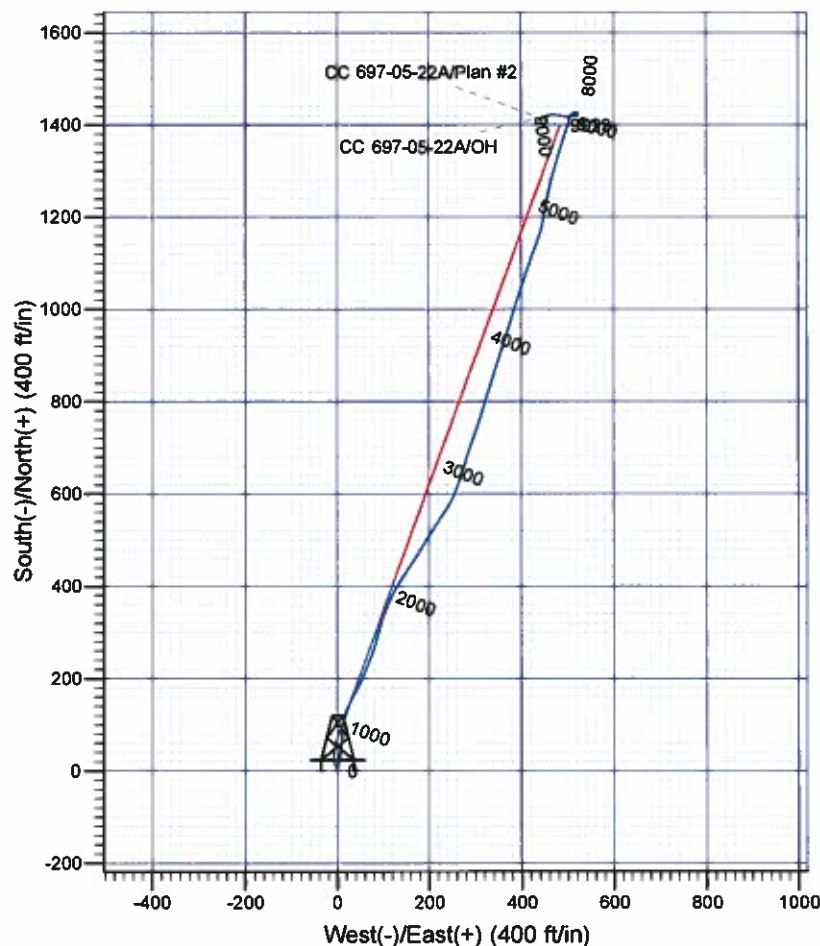
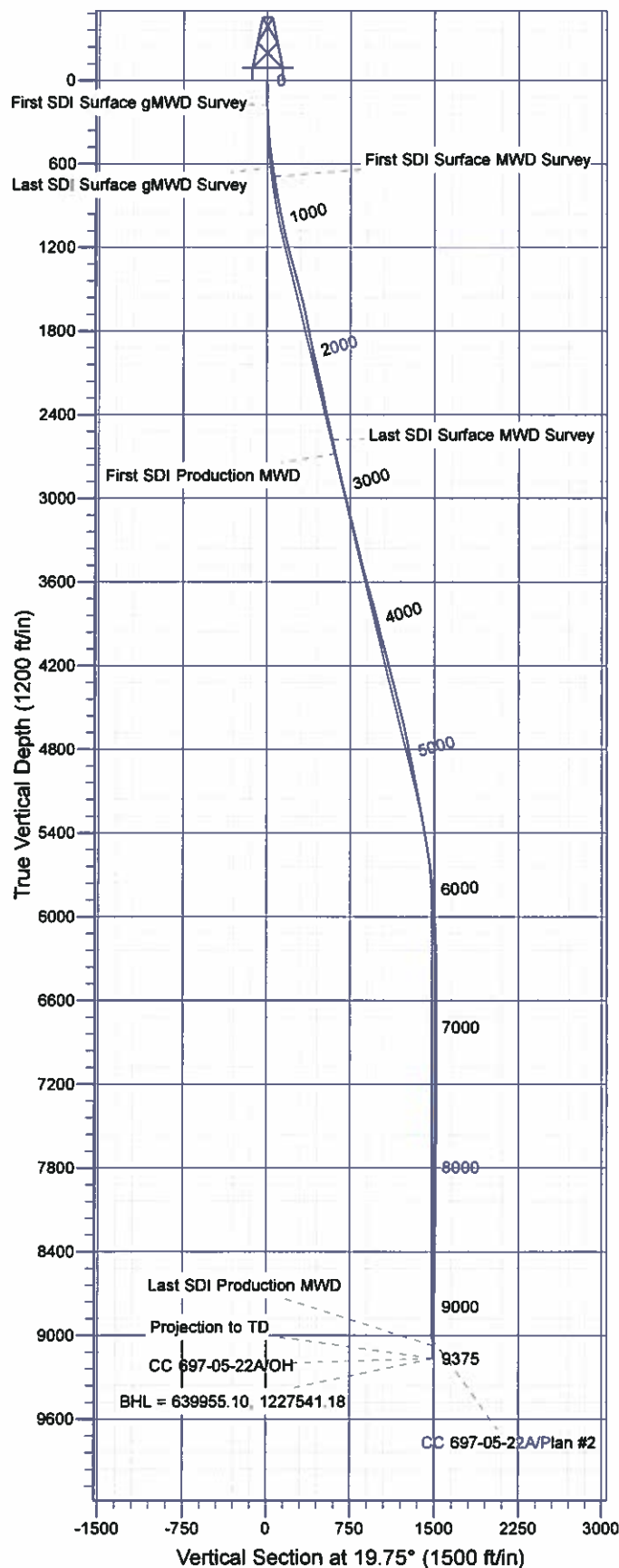




