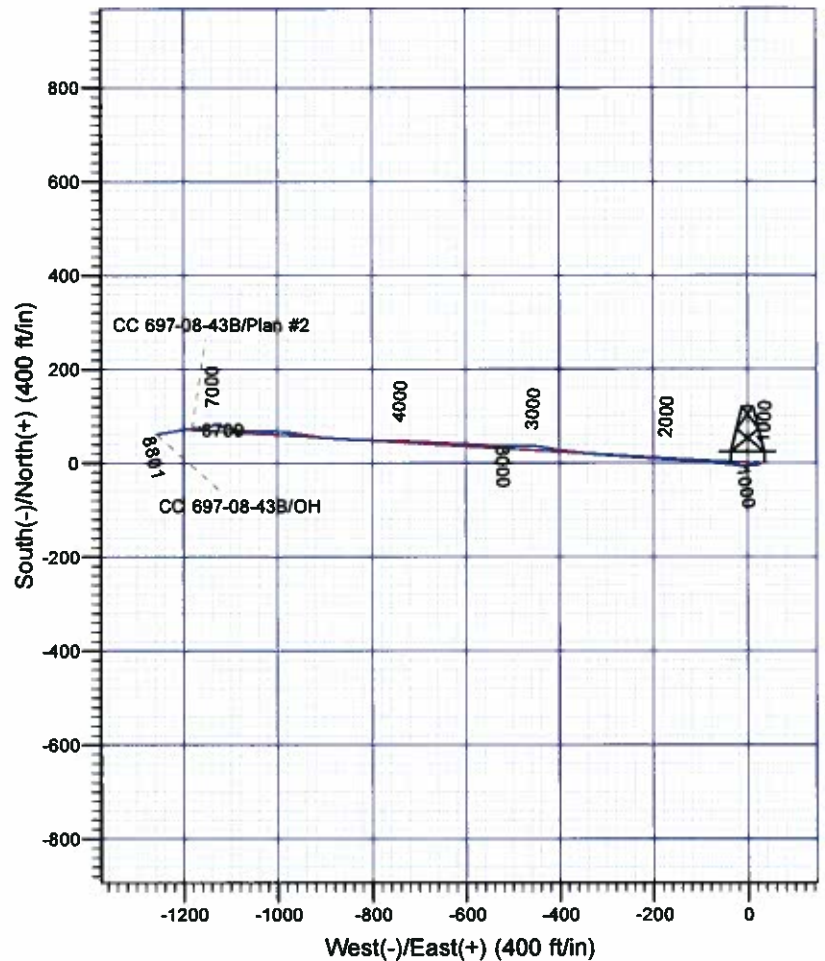
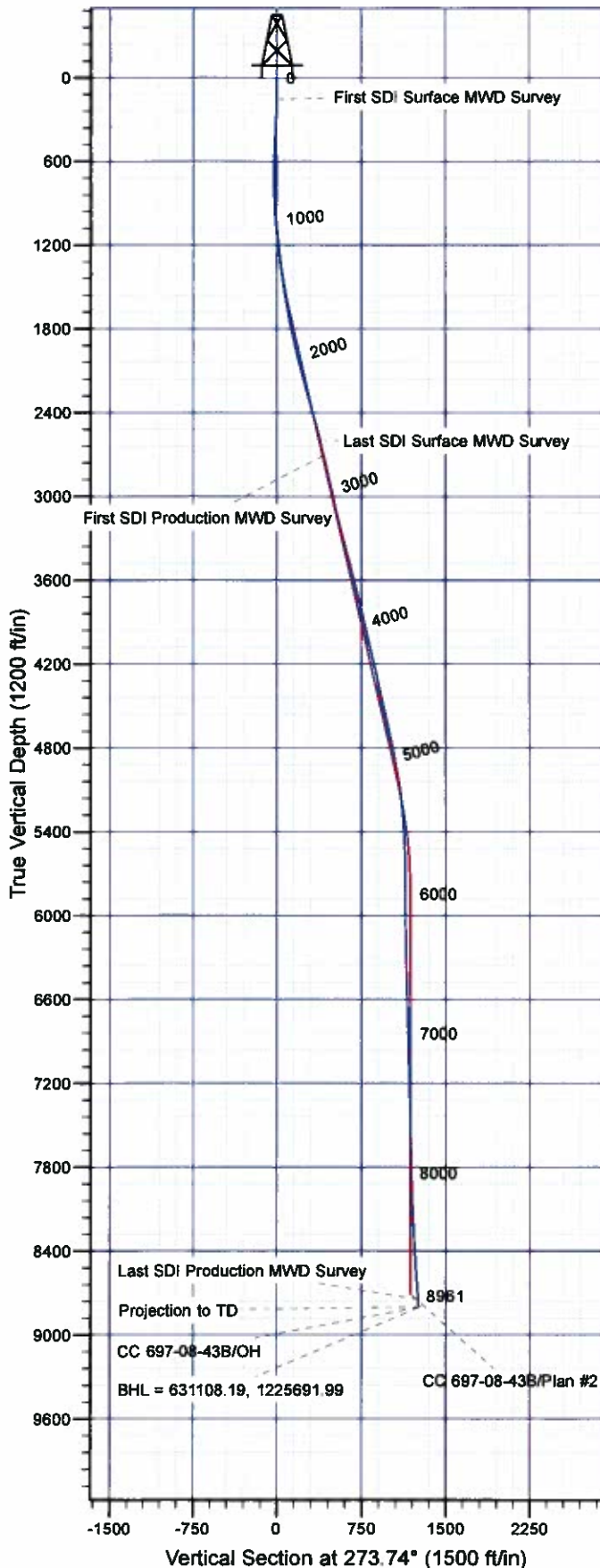




