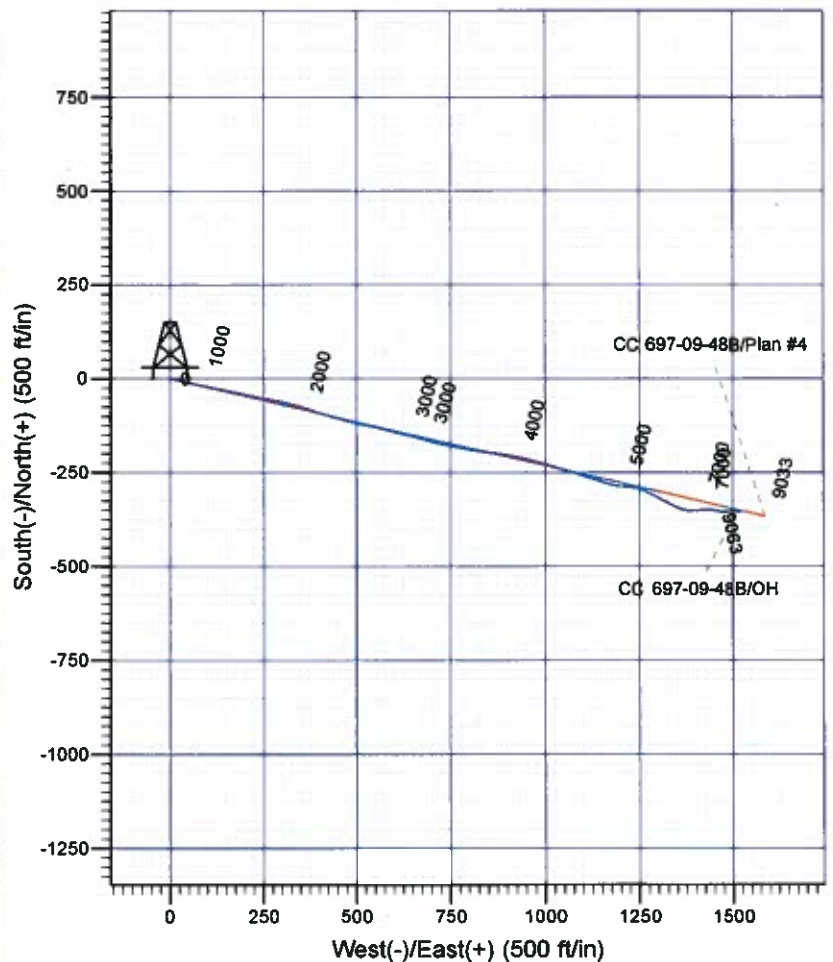
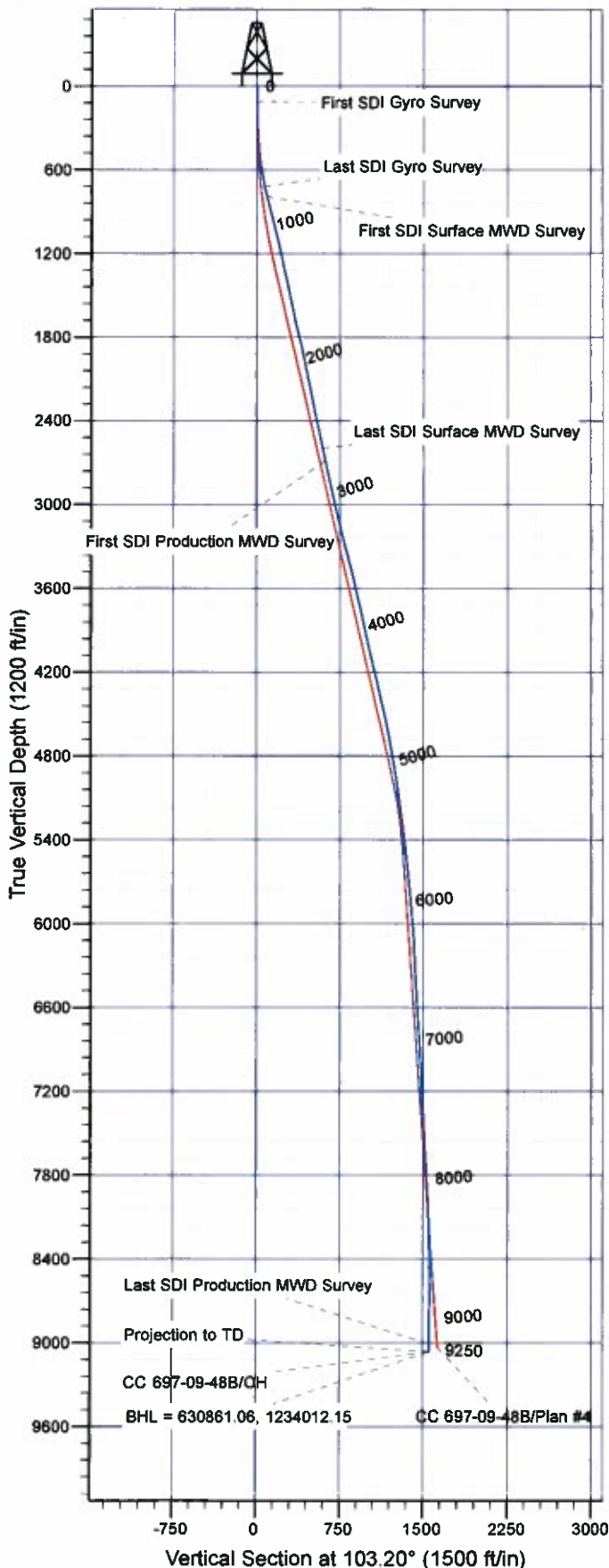