**Scientific Drilling**  
Rocky Mountain Operations

Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 697-05C Pad  
Well: CC 697-05-22A  
Wellbore: OH  
Design: OH



#### Well Details: CC 697-05-22A

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	638551.66	1227046.80	39° 33' 16.644 N	108° 14' 29.942 W	S

#### REFERENCE INFORMATION

Co-ordinate (NE) Reference: Well CC 697-05-22A - Slot S, True North  
Vertical (TVD) Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)  
Section (VS) Reference: Slot - S(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

14:10, January 24 2012  
Created By: Janie Cooke

# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-05C Pad  
CC 697-05-22A - Slot S**

**OH**

**Design: OH**

## **Standard Survey Report**

**24 January, 2012**



**Scientific Drilling International, Inc.**  
Survey Report



<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-22A - Slot S
<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 697-05-22A	<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 697-05C Pad, Sec. 5 T6S R97W			
Site Position:		Northing:	637,463.43 usft	Latitude:	39° 33' 5.626 N
From:	Map	Easting:	1,226,150.07 usft	Longitude:	108° 14' 40.963 W
Position Uncertainty:	0.00 ft	Slot Radius:	0.000 in	Grid Convergence:	-1.73 °

Well	CC 697-05-22A - Slot S					
Well Position	+N/-S	0.00 ft	Northing:	638,551.66 usft	Latitude:	39° 33' 16.644 N
	+E/-W	0.00 ft	Easting:	1,227,046.60 usft	Longitude:	108° 14' 29.942 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	12/16/2010	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	19.75	

<b>Survey Program</b>	<b>Date</b>	01/24/2012		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
173.00	623.00	Survey #1 - Surface Gyro MWD (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4
693.00	2,658.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA
2,763.00	9,375.00	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	0.62	21.80	173.00	0.87	0.35	0.94	0.36	0.36	0.00
<b>First SDI Surface gMWD Survey</b>									
263.00	2.46	3.69	262.96	3.25	0.65	3.28	2.09	2.04	-20.12
354.00	5.45	11.78	353.73	9.43	1.66	9.44	3.33	3.29	8.89
444.00	7.74	10.63	443.13	19.57	3.65	19.65	2.55	2.54	-1.28
534.00	9.33	8.09	532.13	32.75	5.80	32.78	1.82	1.77	-2.82
623.00	10.65	6.94	619.78	48.06	7.81	47.87	1.50	1.48	-1.29

