



**Scientific Drilling**  
Rocky Mountain Operations

Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 697-16-28 Pad



Well Details: CC 697-16-29A

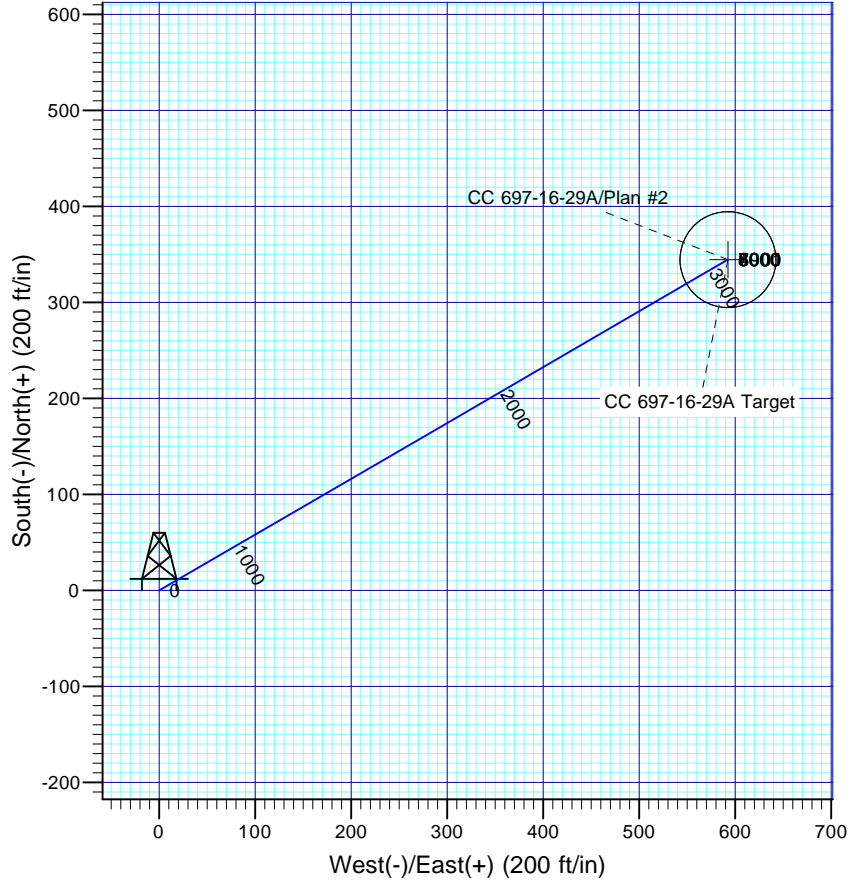
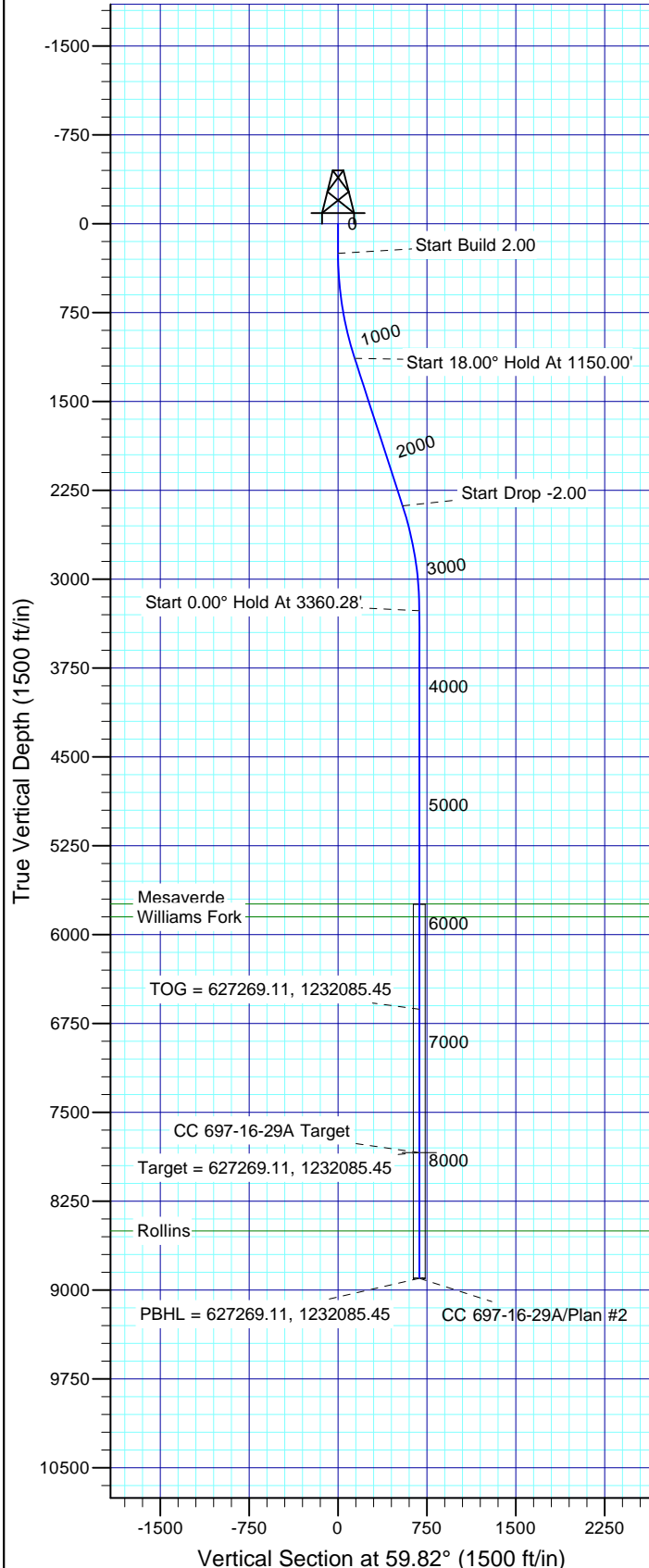
TVD Reference: GL 8301' & RKB 30' @ 8331.00ft (H&P) Ground Level: 8301.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	626942.51	1231482.95	39° 31' 23.274 N	108° 13' 28.883 W	K



