



Scientific Drilling

OXY USA RMAT

**Garfield County, CO NAD27
Cascade Creek 609-14 Pad
CC 697-08-56B - Slot C**

OH

Design: OH

Standard Survey Report

19 October, 2010

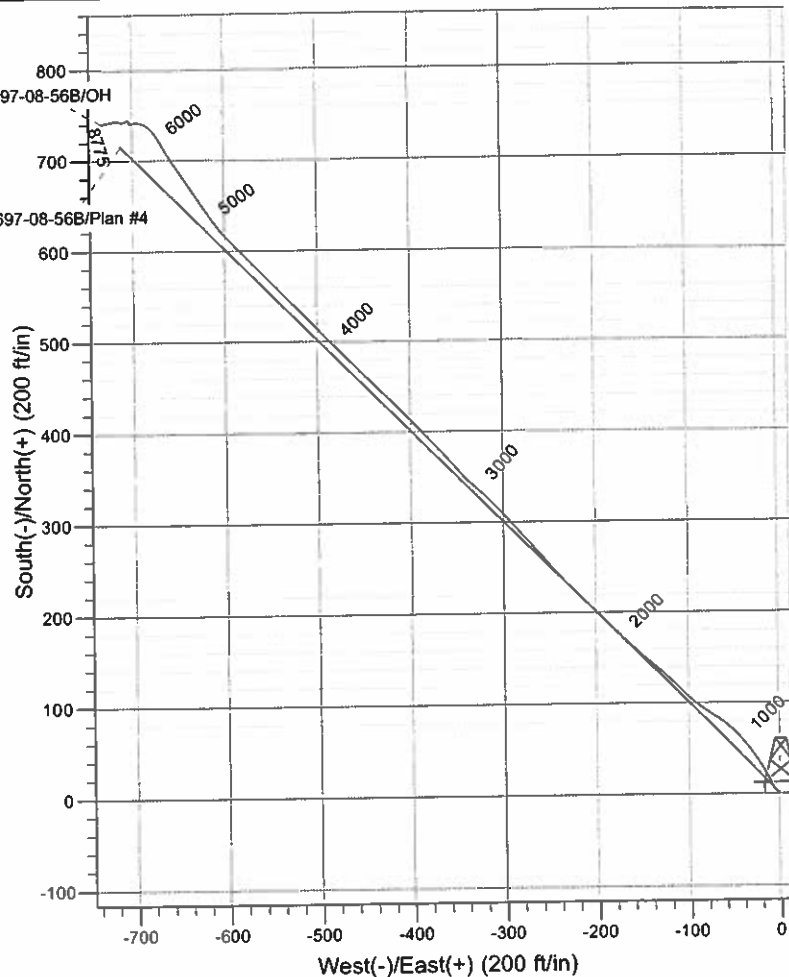
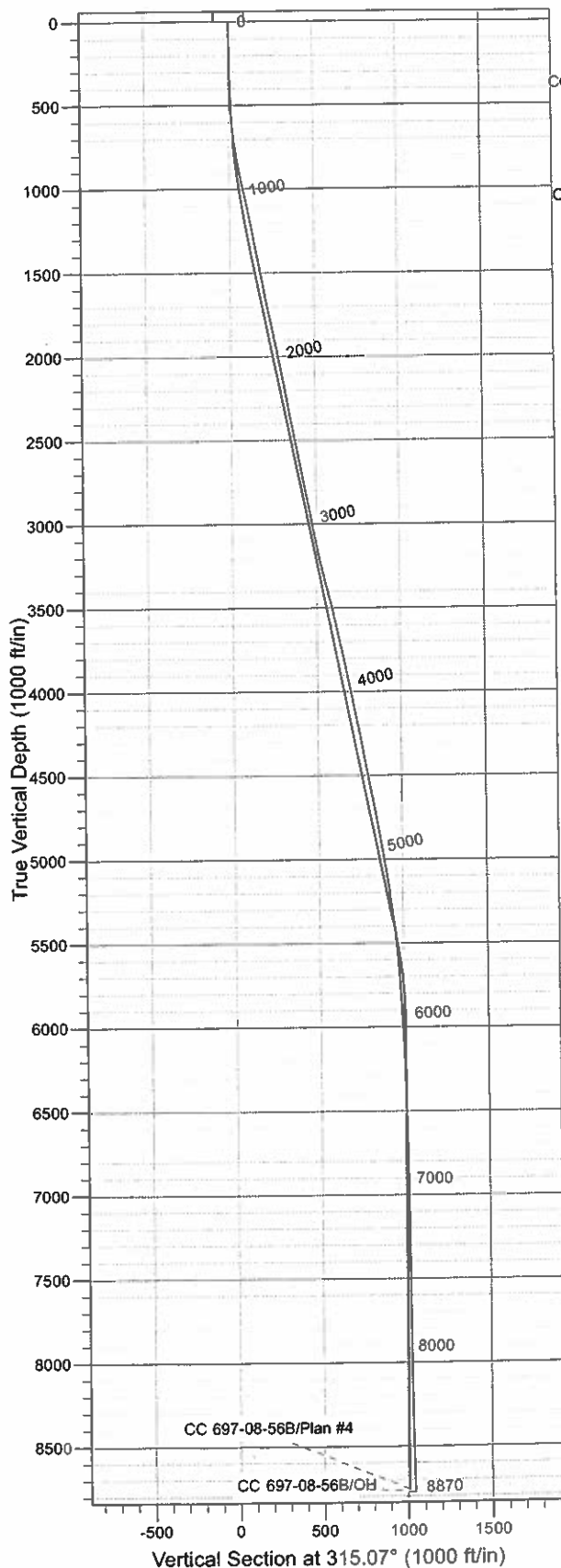