**Scientific Drilling International, Inc.**  
Survey Report



<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-22A - Slot S
<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 697-05-22A	<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)
<b>Last SDI Surface gMWD Survey</b>									
693.00	11.78	5.59	688.44	61.59	9.28	61.10	1.66	1.61	-1.93
<b>First SDI Surface MWD Survey</b>									
783.00	13.28	0.75	776.30	81.07	10.31	79.79	2.03	1.67	-5.38
874.00	13.63	7.96	864.81	102.14	11.94	100.17	1.88	0.38	7.92
964.00	13.54	18.33	952.30	122.65	16.72	121.08	2.70	-0.10	11.52
1,059.00	15.12	28.00	1,044.36	144.15	26.03	144.47	3.01	1.66	10.18
1,153.00	16.18	28.26	1,134.87	166.51	37.99	169.55	1.13	1.13	0.28
1,248.00	18.38	25.28	1,225.58	191.72	50.66	197.56	2.50	2.32	-3.14
1,342.00	19.26	22.38	1,314.56	219.45	62.89	227.79	1.37	0.94	-3.09
1,437.00	18.99	20.00	1,404.31	248.47	74.14	258.90	0.87	-0.28	-2.51
1,531.00	18.11	17.28	1,493.43	276.79	83.71	288.79	1.31	-0.94	-2.89
1,626.00	17.32	15.08	1,583.93	304.54	91.78	317.64	1.09	-0.83	-2.32
1,720.00	14.86	18.42	1,674.24	329.49	99.23	343.64	2.80	-2.62	3.55
1,815.00	13.72	21.58	1,766.30	351.53	107.22	367.08	1.45	-1.20	3.33
1,910.00	14.42	25.45	1,858.45	372.89	116.45	390.11	1.23	0.74	4.07
2,004.00	15.83	30.02	1,949.20	394.36	127.89	414.38	1.96	1.50	4.86
2,099.00	17.50	34.24	2,040.21	417.39	142.41	440.96	2.17	1.76	4.44
2,193.00	17.59	34.06	2,129.83	440.84	158.32	468.41	0.11	0.10	-0.19
2,288.00	13.72	29.41	2,221.30	462.55	171.90	493.43	4.28	-4.07	-4.89
2,382.00	14.33	31.43	2,312.49	482.19	183.44	515.81	0.83	0.65	2.15
2,477.00	15.83	33.19	2,404.22	503.07	196.66	539.93	1.65	1.58	1.85
2,571.00	16.80	32.39	2,494.43	525.27	210.96	565.66	1.06	1.03	-0.85
2,658.00	15.48	33.89	2,578.00	545.52	224.17	589.19	1.59	-1.52	1.72
<b>Last SDI Surface MWD Survey</b>									
2,763.00	15.30	32.32	2,679.24	568.86	239.39	616.30	0.43	-0.17	-1.50
<b>First SDI Production MWD</b>									
2,857.00	16.71	25.60	2,769.60	591.53	251.86	641.85	2.47	1.50	-7.15
2,952.00	18.03	19.89	2,860.27	617.68	262.76	670.14	2.27	1.39	-6.01
3,046.00	15.04	16.64	2,950.38	643.05	271.21	696.87	3.33	-3.18	-3.46
3,141.00	17.41	17.61	3,041.59	668.41	279.04	723.39	2.51	2.49	1.02
3,235.00	18.29	19.01	3,131.06	695.76	288.10	752.19	1.04	0.94	1.49
3,330.00	17.23	18.31	3,221.53	723.21	297.37	781.16	1.14	-1.12	-0.74
3,425.00	16.09	19.45	3,312.54	748.98	306.18	808.39	1.25	-1.20	1.20
3,519.00	17.76	16.64	3,402.47	775.00	314.62	835.73	1.98	1.78	-2.99
3,614.00	16.09	16.73	3,493.35	801.50	322.56	863.35	1.76	-1.76	0.09
3,708.00	19.35	17.61	3,582.88	828.82	331.02	891.93	3.48	3.47	0.94
3,803.00	20.22	17.96	3,672.27	859.44	340.85	924.06	0.92	0.92	0.37
3,897.00	18.73	17.43	3,760.89	889.29	350.38	955.38	1.60	-1.59	-0.56
3,992.00	17.32	17.25	3,851.23	917.35	359.14	984.75	1.49	-1.48	-0.19
4,086.00	16.00	16.55	3,941.28	943.13	366.98	1,011.67	1.42	-1.40	-0.74
4,181.00	18.55	17.34	4,031.99	970.11	375.21	1,039.84	2.70	2.68	0.83
4,275.00	18.82	18.22	4,121.03	998.79	384.41	1,069.94	0.42	0.29	0.94
4,370.00	17.59	18.22	4,211.28	1,026.98	393.69	1,099.61	1.29	-1.29	0.00