Azimuths to True North  
Magnetic North: 10.48°

Magnetic Field  
Strength: 52284.5nT  
Dip Angle: 65.74°  
Date: 2011/02/04  
Model: IGRF2005-10



#### FORMATION TOP DETAILS

TVDP	MDP	Formation
5741.00	5834.59	Mesaverde
5851.00	5944.59	Williams Fork
8501.00	8594.59	Rollins

Plan: Plan #2

**10:43, February 10 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	250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	
3	1150.00	18.00	59.82	1135.27	70.49	121.21	2.00	59.82	140.21	
4	2460.28	18.00	59.82	2381.42	274.03	471.23	0.00	0.00	545.11	
5	3360.28	0.00	0.00	3266.69	344.52	592.43	2.00	180.00	685.33	
6	7932.59	0.00	0.00	7839.00	344.52	592.43	0.00	0.00	685.33	CC 697-16-29A Target
7	8994.59	0.00	0.00	8901.00	344.52	592.43	0.00	0.00	685.33	

# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-16-28 Pad  
CC 697-16-29A - Slot K**

**OH**

**Plan: Plan #2**

## **Standard Planning Report**

**10 February, 2011**

# Scientific Drilling International

## Planning Report

<b>Database:</b>	Rockies-R5000.1	<b>Local Co-ordinate Reference:</b>	Well CC 697-16-29A - Slot K
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8301' & RKB 30' @ 8331.00ft (H&P)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8301' & RKB 30' @ 8331.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-16-28 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-16-29A	<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 697-16-28 Pad, Sec. 16 T6N R97W		
<b>Site Position:</b>		<b>Northing:</b>	627,311.42 usft
<b>From:</b>	Map	<b>Easting:</b>	1,231,538.04 usft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	0.000 in
		<b>Latitude:</b>	39° 31' 26.935 N
		<b>Longitude:</b>	108° 13' 28.321 W
		<b>Grid Convergence:</b>	-1.72 °

<b>Well</b>	CC 697-16-29A - Slot K		
<b>Well Position</b>	<b>+N/-S</b>	-370.40 ft	<b>Northing:</b> 626,942.51 usft
	<b>+E/-W</b>	-44.00 ft	<b>Easting:</b> 1,231,482.95 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	<b>Latitude:</b> 39° 31' 23.274 N
			<b>Longitude:</b> 108° 13' 28.883 W
			<b>Ground Level:</b> 8,301.00 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	2011/02/04	10.48	65.74	52,284

