



# Scientific Drilling

Rocky Mountain Operations

Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 697-08-53 Pad



Well Details: CC 697-08-35A

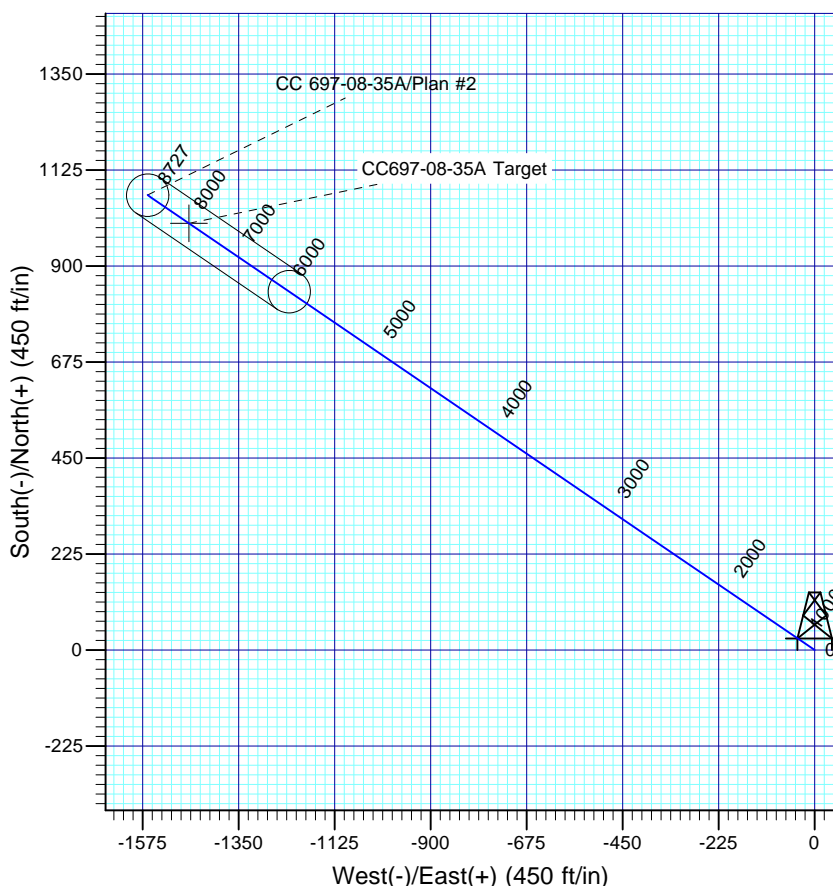
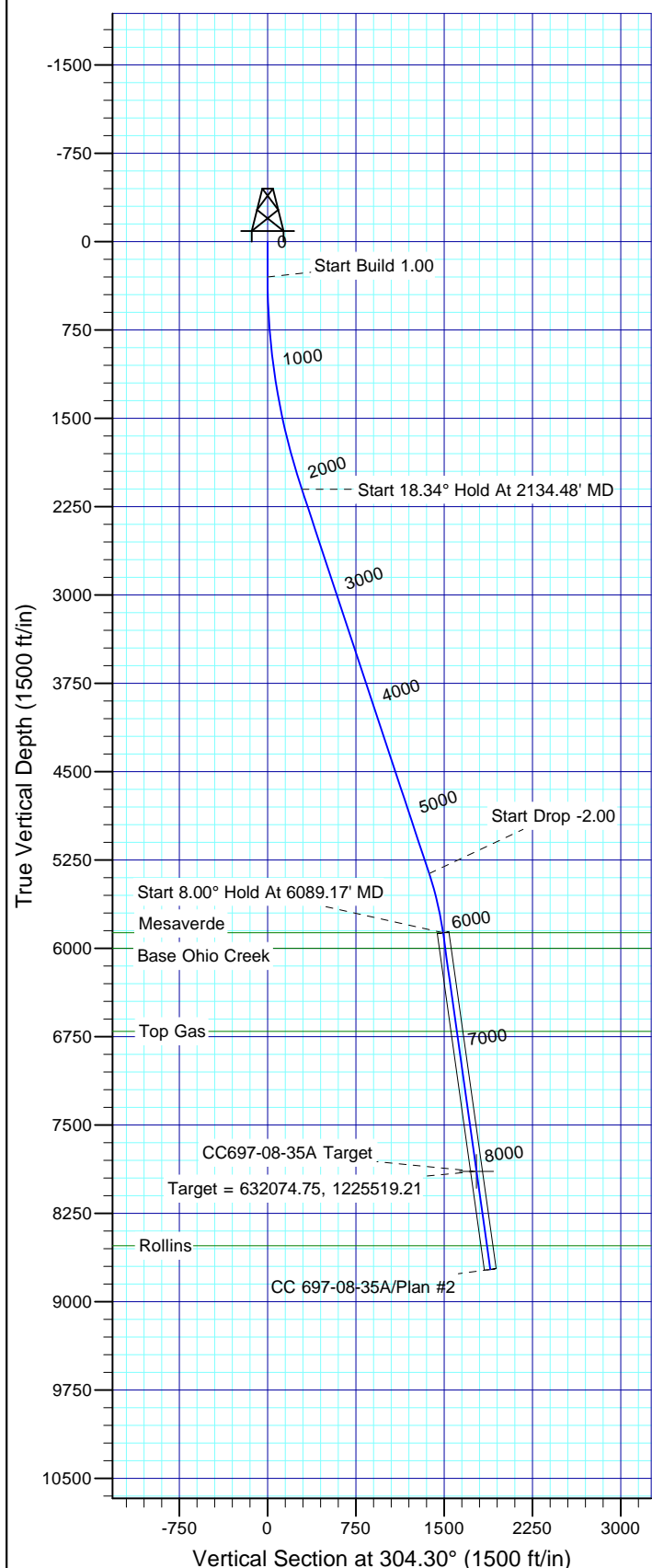
TVD Reference: GL 8411' & RKB 30' @ 8441.00ft (H&P) Ground Level: 8411.00