# Scientific Drilling International, Inc.

## Survey Report



<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-22A - Slot S
<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 697-05-22A	<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	16.62	16.82	4,301.12	1,053.34	402.02	1,127.23	1.12	-1.03	-1.49
4,559.00	18.20	19.89	4,391.76	1,080.30	411.00	1,155.64	1.92	1.66	3.23
4,654.00	17.15	19.98	4,482.28	1,107.41	420.83	1,184.48	1.11	-1.11	0.09
4,748.00	17.76	18.57	4,571.95	1,134.03	430.14	1,212.67	0.79	0.65	-1.50
4,843.00	15.74	17.08	4,662.92	1,160.08	438.54	1,240.03	2.17	-2.13	-1.57
4,937.00	13.72	14.79	4,753.82	1,183.05	445.13	1,263.88	2.24	-2.15	-2.44
5,032.00	13.72	9.08	4,846.12	1,205.07	449.78	1,286.17	1.43	0.00	-6.01
5,126.00	14.42	11.37	4,937.30	1,227.55	453.85	1,308.71	0.95	0.74	2.44
5,221.00	13.72	11.54	5,029.45	1,250.19	458.43	1,331.56	0.74	-0.74	0.18
5,315.00	12.13	11.19	5,121.06	1,270.80	462.58	1,352.36	1.69	-1.69	-0.37
5,410.00	13.54	16.29	5,213.69	1,291.27	467.64	1,373.33	1.90	1.48	5.37
5,504.00	13.01	16.99	5,305.18	1,311.95	473.82	1,394.88	0.59	-0.56	0.74
5,599.00	12.05	16.82	5,397.91	1,331.67	479.81	1,415.47	1.01	-1.01	-0.18
5,693.00	11.26	16.99	5,489.97	1,349.84	485.33	1,434.43	0.84	-0.84	0.18
5,788.00	10.55	16.99	5,583.26	1,367.02	490.58	1,452.39	0.75	-0.75	0.00
5,882.00	7.83	18.40	5,676.04	1,381.33	495.12	1,467.39	2.90	-2.89	1.50
5,977.00	6.51	16.99	5,770.30	1,392.62	498.73	1,479.23	1.40	-1.39	-1.48
6,071.00	5.45	15.50	5,863.78	1,402.02	501.48	1,489.01	1.14	-1.13	-1.59
6,166.00	4.31	15.06	5,958.44	1,409.82	503.62	1,497.07	1.20	-1.20	-0.46
6,260.00	3.87	11.98	6,052.20	1,416.33	505.19	1,503.73	0.52	-0.47	-3.28
6,355.00	3.69	36.24	6,147.00	1,421.93	507.67	1,509.84	1.68	-0.19	25.54
6,449.00	2.64	77.81	6,240.87	1,424.83	511.57	1,513.88	2.61	-1.12	44.22
6,544.00	2.37	91.08	6,335.78	1,425.25	515.67	1,515.67	0.67	-0.28	13.97
6,638.00	1.49	74.47	6,429.72	1,425.54	518.80	1,517.00	1.10	-0.94	-17.67
6,733.00	0.97	77.81	6,524.70	1,426.05	520.77	1,518.14	0.55	-0.55	3.52
6,827.00	0.62	88.89	6,618.69	1,426.22	522.06	1,518.74	0.40	-0.37	11.79
6,922.00	0.35	196.29	6,713.69	1,425.95	522.49	1,518.63	0.84	-0.28	113.05
7,016.00	0.35	238.65	6,807.69	1,425.53	522.16	1,518.12	0.27	0.00	45.06
7,111.00	0.53	247.44	6,902.68	1,425.21	521.51	1,517.60	0.20	0.19	9.25
7,205.00	1.41	247.62	6,996.67	1,424.60	520.04	1,516.53	0.94	0.94	0.19
7,300.00	0.79	255.97	7,091.65	1,424.00	518.32	1,515.38	0.67	-0.65	8.79
7,394.00	0.62	93.10	7,185.65	1,423.81	518.20	1,515.17	1.48	-0.18	-173.27
7,489.00	1.23	69.64	7,280.64	1,424.14	519.67	1,515.97	0.74	0.64	-24.69
7,583.00	1.06	105.06	7,374.62	1,424.27	521.46	1,516.70	0.76	-0.18	37.68
7,678.00	0.62	162.89	7,469.61	1,423.55	522.46	1,516.36	0.95	-0.46	60.87
7,772.00	0.97	205.16	7,563.60	1,422.34	522.27	1,515.16	0.70	0.37	44.97
7,867.00	1.58	211.58	7,658.58	1,420.50	521.24	1,513.07	0.66	0.64	6.76
7,962.00	1.23	240.23	7,753.55	1,418.87	519.67	1,511.02	0.81	-0.37	30.16
8,056.00	0.44	264.14	7,847.54	1,418.34	518.43	1,510.09	0.90	-0.84	25.44
8,150.00	0.79	284.44	7,941.53	1,418.46	517.45	1,509.88	0.43	0.37	21.60
8,245.00	0.79	267.22	8,036.52	1,418.59	516.16	1,509.57	0.25	0.00	-18.13
8,339.00	1.23	280.75	8,130.51	1,418.75	514.52	1,509.16	0.53	0.47	14.39
8,365.23	1.29	271.42	8,156.73	1,418.81	513.95	1,509.02	0.81	0.23	-35.57