<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	59.82

<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	
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,150.00	18.00	59.82	1,135.27	70.49	121.21	2.00	2.00	0.00	59.82	
2,460.28	18.00	59.82	2,381.42	274.03	471.23	0.00	0.00	0.00	0.00	
3,360.28	0.00	0.00	3,266.69	344.52	592.43	2.00	-2.00	0.00	180.00	
7,932.59	0.00	0.00	7,839.00	344.52	592.43	0.00	0.00	0.00	0.00	CC 697-16-29A Target
8,994.59	0.00	0.00	8,901.00	344.52	592.43	0.00	0.00	0.00	0.00	

# Scientific Drilling International

## Planning Report

<b>Database:</b>	Rockies-R5000.1	<b>Local Co-ordinate Reference:</b>	Well CC 697-16-29A - Slot K
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8301' & RKB 30' @ 8331.00ft (H&P)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8301' & RKB 30' @ 8331.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-16-28 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-16-29A	<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
250.00	0.00	0.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
300.00	1.00	59.82	300.00	0.22	0.38	0.44	2.00	2.00	0.00
400.00	3.00	59.82	399.93	1.97	3.39	3.93	2.00	2.00	0.00
500.00	5.00	59.82	499.68	5.48	9.42	10.90	2.00	2.00	0.00
600.00	7.00	59.82	599.13	10.73	18.46	21.35	2.00	2.00	0.00
700.00	9.00	59.82	698.15	17.73	30.49	35.27	2.00	2.00	0.00
800.00	11.00	59.82	796.63	26.46	45.50	52.63	2.00	2.00	0.00
900.00	13.00	59.82	894.44	36.91	63.47	73.42	2.00	2.00	0.00
1,000.00	15.00	59.82	991.46	49.07	84.38	97.62	2.00	2.00	0.00
1,100.00	17.00	59.82	1,087.58	62.93	108.21	125.18	2.00	2.00	0.00
1,150.00	18.00	59.82	1,135.27	70.49	121.21	140.21	2.00	2.00	0.00
Start 18.00° Hold At 1150.00'									
1,200.00	18.00	59.82	1,182.82	78.25	134.56	155.66	0.00	0.00	0.00
1,300.00	18.00	59.82	1,277.93	93.79	161.28	186.57	0.00	0.00	0.00
1,400.00	18.00	59.82	1,373.03	109.32	187.99	217.47	0.00	0.00	0.00
1,500.00	18.00	59.82	1,468.14	124.86	214.70	248.37	0.00	0.00	0.00
1,600.00	18.00	59.82	1,563.24	140.39	241.42	279.27	0.00	0.00	0.00
1,700.00	18.00	59.82	1,658.35	155.93	268.13	310.17	0.00	0.00	0.00
1,800.00	18.00	59.82	1,753.46	171.46	294.84	341.07	0.00	0.00	0.00
1,900.00	18.00	59.82	1,848.56	186.99	321.56	371.98	0.00	0.00	0.00
2,000.00	18.00	59.82	1,943.67	202.53	348.27	402.88	0.00	0.00	0.00
2,100.00	18.00	59.82	2,038.77	218.06	374.98	433.78	0.00	0.00	0.00
2,200.00	18.00	59.82	2,133.88	233.60	401.70	464.68	0.00	0.00	0.00
2,300.00	18.00	59.82	2,228.98	249.13	428.41	495.58	0.00	0.00	0.00
2,400.00	18.00	59.82	2,324.09	264.67	455.12	526.48	0.00	0.00	0.00
2,460.28	18.00	59.82	2,381.42	274.03	471.23	545.11	0.00	0.00	0.00
Start Drop -2.00									
2,500.00	17.21	59.82	2,419.28	280.07	481.61	557.12	2.00	-2.00	0.00
2,600.00	15.21	59.82	2,515.30	294.10	505.73	585.03	2.00	-2.00	0.00
2,700.00	13.21	59.82	2,612.24	306.44	526.95	609.57	2.00	-2.00	0.00
2,800.00	11.21	59.82	2,709.97	317.06	545.22	630.71	2.00	-2.00	0.00
2,900.00	9.21	59.82	2,808.38	325.97	560.54	648.43	2.00	-2.00	0.00
3,000.00	7.21	59.82	2,907.36	333.14	572.88	662.70	2.00	-2.00	0.00
3,100.00	5.21	59.82	3,006.77	338.58	582.22	673.51	2.00	-2.00	0.00
3,200.00	3.21	59.82	3,106.49	342.26	588.56	680.84	2.00	-2.00	0.00
3,300.00	1.21	59.82	3,206.41	344.20	591.89	684.69	2.00	-2.00	0.00
3,360.28	0.00	0.00	3,266.69	344.52	592.43	685.33	2.00	-2.00	0.00
Start 0.00° Hold At 3360.28'									
3,400.00	0.00	0.00	3,306.41	344.52	592.43	685.33	0.00	0.00	0.00
3,500.00	0.00	0.00	3,406.41	344.52	592.43	685.33	0.00	0.00	0.00
3,600.00	0.00	0.00	3,506.41	344.52	592.43	685.33	0.00	0.00	0.00
3,700.00	0.00	0.00	3,606.41	344.52	592.43	685.33	0.00	0.00	0.00
3,800.00	0.00	0.00	3,706.41	344.52	592.43	685.33	0.00	0.00	0.00
3,900.00	0.00	0.00	3,806.41	344.52	592.43	685.33	0.00	0.00	0.00
4,000.00	0.00	0.00	3,906.41	344.52	592.43	685.33	0.00	0.00	0.00
4,100.00	0.00	0.00	4,006.41	344.52	592.43	685.33	0.00	0.00	0.00
4,200.00	0.00	0.00	4,106.41	344.52	592.43	685.33	0.00	0.00	0.00
4,300.00	0.00	0.00	4,206.41	344.52	592.43	685.33	0.00	0.00	0.00
4,400.00	0.00	0.00	4,306.41	344.52	592.43	685.33	0.00	0.00	0.00
4,500.00	0.00	0.00	4,406.41	344.52	592.43	685.33	0.00	0.00	0.00

