

OXY USA RMAT

Garfield County, CO NAD27

Cascade Creek 697-08-53 Pad

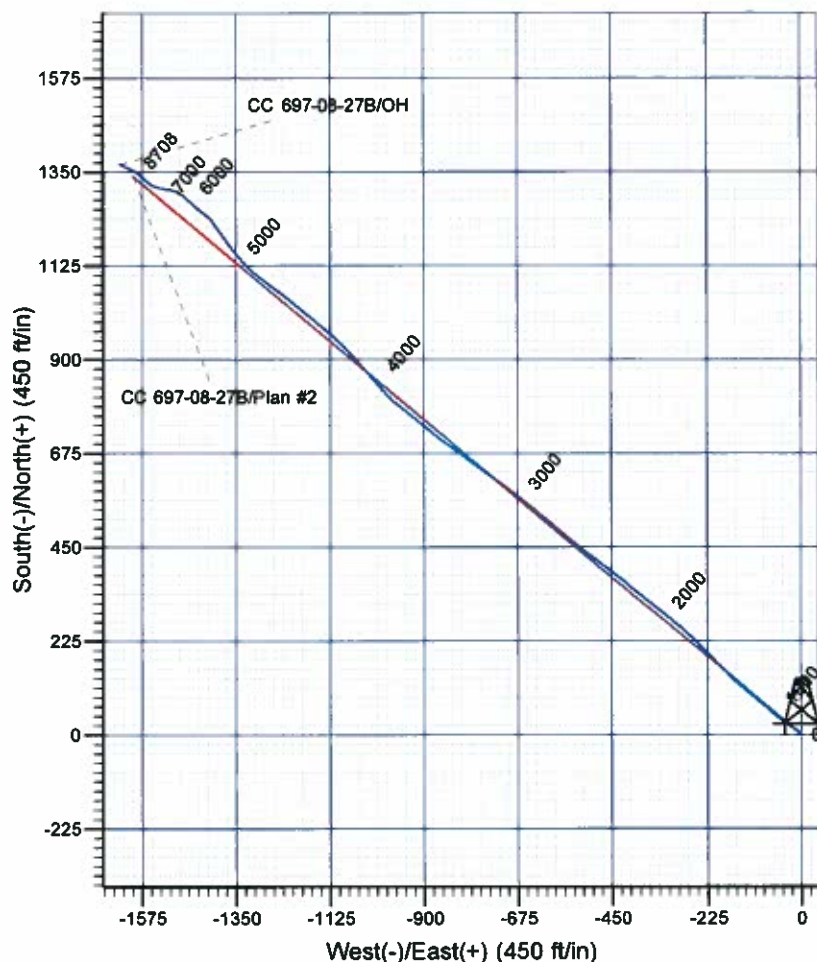
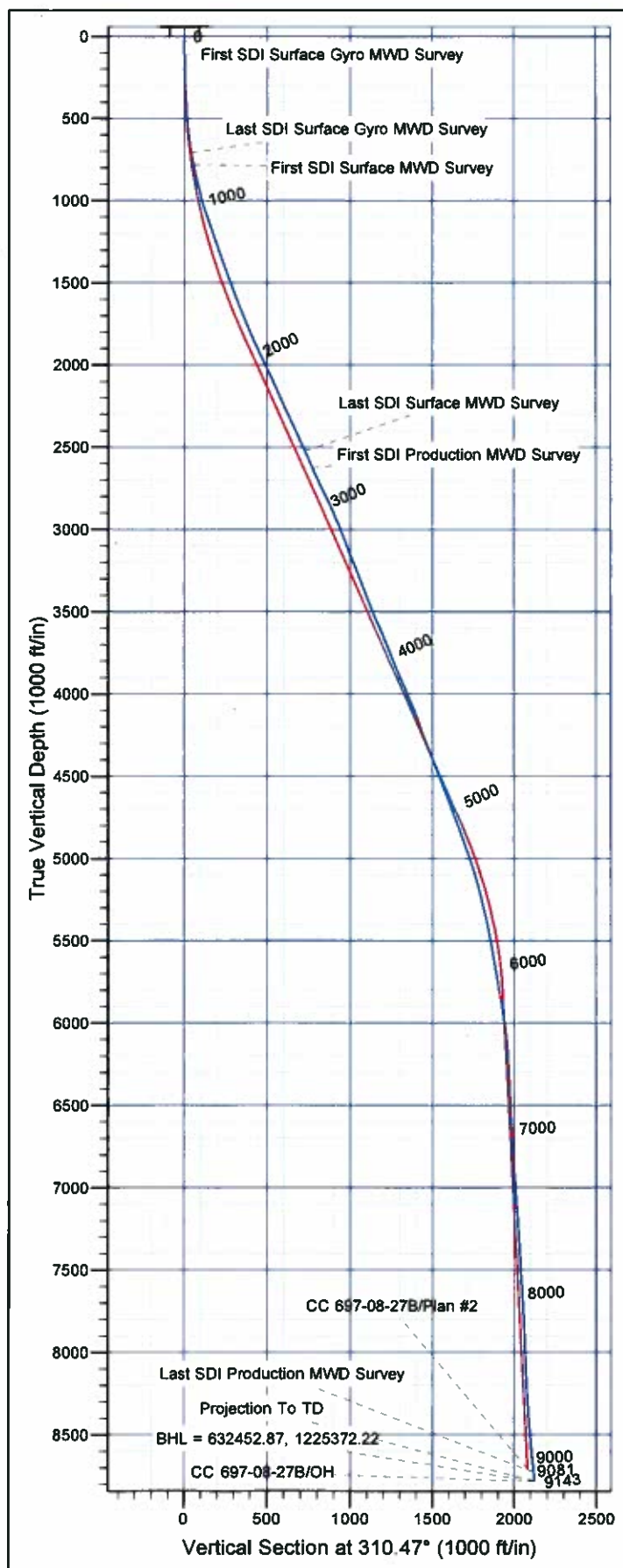
CC 697-08-27B - Slot I

