



# Scientific Drilling

Rocky Mountain Operations

Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 604-12-13 Annex Pad



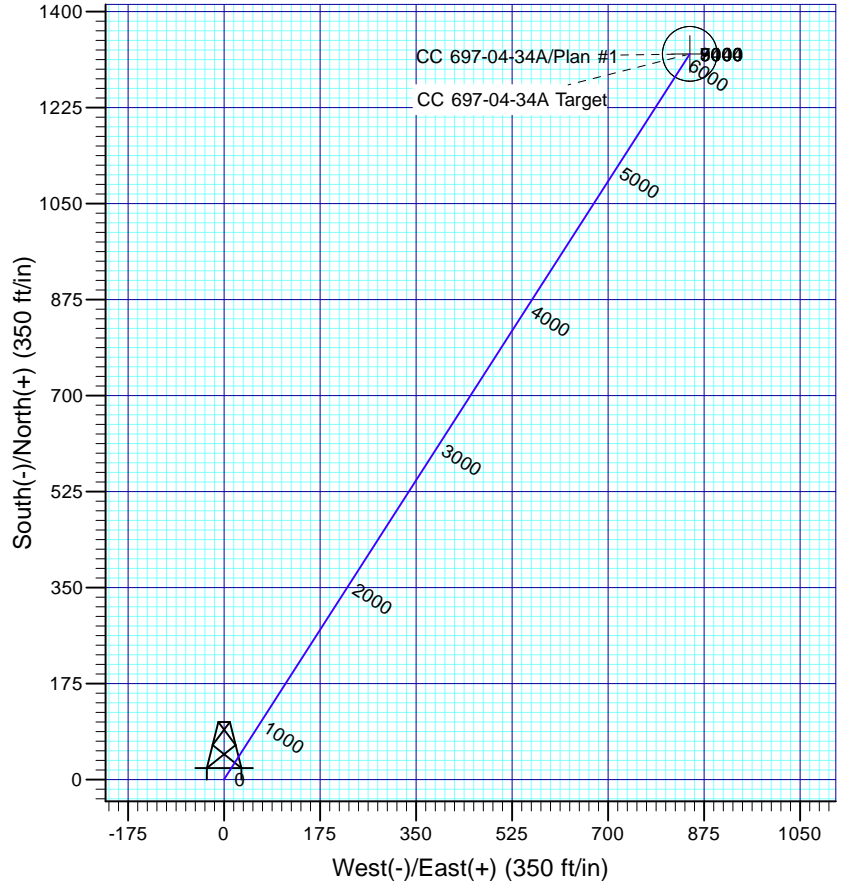
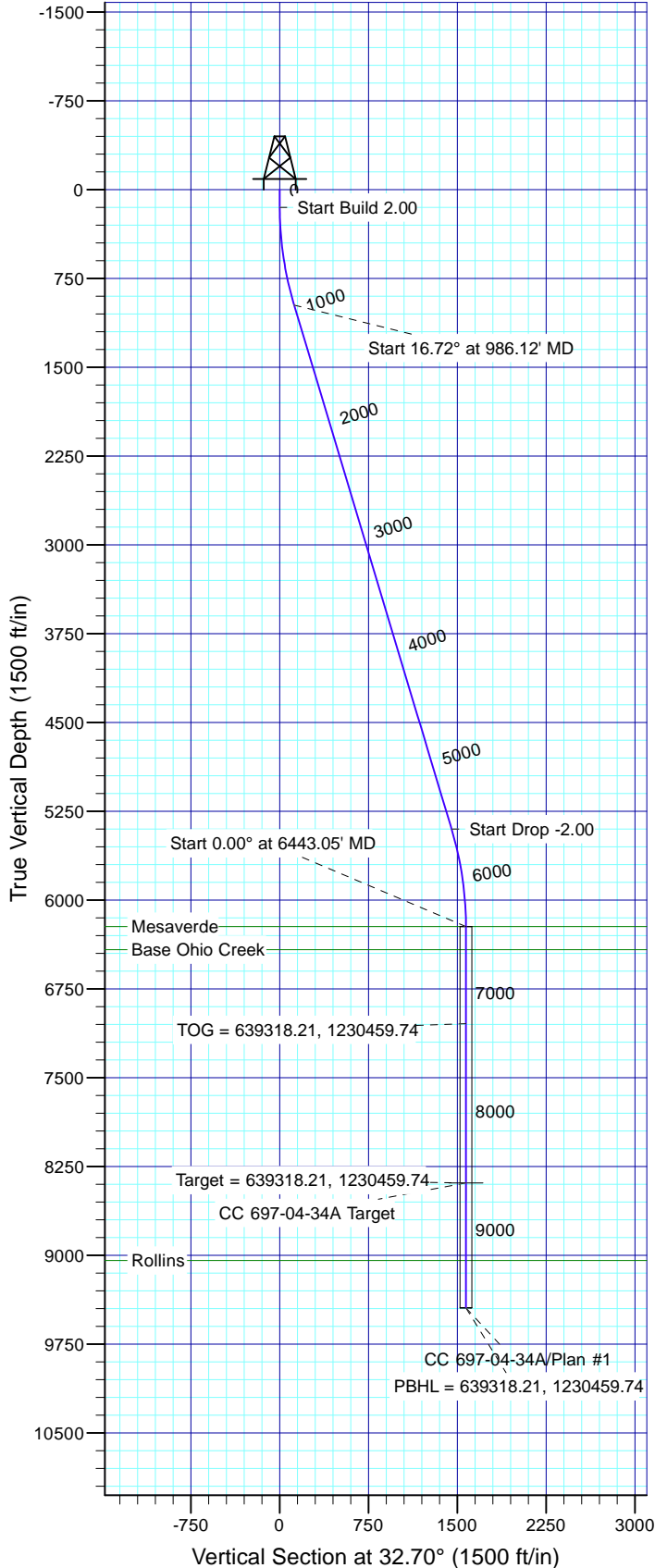
Well Details: CC 697-04-34A

