

# Noble Energy (Rockies)

Garfield County, CO

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

BM 35-23A - B 3

Wellbore #1

Plan: Plan #1

## Sperry Drilling Services

### Proposal Report

12 November, 2009

Well Coordinates: 577,349.75 N, 1,301,606.66 E (39° 23' 33.12" N, 107° 58' 17.12" W)

Ground Level: 9,203.00 ft

Local Coordinate Origin:

Centered on Well BM 35-23A - Slot B 3

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 35-23A - 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
<b>Kickoff at 225.00ft</b>										
300.00	1.50	79.33	299.99	0.18	0.96	0.98	2.00	2.00	0.00	79.33
400.00	3.50	79.33	399.89	0.99	5.25	5.34	2.00	2.00	0.00	0.00
500.00	5.50	79.33	499.58	2.44	12.96	13.19	2.00	2.00	0.00	0.00
560.00	6.70	79.33	559.24	3.62	19.23	19.56	2.00	2.00	0.00	0.00
<b>Build Rate = 2.00°/100ft</b>										
600.00	7.50	79.33	598.93	4.54	24.09	24.51	2.00	2.00	0.00	0.00
700.00	9.50	79.33	697.83	7.27	38.61	39.29	2.00	2.00	0.00	0.00
800.00	11.50	79.33	796.15	10.64	56.52	57.51	2.00	2.00	0.00	0.00
900.00	13.50	79.33	893.77	14.65	77.79	79.15	2.00	2.00	0.00	0.00
901.29	13.53	79.33	895.03	14.70	78.08	79.45	2.00	2.00	0.00	0.00
<b>End Build at 901.29ft</b>										
1,000.00	13.53	79.33	991.00	18.98	100.77	102.54	0.00	0.00	0.00	0.00
1,100.00	13.53	79.33	1,088.22	23.31	123.76	125.92	0.00	0.00	0.00	0.00
1,200.00	13.53	79.33	1,185.45	27.63	146.74	149.31	0.00	0.00	0.00	0.00
1,300.00	13.53	79.33	1,282.68	31.96	169.72	172.70	0.00	0.00	0.00	0.00
1,400.00	13.53	79.33	1,379.90	36.29	192.71	196.08	0.00	0.00	0.00	0.00
1,500.00	13.53	79.33	1,477.13	40.62	215.69	219.47	0.00	0.00	0.00	0.00
<b>8 5/8" Casing Pt.</b>										
1,600.00	13.53	79.33	1,574.36	44.95	238.68	242.86	0.00	0.00	0.00	0.00
1,700.00	13.53	79.33	1,671.58	49.28	261.66	266.25	0.00	0.00	0.00	0.00
1,800.00	13.53	79.33	1,768.81	53.61	284.65	289.63	0.00	0.00	0.00	0.00
1,900.00	13.53	79.33	1,866.04	57.93	307.63	313.02	0.00	0.00	0.00	0.00
2,000.00	13.53	79.33	1,963.26	62.26	330.62	336.41	0.00	0.00	0.00	0.00
2,100.00	13.53	79.33	2,060.49	66.59	353.60	359.79	0.00	0.00	0.00	0.00
2,200.00	13.53	79.33	2,157.72	70.92	376.58	383.18	0.00	0.00	0.00	0.00
2,300.00	13.53	79.33	2,254.94	75.25	399.57	406.57	0.00	0.00	0.00	0.00
2,400.00	13.53	79.33	2,352.17	79.58	422.55	429.95	0.00	0.00	0.00	0.00
2,500.00	13.53	79.33	2,449.39	83.91	445.54	453.34	0.00	0.00	0.00	0.00
2,600.00	13.53	79.33	2,546.62	88.23	468.52	476.73	0.00	0.00	0.00	0.00
2,700.00	13.53	79.33	2,643.85	92.56	491.51	500.12	0.00	0.00	0.00	0.00
2,800.00	13.53	79.33	2,741.07	96.89	514.49	523.50	0.00	0.00	0.00	0.00
2,900.00	13.53	79.33	2,838.30	101.22	537.48	546.89	0.00	0.00	0.00	0.00
3,000.00	13.53	79.33	2,935.53	105.55	560.46	570.28	0.00	0.00	0.00	0.00
3,100.00	13.53	79.33	3,032.75	109.88	583.44	593.66	0.00	0.00	0.00	0.00
3,200.00	13.53	79.33	3,129.98	114.21	606.43	617.05	0.00	0.00	0.00	0.00
3,300.00	13.53	79.33	3,227.21	118.53	629.41	640.44	0.00	0.00	0.00	0.00
3,400.00	13.53	79.33	3,324.43	122.86	652.40	663.83	0.00	0.00	0.00	0.00
3,500.00	13.53	79.33	3,421.66	127.19	675.38	687.21	0.00	0.00	0.00	0.00
3,600.00	13.53	79.33	3,518.89	131.52	698.37	710.60	0.00	0.00	0.00	0.00
<b>13.53 Inclination</b>										
3,700.00	13.53	79.33	3,616.11	135.85	721.35	733.99	0.00	0.00	0.00	0.00
3,800.00	13.53	79.33	3,713.34	140.18	744.33	757.37	0.00	0.00	0.00	0.00
3,900.00	13.53	79.33	3,810.56	144.50	767.32	780.76	0.00	0.00	0.00	0.00
4,000.00	13.53	79.33	3,907.79	148.83	790.30	804.15	0.00	0.00	0.00	0.00
4,100.00	13.53	79.33	4,005.02	153.16	813.29	827.53	0.00	0.00	0.00	0.00
4,200.00	13.53	79.33	4,102.24	157.49	836.27	850.92	0.00	0.00	0.00	0.00
4,300.00	13.53	79.33	4,199.47	161.82	859.26	874.31	0.00	0.00	0.00	0.00
4,400.00	13.53	79.33	4,296.70	166.15	882.24	897.70	0.00	0.00	0.00	0.00
4,500.00	13.53	79.33	4,393.92	170.48	905.23	921.08	0.00	0.00	0.00	0.00
4,600.00	13.53	79.33	4,491.15	174.80	928.21	944.47	0.00	0.00	0.00	0.00
4,700.00	13.53	79.33	4,588.38	179.13	951.19	967.86	0.00	0.00	0.00	0.00
4,800.00	13.53	79.33	4,685.60	183.46	974.18	991.24	0.00	0.00	0.00	0.00
4,900.00	13.53	79.33	4,782.83	187.79	997.16	1,014.63	0.00	0.00	0.00	0.00

