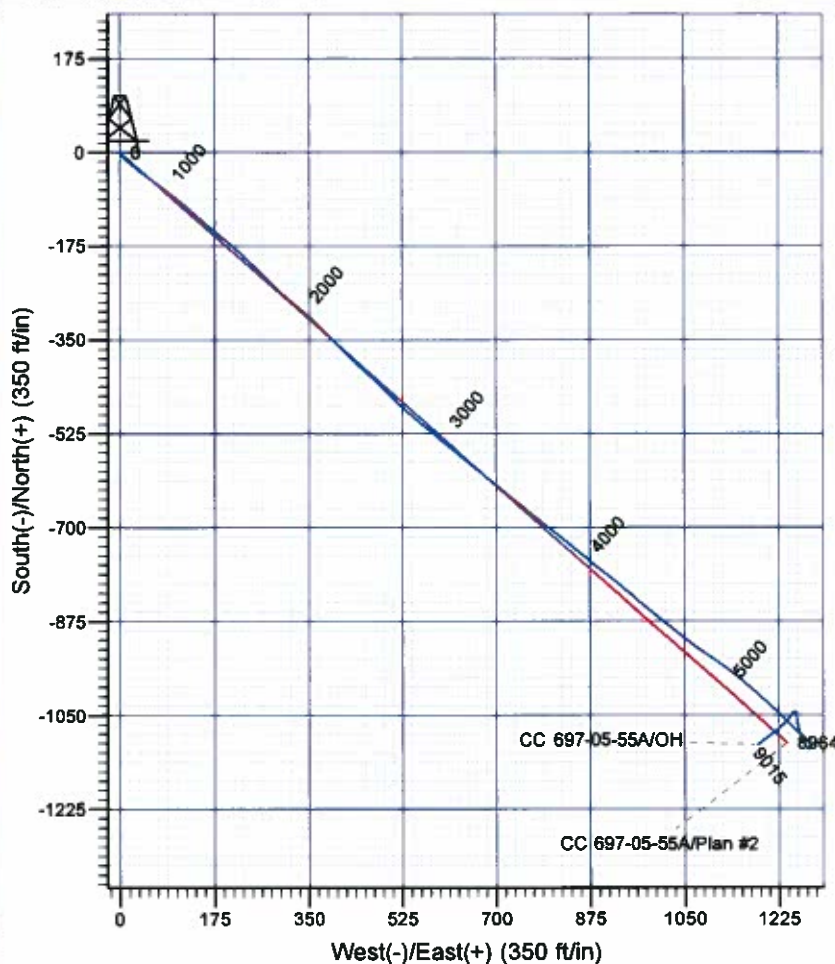
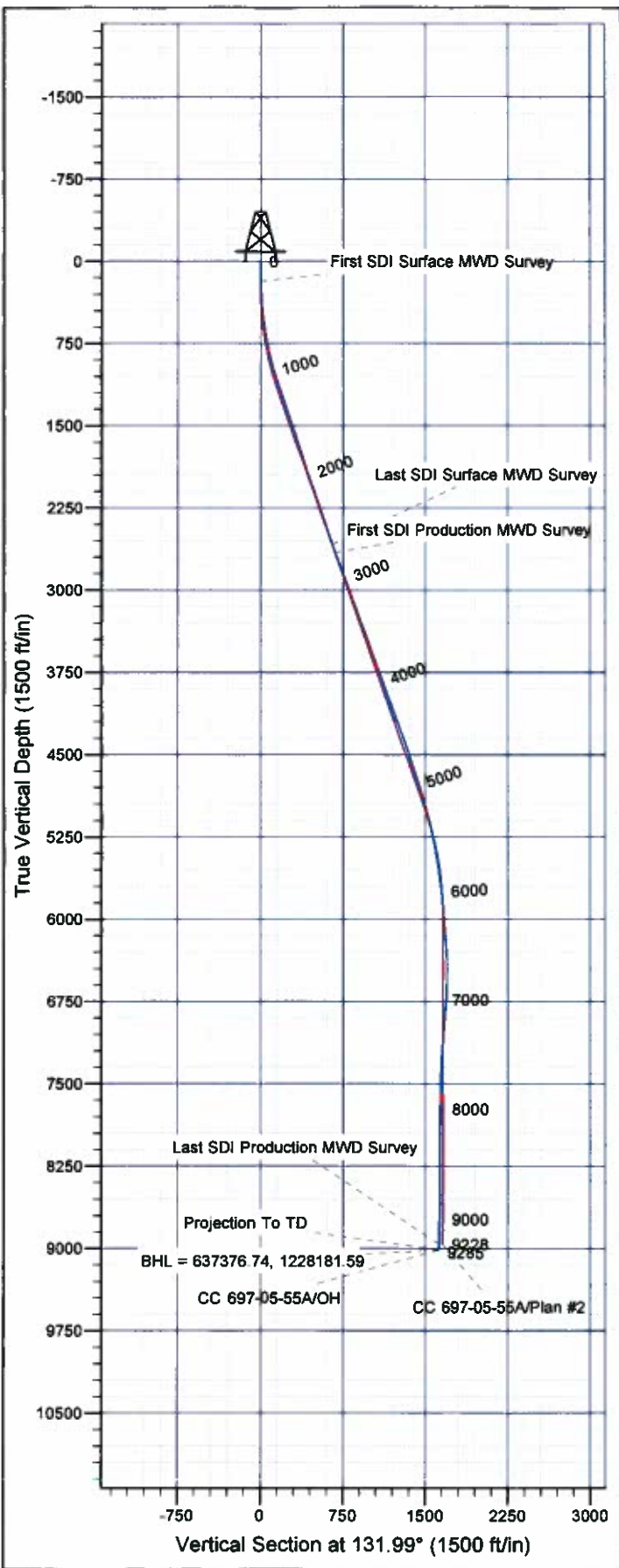