TVD Reference: GL 8529' & RKB 30' @ 8559.00ft (H&P Rig) Ground Level: 8529.00  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.00 0.00 638021.57 1229571.20 39° 33' 12.159 N 108° 13' 57.521 W U



Azimuths to True North  
Magnetic North: 10.46°

Magnetic Field  
Strength: 52229.4snT  
Dip Angle: 65.74°  
Date: 6/15/2011  
Model: IGRF2010



## FORMATION TOP DETAILS

TVDPath	MDPath	Formation
6224.00	6443.05	Mesaverde
6419.00	6638.05	Base Ohio Creek
9044.00	9263.05	Rollins

## Plan: Plan #1

14:38, June 16 2011

Created By: Janie Cooke

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	VFace	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	150.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	0.00	
3	986.12	16.72	32.70	974.30	101.95	65.45	2.00	32.70	121.15	
4	5606.93	16.72	32.70	5399.70	1220.83	783.69	0.00	0.00	0.00	
5	6443.05	0.00	0.00	6224.00	1322.78	849.14	2.00	180.00	1571.87	
6	8607.05	0.00	0.00	8388.00	1322.78	849.14	0.00	0.00	1571.87	CC 697-04-34A Target
7	9663.05	0.00	0.00	9444.00	1322.78	849.14	0.00	0.00	1571.87	

# **OXY USA RMAT**

**Garfield County, CO NAD27**

**Cascade Creek 604-12-13 Annex Pad**

**CC 697-04-34A - Slot U**

**OH**

**Plan: Plan #1**

## **Standard Planning Report**

**16 June, 2011**





<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-04-34A - Slot U
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 604-12-13 Annex Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-04-34A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

<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 604-12-13 Annex Pad			
Site Position:		Northing:	638,644.56 usft	Latitude:	39° 33' 18.364 N
From:	Lat/Long	Easting:	1,229,740.19 usft	Longitude:	108° 13' 55.603 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.72 °

Well		CC 697-04-34A - Slot U				
Well Position	+N/-S	-627.78 ft	Northing:	638,021.57 usft	Latitude:	39° 33' 12.159 N
	+E/-W	-150.19 ft	Easting:	1,229,571.20 usft	Longitude:	108° 13' 57.521 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	8,529.00 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>
	IGRF2010	6/15/2011	10.46	65.74	52,229

<b>Design</b>	Plan #1			
<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	32.70