Scientific Drilling

Project: Garfield County, CO NAD27
Site: Cascade Creek 609-14 Pad
Well: CC 697-08-56B
Wellbore: OH
Design: OH

OXY USA RMAT



WELL DETAILS: CC 697-08-56B

Ground Level: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)				
North	East	Lat	Long	
0.00	0.00	629765.57	1229344.08	39° 31' 50.529 N 108° 13' 57.249 W C

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-08-56B - Slot C, True North
Vertical (TVD) Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Section (VS) Reference: Slot - C(0.00N, 0.00E)
Measured Depth Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Calculation Method: Minimum Curvature
Local North: True
Location: Sec 9 T6S R97W

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

Design: OH (CC 697-08-56B/OH)

Created By: Julie Cruse Date: 2010-10-19



Scientific Drilling Survey Report



Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-56B - Slot C
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Site:	Cascade Creek 609-14 Pad	MD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Well:	CC 697-08-56B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies-R5000.1

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 609-14 Pad, Sec 9 T6S R97W		
Site Position:		Northing:	629,789.23 usft
From:	Map	Easting:	1,229,350.88 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	39° 31' 50.765 N
		Longitude:	108° 13' 57.172 W
		Grid Convergence:	-1.72 °

Well	CC 697-08-56B - Slot C, 191' FSL 263' FWL		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	39° 31' 50.529 N
		Longitude:	108° 13' 57.249 W
		Ground Level:	8,393.00 ft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF200510	2008-06-24	10.83
	IGRF2010	2010-10-13	10.55
		Dip Angle (°)	65.81
			65.74
		Field Strength (nT)	52,541
			52,286

Design	OH		
Audit Notes:		Phase:	ACTUAL
Version:	1.0	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.00	0.00	0.00
			Direction (°)
			315.07

Survey Program	Date	2010-10-19		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
89.00	551.00	Survey #1 - Surface Wireline Gyro (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3
709.00	2,630.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA
2,787.00	8,870.00	Survey #3 - Production (OH)	MWD-SDI	MWD - Standard ISCWSA

Survey	Measured Depth (ft)	Incination (°)	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
	89.00	0.25	338.04	89.00	0.18	-0.07	0.18	0.28	0.28	0.00
First SDI Surface Wireline Gyro Survey										
	120.00	0.89	323.68	120.00	0.44	-0.24	0.48	2.10	2.06	-46.32
	151.00	1.34	325.75	150.99	0.93	-0.59	1.07	1.46	1.45	6.68
	182.00	1.70	321.83	181.98	1.59	-1.08	1.89	1.21	1.16	-12.65
	213.00	1.48	298.11	212.97	2.14	-1.71	2.73	2.22	-0.71	-76.52

