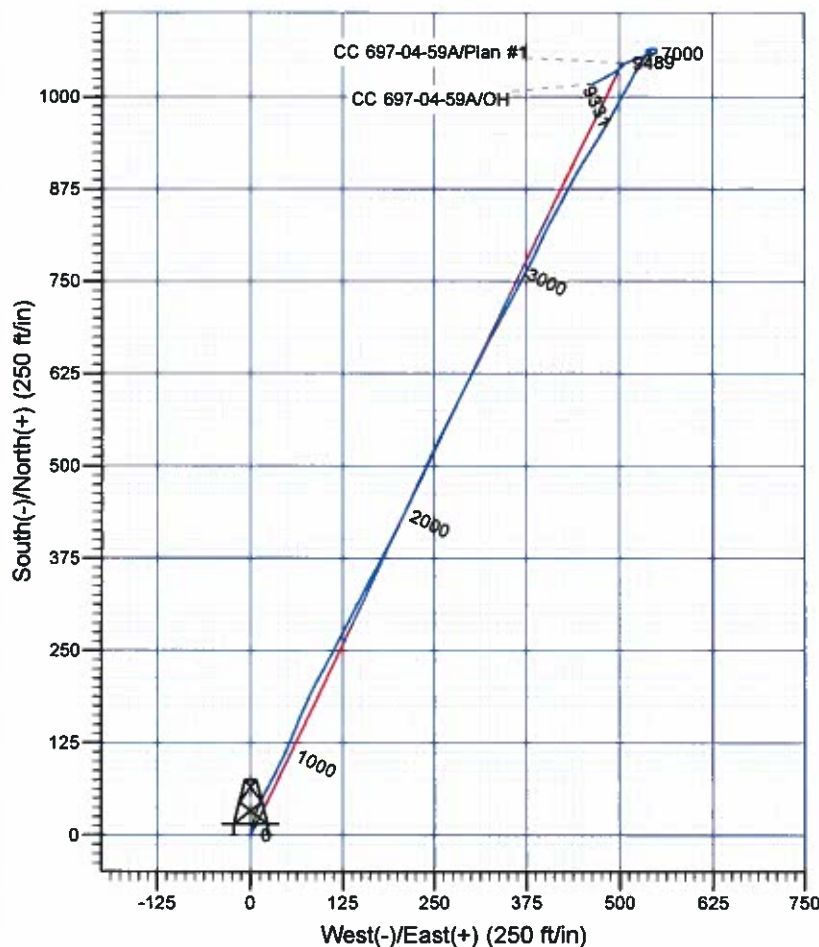
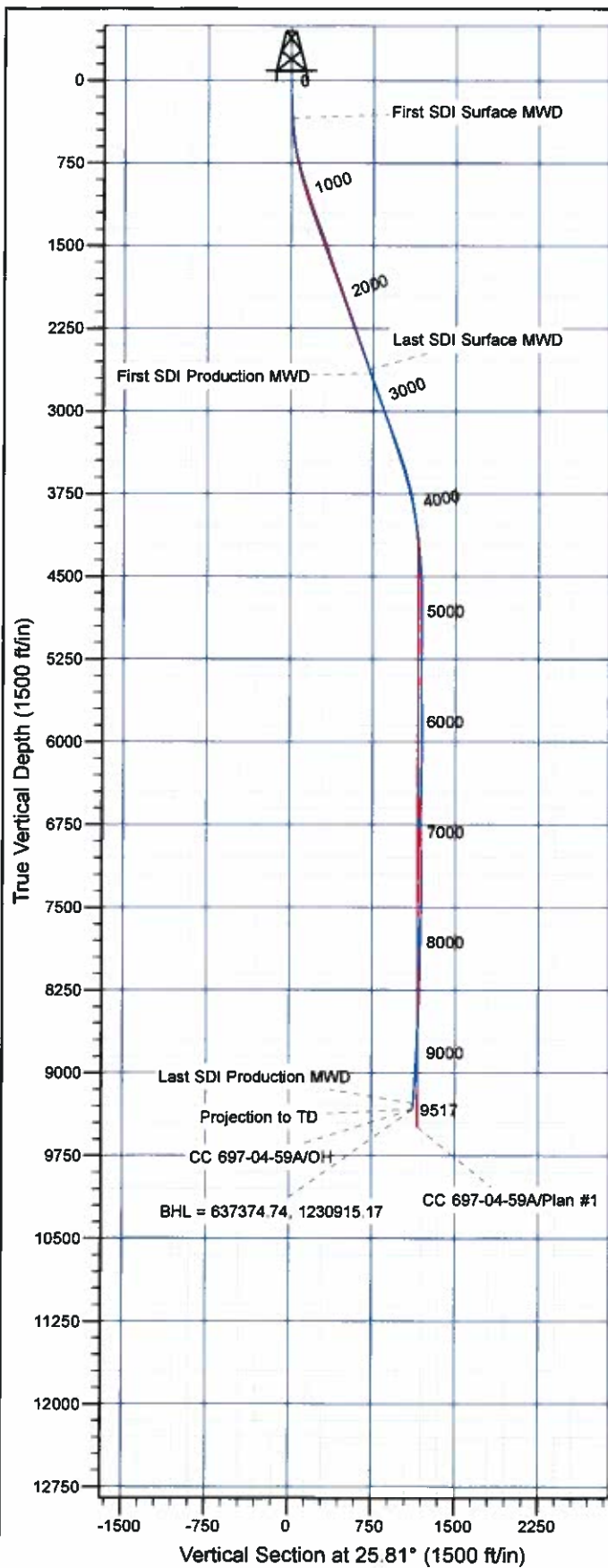




