

# **OXY USA RMAT**

**Garfield County, CO NAD27  
Cascade Creek 697-15-01 Pad  
CC 697-10-50B - Slot D**

**OH**

**Design: OH**

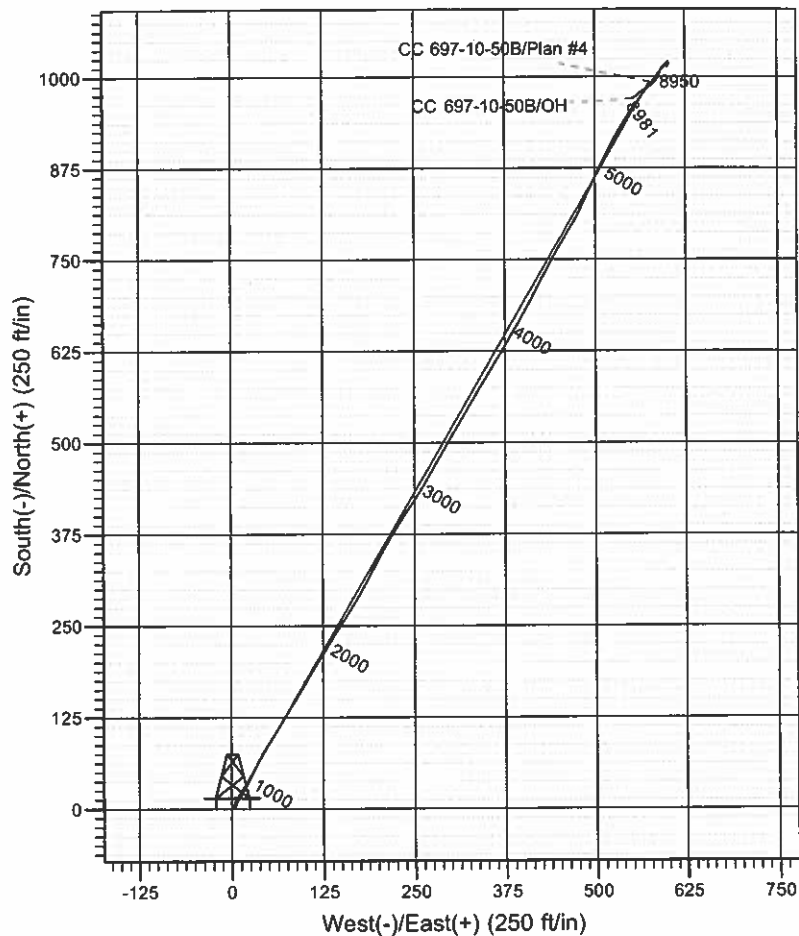
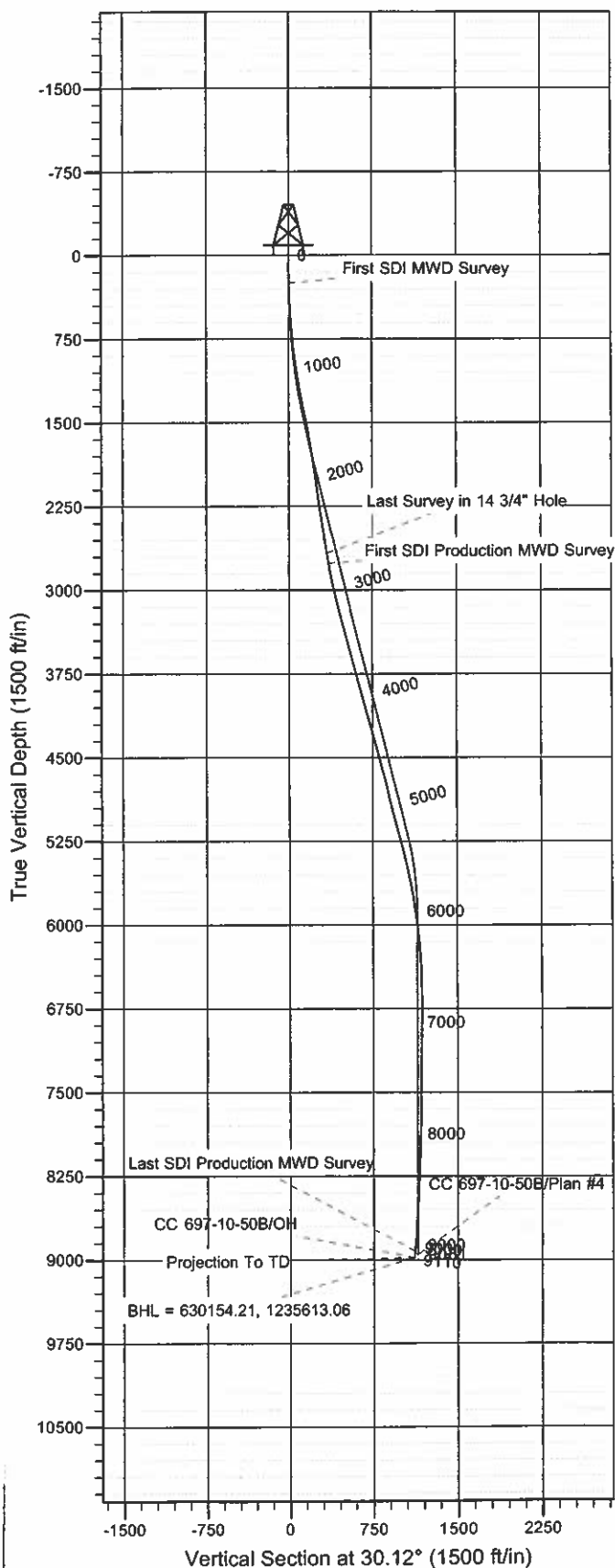
## **Standard Survey Report**

