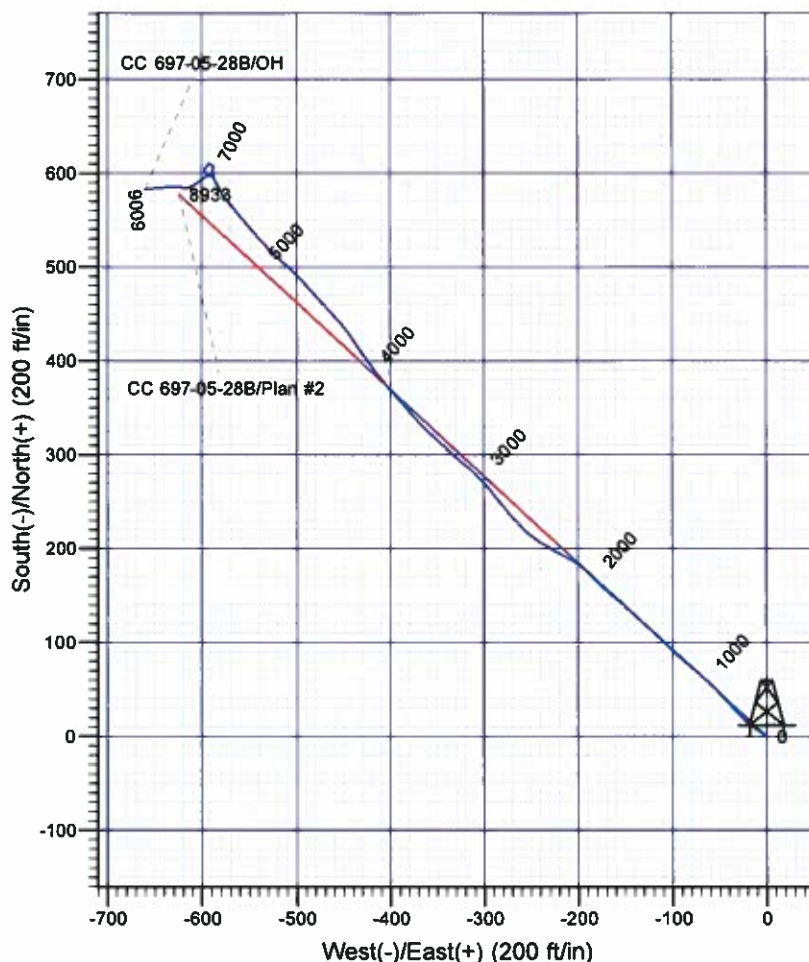
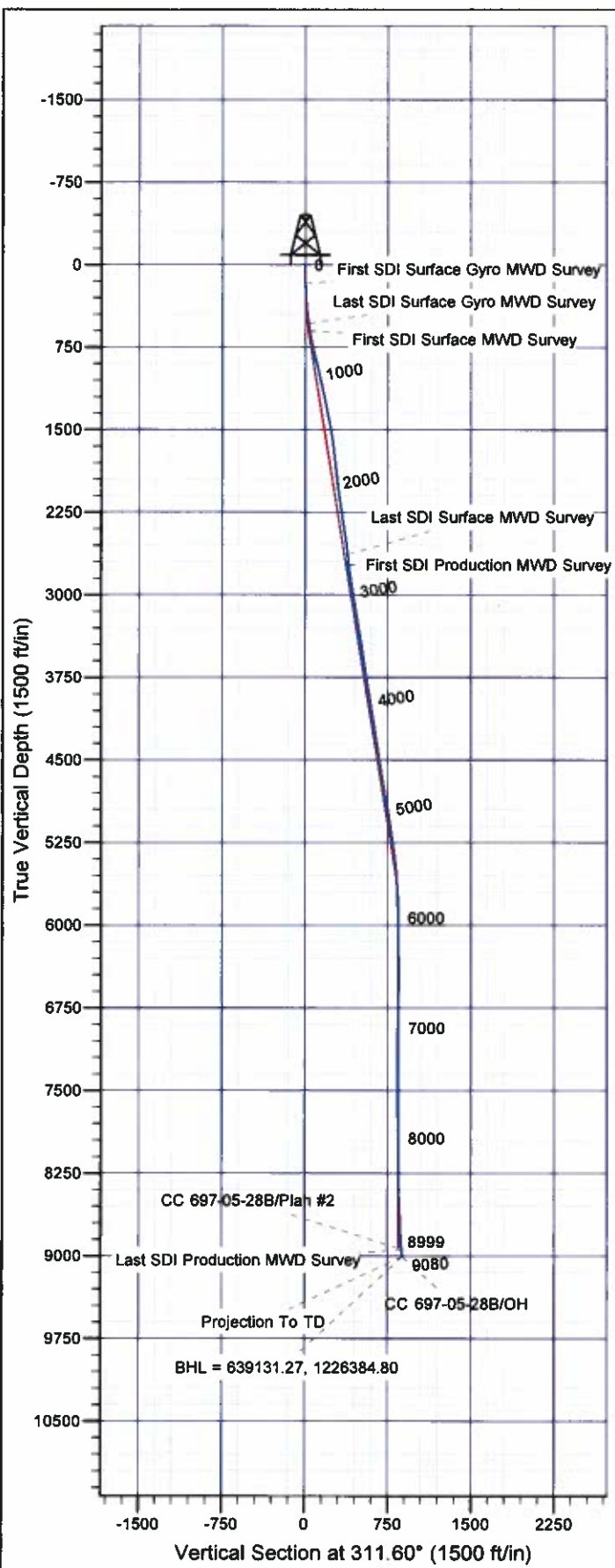