## Plan Report for BM 35-23A - 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	13.53	79.33	4,880.06	192.12	1,020.15	1,038.02	0.00	0.00	0.00	0.00
5,100.00	13.53	79.33	4,977.28	196.45	1,043.13	1,061.40	0.00	0.00	0.00	0.00
5,200.00	13.53	79.33	5,074.51	200.78	1,066.12	1,084.79	0.00	0.00	0.00	0.00
5,300.00	13.53	79.33	5,171.74	205.10	1,089.10	1,108.18	0.00	0.00	0.00	0.00
5,400.00	13.53	79.33	5,268.96	209.43	1,112.09	1,131.57	0.00	0.00	0.00	0.00
5,500.00	13.53	79.33	5,366.19	213.76	1,135.07	1,154.95	0.00	0.00	0.00	0.00
5,600.00	13.53	79.33	5,463.41	218.09	1,158.05	1,178.34	0.00	0.00	0.00	0.00
5,700.00	13.53	79.33	5,560.64	222.42	1,181.04	1,201.73	0.00	0.00	0.00	0.00
5,800.00	13.53	79.33	5,657.87	226.75	1,204.02	1,225.11	0.00	0.00	0.00	0.00
5,900.00	13.53	79.33	5,755.09	231.07	1,227.01	1,248.50	0.00	0.00	0.00	0.00
6,000.00	13.53	79.33	5,852.32	235.40	1,249.99	1,271.89	0.00	0.00	0.00	0.00
6,100.00	13.53	79.33	5,949.55	239.73	1,272.98	1,295.28	0.00	0.00	0.00	0.00
6,200.00	13.53	79.33	6,046.77	244.06	1,295.96	1,318.66	0.00	0.00	0.00	0.00
6,300.00	13.53	79.33	6,144.00	248.39	1,318.95	1,342.05	0.00	0.00	0.00	0.00
6,303.73	13.53	79.33	6,147.63	248.55	1,319.80	1,342.92	0.00	0.00	0.00	0.00
Begin Drop at 6303.73ft										
6,400.00	12.08	79.33	6,241.50	252.50	1,340.77	1,364.25	1.50	-1.50	0.00	180.00
6,500.00	10.58	79.33	6,339.55	256.14	1,360.08	1,383.90	1.50	-1.50	0.00	180.00
6,600.00	9.08	79.33	6,438.08	259.30	1,376.86	1,400.98	1.50	-1.50	0.00	180.00
6,700.00	7.58	79.33	6,537.02	261.98	1,391.10	1,415.47	1.50	-1.50	0.00	180.00
6,800.00	6.08	79.33	6,636.30	264.18	1,402.79	1,427.36	1.50	-1.50	0.00	-180.00
Drop Rate = 1.50°/100ft										
6,900.00	4.58	79.33	6,735.87	265.90	1,411.92	1,436.65	1.50	-1.50	0.00	180.00
7,000.00	3.08	79.33	6,835.64	267.13	1,418.49	1,443.33	1.50	-1.50	0.00	180.00
7,100.00	1.58	79.33	6,935.56	267.89	1,422.48	1,447.40	1.50	-1.50	0.00	180.00
7,200.00	0.08	79.33	7,035.54	268.16	1,423.91	1,448.85	1.50	-1.50	0.00	180.00
7,205.42	0.00	73.87	7,040.96	268.16	1,423.91	1,448.86	1.50	-1.50	-100.91	-179.96
BM 35-23A Plan #1 Zone Tgt										
7,205.46	0.00	0.00	7,041.00	268.16	1,423.91	1,448.86	1.50	-1.38	-192,239.28	-174.49