**18 November, 2010**



**Scientific Drilling**  
Rocky Mountain Operations

Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 697-15-01 Pad  
Well: CC 697-10-50B  
Wellbore: OH  
Design: OH



#### Well Details: CC 697-10-50B

TVD Reference: GL 8348' & RKB 30' @ 8378.00ft		Ground Level: 8348.00		Slot D	
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	629201.96	1235032.83	39° 31' 45.646 N	108° 12' 44.462 W

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-10-50B - Slot D, True North  
Vertical (TVD) Reference: GL 8348' & RKB 30' @ 8378.00ft  
Section (VS) Reference: Slot - D(0.00N, 0.00E)  
Measured Depth Reference: GL 8348' & RKB 30' @ 8378.00ft  
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

15:01, November 18 2010  
Created By: Rex Hall

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-10-50B - Slot D
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8348' & RKB 30' @ 8378.00ft
<b>Site:</b>	Cascade Creek 697-15-01 Pad	<b>MD Reference:</b>	GL 8348' & RKB 30' @ 8378.00ft
<b>Well:</b>	CC 697-10-50B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies-R5000.1

<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 697-15-01 Pad, Sec 15 T6S R97W		
<b>Site Position:</b>		<b>Northing:</b>	629,156.97 usft
<b>From:</b>	Map	<b>Easting:</b>	1,234,961.93 usft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in
		<b>Latitude:</b>	39° 31' 46.180 N
		<b>Longitude:</b>	108° 12' 45.350 W
		<b>Grid Convergence:</b>	-1.71 °

<b>Well</b>	CC 697-10-50B - Slot D, 251' FNL 655' FWL		
<b>Well Position</b>	+N/-S	0.00 ft	<b>Northing:</b> 629,201.96 usft
	+E/-W	0.00 ft	<b>Easting:</b> 1,235,032.83 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	39° 31' 46.646 N
		<b>Longitude:</b>	108° 12' 44.462 W
		<b>Ground Level:</b>	8,348.00 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	9/17/2010	10.52	65.76	52,326

<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	30.12	

<b>Survey Program</b>	<b>Date</b>	11/18/2010			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
250.00	2,695.00	Survey #1 - Surface (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,788.00	9,110.00	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>Bulld 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	
250.00	0.98	75.71	249.99	0.53	2.07	1.50	0.39	0.39	0.00	
<b>First SDI MWD Survey</b>										
342.00	1.81	52.28	341.96	1.61	3.98	3.39	1.08	0.90	-25.47	
434.00	3.16	14.55	433.88	4.95	5.77	7.18	2.23	1.47	-41.01	
526.00	4.04	29.24	525.70	10.24	7.99	12.86	1.38	0.96	15.97	
618.00	4.92	35.31	617.42	16.28	11.85	20.03	1.09	0.96	6.60	
712.00	5.89	28.37	711.00	23.82	16.48	28.87	1.24	1.03	-7.38	
805.00	6.86	27.05	803.42	32.96	21.27	39.19	1.05	1.04	-1.42	
899.00	7.56	26.34	896.68	43.50	26.57	50.96	0.75	0.74	-0.76	