+N/-S 0.00 +E/-W 0.00 Northing 631030.37 Easting 1226955.07 Latitude 39° 32' 2.313 N Longitude 108° 14' 28.213 W Slot K



Azimuths to True North  
Magnetic North: 10.54°

Magnetic Field  
Strength: 52328.8snT  
Dip Angle: 65.76°  
Date: 9/1/2010  
Model: IGRF2005-10



## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
5869.00	6089.17	Mesaverde
6000.00	6221.46	Base Ohio Creek
6706.00	6934.39	Top Gas
8527.00	8773.29	Rollins

Plan: Plan #2

12:14, September 02 2010  
Created By: Rex Hall

PROJECT DETAILS: Garfield County, CO NAD27

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

CC 697-08-35A				Slot	K
	NAD83	NAD83	NAD27	NAD27	
	CO. CENTRAL	CO. CENTRAL	CO. CENTRAL	CO. CENTRAL	
	NORTH (FEET)	EAST (FEET)	NORTH (FEET)	EAST (FEET)	
SHL	1631039.78	2226794.69	631030.37	1226955.07	
Top Gas	1631985.90	2225493.94	631976.46	1225654.34	
BHL	1632152.97	2225264.25	632143.53	1225424.65	

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	
3	2134.48	18.34	304.30	2103.30	164.09	-240.54	1.00	304.30	291.18	
4	5571.93	18.34	304.30	5366.05	773.79	-1134.26	0.00	0.00	1373.06	
5	6089.17	8.00	304.30	5869.00	840.13	-1231.50	2.00	180.00	1490.77	
6	8135.08	8.00	304.30	7895.00	1000.59	-1466.72	0.00	0.00	1775.51	CC697-08-35A Target
7	8975.26	8.00	304.30	8727.00	1066.48	-1563.31	0.00	0.00	1892.44	



# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-08-53 Pad  
CC 697-08-35A - Slot K**

**OH**

**Plan: Plan #2**

## **Standard Planning Report**

**02 September, 2010**



<b>Database:</b>	Rockies-R5000.1	<b>Local Co-ordinate Reference:</b>	Well CC 697-08-35A - Slot K
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8411' & RKB 30' @ 8441.00ft (H&P)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8411' & RKB 30' @ 8441.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-08-53 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-08-35A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2		

<b>Project</b>	Garfield County, CO NAD27		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	Colorado Central 502		

Site		Cascade Creek 697-08-53 Pad, Sec. 8 T6S R97W			
Site Position:		Northing:	630,837.78 usft	Latitude:	39° 32' 0.393 N
From:	Map	Easting:	1,226,897.42 usft	Longitude:	108° 14' 28.874 W
Position Uncertainty:	0.00 ft	Slot Radius:	0.000 in	Grid Convergence:	-1.73 °

Well		CC 697-08-35A - Slot K				
Well Position	+N/-S	194.24 ft	Northing:	631,030.37 usft	Latitude:	39° 32' 2.313 N
	+E/-W	51.81 ft	Easting:	1,226,955.07 usft	Longitude:	108° 14' 28.213 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	8,411.00 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2005-10	9/1/2010	10.54	65.76	52,329

<b>Design</b>	Plan #2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	304.30

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,134.48	18.34	304.30	2,103.30	164.09	-240.54	1.00	1.00	0.00	304.30	
5,571.93	18.34	304.30	5,366.05	773.79	-1,134.26	0.00	0.00	0.00	0.00	
6,089.17	8.00	304.30	5,869.00	840.13	-1,231.50	2.00	-2.00	0.00	180.00	
8,135.08	8.00	304.30	7,895.00	1,000.59	-1,466.72	0.00	0.00	0.00	0.00	CC697-08-35A Targe
8,975.26	8.00	304.30	8,727.00	1,066.48	-1,563.31	0.00	0.00	0.00	0.00	

<b>Database:</b>	Rockies-R5000.1	<b>Local Co-ordinate Reference:</b>	Well CC 697-08-35A - Slot K
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8411' & RKB 30' @ 8441.00ft (H&P)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8411' & RKB 30' @ 8441.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-08-53 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-08-35A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2		

