

# Noble Energy (Rockies)

Garfield County, CO

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

BM 35-22D - B 1

Wellbore #1

Plan: Plan #1

## Sperry Drilling Services

### Proposal Report

12 November, 2009

Well Coordinates: 577,361.60 N, 1,301,615.70 E (39° 23' 33.24" N, 107° 58' 17.00" W)

Ground Level: 9,203.00 ft

Local Coordinate Origin:

Centered on Well BM 35-22D - Slot B 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 35-22D - 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	67.36	299.99	0.38	0.91	0.98	2.00	2.00	0.00	67.36
400.00	3.50	67.36	399.89	2.06	4.93	5.34	2.00	2.00	0.00	0.00
500.00	5.50	67.36	499.58	5.08	12.17	13.19	2.00	2.00	0.00	0.00
560.00	6.70	67.36	559.24	7.53	18.06	19.56	2.00	2.00	0.00	0.00
<b>Build Rate = 2.00°/100ft</b>										
600.00	7.50	67.36	598.93	9.43	22.62	24.51	2.00	2.00	0.00	0.00
700.00	9.50	67.36	697.83	15.12	36.26	39.29	2.00	2.00	0.00	0.00
800.00	11.50	67.36	796.15	22.14	53.08	57.51	2.00	2.00	0.00	0.00
900.00	13.50	67.36	893.77	30.47	73.05	79.15	2.00	2.00	0.00	0.00
950.32	14.51	67.36	942.60	35.16	84.29	91.33	2.00	2.00	0.00	0.00
<b>End Build at 950.32ft</b>										
1,000.00	14.51	67.36	990.69	39.95	95.78	103.77	0.00	0.00	0.00	0.00
1,100.00	14.51	67.36	1,087.50	49.59	118.90	128.82	0.00	0.00	0.00	0.00
1,200.00	14.51	67.36	1,184.32	59.23	142.01	153.87	0.00	0.00	0.00	0.00
1,300.00	14.51	67.36	1,281.13	68.87	165.13	178.92	0.00	0.00	0.00	0.00
1,400.00	14.51	67.36	1,377.94	78.52	188.25	203.97	0.00	0.00	0.00	0.00
1,500.00	14.51	67.36	1,474.75	88.16	211.37	229.02	0.00	0.00	0.00	0.00
<b>8 5/8" Casing Pt.</b>										
1,600.00	14.51	67.36	1,571.56	97.80	234.49	254.07	0.00	0.00	0.00	0.00
1,700.00	14.51	67.36	1,668.38	107.44	257.61	279.12	0.00	0.00	0.00	0.00
1,800.00	14.51	67.36	1,765.19	117.09	280.73	304.16	0.00	0.00	0.00	0.00
1,900.00	14.51	67.36	1,862.00	126.73	303.84	329.21	0.00	0.00	0.00	0.00
2,000.00	14.51	67.36	1,958.81	136.37	326.96	354.26	0.00	0.00	0.00	0.00
2,100.00	14.51	67.36	2,055.62	146.01	350.08	379.31	0.00	0.00	0.00	0.00
2,200.00	14.51	67.36	2,152.44	155.66	373.20	404.36	0.00	0.00	0.00	0.00
2,300.00	14.51	67.36	2,249.25	165.30	396.32	429.41	0.00	0.00	0.00	0.00
2,400.00	14.51	67.36	2,346.06	174.94	419.44	454.46	0.00	0.00	0.00	0.00
2,500.00	14.51	67.36	2,442.87	184.58	442.56	479.50	0.00	0.00	0.00	0.00
2,600.00	14.51	67.36	2,539.68	194.23	465.67	504.55	0.00	0.00	0.00	0.00
2,700.00	14.51	67.36	2,636.50	203.87	488.79	529.60	0.00	0.00	0.00	0.00
2,800.00	14.51	67.36	2,733.31	213.51	511.91	554.65	0.00	0.00	0.00	0.00
2,900.00	14.51	67.36	2,830.12	223.15	535.03	579.70	0.00	0.00	0.00	0.00
3,000.00	14.51	67.36	2,926.93	232.80	558.15	604.75	0.00	0.00	0.00	0.00
3,100.00	14.51	67.36	3,023.74	242.44	581.27	629.80	0.00	0.00	0.00	0.00
3,200.00	14.51	67.36	3,120.56	252.08	604.38	654.85	0.00	0.00	0.00	0.00
3,300.00	14.51	67.36	3,217.37	261.72	627.50	679.89	0.00	0.00	0.00	0.00
3,400.00	14.51	67.36	3,314.18	271.37	650.62	704.94	0.00	0.00	0.00	0.00
3,500.00	14.51	67.36	3,410.99	281.01	673.74	729.99	0.00	0.00	0.00	0.00
3,600.00	14.51	67.36	3,507.80	290.65	696.86	755.04	0.00	0.00	0.00	0.00
<b>14.51 Inclination</b>										
3,700.00	14.51	67.36	3,604.62	300.29	719.98	780.09	0.00	0.00	0.00	0.00
3,800.00	14.51	67.36	3,701.43	309.94	743.10	805.14	0.00	0.00	0.00	0.00
3,900.00	14.51	67.36	3,798.24	319.58	766.21	830.19	0.00	0.00	0.00	0.00
4,000.00	14.51	67.36	3,895.05	329.22	789.33	855.24	0.00	0.00	0.00	0.00
4,100.00	14.51	67.36	3,991.86	338.86	812.45	880.28	0.00	0.00	0.00	0.00
4,200.00	14.51	67.36	4,088.68	348.51	835.57	905.33	0.00	0.00	0.00	0.00
4,300.00	14.51	67.36	4,185.49	358.15	858.69	930.38	0.00	0.00	0.00	0.00
4,400.00	14.51	67.36	4,282.30	367.79	881.81	955.43	0.00	0.00	0.00	0.00
4,500.00	14.51	67.36	4,379.11	377.43	904.93	980.48	0.00	0.00	0.00	0.00
4,600.00	14.51	67.36	4,475.92	387.07	928.04	1,005.53	0.00	0.00	0.00	0.00
4,700.00	14.51	67.36	4,572.73	396.72	951.16	1,030.58	0.00	0.00	0.00	0.00
4,800.00	14.51	67.36	4,669.55	406.36	974.28	1,055.62	0.00	0.00	0.00	0.00
4,900.00	14.51	67.36	4,766.36	416.00	997.40	1,080.67	0.00	0.00	0.00	0.00