**Scientific Drilling**  
Rocky Mountain Operations

Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 697-08-53 Pad  
Well: CC 697-08-43B  
Wellbore: OH  
Design: OH



#### Well Details: CC 697-08-43B

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	631008.36	1226947.02	38° 32' 2.103 N	108° 14' 28.308 W	Q

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-08-43B - Slot Q, True North  
Vertical (TVD) Reference: GL 8379' & RKB 30' @ 8409.00ft (H&P 330)  
Section (VS) Reference: Slot - Q(0.00N, 0.00E)  
Measured Depth Reference: GL 8379' & RKB 30' @ 8409.00ft (H&P 330)  
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

9:27, October 12 2011  
Created By: Janie Cooke

# **OXY USA RMAT**

**Garfield County, CO NAD27**

**Cascade Creek 697-08-53 Pad**

**CC 697-08-43B - Slot Q**

**OH**

**Design: OH**

## **Standard Survey Report**

**12 October, 2011**





<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-08-43B - Slot Q
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
<b>Site:</b>	Cascade Creek 697-08-53 Pad	<b>MD Reference:</b>	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
<b>Well:</b>	CC 697-08-43B	<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 697-08-53 Pad, Sec. 8 T6S R97W				
<b>Site Position:</b>		<b>Northing:</b>	630,837.78 usft	<b>Latitude:</b>	39° 32' 0.393 N
<b>From:</b>	Map	<b>Easting:</b>	1,226,897.42 usft	<b>Longitude:</b>	108° 14' 28.874 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 697-08-43B - Slot Q				
<b>Well Position</b>	+N/-S	0.00 ft	<b>Northing:</b>	631,009.36 usft	<b>Latitude:</b> 39° 32' 2.103 N
	+E/-W	0.00 ft	<b>Easting:</b>	1,226,947.02 usft	<b>Longitude:</b> 108° 14' 28.308 W
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b> 8,379.00 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	09/01/2010	10.54	65.76	52,329