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-56B - Slot C
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Site:	Cascade Creek 609-14 Pad	MD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Well:	CC 697-08-56B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)	
243.00	1.18	302.11	242.96	2.49	-2.32	3.40	1.05	-1.00	13.33	
274.00	1.13	297.56	273.96	2.80	-2.86	4.00	0.34	-0.16	-14.68	
305.00	0.03	276.68	304.95	2.94	-3.14	4.30	3.55	-3.55	-67.35	
336.00	0.49	30.52	335.95	3.06	-3.08	4.34	1.62	1.48	367.23	
366.00	1.77	312.87	365.95	3.48	-3.35	4.83	5.78	4.27	-258.83	
398.00	2.73	313.67	397.92	4.35	-4.26	6.09	3.00	3.00	2.50	
428.00	3.34	314.43	427.88	5.45	-5.41	7.68	2.04	2.03	2.53	
459.00	2.54	327.24	458.84	6.66	-6.42	9.25	3.32	-2.58	41.32	
489.00	2.41	334.48	488.81	7.79	-7.05	10.50	1.13	-0.43	24.13	
520.00	2.68	340.20	519.78	9.06	-7.58	11.77	1.19	0.87	18.45	
551.00	3.54	336.89	550.73	10.62	-8.20	13.31	2.83	2.77	-10.68	
Last SDI Surface Wireline Gyro Survey										
709.00	6.33	329.51	708.14	22.62	-14.54	26.28	1.81	1.77	-4.67	
First SDI Surface MWD Survey										
801.00	8.62	326.62	799.35	32.74	-20.90	37.95	2.52	2.49	-3.14	
895.00	11.43	323.99	891.90	46.16	-30.26	54.05	3.03	2.99	-2.80	
987.00	12.49	318.71	981.91	61.01	-42.18	72.99	1.65	1.15	-5.74	
1,082.00	11.87	307.99	1,074.78	74.75	-56.66	92.94	2.46	-0.65	-11.28	
1,176.00	12.57	303.07	1,166.65	86.28	-72.85	112.54	1.33	0.74	-5.23	
1,271.00	10.46	305.88	1,259.74	96.98	-88.51	131.16	2.30	-2.22	2.96	
1,366.00	10.55	312.91	1,353.15	107.95	-101.86	148.37	1.35	0.09	7.40	
1,461.00	11.87	315.37	1,446.33	120.83	-115.10	166.83	1.48	1.39	2.59	
1,555.00	11.08	312.47	1,538.46	133.81	-128.55	185.52	1.04	-0.84	-3.09	
1,650.00	10.20	309.57	1,631.82	145.33	-141.77	203.01	1.08	-0.93	-3.05	
1,744.00	11.34	312.03	1,724.16	156.82	-155.05	220.53	1.31	1.21	2.62	
1,839.00	12.40	314.76	1,817.13	170.25	-169.23	240.05	1.26	1.12	2.87	
1,934.00	11.87	315.29	1,910.01	184.38	-183.35	260.03	0.57	-0.56	0.56	
2,028.00	11.43	314.85	2,002.07	197.82	-196.75	279.01	0.48	-0.47	-0.47	
2,123.00	10.46	314.58	2,095.34	210.51	-209.57	297.04	1.02	-1.02	-0.28	
2,218.00	10.64	313.70	2,188.74	222.62	-222.05	314.43	0.25	0.19	-0.93	
2,313.00	10.82	317.04	2,282.08	235.21	-234.47	332.11	0.68	0.19	3.52	
2,407.00	10.99	319.24	2,374.38	248.45	-246.33	349.87	0.48	0.18	2.34	
2,502.00	11.34	320.03	2,467.58	262.47	-258.25	368.20	0.40	0.37	0.83	
2,597.00	11.87	317.66	2,560.64	276.85	-270.83	387.27	0.75	0.56	-2.49	
2,630.00	11.70	317.66	2,592.95	281.83	-275.37	394.00	0.52	-0.52	0.00	
Last SDI Surface MWD Survey										
2,787.00	10.55	318.43	2,746.99	304.35	-295.62	424.26	0.74	-0.73	0.49	
First Survey in 8 3/4" Hole										
2,882.00	11.26	316.32	2,840.28	317.57	-307.80	442.21	0.86	0.75	-2.22	
2,977.00	11.70	312.80	2,933.38	330.82	-321.27	461.11	0.87	0.46	-3.71	
3,072.00	9.76	311.57	3,026.71	342.71	-334.37	478.77	2.06	-2.04	-1.29	
3,166.00	11.52	318.96	3,119.10	355.08	-346.49	496.09	2.37	1.87	7.86	
3,261.00	13.45	318.25	3,211.85	370.47	-360.08	516.59	2.04	2.03	-0.75	
3,356.00	14.42	316.32	3,304.05	387.27	-375.61	539.45	1.13	1.02	-2.03	