## Plan Report for BM 35-22D - 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	14.51	67.36	4,863.17	425.64	1,020.52	1,105.72	0.00	0.00	0.00	0.00
5,100.00	14.51	67.36	4,959.98	435.29	1,043.64	1,130.77	0.00	0.00	0.00	0.00
5,200.00	14.51	67.36	5,056.79	444.93	1,066.75	1,155.82	0.00	0.00	0.00	0.00
5,300.00	14.51	67.36	5,153.61	454.57	1,089.87	1,180.87	0.00	0.00	0.00	0.00
5,400.00	14.51	67.36	5,250.42	464.21	1,112.99	1,205.92	0.00	0.00	0.00	0.00
5,500.00	14.51	67.36	5,347.23	473.86	1,136.11	1,230.97	0.00	0.00	0.00	0.00
5,600.00	14.51	67.36	5,444.04	483.50	1,159.23	1,256.01	0.00	0.00	0.00	0.00
5,700.00	14.51	67.36	5,540.85	493.14	1,182.35	1,281.06	0.00	0.00	0.00	0.00
5,800.00	14.51	67.36	5,637.67	502.78	1,205.47	1,306.11	0.00	0.00	0.00	0.00
5,900.00	14.51	67.36	5,734.48	512.43	1,228.58	1,331.16	0.00	0.00	0.00	0.00
6,000.00	14.51	67.36	5,831.29	522.07	1,251.70	1,356.21	0.00	0.00	0.00	0.00
6,100.00	14.51	67.36	5,928.10	531.71	1,274.82	1,381.26	0.00	0.00	0.00	0.00
6,200.00	14.51	67.36	6,024.91	541.35	1,297.94	1,406.31	0.00	0.00	0.00	0.00
6,276.74	14.51	67.36	6,099.21	548.75	1,315.68	1,425.53	0.00	0.00	0.00	0.00
Begin Drop at 6276.74ft										
6,300.00	14.16	67.36	6,121.74	550.97	1,320.99	1,431.29	1.50	-1.50	0.00	180.00
6,400.00	12.66	67.36	6,219.02	559.90	1,342.39	1,454.47	1.50	-1.50	0.00	180.00
6,500.00	11.16	67.36	6,316.86	567.84	1,361.44	1,475.11	1.50	-1.50	0.00	180.00
6,600.00	9.66	67.36	6,415.21	574.79	1,378.11	1,493.17	1.50	-1.50	0.00	180.00
6,700.00	8.16	67.36	6,514.00	580.75	1,392.40	1,508.65	1.50	-1.50	0.00	-180.00
6,800.00	6.66	67.36	6,613.17	585.71	1,404.30	1,521.55	1.50	-1.50	0.00	180.00
Drop Rate = 1.50°/100ft										
6,900.00	5.16	67.36	6,712.63	589.68	1,413.80	1,531.84	1.50	-1.50	0.00	-180.00
7,000.00	3.66	67.36	6,812.33	592.63	1,420.89	1,539.52	1.50	-1.50	0.00	180.00
7,100.00	2.16	67.36	6,912.20	594.59	1,425.57	1,544.59	1.50	-1.50	0.00	180.00
7,200.00	0.66	67.36	7,012.17	595.53	1,427.84	1,547.05	1.50	-1.50	0.00	180.00
7,243.51	0.00	67.36	7,055.68	595.63	1,428.07	1,547.30	1.50	-1.50	0.00	-180.00
BM 35-22D Plan #1 Zone Tgt										
7,243.83	0.00	360.00	7,056.00	595.63	1,428.07	1,547.30	1.50	-1.50	0.00	-180.00
