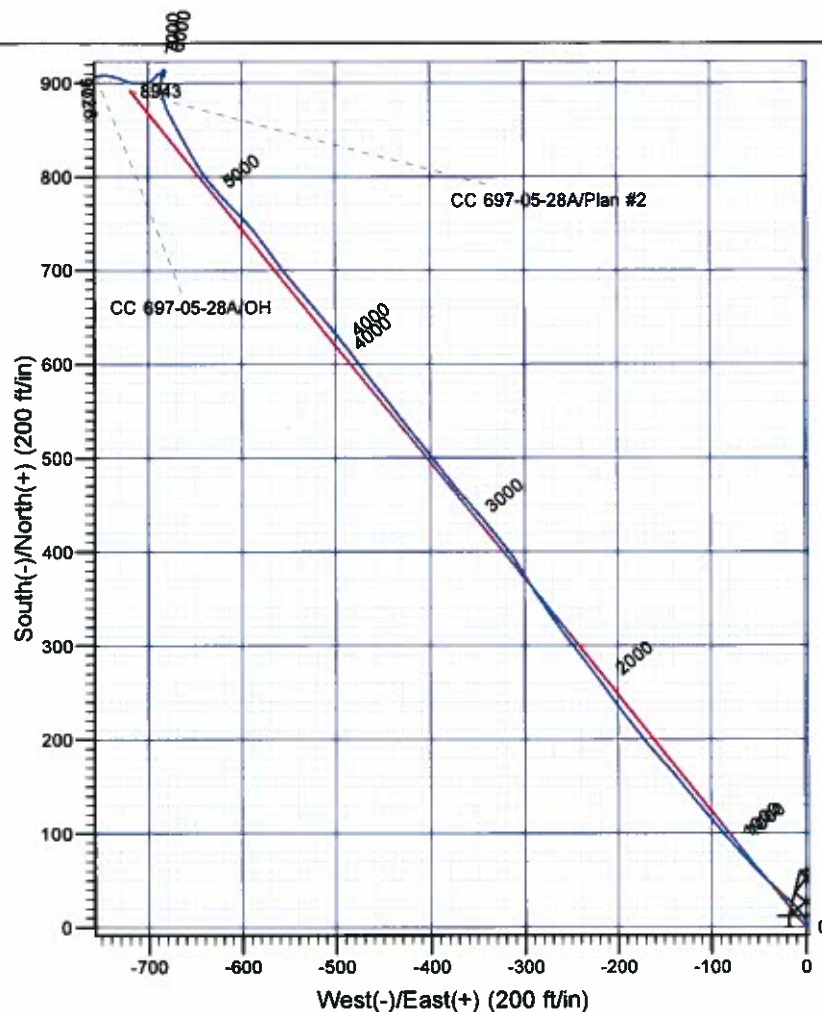
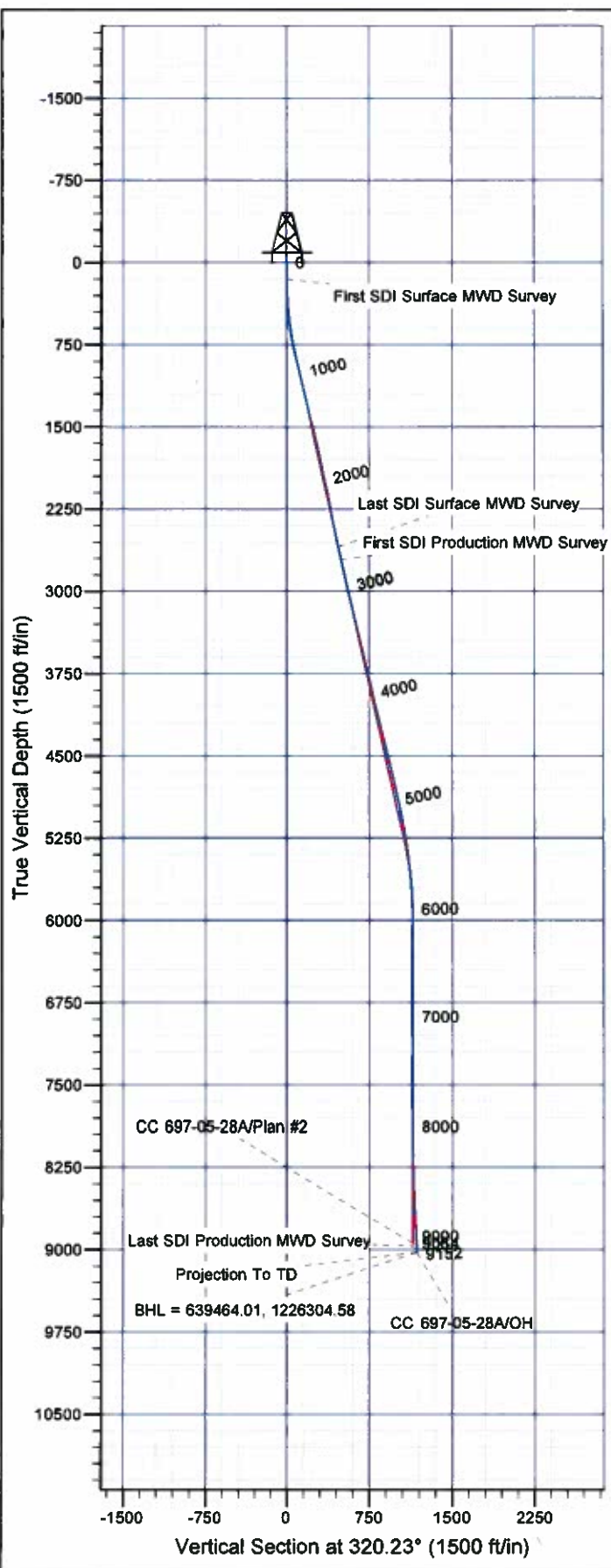