End Drop at 7205.46ft - BM 35-23A Plan #1 Driller's Tgt										
7,220.46	0.01	243.44	7,056.00	268.16	1,423.91	1,448.86	0.09	0.09	-777.08	-116.78
Williams Fork										
7,300.00	0.09	243.44	7,135.54	268.13	1,423.85	1,448.79	0.09	0.09	0.00	0.00
7,400.00	0.18	243.44	7,235.54	268.02	1,423.65	1,448.57	0.09	0.09	0.00	0.00
7,500.00	0.27	243.44	7,335.54	267.85	1,423.31	1,448.20	0.09	0.09	0.00	0.00
7,600.00	0.36	243.44	7,435.54	267.61	1,422.82	1,447.69	0.09	0.09	0.00	0.00
7,700.00	0.45	243.44	7,535.54	267.30	1,422.20	1,447.02	0.09	0.09	0.00	0.00
7,800.00	0.54	243.44	7,635.54	266.92	1,421.43	1,446.20	0.09	0.09	0.00	0.00
7,900.00	0.63	243.44	7,735.53	266.46	1,420.53	1,445.23	0.09	0.09	0.00	0.00
8,000.00	0.72	243.44	7,835.52	265.94	1,419.48	1,444.10	0.09	0.09	0.00	0.00
8,100.00	0.81	243.44	7,935.51	265.35	1,418.29	1,442.83	0.09	0.09	0.00	0.00
8,200.00	0.90	243.44	8,035.50	264.68	1,416.97	1,441.41	0.09	0.09	0.00	0.00
8,300.00	0.99	243.44	8,135.49	263.95	1,415.50	1,439.84	0.09	0.09	0.00	0.00
8,309.51	0.99	243.44	8,145.00	263.88	1,415.35	1,439.68	0.09	0.09	0.00	0.00
Top of Gas										
8,400.00	1.08	243.44	8,235.47	263.15	1,413.89	1,438.11	0.09	0.09	0.00	0.00
8,500.00	1.17	243.44	8,335.45	262.27	1,412.14	1,436.24	0.09	0.09	0.00	0.00
8,600.00	1.26	243.44	8,435.43	261.33	1,410.25	1,434.22	0.09	0.09	0.00	0.00
8,700.00	1.35	243.44	8,535.41	260.31	1,408.22	1,432.04	0.09	0.09	0.00	0.00
8,800.00	1.44	243.44	8,635.38	259.23	1,406.05	1,429.71	0.09	0.09	0.00	0.00
8,900.00	1.53	243.44	8,735.34	258.07	1,403.74	1,427.24	0.09	0.09	0.00	0.00
9,000.00	1.62	243.44	8,835.31	256.85	1,401.29	1,424.61	0.09	0.09	0.00	0.00
9,071.96	1.68	243.44	8,907.23	255.92	1,399.44	1,422.63	0.09	0.09	0.00	0.00
9,100.00	1.66	243.44	8,935.26	255.56	1,398.71	1,421.85	0.09	-0.09	0.00	180.00
9,200.00	1.57	243.44	9,035.22	254.30	1,396.20	1,419.15	0.09	-0.09	0.00	180.00
9,300.00	1.48	243.44	9,135.19	253.11	1,393.81	1,416.59	0.09	-0.09	0.00	180.00
9,400.00	1.40	243.44	9,235.16	251.98	1,391.57	1,414.19	0.09	-0.09	0.00	180.00
9,500.00	1.31	243.44	9,335.13	250.93	1,389.45	1,411.92	0.09	-0.09	0.00	180.00
9,600.00	1.22	243.44	9,435.11	249.94	1,387.47	1,409.80	0.09	-0.09	0.00	180.00