# Scientific Drilling International

## Survey Report

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-10-50B - Slot D
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8348' & RKB 30' @ 8378.00ft
<b>Site:</b>	Cascade Creek 697-15-01 Pad	<b>MD Reference:</b>	GL 8348' & RKB 30' @ 8378.00ft
<b>Well:</b>	CC 697-10-50B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies-R5000.1

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)
994.00	7.83	25.29	990.82	54.96	32.10	63.65	0.32	0.28	-1.11
1,088.00	8.71	27.40	1,083.84	67.06	38.11	77.14	0.99	0.94	2.24
1,183.00	10.02	30.74	1,177.58	80.55	45.65	92.59	1.49	1.38	3.52
1,277.00	11.17	31.27	1,269.97	95.37	54.56	109.87	1.23	1.22	0.56
1,372.00	11.87	31.97	1,363.06	111.52	64.50	128.83	0.75	0.74	0.74
1,466.00	12.40	32.50	1,454.96	128.23	75.05	148.58	0.58	0.56	0.56
1,561.00	11.08	31.62	1,547.97	144.61	85.31	167.90	1.40	-1.39	-0.93
1,656.00	10.29	30.04	1,641.32	159.73	94.35	185.51	0.89	-0.83	-1.66
1,750.00	8.88	29.77	1,734.01	173.29	102.15	201.16	1.50	-1.50	-0.29
1,844.00	8.35	30.21	1,826.94	185.49	109.19	215.24	0.57	-0.56	0.47
1,939.00	9.32	32.85	1,920.82	197.92	116.83	229.82	1.11	1.02	2.78
2,033.00	8.35	32.94	2,013.70	210.04	124.67	244.24	1.03	-1.03	0.10
2,128.00	7.56	29.95	2,107.79	221.24	131.54	257.38	0.94	-0.83	-3.15
2,223.00	7.83	31.62	2,201.93	232.17	138.06	270.10	0.37	0.28	1.76
2,317.00	8.97	30.91	2,294.92	243.91	145.18	283.83	1.22	1.21	-0.76
2,411.00	8.88	33.82	2,387.78	256.22	152.98	298.39	0.49	-0.10	3.10
2,506.00	9.32	34.69	2,481.59	268.64	161.44	313.38	0.49	0.46	0.92
2,601.00	9.67	29.16	2,575.29	281.93	169.71	329.03	1.03	0.37	-5.82
2,695.00	9.41	28.01	2,667.99	295.61	177.16	344.60	0.34	-0.28	-1.22
Last Survey in 14 3/4" Hole									
2,788.00	9.17	29.51	2,759.77	308.77	184.38	359.61	0.37	-0.26	1.61
First SDI Production MWD Survey									
2,883.00	10.20	26.95	2,853.41	322.86	191.92	375.57	1.17	1.08	-2.69
2,977.00	12.75	28.79	2,945.53	339.37	200.69	394.26	2.74	2.71	1.96
3,072.00	13.10	27.30	3,038.12	358.12	210.68	415.49	0.51	0.37	-1.57
3,166.00	14.86	32.05	3,129.33	377.81	221.96	438.18	2.23	1.87	5.05
3,261.00	15.56	33.28	3,221.01	398.79	235.42	463.08	0.81	0.74	1.29
3,355.00	15.21	33.54	3,311.64	419.60	249.15	487.97	0.38	-0.37	0.28
3,450.00	14.95	30.64	3,403.37	440.54	262.28	512.67	0.84	-0.27	-3.05
3,544.00	14.86	29.15	3,494.21	461.49	274.33	536.84	0.42	-0.10	-1.59
3,639.00	15.65	29.41	3,585.86	483.30	286.56	561.84	0.83	0.83	0.27
3,733.00	15.12	30.73	3,676.49	504.88	299.05	586.77	0.68	-0.56	1.40
3,828.00	14.95	31.26	3,768.24	526.00	311.74	611.42	0.23	-0.18	0.56
3,922.00	15.92	29.94	3,858.85	547.54	324.46	636.43	1.10	1.03	-1.40
4,017.00	15.12	30.11	3,950.38	569.55	337.18	661.85	0.84	-0.84	0.18
4,111.00	14.42	31.96	4,041.27	590.09	349.53	685.81	0.90	-0.74	1.97
4,206.00	15.12	31.17	4,133.14	610.72	362.20	710.02	0.77	0.74	-0.83
4,300.00	15.65	30.64	4,223.77	632.12	375.01	734.95	0.58	0.56	-0.56
4,395.00	14.86	30.82	4,315.42	653.61	387.78	759.95	0.83	-0.83	0.19
4,490.00	15.83	28.97	4,407.03	675.41	400.30	785.09	1.14	1.02	-1.95
4,584.00	14.16	27.83	4,497.83	696.79	411.88	809.39	1.80	-1.78	-1.21
4,679.00	15.04	28.00	4,589.76	717.95	423.09	833.32	0.93	0.93	0.18
4,773.00	14.60	27.65	4,680.63	739.21	434.31	857.35	0.48	-0.47	-0.37