End Drop at 7243.83ft - Williams Fork - BM 35-22D Plan #1 Driller's Tgt										
7,300.00	0.05	243.43	7,112.17	595.62	1,428.05	1,547.28	0.09	0.09	0.00	243.43
7,400.00	0.14	243.43	7,212.17	595.54	1,427.90	1,547.11	0.09	0.09	0.00	0.00
7,500.00	0.23	243.43	7,312.17	595.40	1,427.61	1,546.79	0.09	0.09	0.00	0.00
7,600.00	0.32	243.43	7,412.17	595.18	1,427.18	1,546.31	0.09	0.09	0.00	0.00
7,700.00	0.41	243.43	7,512.17	594.90	1,426.61	1,545.67	0.09	0.09	0.00	0.00
7,800.00	0.50	243.43	7,612.16	594.54	1,425.90	1,544.88	0.09	0.09	0.00	0.00
7,900.00	0.59	243.43	7,712.16	594.12	1,425.05	1,543.93	0.09	0.09	0.00	0.00
8,000.00	0.68	243.43	7,812.15	593.62	1,424.05	1,542.82	0.09	0.09	0.00	0.00
8,100.00	0.77	243.43	7,912.14	593.05	1,422.92	1,541.56	0.09	0.09	0.00	0.00
8,200.00	0.86	243.43	8,012.13	592.42	1,421.65	1,540.14	0.09	0.09	0.00	0.00
8,300.00	0.95	243.43	8,112.12	591.71	1,420.23	1,538.56	0.09	0.09	0.00	0.00
8,332.88	0.98	243.43	8,145.00	591.46	1,419.74	1,538.01	0.09	0.09	0.00	0.00
Top of Gas										
8,400.00	1.04	243.43	8,212.11	590.93	1,418.68	1,536.83	0.09	0.09	0.00	0.00
8,500.00	1.13	243.43	8,312.09	590.09	1,416.99	1,534.94	0.09	0.09	0.00	0.00
8,600.00	1.22	243.43	8,412.07	589.17	1,415.15	1,532.89	0.09	0.09	0.00	0.00
8,700.00	1.31	243.43	8,512.04	588.18	1,413.18	1,530.69	0.09	0.09	0.00	0.00
8,800.00	1.40	243.43	8,612.01	587.12	1,411.06	1,528.33	0.09	0.09	0.00	0.00
8,900.00	1.49	243.43	8,711.98	586.00	1,408.80	1,525.81	0.09	0.09	0.00	0.00
9,000.00	1.58	243.43	8,811.95	584.80	1,406.41	1,523.14	0.09	0.09	0.00	0.00
9,100.00	1.67	243.43	8,911.91	583.53	1,403.87	1,520.31	0.09	0.09	0.00	0.00
9,110.36	1.68	243.43	8,922.26	583.39	1,403.60	1,520.01	0.09	0.09	0.00	0.00
9,200.00	1.60	243.43	9,011.86	582.24	1,401.30	1,517.45	0.09	-0.09	0.00	180.00
9,300.00	1.52	243.43	9,111.83	581.03	1,398.87	1,514.73	0.09	-0.09	0.00	180.00
9,400.00	1.43	243.43	9,211.79	579.88	1,396.57	1,512.17	0.09	-0.09	0.00	180.00
9,500.00	1.34	243.43	9,311.77	578.80	1,394.40	1,509.76	0.09	-0.09	0.00	180.00
9,600.00	1.26	243.43	9,411.74	577.78	1,392.37	1,507.49	0.09	-0.09	0.00	180.00
9,649.27	1.21	243.43	9,461.00	577.31	1,391.42	1,506.43	0.09	-0.09	0.00	-180.00
Cameo										

