



# Scientific Drilling

Rocky Mountain Operations

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



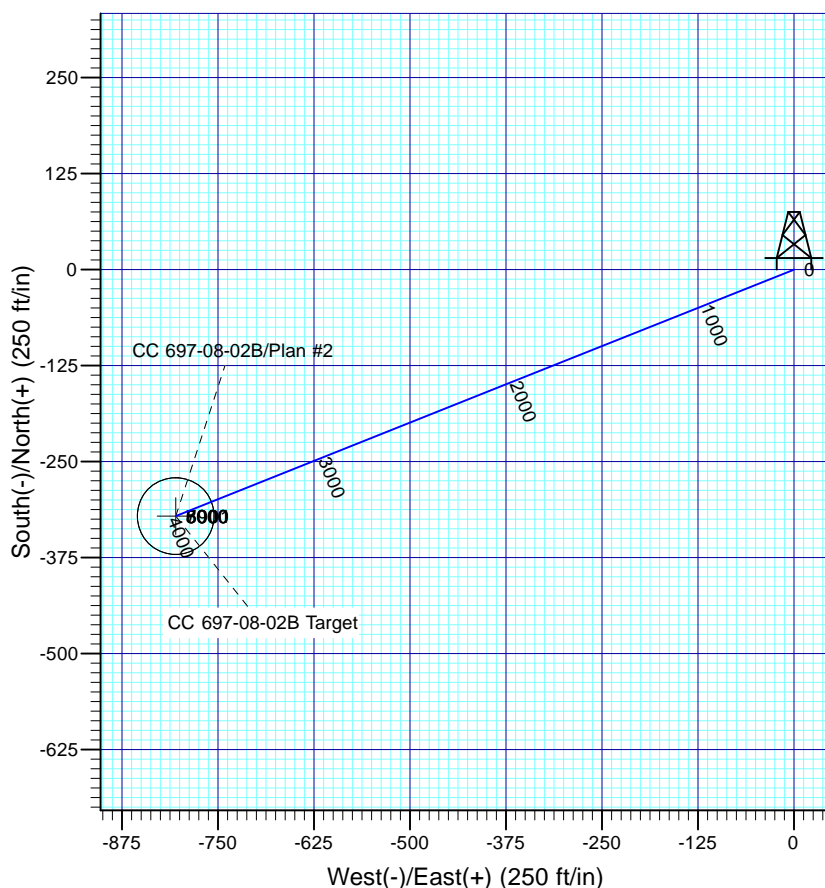
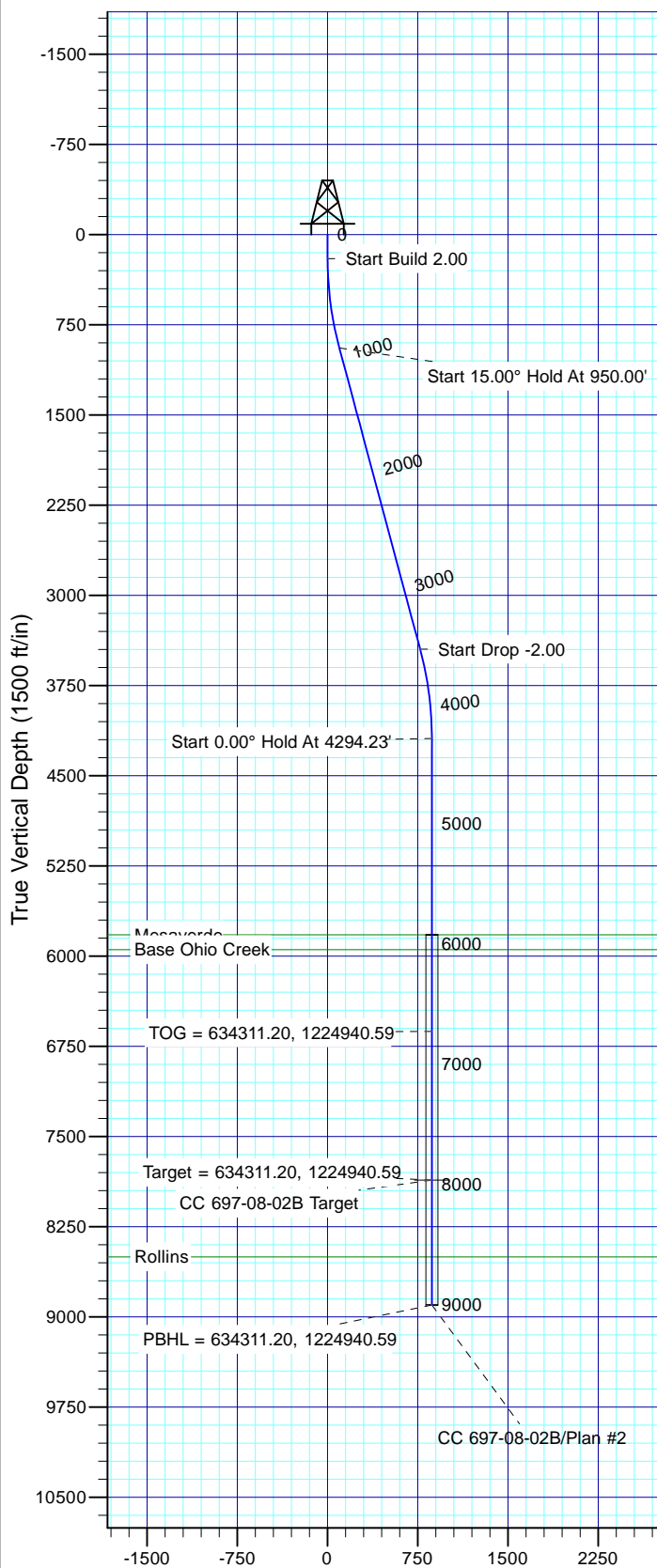
Well Details: CC 697-08-02B