Planned Survey									
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)
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
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 1.00									
400.00	1.00	304.30	399.99	0.49	-0.72	0.87	1.00	1.00	0.00
500.00	2.00	304.30	499.96	1.97	-2.88	3.49	1.00	1.00	0.00
600.00	3.00	304.30	599.86	4.43	-6.49	7.85	1.00	1.00	0.00
700.00	4.00	304.30	699.68	7.87	-11.53	13.96	1.00	1.00	0.00
800.00	5.00	304.30	799.37	12.29	-18.01	21.80	1.00	1.00	0.00
900.00	6.00	304.30	898.90	17.69	-25.93	31.39	1.00	1.00	0.00
1,000.00	7.00	304.30	998.26	24.07	-35.28	42.71	1.00	1.00	0.00
1,100.00	8.00	304.30	1,097.40	31.42	-46.06	55.76	1.00	1.00	0.00
1,200.00	9.00	304.30	1,196.30	39.75	-58.27	70.54	1.00	1.00	0.00
1,300.00	10.00	304.30	1,294.93	49.05	-71.91	87.05	1.00	1.00	0.00
1,400.00	11.00	304.30	1,393.26	59.32	-86.96	105.27	1.00	1.00	0.00
1,500.00	12.00	304.30	1,491.25	70.56	-103.43	125.21	1.00	1.00	0.00
1,600.00	13.00	304.30	1,588.87	82.76	-121.31	146.85	1.00	1.00	0.00
1,700.00	14.00	304.30	1,686.11	95.91	-140.59	170.19	1.00	1.00	0.00
1,800.00	15.00	304.30	1,782.92	110.02	-161.28	195.23	1.00	1.00	0.00
1,900.00	16.00	304.30	1,879.29	125.08	-183.35	221.95	1.00	1.00	0.00
2,000.00	17.00	304.30	1,975.17	141.09	-206.81	250.36	1.00	1.00	0.00
2,100.00	18.00	304.30	2,070.54	158.03	-231.65	280.43	1.00	1.00	0.00
2,134.48	18.34	304.30	2,103.30	164.09	-240.54	291.18	1.00	1.00	0.00
2,200.00	18.34	304.30	2,165.49	175.72	-257.57	311.80	0.00	0.00	0.00
2,300.00	18.34	304.30	2,260.41	193.45	-283.57	343.27	0.00	0.00	0.00
2,400.00	18.34	304.30	2,355.32	211.19	-309.57	374.75	0.00	0.00	0.00
2,500.00	18.34	304.30	2,450.24	228.93	-335.57	406.22	0.00	0.00	0.00
2,600.00	18.34	304.30	2,545.16	246.66	-361.57	437.69	0.00	0.00	0.00
2,700.00	18.34	304.30	2,640.08	264.40	-387.57	469.17	0.00	0.00	0.00
2,800.00	18.34	304.30	2,735.00	282.14	-413.57	500.64	0.00	0.00	0.00
2,900.00	18.34	304.30	2,829.91	299.87	-439.57	532.12	0.00	0.00	0.00
2,971.01	18.34	304.30	2,897.32	312.47	-458.03	554.47	0.00	0.00	0.00
Start 26.71° Hold At 2971.01' MD									
3,000.00	18.34	304.30	2,924.83	317.61	-465.57	563.59	0.00	0.00	0.00
3,100.00	18.34	304.30	3,019.75	335.35	-491.57	595.06	0.00	0.00	0.00
3,200.00	18.34	304.30	3,114.67	353.08	-517.57	626.54	0.00	0.00	0.00
3,300.00	18.34	304.30	3,209.58	370.82	-543.57	658.01	0.00	0.00	0.00
3,400.00	18.34	304.30	3,304.50	388.56	-569.57	689.48	0.00	0.00	0.00
3,500.00	18.34	304.30	3,399.42	406.29	-595.57	720.96	0.00	0.00	0.00
3,600.00	18.34	304.30	3,494.34	424.03	-621.57	752.43	0.00	0.00	0.00
3,700.00	18.34	304.30	3,589.26	441.77	-647.57	783.90	0.00	0.00	0.00
3,800.00	18.34	304.30	3,684.17	459.51	-673.57	815.38	0.00	0.00	0.00
3,900.00	18.34	304.30	3,779.09	477.24	-699.57	846.85	0.00	0.00	0.00
4,000.00	18.34	304.30	3,874.01	494.98	-725.57	878.32	0.00	0.00	0.00
4,100.00	18.34	304.30	3,968.93	512.72	-751.57	909.80	0.00	0.00	0.00
4,200.00	18.34	304.30	4,063.85	530.45	-777.57	941.27	0.00	0.00	0.00
4,300.00	18.34	304.30	4,158.76	548.19	-803.57	972.74	0.00	0.00	0.00
4,400.00	18.34	304.30	4,253.68	565.93	-829.57	1,004.22	0.00	0.00	0.00
4,500.00	18.34	304.30	4,348.60	583.66	-855.57	1,035.69	0.00	0.00	0.00
4,600.00	18.34	304.30	4,443.52	601.40	-881.57	1,067.16	0.00	0.00	0.00
4,700.00	18.34	304.30	4,538.44	619.14	-907.57	1,098.64	0.00	0.00	0.00
4,800.00	18.34	304.30	4,633.35	636.87	-933.57	1,130.11	0.00	0.00	0.00
4,880.84	18.34	304.30	4,710.08	651.21	-954.58	1,155.55	0.00	0.00	0.00