# Scientific Drilling

Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 697-05C Pad  
Well: CC 697-05-28A  
Wellbore: OH  
Design: OH



## Well Details: CC 697-05-28A

TVD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)		Datum: 8423.00		Slot	
+N/-S	+E/-W	North	East	Latitude	Longitude
0.00	0.00	638534.36	1227032.05	39° 33' 16.469 N	108° 14' 30.121 W

## REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-05-28A - Slot M, True North  
Vertical (TVD) Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)  
Section (VS) Reference: Slot - M(0.00N, 0.00E)  
Measured Depth Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)  
Calculation Method: Minimum Curvature

## 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

Plan: OH

13:17, December 30 2011  
Created By: Rex Hall

# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-05C Pad  
CC 697-05-28A - Slot M**

**OH**

**Design: OH**

## **Standard Survey Report**

**30 December, 2011**

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-28A - Slot M
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 697-05C Pad	<b>MD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Well:</b>	CC 697-05-28A	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies Compass Server

<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 697-05C Pad, Sec. 5 T6S R97W				
<b>Site Position:</b>		<b>Northing:</b>	637,463.43 usft	<b>Latitude:</b>	39° 33' 5.626 N
<b>From:</b>	Map	<b>Easting:</b>	1,226,150.07 usft	<b>Longitude:</b>	108° 14' 40.963 W
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	0.000 in	<b>Grid Convergence:</b>	-1.73 °

<b>Well</b>	CC 697-05-28A - Slot M				
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	638,534.36 usft	<b>Latitude:</b> 39° 33' 16.469 N
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	1,227,032.05 usft	<b>Longitude:</b> 108° 14' 30.121 W
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b> 8,423.00 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	2011/10/07	10.43	65.73	52,198

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<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		320.23