**Plan Report for BM 35-22D - 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	1.17	243.43	9,511.72	576.83	1,390.48	1,505.38	0.09	-0.09	0.00	180.00
9,800.00	1.08	243.43	9,611.70	575.95	1,388.72	1,503.41	0.09	-0.09	0.00	180.00
9,900.00	1.00	243.43	9,711.68	575.14	1,387.09	1,501.60	0.09	-0.09	0.00	180.00
10,000.00	0.91	243.43	9,811.67	574.39	1,385.60	1,499.94	0.09	-0.09	0.00	180.00
10,100.00	0.83	243.43	9,911.66	573.72	1,384.24	1,498.43	0.09	-0.09	0.00	180.00
10,130.35	0.80	243.43	9,942.00	573.52	1,383.86	1,498.00	0.09	-0.09	0.00	180.00
<b>Rollins</b>										
10,200.00	0.74	243.43	10,011.65	573.10	1,383.02	1,497.06	0.09	-0.09	0.00	-180.00
10,300.00	0.65	243.43	10,111.64	572.56	1,381.93	1,495.85	0.09	-0.09	0.00	180.00
10,400.00	0.57	243.43	10,211.63	572.08	1,380.98	1,494.79	0.09	-0.09	0.00	180.00
10,436.37	0.54	243.43	10,248.00	571.93	1,380.67	1,494.44	0.09	-0.09	0.00	180.00
<b>Cozzette</b>										
10,500.00	0.48	243.43	10,311.63	571.68	1,380.16	1,493.87	0.09	-0.09	0.00	-180.00
10,600.00	0.39	243.43	10,411.63	571.33	1,379.48	1,493.11	0.09	-0.09	0.00	180.00
10,675.38	0.33	243.43	10,487.00	571.12	1,379.05	1,492.64	0.09	-0.09	0.00	180.00
<b>Corcora</b>										
10,700.00	0.31	243.43	10,511.62	571.06	1,378.93	1,492.50	0.09	-0.09	0.00	-180.00
10,800.00	0.22	243.43	10,611.62	570.85	1,378.52	1,492.04	0.09	-0.09	0.00	180.00
10,807.38	0.22	243.43	10,619.00	570.84	1,378.49	1,492.01	0.09	-0.09	0.00	-180.00
<b>Mancos</b>										
10,900.00	0.14	243.43	10,711.62	570.71	1,378.24	1,491.73	0.09	-0.09	0.00	180.00
11,000.00	0.05	243.43	10,811.62	570.64	1,378.09	1,491.57	0.09	-0.09	0.00	180.00
11,057.38	0.00	360.00	10,869.00	570.63	1,378.07	1,491.54	0.09	-0.09	0.00	180.00
<b>BM 35-22D 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	7.53	18.06	Build Rate = 2.00°/100ft
950.32	942.60	35.16	84.29	End Build at 950.32ft
3,600.00	3,507.80	290.65	696.86	14.51 Inclination
6,276.74	6,099.21	548.75	1,315.68	Begin Drop at 6276.74ft
6,800.00	6,613.17	585.71	1,404.30	Drop Rate = 1.50°/100ft
7,243.83	7,056.00	595.63	1,428.07	End Drop at 7243.83ft
11,057.38	10,869.00	570.63	1,378.07	Total Depth = 11057.38ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
Target	BM 35-22D Plan #1 BH Tgt	67.51	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	11,057.38	Plan #1	MWD