CC 697-05-22A Target

# Scientific Drilling International, Inc.

## Survey Report



<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-05-22A - Slot S
<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 697-05-22A	<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)
8,434.00	1.58	252.10	8,225.48	1,418.54	512.27	1,508.20	0.81	0.42	-28.10
8,528.00	2.55	263.00	8,319.42	1,417.88	508.96	1,506.47	1.11	1.03	11.60
8,623.00	3.17	271.70	8,414.30	1,417.71	504.24	1,504.70	0.79	0.65	9.16
8,717.00	2.73	277.15	8,508.18	1,418.06	499.42	1,503.41	0.55	-0.47	5.80
8,812.00	3.43	271.52	8,603.04	1,418.42	494.34	1,502.02	0.80	0.74	-5.93
8,906.00	4.04	279.08	8,696.84	1,419.01	488.26	1,500.53	0.83	0.65	8.04
9,001.00	4.40	281.19	8,791.58	1,420.25	481.38	1,499.37	0.41	0.38	2.22
9,095.00	4.57	278.90	8,885.30	1,421.53	474.14	1,498.13	0.26	0.18	-2.44
9,190.00	5.28	284.93	8,979.95	1,421.73	466.05	1,495.58	1.46	0.75	-14.71
9,285.00	4.31	249.55	9,074.62	1,420.10	458.35	1,491.44	1.69	-1.02	-16.19
<b>Last SDI Production MWD</b>									
9,375.00	4.31	249.55	9,164.36	1,417.73	452.01	1,487.07	0.00	0.00	0.00
<b>Projection to TD - BHL = 639955.10, 1227541.18</b>									

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
173.00	173.00	0.87	0.35	First SDI Surface gMWD Survey
623.00	619.78	48.06	7.81	Last SDI Surface gMWD Survey
693.00	688.44	61.59	9.28	First SDI Surface MWD Survey
2,658.00	2,578.00	545.52	224.17	Last SDI Surface MWD Survey
2,763.00	2,679.24	568.86	239.39	First SDI Production MWD
9,285.00	9,074.62	1,420.10	458.35	Last SDI Production MWD
9,375.00	9,164.36	1,417.73	452.01	Projection to TD
9,375.00	9,164.36	1,417.73	452.01	BHL = 639955.10, 1227541.18

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