<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	
150.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	0.00	0.00	
986.12	16.72	32.70	974.30	101.95	65.45	2.00	2.00	0.00	32.70	
5,606.93	16.72	32.70	5,399.70	1,220.83	783.69	0.00	0.00	0.00	0.00	
6,443.05	0.00	0.00	6,224.00	1,322.78	849.14	2.00	-2.00	0.00	180.00	
8,607.05	0.00	0.00	8,388.00	1,322.78	849.14	0.00	0.00	0.00	0.00	CC 697-04-34A Target
9,663.05	0.00	0.00	9,444.00	1,322.78	849.14	0.00	0.00	0.00	0.00	



<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-04-34A - Slot U
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 604-12-13 Annex Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-04-34A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

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
150.00	0.00	0.00	150.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Start Build 2.00</b>									
200.00	1.00	32.70	200.00	0.37	0.24	0.44	2.00	2.00	0.00
300.00	3.00	32.70	299.93	3.30	2.12	3.93	2.00	2.00	0.00
400.00	5.00	32.70	399.68	9.17	5.89	10.90	2.00	2.00	0.00
500.00	7.00	32.70	499.13	17.97	11.54	21.35	2.00	2.00	0.00
600.00	9.00	32.70	598.15	29.68	19.05	35.27	2.00	2.00	0.00
700.00	11.00	32.70	696.63	44.29	28.43	52.63	2.00	2.00	0.00
800.00	13.00	32.70	794.44	61.79	39.66	73.42	2.00	2.00	0.00
900.00	15.00	32.70	891.46	82.15	52.73	97.62	2.00	2.00	0.00
986.12	16.72	32.70	974.30	101.95	65.45	121.15	2.00	2.00	0.00
<b>Start 16.72° at 986.12' MD</b>									
1,000.00	16.72	32.70	987.59	105.31	67.60	125.15	0.00	0.00	0.00
1,100.00	16.72	32.70	1,083.36	129.53	83.15	153.92	0.00	0.00	0.00
1,200.00	16.72	32.70	1,179.14	153.74	98.69	182.69	0.00	0.00	0.00
1,300.00	16.72	32.70	1,274.91	177.95	114.24	211.47	0.00	0.00	0.00
1,400.00	16.72	32.70	1,370.68	202.17	129.78	240.24	0.00	0.00	0.00
1,500.00	16.72	32.70	1,466.45	226.38	145.32	269.01	0.00	0.00	0.00
1,600.00	16.72	32.70	1,562.22	250.60	160.87	297.79	0.00	0.00	0.00
1,700.00	16.72	32.70	1,657.99	274.81	176.41	326.56	0.00	0.00	0.00
1,800.00	16.72	32.70	1,753.76	299.02	191.95	355.33	0.00	0.00	0.00
1,900.00	16.72	32.70	1,849.53	323.24	207.50	384.11	0.00	0.00	0.00
2,000.00	16.72	32.70	1,945.30	347.45	223.04	412.88	0.00	0.00	0.00
2,100.00	16.72	32.70	2,041.07	371.67	238.59	441.65	0.00	0.00	0.00
2,200.00	16.72	32.70	2,136.85	395.88	254.13	470.43	0.00	0.00	0.00
2,300.00	16.72	32.70	2,232.62	420.09	269.67	499.20	0.00	0.00	0.00
2,400.00	16.72	32.70	2,328.39	444.31	285.22	527.97	0.00	0.00	0.00
2,500.00	16.72	32.70	2,424.16	468.52	300.76	556.75	0.00	0.00	0.00
2,600.00	16.72	32.70	2,519.93	492.73	316.30	585.52	0.00	0.00	0.00
2,700.00	16.72	32.70	2,615.70	516.95	331.85	614.29	0.00	0.00	0.00
2,800.00	16.72	32.70	2,711.47	541.16	347.39	643.07	0.00	0.00	0.00
2,900.00	16.72	32.70	2,807.24	565.38	362.94	671.84	0.00	0.00	0.00
3,000.00	16.72	32.70	2,903.01	589.59	378.48	700.62	0.00	0.00	0.00
3,100.00	16.72	32.70	2,998.78	613.80	394.02	729.39	0.00	0.00	0.00
3,200.00	16.72	32.70	3,094.56	638.02	409.57	758.16	0.00	0.00	0.00
3,300.00	16.72	32.70	3,190.33	662.23	425.11	786.94	0.00	0.00	0.00
3,400.00	16.72	32.70	3,286.10	686.44	440.65	815.71	0.00	0.00	0.00
3,500.00	16.72	32.70	3,381.87	710.66	456.20	844.48	0.00	0.00	0.00
3,600.00	16.72	32.70	3,477.64	734.87	471.74	873.26	0.00	0.00	0.00
3,700.00	16.72	32.70	3,573.41	759.09	487.29	902.03	0.00	0.00	0.00
3,800.00	16.72	32.70	3,669.18	783.30	502.83	930.80	0.00	0.00	0.00
3,900.00	16.72	32.70	3,764.95	807.51	518.37	959.58	0.00	0.00	0.00
4,000.00	16.72	32.70	3,860.72	831.73	533.92	988.35	0.00	0.00	0.00
4,100.00	16.72	32.70	3,956.49	855.94	549.46	1,017.12	0.00	0.00	0.00
4,200.00	16.72	32.70	4,052.27	880.15	565.00	1,045.90	0.00	0.00	0.00
4,300.00	16.72	32.70	4,148.04	904.37	580.55	1,074.67	0.00	0.00	0.00
4,400.00	16.72	32.70	4,243.81	928.58	596.09	1,103.44	0.00	0.00	0.00
4,500.00	16.72	32.70	4,339.58	952.80	611.64	1,132.22	0.00	0.00	0.00
4,600.00	16.72	32.70	4,435.35	977.01	627.18	1,160.99	0.00	0.00	0.00
4,700.00	16.72	32.70	4,531.12	1,001.22	642.72	1,189.76	0.00	0.00	0.00
4,800.00	16.72	32.70	4,626.89	1,025.44	658.27	1,218.54	0.00	0.00	0.00
4,900.00	16.72	32.70	4,722.66	1,049.65	673.81	1,247.31	0.00	0.00	0.00