# Scientific Drilling International Survey Report

**Company:** OXY USA RMAT  
**Project:** Garfield County, CO NAD27  
**Site:** Cascade Creek 697-15-01 Pad  
**Well:** CC 697-10-50B  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well CC 697-10-50B - Slot D  
**TVD Reference:** GL 8348' & RKB 30' @ 8378.00ft  
**MD Reference:** GL 8348' & RKB 30' @ 8378.00ft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Database:** Rockies-R5000.1

## 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)
4,868.00	14.24	28.18	4,772.64	760.12	445.39	880.99	0.40	-0.38	0.56
4,962.00	12.57	33.54	4,864.08	778.84	456.50	902.75	2.21	-1.78	5.70
5,057.00	13.19	29.76	4,956.69	796.86	467.59	923.91	1.10	0.65	-3.98
5,151.00	15.56	25.72	5,047.74	817.54	478.39	947.21	2.74	2.52	-4.30
5,246.00	15.56	25.72	5,139.26	840.49	489.45	972.62	0.00	0.00	0.00
5,340.00	14.86	26.07	5,229.97	862.68	500.22	997.21	0.75	-0.74	0.37
5,435.00	14.60	25.19	5,321.84	884.46	510.67	1,021.29	0.36	-0.27	-0.93
5,529.00	13.19	28.71	5,413.09	904.59	520.86	1,043.82	1.75	-1.50	3.74
5,624.00	12.40	28.71	5,505.73	923.04	530.97	1,064.85	0.83	-0.83	0.00
5,718.00	11.26	33.80	5,597.74	939.52	540.92	1,084.10	1.64	-1.21	5.41
5,812.00	9.94	34.86	5,690.13	953.80	550.66	1,101.35	1.42	-1.40	1.13
5,907.00	9.41	34.60	5,783.78	966.92	559.76	1,117.26	0.56	-0.56	-0.27
6,002.00	7.83	37.67	5,877.70	978.44	568.13	1,131.42	1.73	-1.66	3.23
6,096.00	6.77	38.46	5,970.94	987.84	575.49	1,143.25	1.13	-1.13	0.84
6,191.00	6.77	36.09	6,065.28	996.75	582.27	1,154.36	0.29	0.00	-2.49
6,285.00	5.89	37.58	6,158.71	1,005.05	588.47	1,164.65	0.95	-0.94	1.59
6,380.00	4.75	35.30	6,253.29	1,012.13	593.72	1,173.40	1.22	-1.20	-2.40
6,475.00	2.81	41.54	6,348.08	1,017.08	597.54	1,179.60	2.08	-2.04	6.57
6,569.00	1.58	50.24	6,442.01	1,019.63	600.06	1,183.08	1.35	-1.31	9.26
6,664.00	0.53	51.82	6,537.00	1,020.74	601.41	1,184.72	1.11	-1.11	1.66
6,758.00	0.09	274.71	6,630.99	1,021.02	601.68	1,185.09	0.64	-0.47	-145.86
6,853.00	0.35	238.50	6,725.99	1,020.87	601.36	1,184.80	0.30	0.27	-38.12
6,947.00	0.62	196.84	6,819.99	1,020.24	600.97	1,184.05	0.45	0.29	-44.32
7,042.00	0.35	122.57	6,914.99	1,019.59	601.06	1,183.54	0.66	-0.28	-78.18
7,136.00	0.79	150.43	7,008.98	1,018.87	601.62	1,183.20	0.54	0.47	29.64
7,231.00	1.49	179.53	7,103.96	1,017.07	601.96	1,181.81	0.93	0.74	30.63
7,325.00	1.23	202.03	7,197.94	1,014.91	601.59	1,179.76	0.63	-0.28	23.94
7,420.00	0.79	289.21	7,292.93	1,014.18	600.59	1,178.62	1.50	-0.46	91.77