# Scientific Drilling

Company: OXY USA RMAT  
 Project: Garfield County, CO NAD27  
 Site: Cascade Creek 697-04D Pad  
 Well: CC 697-04-59A  
 Wellbore: OH  
 Design: OH



## Well Details: CC 697-04-59A

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	636370.75	1230419.57	39° 32' 56.102 N	108° 13' 46.062 W	B

## REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-04-59A - Slot B, True North  
 Vertical (TVD) Reference: GL 8629' & RBK 30' @ 8659.00ft (H&P)  
 Section (VS) Reference: Slot - B(0.00N, 0.00E)  
 Measured Depth Reference: GL 8629' & RBK 30' @ 8659.00ft (H&P)  
 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

10:54, May 08 2012  
 Created By: Janie Cooke

# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-04D Pad  
CC 697-04-59A - Slot B**

**OH**

**Design: OH**

## **Standard Survey Report**

**08 May, 2012**

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-04-59A - Slot B
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8629' & RBK 30' @ 8659.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-04D Pad	<b>MD Reference:</b>	GL 8629' & RBK 30' @ 8659.00ft (H&P)
<b>Well:</b>	CC 697-04-59A	<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 697-04D Pad			
Site Position:		Northing:	635,530.62 usft	Latitude:	39° 32' 47.760 N
From:	Map	Easting:	1,230,276.10 usft	Longitude:	108° 13' 47.570 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.72 °

Well	CC 697-04-59A - Slot B					
Well Position	+N-S	0.00 ft	Northing:	636,370.75 usft	Latitude:	39° 32' 56.102 N
	+E-W	0.00 ft	Easting:	1,230,419.57 usft	Longitude:	108° 13' 46.062 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	8,629.00 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	03/23/11	10.47	65.76	52,283

<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	25.81	

<b>Survey Program</b>	<b>Date</b>	05/08/12			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
339.00	2,735.00	Survey #1 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,776.00	9,517.00	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
339.00	3.82	14.17	338.75	10.95	2.77	11.06	1.13	1.13	0.00
<b>First SDI Surface MWD</b>									
430.00	5.63	9.67	429.44	18.29	4.26	18.32	2.03	1.99	-4.95
522.00	6.77	14.68	520.90	27.99	6.39	27.98	1.37	1.24	5.45
613.00	9.58	22.94	610.97	40.15	10.70	40.81	3.34	3.09	9.08
703.00	12.57	27.51	699.28	55.74	18.15	58.08	3.46	3.32	5.08
792.00	14.95	28.21	785.72	74.45	28.05	79.23	2.68	2.67	0.79
883.00	17.15	25.58	873.17	96.90	39.39	104.38	2.55	2.42	-2.89
973.00	17.94	23.73	958.98	121.55	50.70	131.50	1.07	0.88	-2.06