# Scientific Drilling

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



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

TVD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)							Slot
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude		K
0.00	0.00	638528.63	1227027.20	39° 33' 16.411 N	108° 14' 30.181 W		

## REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-05-28B - Slot K, True North  
 Vertical (TVD) Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)  
 Section (VS) Reference: Slot - K(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

9:45, December 16 2011  
 Created By: Rex Hall

# **OXY USA RMAT**

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

**OH**

**Design: OH**

## **Standard Survey Report**

**16 December, 2011**

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-28B - Slot K
<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 697-05-28B	<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 697-05-28B - Slot K					
Well Position	+N/-S	0.00 ft	Northing:	638,528.63 usft	Latitude:	39° 33' 16.411 N
	+E/-W	0.00 ft	Easting:	1,227,027.20 usft	Longitude:	108° 14' 30.181 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>
	IGRF2010	10/07/11	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		311.60

<b>Survey Program</b>	<b>Date</b>	12/16/11			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
173.00	534.00	Survey #1 - Surface Gyro MWD (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
603.00	2,666.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,763.00	9,080.00	Survey #3 - 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
173.00	0.88	311.57	172.99	0.88	-0.99	1.33	0.51	0.51	0.00
<b>First SDI Surface Gyro MWD Survey</b>									
263.00	2.55	302.34	262.95	2.41	-3.20	4.00	1.87	1.86	-10.26
354.00	5.28	303.05	353.73	5.78	-8.42	10.14	3.00	3.00	0.78
444.00	5.72	308.41	443.31	10.82	-15.41	18.71	0.75	0.49	5.96
534.00	7.57	310.78	532.71	17.48	-23.41	29.12	2.08	2.06	2.63
<b>Last SDI Surface Gyro MWD Survey</b>									