Scientific Drilling Survey Report



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Site: Cascade Creek 609-14 Pad
Well: CC 697-08-56B
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well CC 697-08-56B - Slot C
GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
True
Minimum Curvature
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)
3,450.00	14.25	315.97	3,395.12	404.06	-391.73	562.72	0.20	-0.18	-0.37
3,545.00	13.37	315.00	3,487.38	420.23	-407.62	585.39	0.96	-0.93	-1.02
3,640.00	12.31	315.09	3,580.00	435.17	-422.54	606.50	1.12	-1.12	0.09
3,735.00	13.37	315.44	3,672.62	450.17	-437.40	627.61	1.12	1.12	0.37
3,829.00	12.66	314.65	3,764.21	465.15	-452.35	648.78	0.78	-0.76	-0.84
3,924.00	12.05	315.00	3,857.01	479.48	-466.77	669.11	0.65	-0.64	0.37
4,019.00	11.52	314.91	3,950.00	493.19	-480.50	688.51	0.56	-0.56	-0.09
4,113.00	10.90	316.49	4,042.21	506.26	-493.27	706.78	0.74	-0.66	1.68
4,208.00	12.05	315.26	4,135.31	519.82	-506.43	725.68	1.24	1.21	-1.29
4,303.00	11.52	316.49	4,228.31	533.74	-519.94	745.08	0.62	-0.56	1.29
4,397.00	10.29	315.70	4,320.61	546.56	-532.27	762.86	1.32	-1.31	-0.84
4,492.00	11.17	315.26	4,413.95	559.17	-544.67	780.55	0.93	0.93	-0.46
4,587.00	10.73	314.74	4,507.22	571.93	-557.43	798.59	0.47	-0.46	-0.55
4,682.00	10.99	315.26	4,600.51	584.59	-570.09	816.49	0.29	0.27	0.55
4,775.00	11.43	317.64	4,691.74	597.69	-582.54	834.56	0.69	0.47	2.56
4,871.00	10.55	314.74	4,785.98	610.91	-595.19	852.85	1.08	-0.92	-3.02
4,966.00	9.67	321.59	4,879.51	623.28	-606.32	869.48	1.57	-0.93	7.21
5,060.00	9.58	324.93	4,972.18	635.87	-615.72	885.03	0.60	-0.10	3.55
5,155.00	9.23	326.78	5,065.91	648.71	-624.44	900.28	0.49	-0.37	1.95
5,250.00	8.97	327.57	5,159.71	661.34	-632.58	914.97	0.30	-0.27	0.83
5,345.00	7.65	324.93	5,253.71	672.77	-640.19	928.43	1.45	-1.39	-2.78
5,439.00	7.39	324.67	5,346.90	682.82	-647.28	940.55	0.28	-0.28	-0.28
5,534.00	6.24	328.45	5,441.23	692.20	-653.52	951.60	1.30	-1.21	3.98
5,629.00	6.07	326.43	5,535.68	700.79	-658.99	961.55	0.29	-0.18	-2.13
5,723.00	4.57	330.38	5,629.28	708.18	-663.59	970.03	1.64	-1.60	4.20
5,818.00	3.96	330.64	5,724.01	714.33	-667.07	976.84	0.64	-0.64	0.27
5,913.00	3.43	331.26	5,818.82	719.68	-670.05	982.73	0.56	-0.56	0.65
6,007.00	2.81	327.57	5,912.68	724.09	-672.63	987.68	0.69	-0.66	-3.93
6,102.00	2.64	324.40	6,007.57	727.84	-675.16	992.12	0.24	-0.18	-3.34
6,197.00	2.37	318.96	6,102.48	731.10	-677.72	996.23	0.38	-0.28	-5.73
6,292.00	2.20	316.58	6,197.40	733.91	-680.26	1,000.02	0.20	-0.18	-2.51
6,386.00	2.02	313.33	6,291.34	736.35	-682.71	1,003.48	0.23	-0.19	-3.46
6,481.00	1.76	301.99	6,386.29	738.27	-685.16	1,006.57	0.48	-0.27	-11.94
6,576.00	1.67	293.82	6,481.24	739.61	-687.67	1,009.28	0.27	-0.09	-8.60
6,671.00	1.23	288.55	6,576.21	740.49	-689.90	1,011.48	0.48	-0.46	-5.55
6,765.00	1.23	282.57	6,670.19	741.03	-691.84	1,013.24	0.14	0.00	-6.36
6,860.00	1.23	274.31	6,765.17	741.33	-693.85	1,014.87	0.19	0.00	-8.69
6,955.00	1.14	271.41	6,860.15	741.43	-695.82	1,016.33	0.11	-0.09	-3.05
7,050.00	1.49	263.06	6,955.12	741.30	-697.99	1,017.77	0.42	0.37	-8.79
7,144.00	1.85	258.22	7,049.08	740.85	-700.68	1,019.35	0.41	0.38	-5.15
7,239.00	0.53	279.05	7,144.06	740.60	-702.62	1,020.55	1.44	-1.39	21.93
7,334.00	0.97	354.02	7,239.06	741.47	-703.14	1,021.53	1.03	0.46	78.92
7,429.00	0.70	332.67	7,334.05	742.79	-703.49	1,022.71	0.43	-0.28	-22.47
7,523.00	0.62	307.79	7,428.04	743.61	-704.15	1,023.76	0.31	-0.09	-26.47



