



Scientific Drilling

OXY USA RMAT

**Garfield County, CO NAD27
Cascade Creek 609-14 Pad
CC 697-17-15 - Slot U**

OH

Design: OH

Standard Survey Report

02 August, 2010

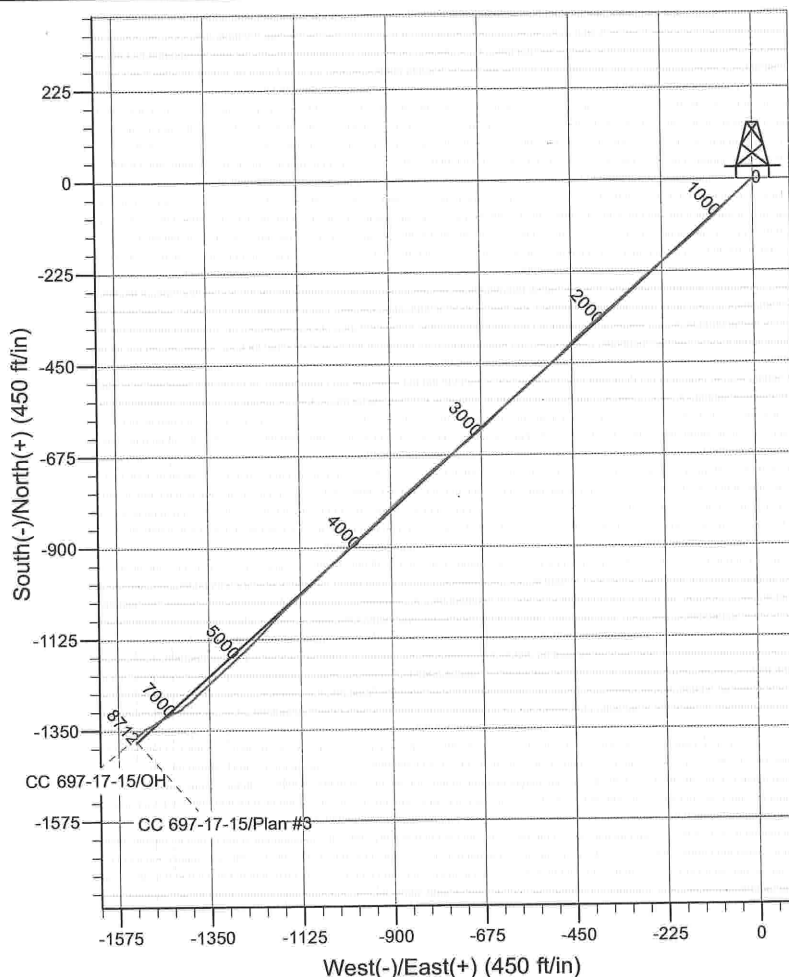
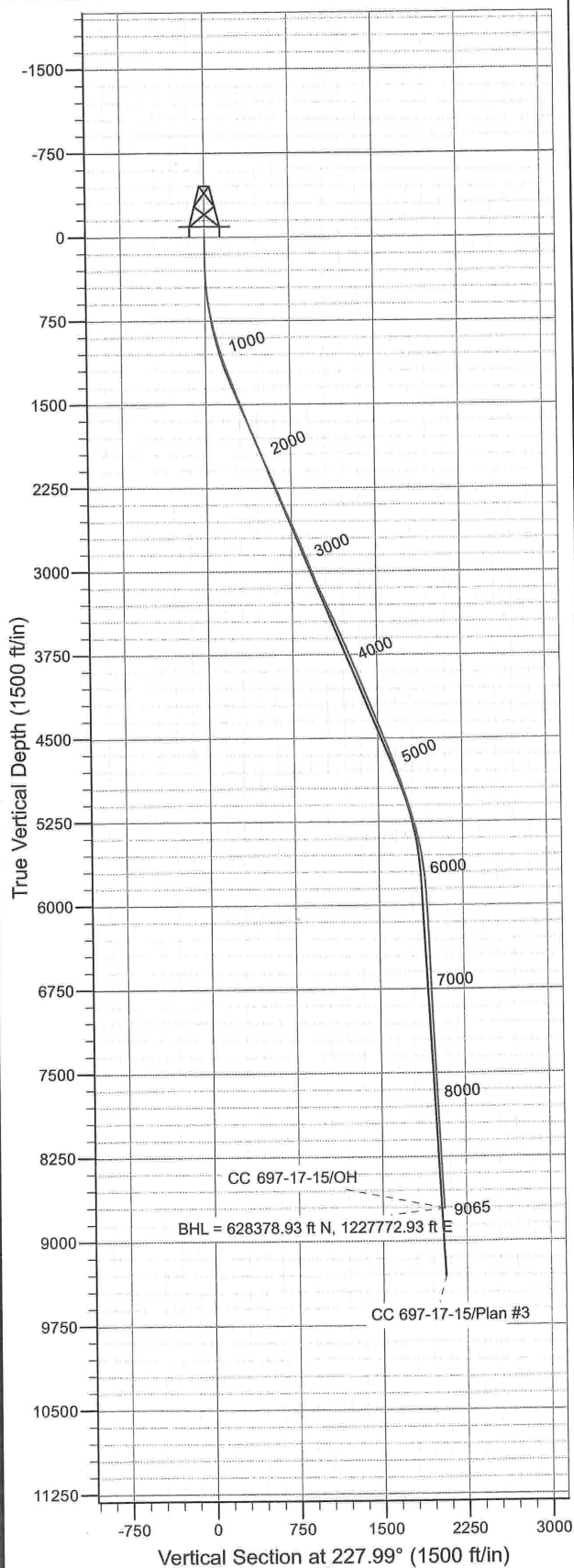