**Scientific Drilling International**  
Survey Report

**Company:** OXY USA RMAT  
**Project:** Garfield County, CO NAD27  
**Site:** Cascade Creek 697-04D Pad  
**Well:** CC 697-04-59A  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well CC 697-04-59A - Slot B  
**TVD Reference:** GL 8629' & RBK 30' @ 8659.00ft (H&P)  
**MD Reference:** GL 8629' & RBK 30' @ 8659.00ft (H&P)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Database:** 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)
1,067.00	18.29	21.36	1,048.33	148.54	61.90	160.67	0.87	0.37	-2.52
1,162.00	19.87	24.17	1,138.11	177.16	73.94	191.68	1.92	1.66	2.96
1,257.00	20.40	28.30	1,227.30	206.47	88.40	224.36	1.60	0.56	4.35
1,352.00	20.66	28.83	1,316.27	235.73	104.33	257.64	0.34	0.27	0.56
1,446.00	20.58	28.39	1,404.25	264.79	120.18	290.70	0.19	-0.09	-0.47
1,541.00	18.55	26.54	1,493.76	293.00	134.87	322.49	2.23	-2.14	-1.95
1,636.00	18.11	28.04	1,583.94	319.55	148.57	352.36	0.68	-0.46	1.58
1,730.00	18.47	29.00	1,673.19	345.47	162.65	381.82	0.50	0.38	1.02
1,825.00	19.35	28.65	1,763.06	372.44	177.49	412.57	0.93	0.93	-0.37
1,920.00	20.22	27.33	1,852.45	400.84	192.58	444.70	1.03	0.92	-1.39
2,015.00	19.96	26.01	1,941.67	430.00	207.23	477.33	0.55	-0.27	-1.39
2,109.00	19.61	24.34	2,030.13	458.79	220.76	509.14	0.71	-0.37	-1.78
2,204.00	18.47	25.22	2,119.93	486.93	233.75	540.13	1.24	-1.20	0.93
2,299.00	19.17	23.91	2,209.85	514.80	246.48	570.76	0.86	0.74	-1.38
2,393.00	20.22	28.74	2,298.35	543.16	260.55	602.41	2.06	1.12	5.14
2,488.00	19.08	26.01	2,387.82	571.51	275.25	634.34	1.54	-1.20	-2.87
2,583.00	20.40	26.81	2,477.24	600.24	289.53	666.42	1.42	1.39	0.84
2,678.00	18.55	26.54	2,566.80	628.54	303.75	698.09	1.95	-1.95	-0.28
2,735.00	17.67	26.81	2,620.97	644.37	311.70	715.80	1.55	-1.54	0.47
<b>Last SDI Surface MWD</b>									
2,776.00	17.23	25.97	2,660.09	655.39	317.17	728.10	1.24	-1.07	-2.05
<b>First SDI Production MWD</b>									
2,871.00	19.17	30.02	2,750.33	681.54	331.14	757.73	2.44	2.04	4.26
2,966.00	21.02	27.64	2,839.55	710.15	346.85	790.32	2.13	1.95	-2.51
3,060.00	20.58	27.73	2,927.42	739.70	362.35	823.68	0.47	-0.47	0.10
3,155.00	20.84	28.08	3,016.28	769.39	378.08	857.25	0.30	0.27	0.37
3,250.00	19.26	23.87	3,105.53	798.63	392.37	889.80	2.25	-1.66	-4.43
3,344.00	18.55	27.82	3,194.46	826.04	405.63	920.24	1.56	-0.76	4.20
3,439.00	18.64	28.79	3,284.50	852.71	419.99	950.50	0.34	0.09	1.02
3,534.00	17.06	26.15	3,374.93	878.52	433.44	979.60	1.87	-1.66	-2.78
3,628.00	18.20	30.81	3,464.51	903.51	447.04	1,008.02	1.93	1.21	4.96
3,723.00	17.15	31.78	3,555.03	928.16	462.02	1,036.73	1.15	-1.11	1.02
3,818.00	16.00	31.60	3,646.08	951.22	476.26	1,063.69	1.21	-1.21	-0.19
3,913.00	13.45	29.05	3,737.95	972.03	488.48	1,087.75	2.77	-2.68	-2.68
4,007.00	12.57	27.29	3,829.54	990.68	498.48	1,108.89	1.03	-0.94	-1.87
4,102.00	10.20	30.72	3,922.66	1,007.10	507.52	1,127.60	2.59	-2.49	3.61
4,197.00	7.65	29.67	4,016.51	1,019.83	514.95	1,142.30	2.69	-2.68	-1.11
4,291.00	7.47	26.68	4,109.69	1,030.72	520.79	1,154.65	0.46	-0.19	-3.18
4,386.00	6.33	31.78	4,204.00	1,040.69	526.32	1,166.03	1.36	-1.20	5.37
4,481.00	5.01	33.97	4,298.53	1,048.59	531.40	1,175.35	1.41	-1.39	2.31
4,575.00	4.13	38.45	4,392.24	1,054.64	535.79	1,182.71	1.01	-0.94	4.77
4,670.00	2.90	34.32	4,487.05	1,059.31	539.28	1,188.43	1.32	-1.29	-4.35
4,765.00	1.85	39.60	4,581.97	1,062.47	541.61	1,192.30	1.13	-1.11	5.56



# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-04-59A - Slot B
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8629' & RBK 30' @ 8659.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-04D Pad	<b>MD Reference:</b>	GL 8629' & RBK 30' @ 8659.00ft (H&P)
<b>Well:</b>	CC 697-04-59A	<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)
4,859.00	0.35	316.37	4,675.95	1,063.85	542.38	1,193.87	1.96	-1.60	-88.54
4,954.00	0.35	288.06	4,770.95	1,064.15	541.90	1,193.93	0.18	0.00	-29.80
5,049.00	0.35	18.86	4,865.95	1,064.51	541.72	1,194.18	0.52	0.00	95.58
5,144.00	0.44	275.14	4,960.95	1,064.82	541.45	1,194.34	0.66	0.09	-109.18
5,238.00	0.88	219.77	5,054.94	1,064.30	540.63	1,193.51	0.77	0.47	-58.90
5,333.00	0.79	4.88	5,149.94	1,064.39	540.22	1,193.42	1.68	-0.09	152.75
5,428.00	0.97	239.99	5,244.94	1,064.64	539.58	1,193.36	1.64	0.19	-131.46
5,522.00	1.49	244.12	5,338.91	1,063.71	537.79	1,191.75	0.56	0.55	4.39
5,617.00	0.35	88.38	5,433.90	1,063.18	538.97	1,190.91	1.91	-1.20	-163.94
5,712.00	1.67	79.41	5,528.89	1,063.44	538.62	1,191.86	1.40	1.39	-9.44
5,806.00	2.11	76.69	5,622.84	1,064.09	541.65	1,193.77	0.48	0.47	-2.89
5,901.00	1.85	80.73	5,717.78	1,064.74	544.86	1,195.75	0.31	-0.27	4.25
5,995.00	2.20	83.10	5,811.72	1,065.20	548.15	1,197.60	0.38	0.37	2.52
6,090.00	1.14	154.21	5,906.69	1,064.57	550.37	1,198.00	2.24	-1.12	74.85
6,185.00	0.97	174.33	6,001.67	1,062.92	550.86	1,196.73	0.43	-0.18	21.18
6,279.00	0.88	230.14	6,095.66	1,061.66	550.39	1,195.39	0.92	-0.10	59.37
6,374.00	0.97	222.85	6,190.65	1,060.61	549.28	1,193.96	0.16	0.09	-7.67
6,468.00	0.79	246.32	6,284.64	1,059.76	548.15	1,192.70	0.42	-0.19	24.97
6,563.00	1.14	241.48	6,379.62	1,059.05	546.72	1,191.44	0.38	0.37	-5.09
6,657.00	1.41	248.69	6,473.60	1,058.18	544.82	1,189.83	0.33	0.29	7.67
6,752.00	2.02	236.82	6,568.56	1,056.84	542.33	1,187.54	0.74	0.64	-12.49
6,846.00	0.88	202.11	6,662.53	1,055.27	540.67	1,185.40	1.48	-1.21	-36.93
6,941.00	0.79	56.56	6,757.52	1,054.95	540.94	1,185.23	1.68	-0.09	-153.21
7,035.00	1.58	37.31	6,851.50	1,056.34	542.27	1,187.06	0.93	0.84	-20.48
7,130.00	1.06	15.25	6,946.48	1,058.23	543.29	1,189.21	0.76	-0.55	-23.22
7,224.00	0.97	346.51	7,040.46	1,059.84	543.34	1,190.68	0.54	-0.10	-30.57
7,319.00	1.49	338.25	7,135.44	1,061.77	542.69	1,192.13	0.58	0.55	-8.69
7,413.00	0.44	335.70	7,229.43	1,063.23	542.09	1,193.19	1.12	-1.12	-2.71
7,508.00	0.44	239.11	7,324.43	1,063.38	541.63	1,193.12	0.69	0.00	-101.67
7,602.00	1.06	234.54	7,418.42	1,062.69	540.61	1,192.06	0.66	0.66	-4.86
7,697.00	1.41	241.04	7,513.40	1,061.61	538.87	1,190.33	0.40	0.37	6.84
7,791.00	0.79	201.93	7,607.38	1,060.45	537.62	1,188.74	1.00	-0.66	-41.61
7,886.00	0.88	171.79	7,702.37	1,059.12	537.48	1,187.48	0.47	0.09	-31.73
7,981.00	0.79	209.58	7,797.36	1,057.83	537.26	1,186.22	0.58	-0.09	39.78
8,075.00	1.32	236.47	7,891.34	1,056.67	536.03	1,184.64	0.76	0.56	28.61
8,170.00	2.20	243.59	7,986.30	1,055.25	533.49	1,182.26	0.95	0.93	7.49
8,265.00	2.29	252.03	8,081.23	1,053.86	530.05	1,179.51	0.36	0.09	8.88
8,360.00	2.20	250.45	8,176.15	1,052.66	526.53	1,176.90	0.11	-0.09	-1.66
8,454.00	2.37	243.86	8,270.08	1,051.20	523.08	1,174.08	0.33	0.18	-7.01
8,549.00	3.52	253.26	8,364.95	1,049.50	518.53	1,170.56	1.31	1.21	9.89
8,643.69	2.99	250.02	8,459.48	1,047.82	513.42	1,166.83	0.59	-0.56	-3.42
<b>CC 697-04-59A Target</b>									
8,644.00	2.99	250.01	8,459.80	1,047.81	513.40	1,166.81	0.59	-0.55	-4.02
8,739.00	1.58	244.12	8,554.72	1,046.39	509.90	1,164.01	1.50	-1.48	-6.20