# Scientific Drilling

Company: OXY USA RMAT  
 Project: Garfield County, CO NAD27  
 Site: Cascade Creek 697-85C Pad  
 Well: CC 697-05-55A  
 Wellbore: OH  
 Design: OH



## Well Details: CC 697-05-55A

TVD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)								Slot J
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude			
0.00	0.00	638517.06	1227029.20	39° 33' 16.297 N	108° 14' 30.151 W			

## REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-05-55A - Slot J, True North  
 Vertical (TVD) Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)  
 Section (VS) Reference: Slot - J(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

16:14, January 03 2012  
 Created By: Rex Hall

# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-05C Pad  
CC 697-05-55A - Slot J**

**OH**

**Design: OH**

## **Standard Survey Report**

**03 January, 2012**

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-55A - Slot J
<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 697-05-55A	<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 °

Well	CC 697-05-55A - Slot J					
Well Position	+N/-S	0.00 ft	Northing:	638,517.06 usft	Latitude:	39° 33' 16.297 N
	+E/-W	0.00 ft	Easting:	1,227,029.20 usft	Longitude:	108° 14' 30.151 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	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>
	IGRF2005-10	12/16/10	10.51	65.77	52,312

<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		131.99

<b>Survey Program</b>	<b>Date</b>	01/03/12			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
183.00	2,683.00	Survey #1 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,763.00	9,285.00	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
183.00	0.93	129.55	182.99	-0.95	1.15	1.48	0.51	0.51	0.00
<b>First SDI Surface MWD Survey</b>									
243.00	1.95	164.18	242.97	-2.24	1.80	2.83	2.16	1.70	57.72
333.00	2.88	152.54	332.89	-5.72	3.26	6.25	1.16	1.03	-12.93
423.00	4.34	130.39	422.72	-9.93	6.90	11.77	2.22	1.62	-24.61
513.00	6.51	133.73	512.31	-15.66	13.18	20.27	2.44	2.41	3.71
603.00	9.15	130.65	601.46	-23.85	22.29	32.53	2.97	2.93	-3.42
693.00	10.90	128.98	690.08	-33.87	34.34	48.18	1.97	1.94	-1.86
783.00	11.96	127.75	778.30	-44.93	48.33	65.98	1.21	1.18	-1.37