Scientific Drilling

Project: Garfield County, CO NAD27
Site: Cascade Creek 609-14 Pad
Well: CC 697-17-15
Wellbore: OH
Design: OH

OXY USA RMAT



WELL DETAILS: CC 697-17-15

Ground Level: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)		North	East	Lat	Long	U
0.00	0.00	629697.71	1229343.93	39° 31' 49.858 N	108° 13' 57.225 W	U

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-17-15 - Slot U, True North
Vertical (TVD) Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Section (VS) Reference: Slot - U(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 697-17-15/OH)

Created By: Julie Cruse Date: 2010-08-03



SDI
Survey Report



Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-17-15 - Slot U
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 697-17-15	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 697-17-15 - Slot U		
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' 49.858 N
		Longitude:	108° 13' 57.225 W
		Ground Level:	8,393.00 ft

Wellbore	OH		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2010-05-18	10.60	65.75	52,326

Design	OH		
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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	227.99

Survey Program	Date	2010-08-02			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
156.00	2,890.00	Survey #1 - Surface (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,977.00	9,065.00	Survey #2 - Production (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
156.00	0.12	272.52	156.00	0.01	-0.16	0.12	0.08	0.08	0.00
First SDI MWD Survey									
248.00	0.91	261.54	248.00	-0.10	-0.98	0.79	0.86	0.86	-11.93
340.00	2.82	219.76	339.95	-1.94	-3.15	3.64	2.42	2.08	-45.41
432.00	4.43	228.69	431.76	-6.03	-7.27	9.44	1.85	1.75	9.71
525.00	6.98	224.50	524.29	-12.43	-13.93	18.67	2.78	2.74	-4.51
617.00	8.37	229.40	615.47	-20.78	-22.93	30.94	1.67	1.51	5.33
709.00	10.56	227.96	706.21	-30.78	-34.28	46.07	2.39	2.38	-1.57
802.00	13.95	227.83	797.08	-44.02	-48.92	65.81	3.65	3.65	-0.14