**Scientific Drilling**  
Rocky Mountain Operations

Company: OXY USA RMA  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 609-33 Pad  
Well: CC 697-09-48B  
Wellbore: OH  
Design: OH



#### Well Details: CC 697-09-48B

TVD Reference: GL 8381' & RKB 30' @ 8411.00ft (H&P 353)		Level: 8381.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot	
0.00	0.00	631260.57	1232512.43	39° 32' 6.238 N	108° 13' 17.402 W	U	

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-09-48B - Slot U, True North  
Vertical (TVD) Reference: GL 8381' & RKB 30' @ 8411.00ft (H&P 353)  
Section (VS) Reference: Slot - U(0.00N, 0.00E)  
Measured Depth Reference: GL 8381' & RKB 30' @ 8411.00ft (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

9:43, July 22 2011  
Created By: Janie Cooke

# **OXY USA RMAT**

**Garfield County, CO NAD27**

**Cascade Creek 609-33 Pad**

**CC 697-09-48B - Slot U**

**OH**

**Design: OH**

## **Standard Survey Report**

**22 July, 2011**





<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-09-48B - Slot U
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8381' & RKB 30' @ 8411.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 609-33 Pad	<b>MD Reference:</b>	GL 8381' & RKB 30' @ 8411.00ft (H&P 353)
<b>Well:</b>	CC 697-09-48B	<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		

Site	Cascade Creek 609-33 Pad, Sec 9 T6S R97W				
Site Position:		Northing:	631,314.66 usft	Latitude:	39° 32' 6.734 N
From:	Map	Easting:	1,232,383.54 usft	Longitude:	108° 13' 19.067 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.72 °

Well	CC 697-09-48B - Slot U					
Well Position	+N/-S	0.00 ft	Northing:	631,260.58 usft	Latitude:	39° 32' 6.238 N
	+E/-W	0.00 ft	Easting:	1,232,512.42 usft	Longitude:	108° 13' 17.402 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	8,381.00 ft

<b>Wellbore</b>	OH				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	12/31/2009	10.62	65.78	52,397

<b>Design</b>	OH				
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<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	103.20

Survey Program		Date	7/22/2011		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
112.00	726.00	Survey #1 - Gyro Survey (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3	
801.00	2,673.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,767.00	9,250.00	Survey #3 - Production MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	

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
112.00	0.88	90.88	112.00	-0.01	0.86	0.84	0.79	0.79	0.00
<b>First SDI Gyro Survey</b>									
174.00	1.50	90.70	173.98	-0.03	2.15	2.10	1.00	1.00	-0.29
266.00	2.90	93.96	265.91	-0.21	5.67	5.57	1.53	1.52	3.54
358.00	4.13	102.13	357.74	-1.06	11.23	11.18	1.44	1.34	8.88
450.00	6.07	103.10	449.37	-2.86	19.21	19.36	2.11	2.11	1.05
542.00	9.68	107.40	540.49	-6.28	31.33	31.94	3.97	3.92	4.67
634.00	12.67	103.71	630.73	-10.98	48.52	49.75	3.34	3.25	-4.01