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<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8411' & RKB 30' @ 8441.00ft (H&P)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8411' & RKB 30' @ 8441.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-08-53 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-08-35A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2		

Planned Survey									
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)
<b>Start Drop -2.00</b>									
4,900.00	18.34	304.30	4,728.27	654.61	-959.56	1,161.59	0.00	0.00	0.00
5,000.00	18.34	304.30	4,823.19	672.35	-985.56	1,193.06	0.00	0.00	0.00
5,100.00	18.34	304.30	4,918.11	690.08	-1,011.56	1,224.53	0.00	0.00	0.00
5,200.00	18.34	304.30	5,013.03	707.82	-1,037.56	1,256.01	0.00	0.00	0.00
5,300.00	18.34	304.30	5,107.94	725.56	-1,063.56	1,287.48	0.00	0.00	0.00
5,400.00	18.34	304.30	5,202.86	743.30	-1,089.56	1,318.95	0.00	0.00	0.00
5,500.00	18.34	304.30	5,297.78	761.03	-1,115.56	1,350.43	0.00	0.00	0.00
5,571.93	18.34	304.30	5,366.05	773.79	-1,134.26	1,373.06	0.00	0.00	0.00
5,600.00	17.78	304.30	5,392.74	778.70	-1,141.45	1,381.77	2.00	-2.00	0.00
5,700.00	15.78	304.30	5,488.48	794.97	-1,165.31	1,410.64	2.00	-2.00	0.00
5,800.00	13.78	304.30	5,585.16	809.35	-1,186.38	1,436.16	2.00	-2.00	0.00
5,900.00	11.78	304.30	5,682.68	821.82	-1,204.66	1,458.28	2.00	-2.00	0.00
6,000.00	9.78	304.30	5,780.91	832.36	-1,220.12	1,476.99	2.00	-2.00	0.00
6,089.17	8.00	304.30	5,869.00	840.13	-1,231.50	1,490.77	2.00	-2.00	0.00
<b>Mesaverde</b>									
6,100.00	8.00	304.30	5,879.73	840.97	-1,232.75	1,492.28	0.00	0.00	0.00
6,200.00	8.00	304.30	5,978.75	848.82	-1,244.24	1,506.20	0.00	0.00	0.00
6,216.34	8.00	304.30	5,994.94	850.10	-1,246.12	1,508.47	0.00	0.00	0.00
<b>Start 0.00° Hold At 6216.34' MD</b>									
6,221.46	8.00	304.30	6,000.00	850.50	-1,246.71	1,509.19	0.00	0.00	0.00
<b>Base Ohio Creek</b>									
6,300.00	8.00	304.30	6,077.78	856.66	-1,255.74	1,520.12	0.00	0.00	0.00
6,400.00	8.00	304.30	6,176.81	864.50	-1,267.24	1,534.03	0.00	0.00	0.00
6,500.00	8.00	304.30	6,275.83	872.35	-1,278.73	1,547.95	0.00	0.00	0.00
6,600.00	8.00	304.30	6,374.86	880.19	-1,290.23	1,561.87	0.00	0.00	0.00
6,700.00	8.00	304.30	6,473.89	888.03	-1,301.73	1,575.79	0.00	0.00	0.00
6,800.00	8.00	304.30	6,572.91	895.88	-1,313.23	1,589.70	0.00	0.00	0.00
6,900.00	8.00	304.30	6,671.94	903.72	-1,324.72	1,603.62	0.00	0.00	0.00
6,934.39	8.00	304.30	6,706.00	906.42	-1,328.68	1,608.41	0.00	0.00	0.00
<b>Top Gas</b>									
7,000.00	8.00	304.30	6,770.97	911.56	-1,336.22	1,617.54	0.00	0.00	0.00
7,100.00	8.00	304.30	6,869.99	919.41	-1,347.72	1,631.45	0.00	0.00	0.00
7,200.00	8.00	304.30	6,969.02	927.25	-1,359.21	1,645.37	0.00	0.00	0.00
7,300.00	8.00	304.30	7,068.05	935.09	-1,370.71	1,659.29	0.00	0.00	0.00
7,400.00	8.00	304.30	7,167.07	942.93	-1,382.21	1,673.21	0.00	0.00	0.00
7,500.00	8.00	304.30	7,266.10	950.78	-1,393.70	1,687.12	0.00	0.00	0.00
7,600.00	8.00	304.30	7,365.13	958.62	-1,405.20	1,701.04	0.00	0.00	0.00
7,700.00	8.00	304.30	7,464.16	966.46	-1,416.70	1,714.96	0.00	0.00	0.00
7,800.00	8.00	304.30	7,563.18	974.31	-1,428.19	1,728.88	0.00	0.00	0.00
7,900.00	8.00	304.30	7,662.21	982.15	-1,439.69	1,742.79	0.00	0.00	0.00
8,000.00	8.00	304.30	7,761.24	989.99	-1,451.19	1,756.71	0.00	0.00	0.00
8,100.00	8.00	304.30	7,860.26	997.84	-1,462.68	1,770.63	0.00	0.00	0.00
8,135.08	8.00	304.30	7,895.00	1,000.59	-1,466.72	1,775.51	0.00	0.00	0.00
8,200.00	8.00	304.30	7,959.29	1,005.68	-1,474.18	1,784.55	0.00	0.00	0.00
8,242.34	8.00	304.30	8,001.22	1,009.00	-1,479.05	1,790.44	0.00	0.00	0.00
<b>Target = 632074.75, 1225519.21</b>									
8,300.00	8.00	304.30	8,058.32	1,013.52	-1,485.68	1,798.46	0.00	0.00	0.00
8,400.00	8.00	304.30	8,157.34	1,021.37	-1,497.17	1,812.38	0.00	0.00	0.00
8,500.00	8.00	304.30	8,256.37	1,029.21	-1,508.67	1,826.30	0.00	0.00	0.00
8,600.00	8.00	304.30	8,355.40	1,037.05	-1,520.17	1,840.21	0.00	0.00	0.00
8,700.00	8.00	304.30	8,454.42	1,044.90	-1,531.67	1,854.13	0.00	0.00	0.00
8,773.29	8.00	304.30	8,527.00	1,050.64	-1,540.09	1,864.33	0.00	0.00	0.00