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-17-15 - Slot U
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 697-17-15	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)
895.00	15.58	225.65	887.00	-60.27	-66.16	89.50	1.85	1.75	-2.34
987.00	15.97	226.62	975.54	-77.60	-84.19	114.50	0.51	0.42	1.05
1,082.00	18.00	227.86	1,066.39	-96.43	-104.58	142.24	2.17	2.14	1.31
1,177.00	19.32	226.36	1,156.39	-117.12	-126.84	172.63	1.48	1.39	-1.58
1,271.00	20.99	227.36	1,244.63	-139.26	-150.48	205.01	1.81	1.78	1.06
1,366.00	22.06	230.06	1,333.01	-162.24	-176.67	239.85	1.53	1.13	2.84
1,461.00	21.03	230.52	1,421.37	-184.53	-203.51	274.71	1.10	-1.08	0.48
1,555.00	20.24	229.75	1,509.34	-205.76	-228.94	307.82	0.89	-0.84	-0.82
1,650.00	22.61	229.84	1,597.77	-228.16	-255.44	342.50	2.49	2.49	0.09
1,744.00	20.44	227.53	1,685.21	-250.90	-281.36	376.97	2.48	-2.31	-2.46
1,839.00	21.01	227.88	1,774.06	-273.52	-306.23	410.59	0.61	0.60	0.37
1,934.00	23.48	228.04	1,861.98	-297.60	-332.94	446.55	2.60	2.60	0.17
2,029.00	23.36	229.67	1,949.16	-322.45	-361.37	484.31	0.69	-0.13	1.72
2,123.00	24.39	229.59	2,035.11	-347.09	-390.35	522.34	1.10	1.10	-0.09
2,218.00	22.31	228.85	2,122.33	-371.67	-418.87	559.98	2.21	-2.19	-0.78
2,313.00	22.00	224.94	2,210.32	-396.13	-445.02	595.78	1.59	-0.33	-4.12
2,407.00	22.96	224.79	2,297.18	-421.61	-470.37	631.67	1.02	1.02	-0.16
2,502.00	22.09	226.83	2,384.93	-446.98	-496.45	668.03	1.23	-0.92	2.15
2,597.00	23.12	227.27	2,472.63	-471.86	-523.18	704.54	1.10	1.08	0.46
2,691.00	23.51	227.64	2,558.95	-497.01	-550.59	741.74	0.44	0.41	0.39
2,786.00	23.68	228.24	2,646.01	-522.49	-578.83	779.76	0.31	0.18	0.63
2,890.00	22.98	228.63	2,741.51	-549.81	-609.64	820.95	0.69	-0.67	0.38
Last Survey in 14 3/4" Hole									
2,977.00	20.84	224.14	2,822.23	-572.15	-633.17	853.38	3.12	-2.46	-5.16
First Survey in 8 3/4" Hole									
3,072.00	21.19	226.29	2,910.91	-596.14	-657.35	887.40	0.89	0.37	2.26
3,167.00	21.85	230.06	2,999.29	-619.36	-683.31	922.23	1.61	0.69	3.97
3,262.00	22.20	229.31	3,087.36	-642.41	-710.48	957.84	0.47	0.37	-0.79
3,356.00	25.44	231.45	3,173.34	-666.57	-739.74	995.76	3.57	3.45	2.28
3,451.00	23.42	230.94	3,259.83	-691.19	-770.36	1,034.98	2.14	-2.13	-0.54
3,546.00	25.30	229.21	3,346.37	-716.35	-800.39	1,074.14	2.12	1.98	-1.82
3,640.00	25.30	227.89	3,431.35	-742.94	-830.50	1,114.30	0.60	0.00	-1.40
3,735.00	23.79	229.90	3,517.77	-768.90	-860.22	1,153.76	1.82	-1.59	2.12
3,830.00	22.50	226.52	3,605.12	-793.75	-888.07	1,191.08	1.95	-1.36	-3.56
3,924.00	23.56	226.04	3,691.63	-819.17	-914.64	1,227.84	1.15	1.13	-0.51
4,019.00	21.67	227.35	3,779.32	-844.23	-941.21	1,264.36	2.06	-1.99	1.38
4,114.00	21.94	227.81	3,867.53	-868.03	-967.26	1,299.64	0.34	0.28	0.48
4,209.00	22.67	227.50	3,955.42	-892.32	-993.91	1,335.70	0.78	0.77	-0.33
4,303.00	21.74	226.34	4,042.44	-916.58	-1,019.86	1,371.21	1.09	-0.99	-1.23
4,398.00	21.72	226.48	4,130.69	-940.83	-1,045.34	1,406.37	0.06	-0.02	0.15
4,493.00	22.15	224.95	4,218.82	-965.61	-1,070.74	1,441.83	0.75	0.45	-1.61
4,588.00	20.83	227.31	4,307.21	-989.74	-1,095.80	1,476.61	1.66	-1.39	2.48
4,682.00	20.83	226.54	4,395.07	-1,012.57	-1,120.22	1,510.03	0.29	0.00	-0.82