Scientific Drilling

Survey Report



Company: OXY USA RMAT
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Site: Cascade Creek 609-14 Pad
Well: CC 697-08-56B
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well CC 697-08-56B - Slot C
GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
True
Minimum Curvature
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)
7,618.00	0.70	260.95	7,523.03	743.83	-705.13	1,024.61	0.56	0.08	-49.31
7,713.00	0.97	254.18	7,618.02	743.52	-706.48	1,025.34	0.30	0.28	-7.13
7,807.00	1.14	240.38	7,712.01	742.84	-708.06	1,025.97	0.32	0.18	-14.68
7,902.00	0.79	262.44	7,806.99	742.29	-709.53	1,026.62	0.53	-0.37	23.22
7,997.00	0.88	250.05	7,901.98	741.95	-710.86	1,027.32	0.21	0.09	-13.04
8,091.00	0.70	286.61	7,995.98	741.87	-712.09	1,028.13	0.56	-0.19	38.89
8,186.00	0.53	290.39	8,090.97	742.19	-713.06	1,029.04	0.18	-0.18	3.98
8,281.00	0.70	270.26	8,185.97	742.35	-714.05	1,029.85	0.29	0.18	-21.19
8,376.00	1.23	278.88	8,280.95	742.51	-715.64	1,031.09	0.58	0.56	9.07
8,471.00	1.58	270.35	8,375.92	742.67	-717.96	1,032.84	0.43	0.37	-8.98
8,565.00	2.37	262.62	8,469.87	742.43	-721.18	1,034.95	0.89	0.84	-8.22
8,660.00	2.29	255.32	8,564.79	741.70	-724.96	1,037.10	0.32	-0.08	-7.68
8,755.00	2.29	257.96	8,659.71	740.82	-728.66	1,039.09	0.11	0.00	2.78
8,812.00	2.55	253.83	8,716.66	740.23	-730.99	1,040.32	0.55	0.46	-7.25
Last SDI MWD Survey									
8,870.00	2.55	253.83	8,774.60	739.51	-733.47	1,041.56	0.00	0.00	0.00
Projection to TD - BHL = 630526.80 ft N, 1228633.19 ft E									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
89.00	89.00	0.18	-0.07	First SDI Surface Wireline Gyro Survey
551.00	550.73	10.62	-8.20	Last SDI Surface Wireline Gyro Survey
709.00	708.14	22.62	-14.54	First SDI Surface MWD Survey
2,630.00	2,592.95	281.83	-275.37	Last SDI Surface MWD Survey
2,787.00	2,746.99	304.35	-295.62	First Survey in 8 3/4" Hole
8,812.00	8,716.66	740.23	-730.99	Last SDI MWD Survey
8,870.00	8,774.60	739.51	-733.47	Projection to TD
8,870.00	8,774.60	739.51	-733.47	BHL = 630526.80 ft N, 1228633.19 ft E

Checked By: _____

Approved By: _____

Date: _____