<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		273.74

<b>Survey Program</b>	<b>Date</b>	10/12/2011			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
154.00	2,655.00	Survey #1 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,766.00	8,961.00	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	
154.00	0.78	91.49	154.00	-0.03	1.05	-1.05	0.51	0.51	0.00	
<b>First SDI Surface MWD Survey</b>										
243.00	1.55	94.35	242.98	-0.13	2.85	-2.86	0.87	0.87	3.21	
333.00	2.81	89.84	332.91	-0.22	6.27	-6.27	1.41	1.40	-5.01	
422.00	3.77	80.67	421.76	0.26	11.34	-11.30	1.23	1.08	-10.30	
511.00	4.92	88.49	510.51	0.83	18.05	-17.95	1.45	1.29	8.79	
602.00	3.08	105.36	601.28	0.29	24.30	-24.23	2.38	-2.02	18.54	
694.00	1.06	179.10	693.23	-1.22	26.70	-26.72	3.22	-2.20	80.15	
786.00	2.37	237.29	785.19	-3.09	25.11	-25.26	2.20	1.42	63.25	



<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-08-43B - Slot Q
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
<b>Site:</b>	Cascade Creek 697-08-53 Pad	<b>MD Reference:</b>	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
<b>Well:</b>	CC 697-08-43B	<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)
875.00	3.52	268.22	874.08	-4.17	20.83	-21.06	2.16	1.29	34.75
966.00	5.10	262.16	964.82	-4.81	14.04	-14.32	1.80	1.74	-6.66
1,060.00	6.51	259.70	1,058.33	-6.34	4.65	-5.06	1.52	1.50	-2.62
1,155.00	8.09	269.98	1,152.56	-7.30	-7.33	6.84	2.15	1.66	10.82
1,250.00	8.27	280.70	1,246.60	-6.03	-20.73	20.29	1.61	0.19	11.28
1,344.00	8.79	279.74	1,339.56	-3.56	-34.45	34.15	0.57	0.55	-1.02
1,439.00	10.20	273.76	1,433.26	-1.78	-50.00	49.78	1.81	1.48	-6.29
1,534.00	11.08	275.17	1,526.63	-0.41	-67.49	67.32	0.97	0.93	1.48
1,628.00	12.22	276.22	1,618.69	1.48	-86.37	86.28	1.23	1.21	1.12
1,723.00	13.19	275.25	1,711.36	3.56	-107.16	107.16	1.05	1.02	-1.02
1,818.00	14.51	273.67	1,803.60	5.32	-129.83	129.90	1.45	1.39	-1.66
1,913.00	15.21	272.71	1,895.42	6.67	-154.16	154.26	0.78	0.74	-1.01
2,007.00	16.88	274.38	1,985.76	8.29	-180.08	180.24	1.84	1.78	1.78
2,102.00	18.38	273.94	2,076.29	10.38	-208.78	209.01	1.59	1.58	-0.46
2,197.00	17.76	273.50	2,166.61	12.29	-238.18	238.48	0.67	-0.65	-0.46
2,291.00	18.55	273.94	2,255.93	14.19	-267.41	267.77	0.85	0.84	0.47
2,386.00	19.17	274.73	2,345.83	16.52	-298.03	298.47	0.71	0.65	0.83
2,480.00	20.14	274.99	2,434.35	19.20	-329.53	330.08	1.04	1.03	0.28
2,575.00	18.11	276.48	2,524.10	22.29	-360.50	361.19	2.20	-2.14	1.57
2,655.00	16.44	277.28	2,600.49	25.12	-384.09	384.91	2.11	-2.09	1.00
Last SDI Surface MWD Survey									
2,766.00	15.92	281.84	2,707.10	30.24	-414.57	415.66	1.24	-0.47	4.11
First SDI Production MWD Survey									
2,860.00	16.00	278.06	2,797.48	34.70	-440.01	441.34	1.11	0.09	-4.02
2,955.00	15.74	271.29	2,888.86	36.83	-465.86	467.27	1.97	-0.27	-7.13
3,050.00	14.86	268.56	2,980.50	36.81	-490.92	492.28	1.20	-0.93	-2.87
3,145.00	15.30	269.88	3,072.22	36.48	-515.63	516.92	0.59	0.46	1.39
3,239.00	16.71	272.78	3,162.58	37.11	-541.54	542.80	1.72	1.50	3.09
3,334.00	18.38	273.93	3,253.16	38.80	-570.12	571.44	1.80	1.76	1.21
3,429.00	18.11	273.66	3,343.38	40.76	-599.80	601.18	0.30	-0.28	-0.28
3,524.00	17.85	272.08	3,433.74	42.24	-629.08	630.50	0.58	-0.27	-1.66
3,618.00	16.88	272.34	3,523.46	43.32	-657.12	658.54	1.04	-1.03	0.28
3,713.00	18.55	273.49	3,613.95	44.80	-685.98	687.45	1.80	1.76	1.21
3,807.00	17.32	272.70	3,703.38	46.37	-714.89	716.39	1.33	-1.31	-0.84
3,902.00	16.00	270.76	3,794.39	47.21	-742.11	743.60	1.51	-1.39	-2.04
3,997.00	15.65	270.76	3,885.79	47.55	-768.01	769.48	0.37	-0.37	0.00
4,091.00	16.53	271.55	3,976.11	48.08	-794.06	795.50	0.96	0.94	0.84
4,186.00	15.83	271.47	4,067.34	48.78	-820.52	821.95	0.74	-0.74	-0.08
4,281.00	16.36	273.93	4,158.62	50.03	-846.82	848.28	0.91	0.56	2.59
4,375.00	14.86	272.43	4,249.15	51.45	-872.07	873.57	1.65	-1.60	-1.60
4,470.00	15.48	275.07	4,340.84	53.08	-896.87	898.42	0.98	0.65	2.78
4,565.00	16.71	280.69	4,432.12	56.74	-922.92	924.66	2.09	1.29	5.92
4,660.00	15.92	279.29	4,523.30	61.38	-949.20	951.18	0.93	-0.83	-1.47