<b>Survey Program</b>	<b>Date</b>	2011/12/30			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
153.00	2,643.00	Survey #1 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,763.00	9,152.00	Survey #2 - Production MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
153.00	0.76	18.61	153.00	0.96	0.32	0.53	0.50	0.50	0.00	
<b>First SDI Surface MWD Survey</b>										
243.00	1.98	350.35	242.97	3.06	0.25	2.19	1.51	1.36	-31.40	
333.00	3.41	339.86	332.87	7.11	-0.93	6.06	1.67	1.59	-11.66	
424.00	4.48	328.51	423.65	12.68	-3.72	12.12	1.45	1.18	-12.47	
513.00	5.63	318.40	512.31	18.91	-8.43	19.93	1.63	1.29	-11.36	
603.00	7.47	312.60	601.72	26.17	-15.67	30.14	2.17	2.04	-6.44	
693.00	10.11	312.86	690.65	35.50	-25.77	43.77	2.93	2.93	0.29	
784.00	12.93	314.00	779.81	48.01	-38.95	61.82	3.11	3.10	1.25	

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-28A - Slot M
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 697-05C Pad	<b>MD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Well:</b>	CC 697-05-28A	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies Compass Server

### 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)
874.00	14.68	316.99	867.21	63.35	-53.97	83.22	2.10	1.94	3.32
964.00	14.07	319.45	954.39	80.00	-68.86	105.54	0.96	-0.68	2.73
1,059.00	13.19	317.61	1,046.71	96.78	-83.68	127.92	1.03	-0.93	-1.94
1,154.00	13.45	320.16	1,139.16	113.27	-98.06	149.79	0.68	0.27	2.68
1,248.00	12.84	318.57	1,230.70	129.49	-111.98	171.16	0.75	-0.65	-1.69
1,343.00	13.72	322.09	1,323.16	146.30	-125.89	192.98	1.26	0.93	3.71
1,437.00	14.42	319.45	1,414.34	163.98	-140.34	215.82	1.01	0.74	-2.81
1,532.00	15.12	316.99	1,506.20	182.03	-156.49	240.02	0.99	0.74	-2.59
1,626.00	13.72	322.44	1,597.24	199.84	-171.65	263.40	2.07	-1.49	5.80
1,721.00	11.70	320.07	1,689.91	216.15	-184.70	284.29	2.20	-2.13	-2.49
1,815.00	12.31	324.38	1,781.85	231.61	-196.65	303.82	1.15	0.65	4.59
1,910.00	11.87	322.27	1,874.74	247.57	-208.53	323.68	0.66	-0.46	-2.22
2,004.00	12.13	323.06	1,966.69	263.11	-220.38	343.21	0.33	0.28	0.84
2,099.00	12.66	323.67	2,059.48	279.47	-232.55	363.57	0.57	0.56	0.64
2,194.00	10.29	321.56	2,152.57	294.51	-243.99	382.45	2.53	-2.49	-2.22
2,288.00	10.02	323.50	2,245.10	307.66	-254.07	399.00	0.46	-0.29	2.06
2,382.00	11.61	323.14	2,337.43	321.80	-264.61	416.62	1.69	1.69	-0.38
2,477.00	12.49	325.96	2,430.33	337.96	-276.10	436.39	1.11	0.93	2.97
2,571.00	12.57	326.13	2,522.09	354.88	-287.49	456.67	0.09	0.09	0.18
2,643.00	11.70	328.07	2,592.48	367.58	-295.72	471.70	1.33	-1.21	2.69
Last SDI Surface MWD Survey									
2,763.00	10.46	327.79	2,710.25	387.12	-307.96	494.55	1.03	-1.03	-0.23
First SDI Production MWD Survey									
2,858.00	12.84	322.87	2,803.28	402.84	-318.93	513.65	2.71	2.51	-5.18
2,952.00	13.45	320.76	2,894.82	419.63	-332.15	535.01	0.83	0.65	-2.24
3,047.00	13.98	320.98	2,987.11	437.10	-346.36	557.54	0.56	0.56	0.23
3,141.00	12.05	317.25	3,078.69	453.13	-360.17	578.69	2.24	-2.05	-3.97
3,236.00	13.89	321.11	3,171.27	469.29	-374.06	600.00	2.14	1.94	4.06
3,330.00	14.77	322.70	3,262.34	487.61	-388.41	623.25	1.03	0.94	1.69
3,425.00	13.98	321.64	3,354.37	506.24	-402.87	646.82	0.88	-0.83	-1.12
3,520.00	12.75	321.03	3,446.79	523.39	-416.58	668.78	1.30	-1.29	-0.64
3,614.00	13.98	323.84	3,538.25	540.62	-429.81	690.48	1.48	1.31	2.99
3,709.00	13.28	322.26	3,630.57	558.51	-443.26	712.84	0.83	-0.74	-1.66
3,803.00	12.13	322.34	3,722.27	574.87	-455.90	733.50	1.22	-1.22	0.09
3,898.00	13.89	323.13	3,814.83	591.89	-468.84	754.86	1.86	1.85	0.83
3,992.00	13.28	323.84	3,906.20	609.64	-481.98	776.90	0.67	-0.65	0.76
4,087.00	12.31	321.64	3,998.84	626.39	-494.70	797.92	1.14	-1.02	-2.32
4,181.00	13.89	319.71	4,090.39	642.85	-508.22	819.22	1.74	1.68	-2.05
4,275.00	14.25	320.50	4,181.57	660.39	-522.88	842.07	0.43	0.38	0.84
4,370.00	13.01	319.18	4,273.89	677.50	-537.30	864.46	1.35	-1.31	-1.39
4,465.00	14.33	321.11	4,366.20	694.75	-551.67	886.90	1.47	1.39	2.03
4,559.00	14.86	324.72	4,457.17	713.64	-565.94	910.55	1.12	0.56	3.84
4,654.00	13.81	322.78	4,549.21	732.61	-579.84	934.02	1.22	-1.11	-2.04



# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-28A - Slot M
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 697-05C Pad	<b>MD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Well:</b>	CC 697-05-28A	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies Compass Server

### 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)
4,748.00	12.22	318.65	4,640.79	749.02	-593.19	955.18	1.96	-1.69	-4.39
4,843.00	11.43	314.35	4,733.78	763.15	-606.57	974.59	1.25	-0.83	-4.53
4,938.00	13.19	318.12	4,826.59	777.80	-620.54	994.79	2.04	1.85	3.97
5,032.00	13.37	321.29	4,918.08	794.26	-634.49	1,016.37	0.80	0.19	3.37
5,126.00	11.78	328.76	5,009.83	810.95	-646.27	1,036.73	2.42	-1.69	7.95
5,221.00	11.17	331.13	5,102.93	827.30	-655.74	1,055.36	0.81	-0.64	2.49
5,316.00	8.97	330.96	5,196.46	841.83	-663.78	1,071.67	2.32	-2.32	-0.18
5,410.00	8.44	331.75	5,289.38	854.32	-670.60	1,085.63	0.58	-0.56	0.84
5,505.00	8.09	331.13	5,383.39	866.31	-677.13	1,099.03	0.38	-0.37	-0.65
5,599.00	7.30	344.58	5,476.55	877.86	-681.91	1,110.96	2.09	-0.84	14.31
5,694.00	7.12	346.25	5,570.80	889.40	-684.91	1,121.75	0.29	-0.19	1.76
5,788.00	4.57	313	5,664.31	898.80	-686.10	1,129.73	3.24	-2.71	17.96
5,883.00	3.73	8.92	5,759.06	905.63	-685.41	1,134.54	0.99	-0.88	6.09
5,977.00	3.43	5.28	5,852.88	911.45	-684.68	1,138.55	0.40	-0.32	-3.87
6,071.00	0.79	70.71	5,946.81	914.47	-683.81	1,140.31	3.39	-2.81	69.61
6,166.00	0.70	127.84	6,041.80	914.33	-682.73	1,139.51	0.75	-0.09	60.14
6,260.00	0.53	146.21	6,135.80	913.61	-682.03	1,138.52	0.27	-0.18	19.54
6,355.00	0.44	169.06	6,230.80	912.89	-681.72	1,137.76	0.22	-0.09	24.05
6,450.00	0.44	182.86	6,325.79	912.17	-681.67	1,137.18	0.11	0.00	14.53
6,544.00	0.70	195.08	6,419.79	911.25	-681.84	1,136.58	0.30	0.28	13.00
6,638.00	1.06	187.61	6,513.78	909.84	-682.10	1,135.66	0.40	0.38	-7.95
6,733.00	1.49	196.48	6,608.75	907.78	-682.57	1,134.38	0.50	0.45	9.34
6,827.00	0.88	334.47	6,702.74	907.26	-683.23	1,134.40	2.37	-0.65	146.80
6,922.00	0.97	320.50	6,797.73	908.54	-684.05	1,135.91	0.25	0.09	-14.71
7,016.00	0.97	297.03	6,891.72	909.52	-685.27	1,137.44	0.42	0.00	-24.97
7,111.00	1.49	272.86	6,986.70	909.94	-687.22	1,139.01	0.76	0.55	-25.44
7,205.00	0.70	260.64	7,080.68	909.91	-689.00	1,140.13	0.87	-0.84	-13.00
7,300.00	0.44	205.71	7,175.67	909.49	-689.73	1,140.27	0.60	-0.27	-57.82