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-04-59A - Slot B
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8629' & RBK 30' @ 8659.00ft (H&P)
<b>Site:</b>	Cascade Creek 697-04D Pad	<b>MD Reference:</b>	GL 8629' & RBK 30' @ 8659.00ft (H&P)
<b>Well:</b>	CC 697-04-59A	<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)
8,833.00	1.85	227.77	8,648.68	1,044.81	507.61	1,161.59	0.59	0.29	-17.39
8,928.00	2.90	225.13	8,743.60	1,042.08	504.77	1,157.90	1.11	1.11	-2.78
9,023.00	3.96	233.31	8,838.42	1,038.42	500.44	1,152.72	1.23	1.12	8.61
9,118.00	4.48	233.75	8,933.17	1,034.27	494.81	1,146.53	0.55	0.55	0.46
9,212.00	4.57	242.54	9,026.87	1,030.37	488.53	1,140.28	0.74	0.10	9.35
9,307.00	4.57	239.99	9,121.57	1,026.73	481.89	1,134.12	0.21	0.00	-2.68
9,402.00	4.92	243.50	9,216.25	1,023.02	474.97	1,127.76	0.48	0.37	3.69
9,461.00	5.54	245.17	9,275.00	1,020.70	470.12	1,123.56	1.08	1.05	2.83
<b>Last SDI Production MWD</b>									
9,517.00	5.54	245.17	9,330.74	1,018.43	465.21	1,119.38	0.00	0.00	0.00
<b>Projection to TD - BHL = 637374.74, 1230915.17</b>									

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
339.00	338.75	10.95	2.77	First SDI Surface MWD
2,735.00	2,620.97	644.37	311.70	Last SDI Surface MWD
2,776.00	2,660.09	655.39	317.17	First SDI Production MWD
9,461.00	9,275.00	1,020.70	470.12	Last SDI Production MWD
9,517.00	9,330.74	1,018.43	465.21	Projection to TD
9,517.00	9,330.74	1,018.43	465.21	BHL = 637374.74, 1230915.17

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