TVD Reference: GL 8401' & RKB 30' @ 8431.00ft (H&P Rig) Ground Level: 8401.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	634607.65	1225754.98	39° 32' 37.295 N	108° 14' 44.903 W	N

T M Azimuths to True North  
Magnetic North: 10.77°

Magnetic Field  
Strength: 52497.8snT  
Dip Angle: 65.81°  
Date: 12/22/2008  
Model: IGRF2005-10



## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
5821.00	5926.47	Mesaverde
5946.00	6051.47	Base Ohio Creek
8501.00	8606.47	Rollins

Plan: Plan #2

16:47, May 25 2011  
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

## 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	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	950.00	15.00	248.27	941.46	-36.15	-90.68	2.00	248.27	97.62	
4	3544.23	15.00	248.27	3447.29	-284.78	-714.38	0.00	0.00	769.05	
5	4294.23	0.00	0.00	4188.76	-320.92	-805.06	2.00	180.00	866.67	
6	7967.47	0.00	0.00	7862.00	-320.92	-805.06	0.00	0.00	866.67	CC 697-08-02B Target
7	9006.47	0.00	0.00	8901.00	-320.92	-805.06	0.00	0.00	866.67	

# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-08A Pad  
CC 697-08-02B - Slot N**

**OH**

**Plan: Plan #2**

## **Standard Planning Report**

**25 May, 2011**





<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-08-02B - Slot N
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 697-08A Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-08-02B	<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		

<b>Site</b>	Cascade Creek 697-08A Pad, Sec 8 T6S R97W			
<b>Site Position:</b>		<b>Northing:</b>	635,765.16 usft	<b>Latitude:</b> 39° 32' 48.728 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,225,748.33 usft	<b>Longitude:</b> 108° 14' 45.434 W
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b> -1.73 °

<b>Well</b>	CC 697-08-02B - Slot N, 358' FNL & 1801' FWL			
<b>Well Position</b>	<b>+N/-S</b>	-1,156.78 ft	<b>Northing:</b>	634,607.65 usft
	<b>+E/-W</b>	41.63 ft	<b>Easting:</b>	1,225,754.98 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b> 8,401.00 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	12/22/2008	10.77	65.81	52,498