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-55A - Slot J
<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 697-05-55A	<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	12.66	125.56	867.21	-56.50	63.90	85.29	0.92	0.77	-2.41
964.00	15.12	126.08	954.57	-69.15	81.41	106.77	2.74	2.73	0.58
1,059.00	17.50	128.37	1,045.74	-85.32	102.62	133.35	2.59	2.51	2.41
1,153.00	19.52	132.59	1,134.87	-104.72	125.27	163.17	2.58	2.15	4.49
1,248.00	19.43	131.45	1,224.44	-125.92	148.80	194.84	0.41	-0.09	-1.20
1,342.00	18.38	129.16	1,313.37	-145.63	172.01	225.28	1.37	-1.12	-2.44
1,437.00	18.11	129.69	1,403.59	-164.52	194.98	254.99	0.33	-0.28	0.56
1,531.00	18.73	133.38	1,492.78	-184.22	217.20	284.68	1.40	0.66	3.93
1,626.00	18.55	133.55	1,582.80	-205.11	239.23	315.03	0.20	-0.19	0.18
1,720.00	17.50	135.84	1,672.18	-225.55	259.92	344.08	1.35	-1.12	2.44
1,815.00	16.80	135.05	1,762.96	-245.51	279.57	372.04	0.78	-0.74	-0.83
1,910.00	17.32	131.18	1,853.78	-264.54	299.91	399.89	1.31	0.55	-4.07
2,004.00	19.35	130.39	1,943.00	-283.84	322.31	429.45	2.18	2.16	-0.84
2,099.00	19.26	130.92	2,032.66	-304.31	346.13	460.85	0.21	-0.09	0.56
2,193.00	18.99	133.20	2,121.48	-324.93	369.00	491.64	0.84	-0.29	2.43
2,288.00	20.84	136.54	2,210.79	-347.78	391.89	523.94	2.29	1.95	3.52
2,382.00	18.38	135.40	2,299.34	-370.47	413.80	555.41	2.65	-2.62	-1.21
2,477.00	17.32	132.06	2,389.76	-390.61	434.82	584.50	1.55	-1.12	-3.52
2,571.00	18.64	132.32	2,479.17	-410.10	456.32	613.52	1.41	1.40	0.28
2,665.00	19.26	133.03	2,568.08	-430.79	478.76	644.04	0.70	0.66	0.76
2,683.00	19.52	133.55	2,585.06	-434.89	483.11	650.02	1.73	1.44	2.89
Last SDI Surface MWD Survey									
2,763.00	18.82	135.86	2,660.62	-453.36	501.78	676.25	1.29	-0.88	2.89
First SDI Production MWD Survey									
2,857.00	21.46	132.04	2,748.87	-475.76	525.11	708.58	3.14	2.81	-4.06
2,952.00	21.54	130.46	2,837.26	-498.71	551.29	743.39	0.62	0.08	-1.66
3,046.00	19.70	129.75	2,925.23	-520.05	576.60	776.48	1.98	-1.96	-0.76
3,141.00	19.43	129.32	3,014.75	-540.30	601.14	808.26	0.32	-0.28	-0.45
3,235.00	19.96	128.52	3,103.25	-560.20	625.79	839.89	0.63	0.56	-0.85
3,330.00	21.54	129.75	3,192.08	-581.45	651.88	873.51	1.73	1.66	1.29
3,424.00	20.22	129.58	3,279.91	-602.83	677.67	906.98	1.41	-1.40	-0.18
3,519.00	19.17	129.67	3,369.35	-623.25	702.33	938.97	1.11	-1.11	0.09
3,614.00	20.93	129.05	3,458.59	-643.90	727.52	971.50	1.87	1.85	-0.65
3,708.00	19.52	128.26	3,546.79	-664.20	752.89	1,003.94	1.53	-1.50	-0.84
3,803.00	21.10	128.70	3,635.88	-684.72	778.70	1,036.86	1.67	1.66	0.46
3,897.00	20.58	128.00	3,723.73	-705.47	804.92	1,070.23	0.61	-0.55	-0.74
3,992.00	19.87	129.58	3,812.87	-726.04	830.52	1,103.02	0.94	-0.75	1.66
4,086.00	18.73	130.19	3,901.59	-745.96	854.36	1,134.06	1.23	-1.21	0.65
4,181.00	20.31	129.05	3,991.13	-766.19	878.82	1,165.77	1.71	1.66	-1.20
4,275.00	19.17	127.56	4,079.60	-785.88	903.73	1,197.46	1.33	-1.21	-1.59
4,369.00	20.93	129.32	4,167.90	-805.93	928.95	1,229.62	1.98	1.87	1.87
4,464.00	20.22	129.93	4,256.84	-827.22	954.67	1,262.97	0.78	-0.75	0.64
4,559.00	19.08	130.90	4,346.31	-847.92	978.99	1,294.91	1.25	-1.20	1.02



# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-55A - Slot J
<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 697-05-55A	<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)
4,653.00	19.70	129.67	4,434.98	-868.09	1,002.80	1,326.10	0.79	0.66	-1.31
4,748.00	18.82	128.79	4,524.66	-887.91	1,027.07	1,357.40	0.98	-0.93	-0.93
4,843.00	17.94	129.05	4,614.81	-906.73	1,050.38	1,387.31	0.93	-0.93	0.27
4,937.00	18.55	126.33	4,704.09	-924.71	1,073.67	1,416.65	1.11	0.65	-2.89
5,032.00	18.20	124.31	4,794.25	-942.03	1,098.10	1,446.39	0.76	-0.37	-2.13
5,126.00	17.06	126.33	4,883.83	-958.47	1,121.33	1,474.66	1.38	-1.21	2.15
5,221.00	16.00	128.00	4,974.90	-974.79	1,142.87	1,501.59	1.22	-1.12	1.76
5,315.00	14.25	129.49	5,065.64	-990.12	1,162.01	1,526.07	1.91	-1.86	1.59
5,410.00	11.96	131.78	5,158.16	-1,004.12	1,178.38	1,547.60	2.47	-2.41	2.41
5,504.00	11.34	131.42	5,250.23	-1,016.72	1,192.57	1,566.58	0.66	-0.66	-0.38
5,599.00	10.55	131.95	5,343.50	-1,028.71	1,206.04	1,584.62	0.84	-0.83	0.56
5,693.00	10.20	132.83	5,435.96	-1,040.13	1,218.55	1,601.54	0.41	-0.37	0.94
5,788.00	8.00	134.76	5,529.76	-1,050.50	1,229.41	1,616.56	2.34	-2.32	2.03
5,882.00	7.30	135.29	5,622.92	-1,059.35	1,238.26	1,629.05	0.75	-0.74	0.56
5,977.00	7.30	135.20	5,717.15	-1,067.92	1,246.76	1,641.11	0.01	0.00	-0.09
6,071.00	5.54	130.90	5,810.56	-1,075.13	1,254.40	1,651.61	1.94	-1.87	-4.57
6,166.00	4.84	131.16	5,905.17	-1,080.77	1,260.88	1,660.20	0.74	-0.74	0.27
6,260.00	4.66	131.95	5,998.85	-1,085.93	1,266.71	1,667.98	0.20	-0.19	0.84
6,355.00	5.19	134.15	6,093.50	-1,091.51	1,272.66	1,676.13	0.59	0.56	2.32
6,449.00	4.66	138.54	6,187.15	-1,097.33	1,278.24	1,684.18	0.69	-0.56	4.67
6,544.00	3.96	148.91	6,281.88	-1,103.03	1,282.49	1,691.15	1.10	-0.74	10.92
6,638.00	2.73	169.22	6,375.72	-1,108.01	1,284.58	1,696.04	1.80	-1.31	21.61
6,732.00	2.02	213.43	6,469.65	-1,111.59	1,284.09	1,698.07	2.03	-0.76	47.03
6,827.00	1.85	268.36	6,564.60	-1,113.03	1,281.63	1,697.21	1.89	-0.18	57.82
6,922.00	2.81	312.39	6,659.53	-1,111.51	1,278.38	1,693.77	2.06	1.01	46.35
7,016.00	3.78	323.73	6,753.37	-1,107.46	1,274.84	1,688.43	1.24	1.03	12.06
7,111.00	4.84	334.28	6,848.11	-1,101.32	1,271.25	1,681.65	1.39	1.12	11.11
7,205.00	5.63	335.24	6,941.71	-1,093.56	1,267.60	1,673.75	0.85	0.84	1.02
7,300.00	5.98	343.24	7,036.23	-1,084.59	1,264.22	1,665.24	0.93	0.37	8.42
7,394.00	5.98	348.07	7,129.72	-1,075.11	1,261.80	1,657.09	0.54	0.00	5.14
7,489.00	5.10	349.31	7,224.27	-1,066.12	1,259.99	1,649.73	0.93	-0.93	1.31
7,583.00	3.61	354.84	7,318.00	-1,059.07	1,258.95	1,644.24	1.65	-1.59	5.88
7,678.00	2.73	352.03	7,412.85	-1,053.85	1,258.37	1,640.32	0.94	-0.93	-2.96
7,772.00	2.11	349.22	7,506.77	-1,049.93	1,257.73	1,637.22	0.67	-0.66	-2.99
7,867.00	1.41	348.69	7,601.72	-1,047.07	1,257.18	1,634.89	0.74	-0.74	-0.56
7,961.00	0.97	355.19	7,695.70	-1,045.14	1,256.88	1,633.39	0.49	-0.47	6.91
8,056.00	0.44	319.33	7,790.69	-1,044.06	1,256.58	1,632.44	0.70	-0.56	-37.75
8,150.00	0.97	270.91	7,884.69	-1,043.77	1,255.55	1,631.48	0.80	0.56	-51.51
8,245.00	1.58	252.19	7,979.66	-1,044.16	1,253.50	1,630.22	0.77	0.64	-19.71
8,339.00	2.37	223.36	8,073.61	-1,045.97	1,250.93	1,629.52	1.33	0.84	-30.67
8,434.00	2.99	216.50	8,168.51	-1,049.39	1,248.11	1,629.71	0.73	0.65	-7.22
8,528.00	3.17	213.34	8,262.37	-1,053.53	1,245.22	1,630.33	0.26	0.19	-3.36
8,623.00	3.52	219.40	8,357.21	-1,057.98	1,241.92	1,630.86	0.52	0.37	6.38
8,717.00	4.22	222.04	8,450.99	-1,062.78	1,237.78	1,630.99	0.77	0.74	2.81