<b>Database:</b>	Rockies Compass Server	<b>Local Co-ordinate Reference:</b>	Well CC 697-04-34A - Slot U
<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 604-12-13 Annex Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-04-34A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

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)
5,000.00	16.72	32.70	4,818.43	1,073.86	689.35	1,276.08	0.00	0.00	0.00
5,100.00	16.72	32.70	4,914.20	1,098.08	704.90	1,304.86	0.00	0.00	0.00
5,200.00	16.72	32.70	5,009.98	1,122.29	720.44	1,333.63	0.00	0.00	0.00
5,300.00	16.72	32.70	5,105.75	1,146.51	735.98	1,362.41	0.00	0.00	0.00
5,400.00	16.72	32.70	5,201.52	1,170.72	751.53	1,391.18	0.00	0.00	0.00
5,500.00	16.72	32.70	5,297.29	1,194.93	767.07	1,419.95	0.00	0.00	0.00
5,600.00	16.72	32.70	5,393.06	1,219.15	782.62	1,448.73	0.00	0.00	0.00
5,606.93	16.72	32.70	5,399.70	1,220.83	783.69	1,450.72	0.00	0.00	0.00
<b>Start Drop -2.00</b>									
5,700.00	14.86	32.70	5,489.25	1,242.14	797.38	1,476.05	2.00	-2.00	0.00
5,800.00	12.86	32.70	5,586.33	1,262.30	810.32	1,500.00	2.00	-2.00	0.00
5,900.00	10.86	32.70	5,684.19	1,279.59	821.42	1,520.56	2.00	-2.00	0.00
6,000.00	8.86	32.70	5,782.71	1,294.00	830.67	1,537.68	2.00	-2.00	0.00
6,100.00	6.86	32.70	5,881.77	1,305.51	838.06	1,551.36	2.00	-2.00	0.00
6,200.00	4.86	32.70	5,981.24	1,314.11	843.57	1,561.57	2.00	-2.00	0.00
6,300.00	2.86	32.70	6,081.01	1,319.77	847.21	1,568.30	2.00	-2.00	0.00
6,400.00	0.86	32.70	6,180.95	1,322.51	848.97	1,571.55	2.00	-2.00	0.00
6,443.05	0.00	0.00	6,224.00	1,322.78	849.14	1,571.87	2.00	-2.00	-75.95
<b>Start 0.00° at 6443.05° MD - Mesaverde</b>									
6,500.00	0.00	0.00	6,280.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
6,600.00	0.00	0.00	6,380.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
6,638.05	0.00	0.00	6,419.00	1,322.78	849.14	1,571.87	0.00	0.00	0.00
<b>Base Ohio Creek</b>									
6,700.00	0.00	0.00	6,480.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
6,800.00	0.00	0.00	6,580.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
6,900.00	0.00	0.00	6,680.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
7,000.00	0.00	0.00	6,780.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
7,100.00	0.00	0.00	6,880.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
7,200.00	0.00	0.00	6,980.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
7,263.05	0.00	0.00	7,044.00	1,322.78	849.14	1,571.87	0.00	0.00	0.00
<b>TOG = 639318.21, 1230459.74</b>									
7,300.00	0.00	0.00	7,080.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
7,400.00	0.00	0.00	7,180.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
7,500.00	0.00	0.00	7,280.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
7,600.00	0.00	0.00	7,380.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
7,700.00	0.00	0.00	7,480.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
7,800.00	0.00	0.00	7,580.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