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Site:	Cascade Creek 609-14 Pad	MD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Well:	CC 697-17-15	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)
4,777.00	22.54	227.17	4,483.34	-1,036.56	-1,145.84	1,545.12	1.82	1.80	0.66
4,872.00	22.21	226.14	4,571.19	-1,061.38	-1,172.14	1,581.27	0.54	-0.35	-1.08
4,966.00	21.57	222.20	4,658.42	-1,086.50	-1,196.55	1,616.22	1.70	-0.68	-4.19
5,061.00	19.37	223.82	4,747.41	-1,110.80	-1,219.20	1,649.31	2.39	-2.32	1.71
5,156.00	19.15	223.49	4,837.10	-1,133.47	-1,240.83	1,680.56	0.26	-0.23	-0.35
5,250.00	18.32	227.56	4,926.12	-1,154.63	-1,262.34	1,710.71	1.65	-0.88	4.33
5,345.00	18.17	227.84	5,016.34	-1,174.65	-1,284.34	1,740.45	0.18	-0.16	0.29
5,440.00	18.04	226.76	5,106.64	-1,194.67	-1,306.04	1,769.97	0.38	-0.14	-1.14
5,534.00	16.27	227.95	5,196.45	-1,213.46	-1,326.42	1,797.69	1.92	-1.88	1.27
5,629.00	14.51	227.59	5,288.04	-1,230.40	-1,345.09	1,822.90	1.86	-1.85	-0.38
5,724.00	12.73	227.04	5,380.37	-1,245.56	-1,361.54	1,845.27	1.88	-1.87	-0.58
5,819.00	10.91	226.52	5,473.35	-1,258.88	-1,375.72	1,864.72	1.92	-1.92	-0.55
5,913.00	9.21	225.57	5,565.90	-1,270.27	-1,387.55	1,881.13	1.82	-1.81	-1.01
6,008.00	7.73	231.40	5,659.87	-1,279.58	-1,397.97	1,895.11	1.80	-1.56	6.14
6,103.00	5.72	234.00	5,754.21	-1,286.35	-1,406.80	1,906.19	2.14	-2.12	2.74
6,198.00	3.78	229.43	5,848.88	-1,291.17	-1,413.01	1,914.03	2.08	-2.04	-4.81
6,292.00	4.31	226.79	5,942.64	-1,295.60	-1,417.93	1,920.66	0.60	0.56	-2.81
6,387.00	2.64	230.22	6,037.46	-1,299.45	-1,422.22	1,926.42	1.77	-1.76	3.61
6,482.00	2.55	243.49	6,132.37	-1,301.79	-1,425.79	1,930.64	0.64	-0.09	13.97
6,576.00	2.55	247.88	6,226.28	-1,303.51	-1,429.60	1,934.62	0.21	0.00	4.67
6,671.00	2.73	255.36	6,321.17	-1,304.88	-1,433.75	1,938.62	0.41	0.19	7.87
6,766.00	2.55	245.42	6,416.07	-1,306.33	-1,437.86	1,942.64	0.52	-0.19	-10.46
6,860.00	2.20	253.25	6,509.99	-1,307.72	-1,441.49	1,946.27	0.51	-0.37	8.33
6,955.00	1.76	249.03	6,604.94	-1,308.77	-1,444.59	1,949.28	0.49	-0.46	-4.44
7,050.00	2.29	239.71	6,699.88	-1,310.24	-1,447.60	1,952.50	0.66	0.56	-9.81
7,145.00	2.20	232.06	6,794.80	-1,312.32	-1,450.67	1,956.18	0.33	-0.09	-8.05
7,240.00	2.29	239.80	6,889.73	-1,314.40	-1,453.75	1,959.85	0.33	0.09	8.15