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-55A - Slot J
<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 697-05-55A	<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)
8,812.00	4.75	226.08	8,545.70	-1,068.10	1,232.60	1,630.71	0.65	0.56	4.25
8,906.00	5.72	227.93	8,639.31	-1,073.94	1,226.32	1,629.94	1.05	1.03	1.97
9,001.00	7.30	232.67	8,733.69	-1,080.78	1,218.01	1,628.34	1.76	1.66	4.99
9,095.00	7.74	233.11	8,826.89	-1,088.20	1,208.20	1,626.01	0.47	0.47	0.47
9,190.00	8.62	233.11	8,920.92	-1,096.31	1,197.39	1,623.40	0.93	0.93	0.00
9,230.00	8.53	231.53	8,960.47	-1,099.96	1,192.67	1,622.33	0.63	-0.23	-3.95
Last SDI Production MWD Survey									
9,285.00	8.53	231.53	9,014.86	-1,105.03	1,186.28	1,620.98	0.00	0.00	0.00
Projection To TD - BHL = 637376.74, 1228181.59									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
183.00	182.99	-0.95	1.15	First SDI Surface MWD Survey
2,683.00	2,585.06	-434.89	483.11	Last SDI Surface MWD Survey
2,763.00	2,660.62	-453.36	501.78	First SDI Production MWD Survey
9,230.00	8,960.47	-1,099.96	1,192.67	Last SDI Production MWD Survey
9,285.00	9,014.86	-1,105.03	1,186.28	Projection To TD
9,285.00	9,014.86	-1,105.03	1,186.28	BHL = 637376.74, 1228181.59

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