<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-08-43B - Slot Q
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
<b>Site:</b>	Cascade Creek 697-08-53 Pad	<b>MD Reference:</b>	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
<b>Well:</b>	CC 697-08-43B	<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)
4,755.00	15.39	277.53	4,614.77	65.13	-974.56	976.73	0.75	-0.56	-1.85
4,849.00	14.77	272.70	4,705.54	67.33	-998.89	1,001.16	1.49	-0.66	-5.14
4,944.00	14.42	270.23	4,797.47	67.95	-1,022.82	1,025.07	0.75	-0.37	-2.60
5,039.00	13.81	269.27	4,889.61	67.85	-1,045.98	1,048.18	0.69	-0.64	-1.01
5,133.00	12.31	274.98	4,981.18	68.58	-1,067.19	1,069.39	2.10	-1.60	6.07
5,228.00	10.64	281.22	5,074.28	71.16	-1,085.88	1,088.21	2.19	-1.76	6.57
5,323.00	8.00	281.40	5,168.01	74.18	-1,100.97	1,103.46	2.78	-2.78	0.19
5,417.00	5.19	284.56	5,261.38	76.54	-1,111.50	1,114.12	3.01	-2.99	3.36
5,512.00	5.01	278.32	5,356.01	78.22	-1,119.76	1,122.48	0.61	-0.19	-6.57
5,607.00	4.04	287.37	5,450.71	79.82	-1,127.06	1,129.86	1.26	-1.02	9.53
5,701.00	2.99	294.49	5,544.53	81.82	-1,132.45	1,135.38	1.21	-1.12	7.57
5,797.00	0.79	252.13	5,640.48	82.66	-1,135.36	1,138.33	2.57	-2.29	-44.13
5,891.00	0.62	216.97	5,734.47	82.05	-1,136.28	1,139.21	0.48	-0.18	-37.40
5,986.00	0.70	216.27	5,829.47	81.18	-1,136.93	1,139.81	0.08	0.08	-0.74
6,081.00	0.70	218.38	5,924.46	80.25	-1,137.64	1,140.45	0.03	0.00	2.22
6,175.00	1.06	242.02	6,018.45	79.39	-1,138.76	1,141.52	0.54	0.38	25.15
6,270.00	1.23	243.16	6,113.43	78.52	-1,140.45	1,143.14	0.18	0.18	1.20
6,364.00	1.41	246.15	6,207.40	77.60	-1,142.40	1,145.03	0.20	0.19	3.18
6,459.00	1.67	246.06	6,302.37	76.56	-1,144.74	1,147.30	0.27	0.27	-0.09
6,554.00	1.76	255.91	6,397.33	75.65	-1,147.42	1,149.91	0.32	0.09	10.37
6,649.00	1.76	255.21	6,492.28	74.92	-1,150.24	1,152.68	0.02	0.00	-0.74
6,743.00	2.29	259.34	6,586.22	74.20	-1,153.49	1,155.87	0.58	0.56	4.39
6,838.00	1.76	270.94	6,681.16	73.88	-1,156.81	1,159.17	0.70	-0.56	12.21
6,932.00	1.76	285.62	6,775.12	74.29	-1,159.64	1,162.02	0.48	0.00	15.62
7,027.00	2.20	282.80	6,870.06	75.09	-1,162.83	1,165.25	0.47	0.46	-2.97
7,122.00	1.76	271.47	6,965.01	75.53	-1,166.06	1,168.51	0.62	-0.46	-11.93
7,217.00	2.20	269.44	7,059.95	75.55	-1,169.34	1,171.78	0.47	0.46	-2.14