7,515.00	1.23	269.44	7,387.91	1,014.38	598.95	1,177.98	0.58	0.46	-20.81
7,609.00	1.67	246.32	7,481.88	1,013.82	596.69	1,176.36	0.77	0.47	-24.60
7,704.00	0.70	259.07	7,576.86	1,013.16	594.85	1,174.86	1.05	-1.02	13.42
7,798.00	0.18	257.93	7,670.86	1,013.02	594.14	1,174.38	0.55	-0.55	-1.21
7,893.00	0.35	232.17	7,765.86	1,012.81	593.77	1,174.01	0.21	0.18	-27.12
7,987.00	0.79	220.40	7,859.85	1,012.14	593.12	1,173.11	0.48	0.47	-12.52
8,082.00	1.32	213.36	7,954.84	1,010.73	592.09	1,171.37	0.57	0.56	-7.41
8,177.00	1.76	198.25	8,049.80	1,008.43	591.03	1,168.85	0.63	0.46	-15.91
8,271.00	2.81	197.28	8,143.73	1,004.86	589.90	1,165.19	1.12	1.12	-1.03
8,365.00	3.43	205.54	8,237.59	1,000.12	588.00	1,160.14	0.81	0.66	8.79
8,460.00	2.81	212.24	8,332.45	995.58	585.53	1,154.98	0.76	-0.65	7.05
8,555.00	2.81	223.74	8,427.33	991.93	582.68	1,150.39	0.59	0.00	12.11
8,649.00	2.99	234.02	8,521.21	988.83	579.10	1,145.91	0.58	0.19	10.94
8,744.00	3.43	240.17	8,616.06	985.96	574.63	1,141.19	0.59	0.46	6.47
8,838.00	4.13	233.49	8,709.86	982.55	569.47	1,135.65	0.88	0.74	-7.11
8,933.00	4.66	233.23	8,804.58	978.20	563.63	1,128.96	0.56	0.56	-0.27

# Scientific Drilling International

## Survey Report

**Company:** OXY USA RMAT  
**Project:** Garfield County, CO NAD27  
**Site:** Cascade Creek 697-15-01 Pad  
**Well:** CC 697-10-50B  
**Wellbore:** OH  
**Design:** OH

**Local Co-ordinate Reference:** Well CC 697-10-50B - Slot D  
**TVD Reference:** GL 8348' & RKB 30' @ 8378.00ft  
**MD Reference:** GL 8348' & RKB 30' @ 8378.00ft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Database:** Rockies-R5000.1

### 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)
9,027.00	4.84	231.03	8,898.26	973.42	557.49	1,121.74	0.27	0.19	-2.34
9,053.00	5.10	234.90	8,924.16	972.07	555.69	1,119.67	1.63	1.00	14.88
<b>Last SDI Production MWD Survey</b>									
9,110.00	5.10	234.90	8,980.93	969.15	551.55	1,115.07	0.00	0.00	0.00
<b>Projection To TD - BHL = 630154.21, 1235613.06</b>									

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
250.00	249.99	0.53	2.07	First SDI MWD Survey
2,695.00	2,667.99	295.61	177.16	Last Survey in 14 3/4" Hole
2,788.00	2,759.77	308.77	184.38	First SDI Production MWD Survey
9,053.00	8,924.16	972.07	555.69	Last SDI Production MWD Survey
9,110.00	8,980.93	969.15	551.55	Projection To TD
9,110.00	8,980.93	969.15	551.55	BHL = 630154.21, 1235613.06

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