<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-09-48B - Slot U
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8381' & RKB 30' @ 8411.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 609-33 Pad	<b>MD Reference:</b>	GL 8381' & RKB 30' @ 8411.00ft (H&P 353)
<b>Well:</b>	CC 697-09-48B	<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)
726.00	14.78	101.25	720.10	-15.66	69.83	71.57	2.38	2.29	-2.67
<b>Last SDI Gyro Survey</b>									
801.00	16.88	102.47	792.25	-19.88	89.85	92.02	2.83	2.80	1.63
<b>First SDI Surface MWD Survey</b>									
892.00	19.08	100.45	878.81	-25.43	117.38	120.09	2.51	2.42	-2.22
984.00	17.76	100.71	966.09	-30.77	145.96	149.13	1.44	-1.43	0.28
1,078.00	15.65	103.53	1,056.12	-36.40	172.38	176.13	2.40	-2.24	3.00
1,173.00	16.71	101.59	1,147.36	-42.14	198.21	202.60	1.25	1.12	-2.04
1,268.00	15.21	101.77	1,238.69	-47.43	223.79	228.71	1.58	-1.58	0.19
1,363.00	15.21	101.42	1,330.36	-52.44	248.21	253.63	0.10	0.00	-0.37
1,457.00	15.30	99.40	1,421.05	-56.91	272.53	278.32	0.57	0.10	-2.15
1,552.00	14.86	102.30	1,512.78	-61.55	296.80	303.01	0.92	-0.46	3.05
1,647.00	14.33	104.05	1,604.72	-67.00	320.11	326.95	0.73	-0.56	1.84
1,742.00	15.04	105.99	1,696.61	-73.25	343.36	351.01	0.91	0.75	2.04
1,836.00	18.11	108.45	1,786.70	-81.23	368.95	377.75	3.35	3.27	2.62
1,931.00	15.92	108.27	1,877.53	-89.99	395.33	405.44	2.31	-2.31	-0.19
2,025.00	14.86	106.87	1,968.16	-97.53	419.11	430.31	1.19	-1.13	-1.49
2,120.00	14.16	103.61	2,060.13	-103.80	442.06	454.08	1.13	-0.74	-3.43
2,215.00	13.98	105.64	2,152.28	-109.63	464.41	477.17	0.55	-0.19	2.14
2,310.00	13.98	106.34	2,244.47	-115.95	486.47	500.09	0.18	0.00	0.74
2,404.00	14.51	100.80	2,335.58	-121.35	508.93	523.20	1.56	0.56	-5.89
2,499.00	14.95	102.30	2,427.46	-126.19	532.59	547.34	0.61	0.46	1.58
2,594.00	15.65	102.82	2,519.09	-131.64	557.06	572.41	0.75	0.74	0.55
2,673.00	15.39	104.58	2,595.21	-136.65	577.60	593.54	0.68	-0.33	2.23
<b>Last SDI Surface MWD Survey</b>									
2,767.00	15.36	104.20	2,685.85	-142.84	601.74	618.46	0.11	-0.03	-0.40
<b>First SDI Production MWD Survey</b>									
2,861.00	14.68	102.91	2,776.64	-148.56	625.42	642.82	0.81	-0.72	-1.37
2,956.00	14.42	104.41	2,868.59	-154.19	648.61	666.68	0.48	-0.27	1.58
3,051.00	16.71	105.46	2,960.10	-160.78	673.23	692.16	2.43	2.41	1.11
3,145.00	16.18	105.37	3,050.26	-167.85	698.88	718.75	0.56	-0.56	-0.10
3,240.00	17.85	101.95	3,141.10	-174.37	725.89	746.53	2.05	1.76	-3.60
3,334.00	18.64	100.98	3,230.37	-180.22	754.74	775.95	0.90	0.84	-1.03
3,429.00	17.32	102.65	3,320.73	-186.21	783.44	805.26	1.49	-1.39	1.76
3,524.00	18.29	97.90	3,411.18	-191.35	812.00	834.25	1.84	1.02	-5.00
3,619.00	17.32	97.82	3,501.63	-195.33	840.78	863.17	1.02	-1.02	-0.08
3,713.00	15.51	98.44	3,591.80	-199.07	867.08	889.63	1.93	-1.93	0.66
3,808.00	17.15	99.66	3,682.96	-203.29	893.45	916.27	1.76	1.73	1.28
3,903.00	15.65	99.13	3,774.09	-207.67	919.91	943.03	1.59	-1.58	-0.56
3,998.00	14.95	104.49	3,865.73	-212.77	944.43	968.06	1.66	-0.74	5.64
4,092.00	15.39	104.67	3,956.45	-218.96	968.23	992.65	0.47	0.47	0.19
4,187.00	16.36	106.08	4,047.83	-225.86	993.29	1,018.62	1.10	1.02	1.48
4,282.00	17.32	107.66	4,138.76	-233.86	1,019.62	1,046.08	1.12	1.01	1.66
4,376.00	16.36	108.63	4,228.72	-242.33	1,045.50	1,073.21	1.06	-1.02	1.03





