

Noble Energy (Rockies)

HALLIBURTON

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec
0.00	0.00	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
878.38	13.07	92.02	872.73	-2.62	74.14	2.00	92.02	74.17
6308.63	13.07	92.02	6162.36	-45.96	1301.16	0.00	0.00	1301.71
7179.80	0.00	360.00	7026.00	-49.45	1400.01	1.50	180.00	1400.61
9046.27	1.68	243.44	8892.20	-61.68	1375.54	0.09	243.44	1376.85
10993.35	0.00	360.00	10839.00	-74.45	1350.01	0.09	180.00	1352.06

BM 35-23B Plan #1 Driller's Tgt

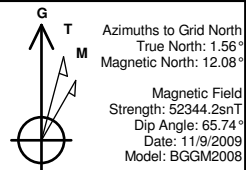
BM 35-23B Plan #1 BH Tgt

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
BM 35-23B Plan #1 Driller's Tgt	7026.00	-49.45	1400.01	Rectangle (Sides: L25.00 W25.00)
BM 35-23B Plan #1 Zone Tgt	7026.00	-74.45	1350.01	Rectangle (Sides: L100.00 W200.00)
BM 35-23B Plan #1 BH Tgt	10839.00	-74.45	1350.01	Point

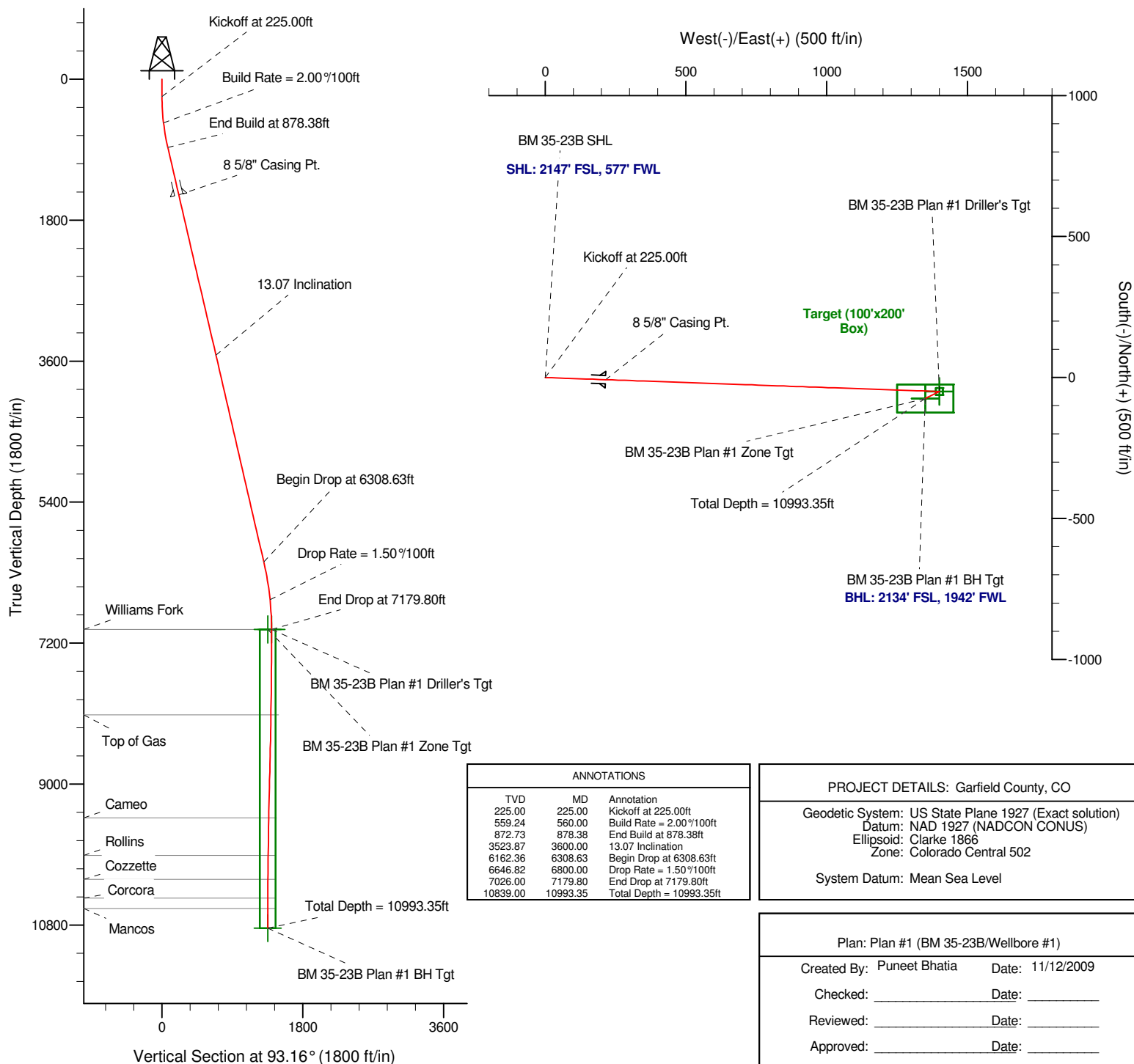
WELL DETAILS: BM 35-23B

Northing	Ground Level:	9203.00	Longitude
0.00	Easting	1301623.26	39° 23' 33.190 N
0.00	Latitude	107° 58' 16.907 W	A 1



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
7026.00	7179.80	Williams Fork
8115.00	8268.86	Top of Gas
9431.00	9585.25	Cameo
9912.00	10066.32	Rollins
10218.00	10372.34	Cozzette
10457.00	10611.35	Corcora
10589.00	10743.35	Mancos



ANNOTATIONS

TVD	MD	Annotation
225.00	225.00	Kickoff at 225.00ft
559.24	560.00	Build Rate = 2.00°/100ft
872.73	878.38	End Build at 878.38ft
3523.87	3600.00	13.07 Inclination
6162.36	6308.63	Begin Drop at 6308.63ft
6646.82	6800.00	Drop Rate = 1.50°/100ft
7026.00	7179.80	End Drop at 7179.80ft
10839.00	10993.35	Total Depth = 10993.35ft

PROJECT DETAILS: Garfield County, CO

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Colorado Central 502

System Datum: Mean Sea Level

Plan: Plan #1 (BM 35-23B/Wellbore #1)

Created By: Puneet Bhatia Date: 11/12/2009
Checked: _____ Date: _____
Reviewed: _____ Date: _____
Approved: _____ Date: _____