OH

Design: OH

Standard Survey Report

02 December, 2011



Well Details: CC 697-08-27B

TVD Reference: GL 8379' & RKB 30' @ 8409.00ft (H&P 330)						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	631037.38	1226957.75	39° 32' 2.383 N	108° 14' 28.181 W	I

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-08-27B - Slot I, True North
 Vertical (TVD) Reference: GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
 Section (VS) Reference: Slot - I(0.00N, 0.00E)
 Measured Depth Reference: GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
 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

8:53, December 02 2011
 Created By: Rex Hall

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-27B - Slot I
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Site:	Cascade Creek 697-08-53 Pad	MD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Well:	CC 697-08-27B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies Compass Server

Project	Garfield County, CO NAD27		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Colorado Central 502		

Site	Cascade Creek 697-08-53 Pad, Sec. 8 T6S R97W				
Site Position:		Northing:	630,837.78 usft	Latitude:	39° 32' 0.393 N
From:	Map	Easting:	1,226,897.42 usft	Longitude:	108° 14' 28.874 W
Position Uncertainty:	0.00 ft	Slot Radius:	0.000 in	Grid Convergence:	-1.73 °

Well	CC 697-08-27B - Slot I					
Well Position	+N/-S	0.00 ft	Northing:	631,037.38 usft	Latitude:	39° 32' 2.383 N
	+E/-W	0.00 ft	Easting:	1,226,957.75 usft	Longitude:	108° 14' 28.181 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	8,379.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	2010/09/01	10.54	65.76	52,329

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00		310.47

Survey Program	Date	2011/12/02			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
110.00	711.00	Survey #1 - Surface Gyro MWD (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
786.00	2,656.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,766.00	9,143.00	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	
110.00	0.35	313.59	110.00	0.23	-0.24	0.34	0.32	0.32	0.00	
First SDI Surface Gyro MWD Survey										
171.00	1.32	317.99	170.99	0.88	-0.85	1.22	1.59	1.59	7.21	
260.00	1.67	306.47	259.96	2.41	-2.58	3.53	0.52	0.39	-12.94	
349.00	2.55	318.43	348.90	4.67	-4.93	6.78	1.10	0.99	13.44	
439.00	3.26	313.59	438.78	7.93	-8.12	11.32	0.83	0.79	-5.38	
528.00	5.10	306.39	527.55	12.02	-13.13	17.79	2.15	2.07	-8.09	
619.00	7.30	305.24	618.01	17.76	-21.11	27.59	2.42	2.42	-1.26	