<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	248.27

<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	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
950.00	15.00	248.27	941.46	-36.15	-90.68	2.00	2.00	0.00	248.27	
3,544.23	15.00	248.27	3,447.30	-284.78	-714.38	0.00	0.00	0.00	0.00	
4,294.23	0.00	0.00	4,188.76	-320.92	-805.06	2.00	-2.00	0.00	180.00	
7,967.47	0.00	0.00	7,862.00	-320.92	-805.06	0.00	0.00	0.00	0.00	CC 697-08-02B Target
9,006.47	0.00	0.00	8,901.00	-320.92	-805.06	0.00	0.00	0.00	0.00	



<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-08-02B - Slot N
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 697-08A Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-08-02B	<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
<b>Start Build 2.00</b>									
300.00	2.00	248.27	299.98	-0.65	-1.62	1.75	2.00	2.00	0.00
400.00	4.00	248.27	399.84	-2.58	-6.48	6.98	2.00	2.00	0.00
500.00	6.00	248.27	499.45	-5.81	-14.58	15.69	2.00	2.00	0.00
600.00	8.00	248.27	598.70	-10.32	-25.90	27.88	2.00	2.00	0.00
700.00	10.00	248.27	697.47	-16.12	-40.43	43.52	2.00	2.00	0.00
800.00	12.00	248.27	795.62	-23.18	-58.15	62.60	2.00	2.00	0.00
900.00	14.00	248.27	893.06	-31.51	-79.05	85.10	2.00	2.00	0.00
950.00	15.00	248.27	941.46	-36.15	-90.68	97.62	2.00	2.00	0.00
<b>Start 15.00° Hold At 950.00'</b>									
1,000.00	15.00	248.27	989.76	-40.94	-102.70	110.56	0.00	0.00	0.00
1,100.00	15.00	248.27	1,086.35	-50.52	-126.74	136.44	0.00	0.00	0.00
1,200.00	15.00	248.27	1,182.94	-60.11	-150.78	162.32	0.00	0.00	0.00
1,300.00	15.00	248.27	1,279.54	-69.69	-174.82	188.20	0.00	0.00	0.00
1,400.00	15.00	248.27	1,376.13	-79.27	-198.87	214.08	0.00	0.00	0.00
1,500.00	15.00	248.27	1,472.72	-88.86	-222.91	239.97	0.00	0.00	0.00
1,600.00	15.00	248.27	1,569.31	-98.44	-246.95	265.85	0.00	0.00	0.00
1,700.00	15.00	248.27	1,665.91	-108.03	-270.99	291.73	0.00	0.00	0.00
1,800.00	15.00	248.27	1,762.50	-117.61	-295.03	317.61	0.00	0.00	0.00
1,900.00	15.00	248.27	1,859.09	-127.19	-319.08	343.49	0.00	0.00	0.00
2,000.00	15.00	248.27	1,955.68	-136.78	-343.12	369.38	0.00	0.00	0.00
2,100.00	15.00	248.27	2,052.28	-146.36	-367.16	395.26	0.00	0.00	0.00
2,200.00	15.00	248.27	2,148.87	-155.95	-391.20	421.14	0.00	0.00	0.00
2,300.00	15.00	248.27	2,245.46	-165.53	-415.24	447.02	0.00	0.00	0.00
2,400.00	15.00	248.27	2,342.05	-175.11	-439.29	472.90	0.00	0.00	0.00
2,500.00	15.00	248.27	2,438.65	-184.70	-463.33	498.78	0.00	0.00	0.00
2,600.00	15.00	248.27	2,535.24	-194.28	-487.37	524.67	0.00	0.00	0.00
2,700.00	15.00	248.27	2,631.83	-203.87	-511.41	550.55	0.00	0.00	0.00
2,800.00	15.00	248.27	2,728.42	-213.45	-535.45	576.43	0.00	0.00	0.00
2,900.00	15.00	248.27	2,825.02	-223.03	-559.50	602.31	0.00	0.00	0.00
3,000.00	15.00	248.27	2,921.61	-232.62	-583.54	628.19	0.00	0.00	0.00
3,100.00	15.00	248.27	3,018.20	-242.20	-607.58	654.08	0.00	0.00	0.00
3,200.00	15.00	248.27	3,114.80	-251.79	-631.62	679.96	0.00	0.00	0.00
3,300.00	15.00	248.27	3,211.39	-261.37	-655.66	705.84	0.00	0.00	0.00
3,400.00	15.00	248.27	3,307.98	-270.95	-679.71	731.72	0.00	0.00	0.00
3,500.00	15.00	248.27	3,404.57	-280.54	-703.75	757.60	0.00	0.00	0.00
3,544.23	15.00	248.27	3,447.30	-284.78	-714.38	769.05	0.00	0.00	0.00
<b>Start Drop -2.00</b>									
3,600.00	13.88	248.27	3,501.30	-289.93	-727.30	782.96	2.00	-2.00	0.00
3,700.00	11.88	248.27	3,598.78	-298.19	-748.01	805.26	2.00	-2.00	0.00
3,800.00	9.88	248.27	3,696.98	-305.18	-765.55	824.14	2.00	-2.00	0.00
3,900.00	7.88	248.27	3,795.77	-310.90	-779.90	839.58	2.00	-2.00	0.00
4,000.00	5.88	248.27	3,895.04	-315.33	-791.03	851.57	2.00	-2.00	0.00
4,100.00	3.88	248.27	3,994.68	-318.49	-798.94	860.08	2.00	-2.00	0.00
4,200.00	1.88	248.27	4,094.54	-320.35	-803.62	865.12	2.00	-2.00	0.00
4,294.23	0.00	0.00	4,188.76	-320.92	-805.06	866.67	2.00	-2.00	0.00
<b>Start 0.00° Hold At 4294.23'</b>									
4,300.00	0.00	0.00	4,194.53	-320.92	-805.06	866.67	0.00	0.00	0.00
4,400.00	0.00	0.00	4,294.53	-320.92	-805.06	866.67	0.00	0.00	0.00
4,500.00	0.00	0.00	4,394.53	-320.92	-805.06	866.67	0.00	0.00	0.00
4,600.00	0.00	0.00	4,494.53	-320.92	-805.06	866.67	0.00	0.00	0.00