<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-09-48B - Slot U
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8381' & RKB 30' @ 8411.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 609-33 Pad	<b>MD Reference:</b>	GL 8381' & RKB 30' @ 8411.00ft (H&P 353)
<b>Well:</b>	CC 697-09-48B	<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)
4,471.00	16.71	104.93	4,319.80	-250.13	1,071.37	1,100.18	1.17	0.37	-3.89
4,565.00	16.53	108.27	4,409.87	-257.80	1,097.13	1,127.01	1.03	-0.19	3.55
4,660.00	14.95	108.19	4,501.31	-265.86	1,121.60	1,152.68	1.66	-1.66	-0.08
4,755.00	13.63	108.01	4,593.37	-273.15	1,143.89	1,176.04	1.39	-1.39	-0.19
4,849.00	13.72	106.43	4,684.70	-279.73	1,165.12	1,198.21	0.41	0.10	-1.68
4,944.00	12.40	102.21	4,777.25	-285.07	1,185.89	1,219.66	1.71	-1.39	-4.44
5,039.00	11.61	93.33	4,870.17	-287.78	1,205.41	1,239.28	2.11	-0.83	-9.35
5,134.00	11.08	95.71	4,963.32	-289.25	1,224.03	1,257.74	0.74	-0.56	2.51
5,228.00	10.20	102.30	5,055.71	-291.92	1,241.15	1,275.02	1.60	-0.94	7.01
5,323.00	9.76	112.23	5,149.27	-296.76	1,256.83	1,291.39	1.87	-0.46	10.45
5,417.00	9.23	116.18	5,241.99	-303.10	1,270.97	1,306.60	0.89	-0.56	4.20
5,512.00	8.79	117.15	5,335.81	-309.77	1,284.27	1,321.07	0.49	-0.46	1.02
5,607.00	8.44	117.85	5,429.74	-316.34	1,296.89	1,334.86	0.38	-0.37	0.74
5,702.00	8.09	118.73	5,523.76	-322.81	1,308.91	1,348.05	0.39	-0.37	0.93
5,796.00	7.30	118.65	5,616.91	-328.85	1,319.96	1,360.17	0.84	-0.84	-0.09
5,891.00	7.65	114.87	5,711.10	-334.41	1,330.99	1,372.19	0.64	0.37	-3.98
5,986.00	7.39	114.51	5,805.28	-339.60	1,342.29	1,384.37	0.28	-0.27	-0.38
6,081.00	6.77	113.20	5,899.56	-344.34	1,352.99	1,395.87	0.67	-0.65	-1.38
6,175.00	5.54	112.23	5,993.02	-348.24	1,362.28	1,405.81	1.31	-1.31	-1.03
6,270.00	4.13	95.88	6,087.68	-350.33	1,369.93	1,413.73	2.06	-1.48	-17.21
6,365.00	2.99	103.97	6,182.50	-351.28	1,375.74	1,419.61	1.31	-1.20	8.52
6,460.00	3.52	93.16	6,277.34	-352.03	1,381.06	1,424.95	0.85	0.56	-11.38
6,554.00	4.92	81.29	6,371.09	-351.58	1,387.92	1,431.54	1.75	1.49	-12.63
6,649.00	4.31	90.34	6,465.78	-350.99	1,395.52	1,438.80	1.00	-0.64	9.53
6,744.00	3.43	93.16	6,560.56	-351.17	1,401.93	1,445.08	0.95	-0.93	2.97
6,838.00	5.19	84.72	6,654.29	-350.93	1,408.97	1,451.88	1.99	1.87	-8.98
6,933.00	5.19	81.20	6,748.91	-349.88	1,417.49	1,459.94	0.34	0.00	-3.71
7,027.00	3.87	92.19	6,842.61	-349.35	1,424.87	1,466.99	1.67	-1.40	11.69
7,122.00	4.40	88.85	6,937.36	-349.40	1,431.71	1,473.67	0.61	0.56	-3.52
7,217.00	4.22	94.12	7,032.10	-349.57	1,438.84	1,480.65	0.46	-0.19	5.55
7,311.00	3.96	99.57	7,125.86	-350.36	1,445.49	1,487.31	0.50	-0.28	5.80
7,406.00	3.61	99.92	7,220.65	-351.42	1,451.67	1,493.57	0.37	-0.37	0.37
7,500.00	3.34	106.16	7,314.48	-352.69	1,457.22	1,499.26	0.49	-0.29	6.64
7,595.00	3.34	96.50	7,409.32	-353.78	1,462.63	1,504.77	0.59	0.00	-10.17
7,689.00	2.99	102.21	7,503.17	-354.61	1,467.74	1,509.94	0.50	-0.37	6.07
7,784.00	3.34	91.84	7,598.03	-355.22	1,472.93	1,515.13	0.70	0.37	-10.92
7,879.00	5.36	82.08	7,692.75	-354.70	1,480.09	1,521.98	2.28	2.13	-10.27
7,973.00	4.31	83.23	7,786.42	-353.68	1,487.95	1,529.40	1.12	-1.12	1.22
8,068.00	3.96	84.37	7,881.17	-352.93	1,494.76	1,535.86	0.38	-0.37	1.20
8,163.00	3.43	84.19	7,975.97	-352.32	1,500.85	1,541.65	0.56	-0.56	-0.19
8,257.00	2.55	85.16	8,069.84	-351.86	1,505.73	1,546.30	0.94	-0.94	1.03
8,352.00	2.55	90.61	8,164.75	-351.71	1,509.95	1,550.37	0.26	0.00	5.74
8,446.00	1.58	96.15	8,258.69	-351.87	1,513.33	1,553.69	1.05	-1.03	5.89