# Scientific Drilling International

## Planning Report

<b>Database:</b>	Rockies-R5000.1	<b>Local Co-ordinate Reference:</b>	Well CC 697-16-29A - Slot K
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8301' & RKB 30' @ 8331.00ft (H&P)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8301' & RKB 30' @ 8331.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-16-28 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-16-29A	<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)
4,600.00	0.00	0.00	4,506.41	344.52	592.43	685.33	0.00	0.00	0.00
4,700.00	0.00	0.00	4,606.41	344.52	592.43	685.33	0.00	0.00	0.00
4,800.00	0.00	0.00	4,706.41	344.52	592.43	685.33	0.00	0.00	0.00
4,900.00	0.00	0.00	4,806.41	344.52	592.43	685.33	0.00	0.00	0.00
5,000.00	0.00	0.00	4,906.41	344.52	592.43	685.33	0.00	0.00	0.00
5,100.00	0.00	0.00	5,006.41	344.52	592.43	685.33	0.00	0.00	0.00
5,200.00	0.00	0.00	5,106.41	344.52	592.43	685.33	0.00	0.00	0.00
5,300.00	0.00	0.00	5,206.41	344.52	592.43	685.33	0.00	0.00	0.00
5,400.00	0.00	0.00	5,306.41	344.52	592.43	685.33	0.00	0.00	0.00
5,500.00	0.00	0.00	5,406.41	344.52	592.43	685.33	0.00	0.00	0.00
5,600.00	0.00	0.00	5,506.41	344.52	592.43	685.33	0.00	0.00	0.00
5,700.00	0.00	0.00	5,606.41	344.52	592.43	685.33	0.00	0.00	0.00
5,800.00	0.00	0.00	5,706.41	344.52	592.43	685.33	0.00	0.00	0.00
5,834.59	0.00	0.00	5,741.00	344.52	592.43	685.33	0.00	0.00	0.00
<b>Mesaverde</b>									
5,900.00	0.00	0.00	5,806.41	344.52	592.43	685.33	0.00	0.00	0.00
5,944.59	0.00	0.00	5,851.00	344.52	592.43	685.33	0.00	0.00	0.00
<b>Williams Fork</b>									
6,000.00	0.00	0.00	5,906.41	344.52	592.43	685.33	0.00	0.00	0.00
6,100.00	0.00	0.00	6,006.41	344.52	592.43	685.33	0.00	0.00	0.00
6,200.00	0.00	0.00	6,106.41	344.52	592.43	685.33	0.00	0.00	0.00
6,300.00	0.00	0.00	6,206.41	344.52	592.43	685.33	0.00	0.00	0.00
6,400.00	0.00	0.00	6,306.41	344.52	592.43	685.33	0.00	0.00	0.00
6,500.00	0.00	0.00	6,406.41	344.52	592.43	685.33	0.00	0.00	0.00
6,600.00	0.00	0.00	6,506.41	344.52	592.43	685.33	0.00	0.00	0.00
6,700.00	0.00	0.00	6,606.41	344.52	592.43	685.33	0.00	0.00	0.00
6,724.59	0.00	0.00	6,631.00	344.52	592.43	685.33	0.00	0.00	0.00
<b>TOG = 627269.11, 1232085.45</b>									
6,800.00	0.00	0.00	6,706.41	344.52	592.43	685.33	0.00	0.00	0.00
6,900.00	0.00	0.00	6,806.41	344.52	592.43	685.33	0.00	0.00	0.00
7,000.00	0.00	0.00	6,906.41	344.52	592.43	685.33	0.00	0.00	0.00
7,100.00	0.00	0.00	7,006.41	344.52	592.43	685.33	0.00	0.00	0.00
7,200.00	0.00	0.00	7,106.41	344.52	592.43	685.33	0.00	0.00	0.00
7,300.00	0.00	0.00	7,206.41	344.52	592.43	685.33	0.00	0.00	0.00
7,400.00	0.00	0.00	7,306.41	344.52	592.43	685.33	0.00	0.00	0.00
7,500.00	0.00	0.00	7,406.41	344.52	592.43	685.33	0.00	0.00	0.00
7,600.00	0.00	0.00	7,506.41	344.52	592.43	685.33	0.00	0.00	0.00
7,700.00	0.00	0.00	7,606.41	344.52	592.43	685.33	0.00	0.00	0.00
7,800.00	0.00	0.00	7,706.41	344.52	592.43	685.33	0.00	0.00	0.00
7,900.00	0.00	0.00	7,806.41	344.52	592.43	685.33	0.00	0.00	0.00
7,932.59	0.00	0.00	7,839.00	344.52	592.43	685.33	0.00	0.00	0.00
<b>Target = 627269.11, 1232085.45</b>									
8,000.00	0.00	0.00	7,906.41	344.52	592.43	685.33	0.00	0.00	0.00
8,100.00	0.00	0.00	8,006.41	344.52	592.43	685.33	0.00	0.00	0.00
8,200.00	0.00	0.00	8,106.41	344.52	592.43	685.33	0.00	0.00	0.00
8,300.00	0.00	0.00	8,206.41	344.52	592.43	685.33	0.00	0.00	0.00
8,400.00	0.00	0.00	8,306.41	344.52	592.43	685.33	0.00	0.00	0.00
8,500.00	0.00	0.00	8,406.41	344.52	592.43	685.33	0.00	0.00	0.00
8,594.59	0.00	0.00	8,501.00	344.52	592.43	685.33	0.00	0.00	0.00
<b>Rollins</b>									
8,600.00	0.00	0.00	8,506.41	344.52	592.43	685.33	0.00	0.00	0.00
8,700.00	0.00	0.00	8,606.41	344.52	592.43	685.33	0.00	0.00	0.00
8,800.00	0.00	0.00	8,706.41	344.52	592.43	685.33	0.00	0.00	0.00