<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-08-02B - Slot N
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8401' & RKB 30' @ 8431.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 697-08A Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-08-02B	<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)
4,700.00	0.00	0.00	4,594.53	-320.92	-805.06	866.67	0.00	0.00	0.00
4,800.00	0.00	0.00	4,694.53	-320.92	-805.06	866.67	0.00	0.00	0.00
4,900.00	0.00	0.00	4,794.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,000.00	0.00	0.00	4,894.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,100.00	0.00	0.00	4,994.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,200.00	0.00	0.00	5,094.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,300.00	0.00	0.00	5,194.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,400.00	0.00	0.00	5,294.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,500.00	0.00	0.00	5,394.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,600.00	0.00	0.00	5,494.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,700.00	0.00	0.00	5,594.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,800.00	0.00	0.00	5,694.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,900.00	0.00	0.00	5,794.53	-320.92	-805.06	866.67	0.00	0.00	0.00
5,926.47	0.00	0.00	5,821.00	-320.92	-805.06	866.67	0.00	0.00	0.00
<b>Mesaverde</b>									
6,000.00	0.00	0.00	5,894.53	-320.92	-805.06	866.67	0.00	0.00	0.00
6,051.47	0.00	0.00	5,946.00	-320.92	-805.06	866.67	0.00	0.00	0.00
<b>Base Ohio Creek</b>									
6,100.00	0.00	0.00	5,994.53	-320.92	-805.06	866.67	0.00	0.00	0.00
6,200.00	0.00	0.00	6,094.53	-320.92	-805.06	866.67	0.00	0.00	0.00
6,300.00	0.00	0.00	6,194.53	-320.92	-805.06	866.67	0.00	0.00	0.00
6,400.00	0.00	0.00	6,294.53	-320.92	-805.06	866.67	0.00	0.00	0.00
6,500.00	0.00	0.00	6,394.53	-320.92	-805.06	866.67	0.00	0.00	0.00
6,600.00	0.00	0.00	6,494.53	-320.92	-805.06	866.67	0.00	0.00	0.00
6,700.00	0.00	0.00	6,594.53	-320.92	-805.06	866.67	0.00	0.00	0.00
6,731.47	0.00	0.00	6,626.00	-320.92	-805.06	866.67	0.00	0.00	0.00
<b>TOG = 634311.20, 1224940.59</b>									
6,800.00	0.00	0.00	6,694.53	-320.92	-805.06	866.67	0.00	0.00	0.00
6,900.00	0.00	0.00	6,794.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,000.00	0.00	0.00	6,894.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,100.00	0.00	0.00	6,994.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,200.00	0.00	0.00	7,094.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,300.00	0.00	0.00	7,194.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,400.00	0.00	0.00	7,294.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,500.00	0.00	0.00	7,394.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,600.00	0.00	0.00	7,494.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,700.00	0.00	0.00	7,594.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,800.00	0.00	0.00	7,694.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,900.00	0.00	0.00	7,794.53	-320.92	-805.06	866.67	0.00	0.00	0.00
7,967.47	0.00	0.00	7,862.00	-320.92	-805.06	866.67	0.00	0.00	0.00
<b>Target = 634311.20, 1224940.59</b>									
8,000.00	0.00	0.00	7,894.53	-320.92	-805.06	866.67	0.00	0.00	0.00
8,100.00	0.00	0.00	7,994.53	-320.92	-805.06	866.67	0.00	0.00	0.00
8,200.00	0.00	0.00	8,094.53	-320.92	-805.06	866.67	0.00	0.00	0.00
8,300.00	0.00	0.00	8,194.53	-320.92	-805.06	866.67	0.00	0.00	0.00
8,400.00	0.00	0.00	8,294.53	-320.92	-805.06	866.67	0.00	0.00	0.00
8,500.00	0.00	0.00	8,394.53	-320.92	-805.06	866.67	0.00	0.00	0.00
8,600.00	0.00	0.00	8,494.53	-320.92	-805.06	866.67	0.00	0.00	0.00
8,606.47	0.00	0.00	8,501.00	-320.92	-805.06	866.67	0.00	0.00	0.00
<b>Rollins</b>									
8,700.00	0.00	0.00	8,594.53	-320.92	-805.06	866.67	0.00	0.00	0.00
8,800.00	0.00	0.00	8,694.53	-320.92	-805.06	866.67	0.00	0.00	0.00
8,900.00	0.00	0.00	8,794.53	-320.92	-805.06	866.67	0.00	0.00	0.00