<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-09-48B - Slot U
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8381' & RKB 30' @ 8411.00ft (H&P 353)
<b>Site:</b>	Cascade Creek 609-33 Pad	<b>MD Reference:</b>	GL 8381' & RKB 30' @ 8411.00ft (H&P 353)
<b>Well:</b>	CC 697-09-48B	<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)
8,541.00	1.06	128.75	8,353.66	-352.56	1,515.32	1,555.79	0.94	-0.55	34.32
8,636.00	1.14	110.03	8,448.64	-353.43	1,516.89	1,557.52	0.39	0.08	-19.71
8,730.00	0.70	149.58	8,542.63	-354.25	1,518.06	1,558.84	0.80	-0.47	42.07
8,825.00	0.44	260.76	8,637.63	-354.81	1,517.99	1,558.91	1.00	-0.27	117.03
8,920.00	0.79	292.49	8,732.62	-354.81	1,517.03	1,557.92	0.50	0.37	33.40
9,014.00	1.14	283.44	8,826.61	-354.15	1,515.52	1,556.35	0.40	0.37	-9.63
9,109.00	1.06	267.71	8,921.59	-353.96	1,513.72	1,554.56	0.33	-0.08	-16.56
9,194.00	1.14	257.86	9,006.58	-354.17	1,512.11	1,553.03	0.24	0.09	-11.59
<b>Last SDI Production MWD Survey</b>									
9,250.00	1.14	257.86	9,062.57	-354.41	1,511.02	1,552.03	0.00	0.00	0.00
<b>Projection to TD - BHL = 630861.06, 1234012.15</b>									

## Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
112.00	112.00	-0.01	0.86	First SDI Gyro Survey
726.00	720.10	-15.66	69.83	Last SDI Gyro Survey
801.00	792.25	-19.88	89.85	First SDI Surface MWD Survey
2,673.00	2,595.21	-136.65	577.60	Last SDI Surface MWD Survey
2,767.00	2,685.85	-142.84	601.74	First SDI Production MWD Survey
9,194.00	9,006.58	-354.17	1,512.11	Last SDI Production MWD Survey
9,250.00	9,062.57	-354.41	1,511.02	Projection to TD
9,250.00	9,062.57	-354.41	1,511.02	BHL = 630861.06, 1234012.15

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