7,395.00	0.88	208.09	7,270.67	908.52	-690.24	1,139.85	0.46	0.46	2.51
7,489.00	0.97	225.05	7,364.66	907.32	-691.14	1,139.50	0.31	0.10	18.04
7,584.00	1.23	225.66	7,459.64	906.04	-692.44	1,139.35	0.27	0.27	0.64
7,678.00	1.58	230.06	7,553.61	904.50	-694.15	1,139.27	0.39	0.37	4.68
7,773.00	1.49	224.26	7,648.58	902.77	-696.02	1,139.13	0.19	-0.09	-6.11
7,867.00	1.93	232.34	7,742.53	900.93	-698.13	1,139.07	0.53	0.47	8.60
7,962.00	1.32	281.83	7,837.50	900.18	-700.46	1,139.98	1.55	-0.64	52.09
8,056.00	1.67	266.36	7,931.47	900.31	-702.89	1,141.64	0.57	0.37	-16.46
8,151.00	1.85	265.30	8,026.42	900.10	-705.80	1,143.34	0.19	0.19	-1.12
8,245.00	2.11	263.37	8,120.37	899.77	-709.03	1,145.15	0.29	0.28	-2.05
8,340.00	2.37	268.99	8,215.29	899.54	-712.73	1,147.34	0.36	0.27	5.92
8,434.00	2.29	282.18	8,309.22	899.90	-716.51	1,150.04	0.58	-0.09	14.03
8,529.00	2.20	285.96	8,404.14	900.80	-720.12	1,153.04	0.18	-0.09	3.98
8,623.00	2.20	292.55	8,498.08	901.99	-723.52	1,156.13	0.27	0.00	7.01
8,718.00	2.90	295.54	8,592.98	903.73	-727.37	1,159.92	0.75	0.74	3.15
8,812.00	3.52	288.33	8,686.83	905.66	-732.26	1,164.54	0.79	0.66	-7.67

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-28A - Slot M
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 697-05C Pad	<b>MD Reference:</b>	GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
<b>Well:</b>	CC 697-05-28A	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies Compass Server

### 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)
8,907.00	3.87	281.30	8,781.64	907.20	-738.17	1,169.51	0.60	0.37	-7.40
9,001.00	3.87	274.44	8,875.42	908.07	-744.44	1,174.19	0.49	0.00	-7.30
9,095.00	4.22	262.23	8,969.19	907.85	-751.03	1,178.23	0.99	0.37	-12.99
<b>Last SDI Production MWD Survey</b>									
9,152.00	4.22	262.23	9,026.03	907.28	-755.19	1,180.45	0.00	0.00	0.00
<b>Projection To TD - BHL = 639464.01, 1226304.58</b>									

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
153.00	153.00	0.96	0.32	First SDI Surface MWD Survey
2,643.00	2,592.48	367.58	-295.72	Last SDI Surface MWD Survey
2,763.00	2,710.25	387.12	-307.96	First SDI Production MWD Survey
9,095.00	8,969.19	907.85	-751.03	Last SDI Production MWD Survey
9,152.00	9,026.03	907.28	-755.19	Projection To TD
9,152.00	9,026.03	907.28	-755.19	BHL = 639464.01, 1226304.58

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_