**Plan Report for BM 35-23A - 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 (°)
9,625.90	1.20	243.44	9,461.00	249.69	1,386.98	1,409.27	0.09	-0.09	0.00	180.00
<b>Cameo</b>										
9,700.00	1.14	243.44	9,535.08	249.02	1,385.63	1,407.82	0.09	-0.09	0.00	-180.00
9,800.00	1.05	243.44	9,635.07	248.16	1,383.92	1,405.99	0.09	-0.09	0.00	180.00
9,900.00	0.97	243.44	9,735.05	247.38	1,382.35	1,404.30	0.09	-0.09	0.00	180.00
10,000.00	0.88	243.44	9,835.04	246.66	1,380.91	1,402.76	0.09	-0.09	0.00	180.00
10,100.00	0.79	243.44	9,935.03	246.00	1,379.60	1,401.36	0.09	-0.09	0.00	180.00
10,106.97	0.79	243.44	9,942.00	245.96	1,379.52	1,401.27	0.09	-0.09	0.00	180.00
<b>Rollins</b>										
10,200.00	0.71	243.44	10,035.02	245.42	1,378.43	1,400.11	0.09	-0.09	0.00	-180.00
10,300.00	0.62	243.44	10,135.01	244.90	1,377.40	1,399.00	0.09	-0.09	0.00	180.00
10,400.00	0.53	243.44	10,235.01	244.45	1,376.50	1,398.03	0.09	-0.09	0.00	180.00
10,412.99	0.52	243.44	10,248.00	244.40	1,376.39	1,397.92	0.09	-0.09	0.00	-180.00
<b>Cozzette</b>										
10,500.00	0.45	243.44	10,335.00	244.07	1,375.73	1,397.21	0.09	-0.09	0.00	180.00
10,600.00	0.36	243.44	10,435.00	243.75	1,375.10	1,396.53	0.09	-0.09	0.00	180.00
10,652.00	0.32	243.44	10,487.00	243.61	1,374.82	1,396.24	0.09	-0.09	0.00	180.00
<b>Corcora</b>										
10,700.00	0.28	243.44	10,535.00	243.50	1,374.60	1,396.00	0.09	-0.09	0.00	-180.00
10,784.00	0.20	243.44	10,619.00	243.35	1,374.29	1,395.67	0.09	-0.09	0.00	180.00
<b>Mancos</b>										
10,800.00	0.19	243.44	10,635.00	243.32	1,374.24	1,395.61	0.09	-0.09	0.00	-180.00
10,900.00	0.10	243.44	10,735.00	243.21	1,374.01	1,395.37	0.09	-0.09	0.00	180.00
11,000.00	0.02	243.44	10,835.00	243.16	1,373.92	1,395.27	0.09	-0.09	0.00	180.00
11,019.00	0.00	0.00	10,854.00	243.16	1,373.91	1,395.27	0.09	-0.09	613.49	179.99
<b>Total Depth = 11019.00ft - BM 35-23A Plan #1 BH Tgt</b>										