# Scientific Drilling International

## Planning Report

<b>Database:</b>	Rockies-R5000.1	<b>Local Co-ordinate Reference:</b>	Well CC 697-16-29A - Slot K
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8301' & RKB 30' @ 8331.00ft (H&P)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8301' & RKB 30' @ 8331.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-16-28 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-16-29A	<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)
8,900.00	0.00	0.00	8,806.41	344.52	592.43	685.33	0.00	0.00	0.00
8,994.59	0.00	0.00	8,901.00	344.52	592.43	685.33	0.00	0.00	0.00
PBHL = 627269.11, 1232085.45									

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 697-16-29A Target	0.00	0.00	7,839.00	344.52	592.43	627,269.11	1,232,085.45	39° 31' 26.679 N	108° 13' 21.323 W
- plan hits target center									
- Circle (radius 50.00)									

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
5,834.59	5,741.00	Mesaverde		0.00		
5,944.59	5,851.00	Williams Fork		0.00		
8,594.59	8,501.00	Rollins		0.00		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
250.00	250.00	0.00	0.00	Start Build 2.00
1,150.00	1,135.27	70.49	121.21	Start 18.00° Hold At 1150.00'
2,460.28	2,381.42	274.03	471.23	Start Drop -2.00
3,360.28	3,266.69	344.52	592.43	Start 0.00° Hold At 3360.28'
6,724.59	6,631.00	344.52	592.43	TOG = 627269.11, 1232085.45
7,932.59	7,839.00	344.52	592.43	Target = 627269.11, 1232085.45
8,994.59	8,901.00	344.52	592.43	PBHL = 627269.11, 1232085.45