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-27B - Slot I
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Site:	Cascade Creek 697-08-53 Pad	MD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Well:	CC 697-08-27B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)	
711.00	9.85	301.90	708.97	25.29	-32.57	41.19	2.82	2.77	-3.63	
Last SDI Surface Gyro MWD Survey										
786.00	11.40	303.86	782.68	32.81	-44.17	54.90	2.12	2.07	2.61	
First SDI Surface MWD Survey										
875.00	13.31	310.07	869.62	44.31	-59.32	73.88	2.61	2.15	6.98	
965.00	14.54	311.76	956.98	58.50	-75.67	95.54	1.44	1.37	1.88	
1,060.00	17.09	309.83	1,048.37	75.39	-95.29	121.42	2.74	2.68	-2.03	
1,155.00	19.81	308.25	1,138.48	94.30	-118.66	151.47	2.91	2.86	-1.66	
1,249.00	19.70	309.35	1,226.95	114.20	-143.42	183.23	0.41	-0.12	1.17	
1,344.00	18.99	314.88	1,316.59	135.27	-166.76	214.65	2.07	-0.75	5.82	
1,439.00	19.70	316.20	1,406.23	157.73	-188.79	246.00	0.88	0.75	1.39	
1,534.00	21.10	316.38	1,495.27	181.67	-211.67	278.94	1.48	1.47	0.19	
1,628.00	21.72	316.11	1,582.78	206.45	-235.40	313.08	0.67	0.66	-0.29	
1,723.00	20.84	315.23	1,671.30	231.12	-259.49	347.41	0.99	-0.93	-0.93	
1,818.00	22.42	311.10	1,759.62	255.03	-285.05	382.37	2.31	1.66	-4.35	
1,912.00	23.74	308.82	1,846.09	278.67	-313.30	419.21	1.70	1.40	-2.43	
2,007.00	24.36	309.35	1,932.85	303.08	-343.35	457.92	0.69	0.65	0.56	
2,102.00	25.85	309.70	2,018.87	328.74	-374.44	498.22	1.58	1.57	0.37	
2,196.00	23.48	311.10	2,104.29	354.14	-404.32	537.44	2.60	-2.52	1.49	
2,291.00	23.83	307.85	2,191.31	378.36	-433.73	575.53	1.42	0.37	-3.42	
2,385.00	25.41	306.97	2,276.76	402.14	-464.84	614.64	1.73	1.68	-0.94	
2,480.00	23.57	308.29	2,363.21	426.17	-496.04	653.96	2.02	-1.94	1.39	
2,575.00	24.80	308.73	2,449.87	450.40	-526.49	692.86	1.31	1.29	0.46	
2,656.00	23.65	308.91	2,523.74	471.24	-552.39	726.08	1.42	-1.42	0.22	
Last SDI Surface MWD Survey										
2,766.00	22.42	310.57	2,624.97	498.74	-585.49	769.12	1.26	-1.12	1.51	
First SDI Production MWD Survey										
2,861.00	25.32	309.34	2,711.83	523.41	-614.97	807.55	3.10	3.05	-1.29	
2,956.00	26.82	309.25	2,797.16	549.84	-647.28	849.29	1.58	1.58	-0.09	
3,050.00	24.27	307.40	2,881.97	575.00	-679.05	889.79	2.84	-2.71	-1.97	
3,145.00	22.60	306.08	2,969.13	597.61	-709.32	927.49	1.84	-1.76	-1.39	
3,240.00	19.96	304.77	3,057.65	617.61	-737.40	961.83	2.82	-2.78	-1.38	
3,335.00	22.42	306.96	3,146.22	637.75	-765.20	996.05	2.72	2.59	2.31	
3,430.00	21.81	306.96	3,234.23	659.26	-793.77	1,031.75	0.64	-0.64	0.00	
3,524.00	21.02	306.17	3,321.74	679.71	-821.34	1,065.99	0.89	-0.84	-0.84	
3,619.00	20.75	305.56	3,410.50	699.55	-848.78	1,099.75	0.36	-0.28	-0.64	
3,713.00	23.04	309.42	3,497.71	720.92	-876.54	1,134.74	2.88	2.44	4.11	
3,808.00	23.74	309.95	3,584.91	745.00	-905.56	1,172.45	0.77	0.74	0.56	
3,903.00	22.51	308.28	3,672.27	768.55	-934.50	1,209.74	1.47	-1.29	-1.76	
3,997.00	21.10	308.11	3,759.55	790.14	-961.94	1,244.63	1.50	-1.50	-0.18	
4,092.00	22.16	316.63	3,847.88	813.72	-987.70	1,279.54	3.49	1.12	8.97	
4,187.00	24.89	320.15	3,934.98	842.10	-1,012.82	1,317.07	3.23	2.87	3.71	
4,281.00	23.39	318.21	4,020.76	871.20	-1,037.94	1,355.06	1.81	-1.60	-2.06	
4,376.00	21.90	317.60	4,108.43	898.35	-1,062.45	1,391.33	1.59	-1.57	-0.64	