7,900.00	0.00	0.00	7,680.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
8,000.00	0.00	0.00	7,780.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
8,100.00	0.00	0.00	7,880.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
8,200.00	0.00	0.00	7,980.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
8,300.00	0.00	0.00	8,080.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
8,400.00	0.00	0.00	8,180.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
8,500.00	0.00	0.00	8,280.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
8,600.00	0.00	0.00	8,380.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
8,607.05	0.00	0.00	8,388.00	1,322.78	849.14	1,571.87	0.00	0.00	0.00
<b>Target = 639318.21, 1230459.74</b>									
8,700.00	0.00	0.00	8,480.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
8,800.00	0.00	0.00	8,580.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
8,900.00	0.00	0.00	8,680.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
9,000.00	0.00	0.00	8,780.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
9,100.00	0.00	0.00	8,880.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
9,200.00	0.00	0.00	8,980.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00



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<b>Company:</b>	OXY USA RMAT	<b>TVD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Project:</b>	Garfield County, CO NAD27	<b>MD Reference:</b>	GL 8529' & RKB 30' @ 8559.00ft (H&P Rig)
<b>Site:</b>	Cascade Creek 604-12-13 Annex Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 697-04-34A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

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)
9,263.05	0.00	0.00	9,044.00	1,322.78	849.14	1,571.87	0.00	0.00	0.00
<b>Rollins</b>									
9,300.00	0.00	0.00	9,080.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
9,400.00	0.00	0.00	9,180.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
9,500.00	0.00	0.00	9,280.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
9,600.00	0.00	0.00	9,380.95	1,322.78	849.14	1,571.87	0.00	0.00	0.00
9,663.05	0.00	0.00	9,444.00	1,322.78	849.14	1,571.87	0.00	0.00	0.00
<b>PBHL = 639318.21, 1230459.74</b>									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
CC 697-04-34A Target - plan hits target center - Circle (radius 50.00)	0.00	0.00	8,388.00	1,322.78	849.14	639,318.21	1,230,459.74	39° 33' 25.233 N	108° 13' 46.679 W

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,443.05	6,224.00	Mesaverde		0.00	
6,638.05	6,419.00	Base Ohio Creek		0.00	
9,263.05	9,044.00	Rollins		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
150.00	150.00	0.00	0.00	Start Build 2.00
986.12	974.30	101.95	65.45	Start 16.72° at 986.12' MD
5,606.93	5,399.70	1,220.83	783.69	Start Drop -2.00
6,443.05	6,224.00	1,322.78	849.14	Start 0.00° at 6443.05' MD
7,263.05	7,044.00	1,322.78	849.14	TOG = 639318.21, 1230459.74
8,607.05	8,388.00	1,322.78	849.14	Target = 639318.21, 1230459.74
9,663.05	9,444.00	1,322.78	849.14	PBHL = 639318.21, 1230459.74