**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	3.62	19.23	Build Rate = 2.00°/100ft
901.29	895.03	14.70	78.08	End Build at 901.29ft
3,600.00	3,518.89	131.52	698.37	13.53 Inclination
6,303.73	6,147.63	248.55	1,319.80	Begin Drop at 6303.73ft
6,800.00	6,636.30	264.18	1,402.79	Drop Rate = 1.50°/100ft
7,205.46	7,041.00	268.16	1,423.91	End Drop at 7205.46ft
11,019.00	10,854.00	243.16	1,373.91	Total Depth = 11019.00ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
Target	BM 35-23A Plan #1 BH Tgt	79.96	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	11,019.00	Plan #1	MWD

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

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,500.00	1,477.13	8 5/8" Casing Pt.	8-5/8	11

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,220.46	7,056.00	Williams Fork		0.00	
8,309.51	8,145.00	Top of Gas		0.00	
9,625.90	9,461.00	Cameo		0.00	
10,106.97	9,942.00	Rollins		0.00	
10,412.99	10,248.00	Cozzette		0.00	
10,652.00	10,487.00	Corcora		0.00	
10,784.00	10,619.00	Mancos		0.00	

*Targets associated with this wellbore*

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
BM 35-23A Plan #1 BH Tgt	10,854.00	243.16	1,373.91	Point
BM 35-23A Plan #1 Zone Tgt	7,041.00	243.16	1,373.91	Rectangle
BM 35-23A Plan #1 Driller's Tgt	7,041.00	268.16	1,423.91	Rectangle

## North Reference Sheet for Sec. 35-T7S-R95W (SGV 35L PAD) - BM 35-23A - 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 35-23A - Slot B 3

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

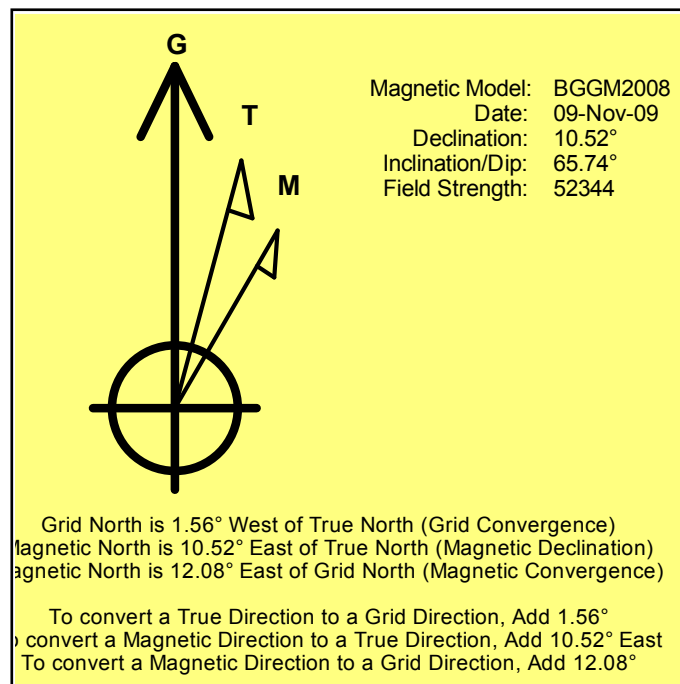
Grid Coordinates of Well: 577,349.75 ft N, 1,301,606.66 ft E

Geographical Coordinates of Well: 39° 23' 33.12" N, 107° 58' 17.12" W

Grid Convergence at Surface is: -1.56°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,019.00ft the Bottom Hole Displacement is 1,395.27ft in the Direction of 79.96° (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 35-23A  
Wellbore: Wellbore #1  
Plan: Plan #1

# Noble Energy (Rockies)

HALLIBURTON

## SECTION DETAILS

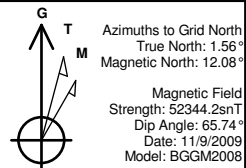
MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
225.00	0.00	0.00	225.00	0.00	0.00	0.00	0.00	0.00	
901.29	13.53	79.33	895.03	14.71	78.08	2.00	79.33	79.45	
6303.73	13.53	79.33	6147.63	248.55	1319.80	0.00	0.00	1342.92	BM 35-23A Plan #1 Driller's Tgt
7205.46	0.00	360.00	7041.00	268.16	1423.91	1.50	180.00	1448.86	
9071.96	1.68	243.44	8907.23	255.92	1399.44	0.09	243.44	1422.63	BM 35-23A Plan #1 BH Tgt
11019.00	0.00	360.00	10854.00	243.16	1373.91	0.09	180.00	1395.27	

## WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
BM 35-23A Plan #1 Driller's Tgt	7041.00	268.16	1423.91	Rectangle (Sides: L25.00 W25.00)
BM 35-23A Plan #1 Zone Tgt	7041.00	243.16	1373.91	Rectangle (Sides: L100.00 W200.00)
BM 35-23A Plan #1 BH Tgt	10854.00	243.16	1373.91	Point

## WELL DETAILS: BM 35-23A

Ground Level:	9203.00	Latitude	107° 58' 17.116 W	B 3
Northing	0.0007309.75	Easting	1301606.66	



## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
7056.00	7220.46	Williams Fork
8145.00	8309.51	Top of Gas
9461.00	9625.90	Cameo
9942.00	10106.97	Rollins
10248.00	10412.99	Cozzette
10487.00	10652.00	Corcora
10619.00	10784.00	Mancos