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<b>Site:</b>	Cascade Creek 697-08A Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-08-02B	<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)
9,000.00	0.00	0.00	8,894.53	-320.92	-805.06	866.67	0.00	0.00	0.00
9,006.47	0.00	0.00	8,901.00	-320.92	-805.06	866.67	0.00	0.00	0.00
PBHL = 634311.20, 1224940.59									

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									
CC 697-08-02B Target	0.00	0.00	7,862.00	-320.92	-805.06	634,311.20	1,224,940.59	39° 32' 34.123 N	108° 14' 55.180 W
- plan hits target center									
- Circle (radius 50.00)									

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,926.47	5,821.00	Mesaverde		0.00	
6,051.47	5,946.00	Base Ohio Creek		0.00	
8,606.47	8,501.00	Rollins		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.00	200.00	0.00	0.00	Start Build 2.00
950.00	941.46	-36.15	-90.68	Start 15.00° Hold At 950.00'
3,544.23	3,447.30	-284.78	-714.38	Start Drop -2.00
4,294.23	4,188.76	-320.92	-805.06	Start 0.00° Hold At 4294.23'
6,731.47	6,626.00	-320.92	-805.06	TOG = 634311.20, 1224940.59
7,967.47	7,862.00	-320.92	-805.06	Target = 634311.20, 1224940.59
9,006.47	8,901.00	-320.92	-805.06	PBHL = 634311.20, 1224940.59