7,334.00	2.11	235.40	6,983.66	-1,316.33	-1,456.80	1,963.41	0.26	-0.19	-4.68
7,429.00	3.08	241.82	7,078.56	-1,318.52	-1,460.49	1,967.62	1.06	1.02	6.76
7,524.00	2.46	242.08	7,173.45	-1,320.68	-1,464.54	1,972.08	0.65	-0.65	0.27
7,619.00	2.81	243.05	7,268.35	-1,322.69	-1,468.42	1,976.30	0.37	0.37	1.02
7,713.00	3.17	239.01	7,362.22	-1,325.08	-1,472.70	1,981.08	0.44	0.38	-4.30
7,808.00	3.08	238.22	7,457.08	-1,327.77	-1,477.12	1,986.17	0.11	-0.09	-0.83
7,903.00	3.61	234.44	7,551.92	-1,330.86	-1,481.72	1,991.65	0.60	0.56	-3.98
7,997.00	3.08	232.68	7,645.76	-1,334.11	-1,486.14	1,997.11	0.57	-0.56	-1.87
8,092.00	2.81	242.08	7,740.64	-1,336.75	-1,490.22	2,001.91	0.58	-0.28	9.89
8,187.00	2.81	239.97	7,835.52	-1,339.00	-1,494.30	2,006.45	0.11	0.00	-2.22
8,282.00	2.73	239.45	7,930.41	-1,341.32	-1,498.26	2,010.94	0.09	-0.08	-0.55
8,376.00	2.29	251.22	8,024.32	-1,343.06	-1,501.97	2,014.86	0.72	-0.47	12.52
8,471.00	2.11	247.36	8,119.25	-1,344.34	-1,505.38	2,018.26	0.25	-0.19	-4.06
8,566.00	2.37	234.17	8,214.18	-1,346.17	-1,508.59	2,021.86	0.61	0.27	-13.88
8,661.00	2.73	224.86	8,309.08	-1,348.92	-1,511.77	2,026.07	0.58	0.38	-9.80
8,755.00	3.17	226.97	8,402.96	-1,352.28	-1,515.25	2,030.90	0.48	0.47	2.24
8,850.00	3.87	229.16	8,497.78	-1,356.17	-1,519.60	2,036.74	0.75	0.74	2.31

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Site:	Cascade Creek 609-14 Pad	MD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Well:	CC 697-17-15	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)
8,945.00	3.69	229.87	8,592.57	-1,360.24	-1,524.36	2,043.00	0.20	-0.19	0.75
9,008.00	3.96	230.48	8,655.43	-1,362.93	-1,527.59	2,047.20	0.43	0.43	0.97
Last SDI MWD Survey									
9,065.00	3.96	230.48	8,712.30	-1,365.43	-1,530.63	2,051.13	0.00	0.00	0.00
Projection to TD - BHL = 628378.93 ft N, 1227772.93 ft E									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
156.00	156.00	0.01	-0.16	First SDI MWD Survey
2,890.00	2,741.51	-549.81	-609.64	Last Survey in 14 3/4" Hole
2,977.00	2,822.23	-572.15	-633.17	First Survey in 8 3/4" Hole
9,008.00	8,655.43	-1,362.93	-1,527.59	Last SDI MWD Survey
9,065.00	8,712.30	-1,365.43	-1,530.63	Projection to TD
9,065.00	8,712.30	-1,365.43	-1,530.63	BHL = 628378.93 ft N, 1227772.93 ft E

Checked By: _____ Approved By: _____ Date: _____