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-27B - Slot I
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Site:	Cascade Creek 697-08-53 Pad	MD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Well:	CC 697-08-27B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)
4,471.00	20.14	317.16	4,197.10	923.42	-1,085.52	1,425.15	1.86	-1.85	-0.46
4,566.00	20.40	312.85	4,286.23	946.68	-1,108.78	1,457.94	1.60	0.27	-4.54
4,661.00	22.42	311.09	4,374.67	969.85	-1,134.57	1,492.60	2.23	2.13	-1.85
4,755.00	20.75	309.42	4,462.07	992.21	-1,160.95	1,527.18	1.89	-1.78	-1.78
4,850.00	20.40	307.58	4,551.01	1,012.99	-1,187.07	1,560.54	0.77	-0.37	-1.94
4,945.00	22.25	310.74	4,639.51	1,034.83	-1,213.83	1,595.07	2.29	1.95	3.33
5,039.00	21.37	308.02	4,726.78	1,056.99	-1,240.80	1,629.98	1.43	-0.94	-2.89
5,134.00	19.96	304.85	4,815.67	1,076.92	-1,267.75	1,663.41	1.89	-1.48	-3.34
5,229.00	19.70	308.63	4,905.04	1,096.18	-1,293.56	1,695.55	1.38	-0.27	3.98
5,323.00	19.26	313.99	4,993.67	1,116.84	-1,317.10	1,726.86	1.96	-0.47	5.70
5,418.00	17.67	319.27	5,083.78	1,138.65	-1,337.78	1,756.75	2.43	-1.67	5.56
5,513.00	14.51	323.57	5,175.05	1,159.16	-1,354.26	1,782.60	3.55	-3.33	4.53
5,608.00	14.16	323.22	5,267.09	1,178.04	-1,368.28	1,805.52	0.38	-0.37	-0.37
5,702.00	13.89	323.13	5,358.29	1,196.28	-1,381.94	1,827.75	0.29	-0.29	-0.10
5,797.00	11.61	325.07	5,450.94	1,213.24	-1,394.25	1,848.13	2.44	-2.40	2.04
5,892.00	10.11	325.42	5,544.24	1,227.94	-1,404.46	1,865.43	1.58	-1.58	0.37
5,987.00	10.02	313.47	5,637.78	1,240.50	-1,415.19	1,881.74	2.20	-0.09	-12.58
6,081.00	9.67	308.90	5,730.40	1,251.08	-1,427.27	1,897.80	0.91	-0.37	-4.86
6,176.00	9.76	308.02	5,824.04	1,261.05	-1,439.82	1,913.82	0.18	0.09	-0.93
6,270.00	9.32	308.90	5,916.74	1,270.74	-1,452.02	1,929.39	0.49	-0.47	0.94
6,365.00	7.56	311.27	6,010.71	1,279.69	-1,462.71	1,943.33	1.89	-1.85	2.49
6,460.00	6.07	311.62	6,105.03	1,287.15	-1,471.16	1,954.60	1.57	-1.57	0.37
6,555.00	4.13	317.42	6,199.65	1,293.00	-1,477.23	1,963.02	2.11	-2.04	6.11
6,649.00	2.55	303.01	6,293.49	1,296.64	-1,481.28	1,968.45	1.89	-1.68	-15.33
6,744.00	2.73	298.17	6,388.39	1,298.86	-1,485.04	1,972.76	0.30	0.19	-5.09
6,839.00	2.99	297.21	6,483.27	1,301.06	-1,489.24	1,977.38	0.28	0.27	-1.01
6,933.00	3.25	292.55	6,577.13	1,303.20	-1,493.88	1,982.30	0.39	0.28	-4.96
7,028.00	3.61	287.19	6,671.96	1,305.12	-1,499.23	1,987.61	0.51	0.38	-5.64
7,123.00	4.04	278.57	6,766.75	1,306.50	-1,505.39	1,993.20	0.75	0.45	-9.07
7,217.00	4.40	278.05	6,860.50	1,307.50	-1,512.24	1,999.06	0.39	0.38	-0.55
7,312.00	4.57	281.12	6,955.21	1,308.74	-1,519.56	2,005.43	0.31	0.18	3.23
7,407.00	4.84	279.89	7,049.89	1,310.16	-1,527.22	2,012.18	0.30	0.28	-1.29
7,502.00	4.92	281.74	7,144.54	1,311.67	-1,535.16	2,019.21	0.19	0.08	1.95
7,596.00	3.96	290.09	7,238.26	1,313.61	-1,542.15	2,025.78	1.23	-1.02	8.88
7,691.00	3.78	297.47	7,333.04	1,316.18	-1,548.01	2,031.91	0.56	-0.19	7.77
7,786.00	3.52	301.69	7,427.85	1,319.16	-1,553.27	2,037.84	0.39	-0.27	4.44
7,880.00	3.08	305.91	7,521.70	1,322.15	-1,557.77	2,043.21	0.53	-0.47	4.49
7,975.00	3.69	304.15	7,616.53	1,325.37	-1,562.37	2,048.79	0.65	0.64	-1.85
8,070.00	3.96	310.30	7,711.32	1,329.20	-1,567.40	2,055.11	0.52	0.28	6.47
8,164.00	2.73	318.21	7,805.16	1,332.97	-1,571.37	2,060.58	1.39	-1.31	8.41
8,259.00	2.11	310.21	7,900.07	1,335.79	-1,574.21	2,064.57	0.74	-0.65	-8.42
8,354.00	1.85	314.17	7,995.01	1,337.99	-1,576.65	2,067.85	0.31	-0.27	4.17
8,448.00	2.37	321.11	8,088.95	1,340.56	-1,578.96	2,071.27	0.62	0.55	7.38