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-28B - Slot K
<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 697-05-28B	<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)
603.00	9.94	317.95	600.90	24.87	-30.84	39.58	3.78	3.43	10.39
<b>First SDI Surface MWD Survey</b>									
694.00	12.49	317.51	690.15	37.96	-42.75	57.18	2.80	2.80	-0.48
784.00	12.40	313.99	778.04	51.85	-56.28	76.51	0.85	-0.10	-3.91
874.00	13.10	311.71	865.82	65.35	-70.85	96.37	0.96	0.78	-2.53
965.00	14.16	310.74	954.26	79.48	-86.98	117.81	1.19	1.16	-1.07
1,059.00	12.66	315.14	1,045.70	94.28	-102.96	139.59	1.93	-1.60	4.68
1,154.00	13.01	312.24	1,138.32	108.85	-118.22	160.67	0.77	0.37	-3.05
1,248.00	10.90	314.87	1,230.28	122.24	-132.35	180.13	2.32	-2.24	2.80
1,343.00	11.08	312.32	1,323.54	134.72	-145.47	198.22	0.55	0.19	-2.68
1,437.00	11.34	307.49	1,415.75	146.42	-159.48	216.47	1.04	0.28	-5.14
1,532.00	10.02	312.85	1,509.10	157.73	-172.95	234.05	1.74	-1.39	5.64
1,626.00	8.71	316.81	1,601.85	168.48	-183.82	249.32	1.55	-1.39	4.21
1,721.00	6.33	313.20	1,696.02	177.31	-192.56	261.72	2.55	-2.51	-3.80
1,816.00	5.36	304.68	1,790.53	183.42	-200.03	271.36	1.37	-1.02	-8.97
1,910.00	6.33	299.67	1,884.04	188.49	-208.14	280.79	1.17	1.03	-5.33
2,005.00	7.21	297.65	1,978.38	193.84	-217.97	291.70	0.96	0.93	-2.13
2,099.00	8.35	301.07	2,071.51	200.10	-229.04	304.13	1.31	1.21	3.64
2,194.00	8.09	302.13	2,165.54	207.22	-240.61	317.51	0.32	-0.27	1.12
2,288.00	8.79	310.30	2,258.52	215.38	-251.69	331.21	1.48	0.74	8.69
2,383.00	9.41	317.07	2,352.33	225.77	-262.52	346.20	1.30	0.65	7.13
2,477.00	8.53	318.65	2,445.18	236.63	-272.36	360.77	0.97	-0.94	1.68
2,571.00	7.74	320.23	2,538.23	246.72	-281.01	373.95	0.87	-0.84	1.68
2,666.00	6.95	322.61	2,632.45	256.21	-288.59	385.91	0.89	-0.83	2.51
<b>Last SDI Surface MWD Survey</b>									
2,763.00	6.11	320.74	2,728.82	264.87	-295.42	396.77	0.89	-0.87	-1.93
<b>First SDI Production MWD Survey</b>									
2,857.00	7.91	317.42	2,822.11	273.50	-302.97	408.15	1.96	1.91	-3.53
2,952.00	8.71	310.30	2,916.12	282.97	-312.88	421.84	1.37	0.84	-7.49
3,046.00	9.76	309.34	3,008.90	292.62	-324.47	436.92	1.13	1.12	-1.02
3,141.00	9.76	313.20	3,102.52	303.24	-336.56	453.01	0.69	0.00	4.06
3,235.00	9.50	312.85	3,195.20	313.97	-348.06	468.73	0.28	-0.28	-0.37
3,330.00	9.15	311.80	3,288.94	324.34	-359.44	484.12	0.41	-0.37	-1.11
3,425.00	10.02	320.23	3,382.62	335.73	-370.36	499.85	1.74	0.92	8.87
3,519.00	9.06	317.77	3,475.32	347.49	-380.56	515.29	1.11	-1.02	-2.62
3,614.00	8.00	316.63	3,569.27	357.84	-390.13	529.31	1.13	-1.12	-1.20
3,708.00	9.23	320.06	3,662.21	368.37	-399.46	543.29	1.42	1.31	3.65
3,803.00	7.91	319.18	3,756.14	379.16	-408.63	557.30	1.40	-1.39	-0.93
3,897.00	9.50	324.10	3,849.06	390.34	-417.40	571.29	1.87	1.69	5.23
3,992.00	8.97	323.75	3,942.83	402.66	-426.38	586.18	0.56	-0.56	-0.37
4,086.00	10.02	325.07	4,035.54	415.28	-435.40	601.30	1.14	1.12	1.40
4,181.00	8.97	325.68	4,129.24	428.17	-444.30	616.52	1.11	-1.11	0.64
4,275.00	9.32	319.71	4,222.04	440.03	-453.36	631.17	1.08	0.37	-6.35
4,369.00	8.71	316.89	4,314.88	451.03	-463.14	645.79	0.80	-0.65	-3.00



# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-28B - Slot K
<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 697-05-28B	<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)
4,464.00	8.53	316.63	4,408.81	461.40	-472.90	659.97	0.19	-0.19	-0.27
4,559.00	10.02	319.27	4,502.57	472.79	-483.13	675.18	1.63	1.57	2.78
4,653.00	8.97	317.25	4,595.28	484.37	-493.44	690.58	1.17	-1.12	-2.15
4,748.00	8.62	315.40	4,689.16	494.87	-503.47	705.05	0.47	-0.37	-1.95
4,843.00	8.88	309.60	4,783.06	504.62	-514.12	719.48	0.97	0.27	-6.11
4,937.00	10.64	317.16	4,875.70	515.61	-525.61	735.37	2.31	1.87	8.04
5,032.00	9.85	314.70	4,969.18	527.75	-537.35	752.22	0.95	-0.83	-2.59
5,126.00	8.88	319.88	5,061.93	538.96	-547.74	767.42	1.37	-1.03	5.51
5,221.00	8.62	322.43	5,155.82	550.21	-556.80	781.67	0.49	-0.27	2.68
5,315.00	8.00	319.88	5,248.84	560.79	-565.31	795.06	0.77	-0.66	-2.71
5,410.00	8.18	321.90	5,342.89	571.17	-573.74	808.26	0.35	0.19	2.13
5,504.00	6.16	331.57	5,436.15	580.87	-580.27	819.58	2.50	-2.15	10.29
5,599.00	5.80	334.03	5,530.64	589.66	-584.80	828.80	0.47	-0.38	2.59
5,693.00	4.31	343.53	5,624.27	597.32	-587.88	836.19	1.81	-1.59	10.11
5,788.00	1.85	11.56	5,719.13	602.25	-588.59	839.99	2.96	-2.59	29.51
5,882.00	1.23	19.12	5,813.10	604.69	-587.95	841.14	0.69	-0.66	8.04
5,977.00	0.88	355.48	5,908.08	606.38	-587.68	842.05	0.58	-0.37	-24.88
6,071.00	0.79	325.51	6,002.07	607.63	-588.10	843.20	0.47	-0.10	-31.88
6,166.00	0.79	308.46	6,097.06	608.58	-588.98	844.49	0.25	0.00	-17.95
6,260.00	0.97	310.48	6,191.05	609.50	-590.10	845.93	0.19	0.19	2.15
6,355.00	0.97	304.50	6,286.04	610.48	-591.37	847.54	0.11	0.00	-6.29
6,449.00	0.62	196.31	6,380.03	610.44	-592.17	848.11	1.39	-0.37	-115.10
6,544.00	1.14	221.97	6,475.02	609.24	-592.95	847.89	0.67	0.55	27.01
6,638.00	1.58	229.09	6,568.99	607.70	-594.55	848.07	0.50	0.47	7.57
6,732.00	1.93	216.88	6,662.95	605.58	-596.48	848.11	0.54	0.37	-12.99
6,827.00	1.67	171.26	6,757.91	602.94	-597.23	846.91	1.49	-0.27	-48.02
6,922.00	1.85	128.98	6,852.87	600.60	-595.83	844.31	1.35	0.19	-44.51
7,016.00	1.49	134.87	6,946.83	598.79	-593.78	841.58	0.42	-0.38	6.27
7,111.00	1.76	103.58	7,041.79	597.57	-591.49	839.06	0.96	0.28	-32.94
7,205.00	1.85	117.38	7,135.74	596.54	-588.74	836.31	0.47	0.10	14.68
7,300.00	0.62	38.46	7,230.72	596.23	-587.06	834.85	1.93	-1.29	-83.07
7,394.00	1.06	299.93	7,324.72	597.07	-587.49	835.73	1.39	0.47	-104.82
7,489.00	1.32	281.21	7,419.70	597.72	-589.33	837.54	0.49	0.27	-19.71
7,583.00	1.49	255.55	7,513.67	597.62	-591.57	839.15	0.69	0.18	-27.30
7,678.00	1.76	256.51	7,608.63	596.97	-594.19	840.68	0.29	0.28	1.01
7,772.00	2.11	240.34	7,702.58	595.78	-597.10	842.06	0.69	0.37	-17.20
7,867.00	1.49	227.33	7,797.53	594.08	-599.52	842.75	0.78	-0.65	-13.69
7,961.00	1.58	222.94	7,891.50	592.30	-601.31	842.90	0.16	0.10	-4.67
8,056.00	1.93	236.74	7,986.45	590.46	-603.54	843.35	0.58	0.37	14.53
8,150.00	2.29	240.25	8,080.39	588.66	-606.49	844.36	0.41	0.38	3.73
8,245.00	2.46	237.62	8,175.31	586.63	-609.86	845.53	0.21	0.18	-2.77
8,339.00	2.20	244.12	8,269.23	584.76	-613.19	846.78	0.39	-0.28	6.91
8,434.00	1.93	275.06	8,364.17	584.11	-616.42	848.76	1.19	-0.28	32.57

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-28B - Slot K
<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 697-05-28B	<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)
8,528.00	2.20	282.71	8,458.11	584.65	-619.76	851.61	0.41	0.29	8.14
8,623.00	3.08	276.73	8,553.01	585.35	-624.07	855.30	0.97	0.93	-6.29
8,717.00	3.78	268.12	8,646.84	585.54	-629.67	859.62	0.92	0.74	-9.16
8,812.00	4.48	264.51	8,741.59	585.08	-636.50	864.42	0.79	0.74	-3.80
8,906.00	4.84	266.80	8,835.28	584.51	-644.11	869.74	0.43	0.38	2.44
8,938.00	5.19	264.51	8,867.16	584.30	-646.90	871.68	1.26	1.09	-7.16
9,022.00	5.54	264.34	8,950.79	583.53	-654.72	877.02	0.42	0.42	-0.20
Last SDI Production MWD Survey									
9,080.00	5.54	264.34	9,008.52	582.98	-660.29	880.82	0.00	0.00	0.00
Projection To TD - BHL = 639131.27, 1226384.80									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
173.00	172.99	0.88	-0.99	First SDI Surface Gyro MWD Survey
534.00	532.71	17.48	-23.41	Last SDI Surface Gyro MWD Survey
603.00	600.90	24.87	-30.84	First SDI Surface MWD Survey
2,666.00	2,632.45	256.21	-288.59	Last SDI Surface MWD Survey
2,763.00	2,728.82	264.87	-295.42	First SDI Production MWD Survey
9,022.00	8,950.79	583.53	-654.72	Last SDI Production MWD Survey
9,080.00	9,008.52	582.98	-660.29	Projection To TD
9,080.00	9,008.52	582.98	-660.29	BHL = 639131.27, 1226384.80

Checked By: _____	Approved By: _____	Date: _____
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