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<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8411' & RKB 30' @ 8441.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-08-53 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-08-35A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2		

Planned Survey									
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)
<b>Rollins</b>									
8,800.00	8.00	304.30	8,553.45	1,052.74	-1,543.16	1,868.05	0.00	0.00	0.00
8,900.00	8.00	304.30	8,652.48	1,060.58	-1,554.66	1,881.97	0.00	0.00	0.00
8,975.26	8.00	304.30	8,727.00	1,066.48	-1,563.31	1,892.44	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
CC697-08-35A Target	-8.00	304.30	7,895.00	1,000.59	-1,466.72	632,074.75	1,225,519.21	39° 32' 12.202 N	108° 14' 46.934 W
- plan hits target center									
- Circle (radius 50.00)									

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,089.17	5,869.00	Mesaverde		0.00	
6,221.46	6,000.00	Base Ohio Creek		0.00	
6,934.39	6,706.00	Top Gas		0.00	
8,773.29	8,527.00	Rollins		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
300.00	300.00	0.00	0.00	Start Build 1.00
2,971.01	2,875.31	344.55	-505.06	Start 26.71° Hold At 2971.01' MD
4,880.84	4,581.34	828.31	-1,214.19	Start Drop -2.00
6,216.34	5,869.00	1,000.59	-1,466.72	Start 0.00° Hold At 6216.34' MD
8,242.34	7,895.00	1,000.59	-1,466.72	Target = 632074.75, 1225519.21
9,074.34	8,727.00	1,000.59	-1,466.72	PBHL = 632074.75, 1225519.21