## Plan Report for BM 35-22D - Plan #1

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,500.00	1,474.75	8 5/8" Casing Pt.	8-5/8	11

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,243.83	7,056.00	Williams Fork		0.00	
8,332.88	8,145.00	Top of Gas		0.00	
9,649.27	9,461.00	Cameo		0.00	
10,130.35	9,942.00	Rollins		0.00	
10,436.37	10,248.00	Cozzette		0.00	
10,675.38	10,487.00	Corcora		0.00	
10,807.38	10,619.00	Mancos		0.00	

*Targets associated with this wellbore*

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
BM 35-22D Plan #1 Driller's Tgt	7,056.00	595.63	1,428.07	Rectangle
BM 35-22D Plan #1 BH Tgt	10,869.00	570.63	1,378.07	Point
BM 35-22D Plan #1 Zone Tgt	7,056.00	570.63	1,378.07	Rectangle

## North Reference Sheet for Sec. 35-T7S-R95W (SGV 35L PAD) - BM 35-22D - 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 35-22D - Slot B 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

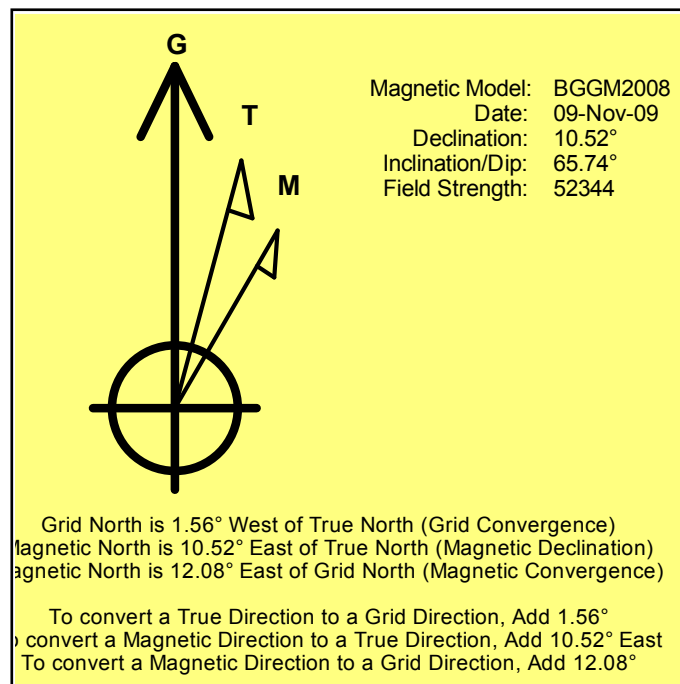
Grid Coordinates of Well: 577,361.60 ft N, 1,301,615.70 ft E

Geographical Coordinates of Well: 39° 23' 33.24" N, 107° 58' 17.00" W

Grid Convergence at Surface is: -1.56°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,057.38ft  
the Bottom Hole Displacement is 1,491.54ft in the Direction of 67.51° (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 35-22D  
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
950.32	14.51	67.36	942.59	35.16	84.29	2.00	67.36	91.33
6276.74	14.51	67.36	6099.21	548.75	1315.68	0.00	0.00	1425.53
7243.83	0.00	360.00	7056.00	595.63	1428.07	1.50	180.00	1547.30
9110.36	1.68	243.43	8922.26	583.39	1403.60	0.09	243.43	1520.01
11057.38	0.00	360.00	10869.00	570.63	1378.07	0.09	180.00	1491.54

BM 35-22D Plan #1 Driller's Tgt

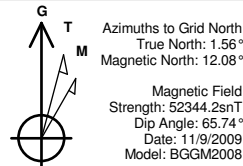
BM 35-22D Plan #1 BH Tgt

## WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
BM 35-22D Plan #1 Driller's Tgt	7056.00	595.63	1428.07	Rectangle (Sides: L25.00 W25.00)
BM 35-22D Plan #1 Zone Tgt	7056.00	570.63	1378.07	Rectangle (Sides: L100.00 W200.00)
BM 35-22D Plan #1 BH Tgt	10869.00	570.63	1378.07	Point

## WELL DETAILS: BM 35-22D

North	Ground Level:	9203.00	Longitude
0.0007361.60	Easting	1301615.70	39° 23' 33.243 N
	Latitude	107° 58' 17.005 W	B 1



## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
7056.00	7243.83	Williams Fork
8145.00	8332.88	Top of Gas
9461.00	9649.27	Cameo
9942.00	10130.35	Rollins
10248.00	10436.37	Cozzette
10487.00	10675.38	Corcora
10619.00	10807.38	Mancos