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-27B - Slot I
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Site:	Cascade Creek 697-08-53 Pad	MD Reference:	GL 8379' & RKB 30' @ 8409.00ft (H&P 330)
Well:	CC 697-08-27B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)	
8,543.00	2.73	307.05	8,183.86	1,343.45	-1,581.99	2,075.46	0.76	0.38	-14.80	
8,638.00	3.78	305.03	8,278.70	1,346.61	-1,586.36	2,080.84	1.11	1.11	-2.13	
8,732.00	4.31	299.84	8,372.47	1,350.14	-1,591.97	2,087.39	0.68	0.56	-5.52	
8,827.00	4.84	297.56	8,467.17	1,353.78	-1,598.62	2,094.81	0.59	0.56	-2.40	
8,922.00	5.63	297.73	8,561.77	1,357.80	-1,606.29	2,103.26	0.83	0.83	0.18	
9,016.00	5.98	292.37	8,655.29	1,361.81	-1,614.90	2,112.41	0.69	0.37	-5.70	
9,087.00	6.24	292.46	8,725.88	1,364.69	-1,621.89	2,119.60	0.37	0.37	0.13	
Last SDI Production MWD Survey										
9,143.00	6.24	292.46	8,781.55	1,367.01	-1,627.51	2,125.39	0.00	0.00	0.00	
Projection To TD - BHL = 632452.87, 1225372.22										

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
110.00	110.00	0.23	-0.24	First SDI Surface Gyro MWD Survey	
711.00	708.97	25.29	-32.57	Last SDI Surface Gyro MWD Survey	
786.00	782.68	32.81	-44.17	First SDI Surface MWD Survey	
2,656.00	2,523.74	471.24	-552.39	Last SDI Surface MWD Survey	
2,766.00	2,624.97	498.74	-585.49	First SDI Production MWD Survey	
9,087.00	8,725.88	1,364.69	-1,621.89	Last SDI Production MWD Survey	
9,143.00	8,781.55	1,367.01	-1,627.51	Projection To TD	
9,143.00	8,781.55	1,367.01	-1,627.51	BHL = 632452.87, 1225372.22	

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------