7,311.00	2.29	265.84	7,153.88	75.39	-1,173.02	1,175.44	0.18	0.10	-3.83
7,406.00	1.85	261.09	7,248.82	75.02	-1,176.43	1,178.82	0.50	-0.46	-5.00
7,501.00	0.88	236.13	7,343.79	74.37	-1,178.55	1,180.89	1.17	-1.02	-26.27
7,596.00	1.06	241.14	7,438.77	73.54	-1,179.93	1,182.21	0.21	0.19	5.27
7,690.00	1.76	252.74	7,532.75	72.70	-1,182.07	1,184.29	0.80	0.74	12.34
7,785.00	2.11	257.40	7,627.69	71.88	-1,185.17	1,187.33	0.40	0.37	4.91
7,879.00	1.76	274.10	7,721.64	71.61	-1,188.29	1,190.43	0.70	-0.37	17.77
7,974.00	2.11	270.50	7,816.58	71.73	-1,191.50	1,193.64	0.39	0.37	-3.79
8,069.00	2.11	269.36	7,911.52	71.72	-1,195.00	1,197.13	0.04	0.00	-1.20
8,164.00	2.20	263.73	8,006.45	71.50	-1,198.56	1,200.67	0.24	0.09	-5.93
8,258.00	2.99	255.38	8,100.36	70.69	-1,202.72	1,204.77	0.93	0.84	-8.88
8,353.00	3.61	258.81	8,195.20	69.48	-1,208.05	1,210.01	0.68	0.65	3.61
8,448.00	3.61	259.51	8,290.01	68.36	-1,213.93	1,215.80	0.05	0.00	0.74
8,542.00	4.31	259.86	8,383.78	67.20	-1,220.32	1,222.10	0.75	0.74	0.37
8,637.00	4.75	260.48	8,478.49	65.92	-1,227.71	1,229.39	0.47	0.46	0.65
8,731.00	5.63	262.76	8,572.10	64.69	-1,236.12	1,237.71	0.96	0.94	2.43
8,826.00	5.63	262.41	8,666.64	63.49	-1,245.36	1,246.85	0.04	0.00	-0.37



<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-08-43B - Slot Q
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
<b>Site:</b>	Cascade Creek 697-08-53 Pad	<b>MD Reference:</b>	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
<b>Well:</b>	CC 697-08-43B	<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)
8,905.00	5.10	256.00	8,745.30	62.13	-1,252.61	1,254.00	1.01	-0.67	-8.11
Last SDI Production MWD Survey									
8,961.00	5.10	256.00	8,801.08	60.92	-1,257.44	1,258.74	0.00	0.00	0.00
Projection to TD - BHL = 631108.19, 1225691.99									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
154.00	154.00	-0.03	1.05	First SDI Surface MWD Survey
2,655.00	2,600.49	25.12	-384.09	Last SDI Surface MWD Survey
2,766.00	2,707.10	30.24	-414.57	First SDI Production MWD Survey
8,905.00	8,745.30	62.13	-1,252.61	Last SDI Production MWD Survey
8,961.00	8,801.08	60.92	-1,257.44	Projection to TD
8,961.00	8,801.08	60.92	-1,257.44	BHL = 631108.19, 1225691.99

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