



MWD SURVEY REPORT

MWD Services, Inc.

MEASUREMENT WHILE DRILLING SERVICES

Report Date : APRIL 08, 2004

Job Number : 04023

Operator : OXY, U.S.A., INC.

Lease / Well : CDM -A- COM #2

Location : EDDY COUNTY, NEW MEXICO

Field : BURTON

Contractor / Rig : McVAY DRILLING 8

Directional Company : BLACK VIPER ENERGY SERVICES, LTD.

MWD Field Rep. : JOE COVINGTON

Tie In Survey Reference : GEARHART INDUSTRIES, INC.

Calculation Method : MINIMUM CURVATURE

Target +N / -S = -2740.3'

Target +E / -W = 319.4'

Target TVD = 11700.0'

Magnetic Declination +E / -W = 8.93°

Grid Convergence +E / -W = 0.06°

Total Correction +E / -W = 8.87°

North Reference = Grid

RKB Height = 19.40'

Ground Level Elevation =

Vertical Section Azimuth = 173.35°

Comments :

SURVEY #0 = TIE IN SURVEY

SURVEY #134 = STRAIGHT LINE PROJECTED SURVEY TO BIT DEPTH

Srv. No.	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (deg/100 ')
							+N / -S (ft)	+E / -W (ft)	Distance (ft)	Azimuth (deg)	
0	6351.00'	1.39°	150.30°		6348.47'	-8.20'	-4.75'	-111.13'	111.23'	267.55°	
1	6366.00'	1.20°	164.00°	15'	6363.47'	-7.83'	-5.06'	-111.00'	111.11'	267.39°	2.41°
2	6398.00'	1.50°	172.40°	32'	6395.46'	-7.08'	-5.80'	-110.85'	111.00'	267.01°	1.12°
3	6429.00'	2.00°	174.20°	31'	6426.44'	-6.13'	-6.74'	-110.74'	110.95'	266.52°	1.62°
4	6461.00'	3.00°	181.60°	32'	6458.41'	-4.75'	-8.13'	-110.71'	111.01'	265.80°	3.28°
5	6493.00'	4.00°	178.80°	32'	6490.35'	-2.81'	-10.08'	-110.71'	111.17'	264.80°	3.17°
6	6521.00'	5.10°	177.40°	28'	6518.26'	-0.59'	-12.30'	-110.63'	111.31'	263.65°	3.95°
7	6556.00'	6.20°	174.90°	35'	6553.09'	2.85'	-15.74'	-110.39'	111.51'	261.89°	3.22°
8	6588.00'	7.30°	173.80°	32'	6584.87'	6.61'	-19.48'	-110.02'	111.73'	259.96°	3.46°
9	6619.00'	6.60°	171.20°	31'	6615.64'	10.36'	-23.20'	-109.53'	111.96'	258.04°	2.48°
10	6651.00'	8.50°	170.90°	32'	6647.36'	14.56'	-27.35'	-108.88'	112.26'	255.90°	5.94°
11	6682.00'	9.70°	171.60°	31'	6677.97'	19.46'	-32.20'	-108.13'	112.83'	253.42°	3.89°
12	6714.00'	10.40°	172.60°	32'	6709.48'	25.04'	-37.73'	-107.37'	113.80'	250.64°	2.25°
13	6745.00'	11.10°	173.00°	31'	6739.94'	30.82'	-43.47'	-106.64'	115.16'	247.83°	2.27°
14	6776.00'	12.00°	173.00°	31'	6770.31'	37.03'	-49.63'	-105.89'	116.94'	244.89°	2.90°
15	6807.00'	12.90°	171.60°	31'	6800.58'	43.71'	-56.25'	-104.99'	119.11'	241.82°	3.06°
16	6839.00'	14.40°	171.20°	32'	6831.68'	51.26'	-63.72'	-103.86'	121.85'	238.47°	4.70°
17	6871.00'	15.60°	169.80°	32'	6862.58'	59.53'	-71.88'	-102.49'	125.18'	234.96°	3.92°
18	6902.00'	16.60°	170.20°	31'	6892.37'	68.11'	-80.35'	-101.00'	129.06'	231.50°	3.25°
19	6934.00'	17.60°	170.60°	32'	6922.95'	77.51'	-89.63'	-99.43'	133.86'	227.97°	3.15°
20	6966.00'	18.90°	171.70°	32'	6953.34'	87.52'	-99.53'	-97.89'	139.60'	224.52°	4.20°
21	6998.00'	19.90°	171.80°	32'	6983.53'	98.15'	-110.05'	-96.36'	146.28'	221.21°	3.13°
22	7030.00'	20.60°	172.10°	32'	7013.55'	109.22'	-121.01'	-94.81'	153.73'	218.08°	2.21°
23	7062.00'	21.50°	172.10°	32'	7043.41'	120.71'	-132.40'	-93.23'	161.93'	215.15°	2.81°
24	7093.00'	22.40°	171.60°	31'	7072.16'	132.29'	-143.87'	-91.59'	170.55'	212.48°	2.97°
25	7122.00'	23.30°	171.20°	29'	7098.89'	143.55'	-155.00'	-89.91'	179.19'	210.11°	3.15°
26	7154.00'	24.40°	170.10°	32'	7128.16'	156.47'	-167.77'	-87.80'	189.36'	207.63°	3.71°
27	7186.00'	25.50°	170.10°	32'	7157.17'	169.95'	-181.07'	-85.48'	200.23'	205.27°	3.44°
28	7218.00'	26.60°	171.50°	32'	7185.92'	183.99'	-194.94'	-83.24'	211.97'	203.12°	3.94°

Srv. No.	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (deg/100 ')
							+N / -S (ft)	+E / -W (ft)	Distance (ft)	Azimuth (deg)	
29	7249.00'	27.40°	171.60°	31'	7213.54'	198.05'	-208.86'	-81.17'	224.08'	201.24°	2.58°
30	7281.00'	28.20°	171.80°	32'	7241.85'	212.97'	-223.63'	-79.02'	237.18'	199.46°	2.52°
31	7313.00'	29.20°	171.60°	32'	7269.91'	228.33'	-238.83'	-76.80'	250.88'	197.83°	3.14°
32	7345.00'	30.20°	170.90°	32'	7297.71'	244.18'	-254.50'	-74.38'	265.15'	196.29°	3.31°
33	7377.00'	30.40°	170.50°	32'	7325.34'	260.30'	-270.43'	-71.77'	279.80'	194.86°	0.89°
34	7440.00'	30.50°	170.50°	63'	7379.65'	292.19'	-301.92'	-66.50'	309.16'	192.42°	0.16°
35	7503.00'	30.40°	171.10°	63'	7433.96'	324.09'	-333.44'	-61.40'	339.05'	190.43°	0.51°
36	7598.00'	30.00°	170.90°	95'	7516.07'	371.83'	-380.64'	-53.92'	384.44'	188.06°	0.43°
37	7693.00'	29.80°	169.00°	95'	7598.42'	419.10'	-427.26'	-45.66'	429.70'	186.10°	1.02°
38	7788.00'	28.90°	168.70°	95'	7681.23'	465.52'	-472.95'	-36.66'	474.37'	184.43°	0.96°
39	7820.00'	28.60°	168.60°	32'	7709.28'	480.86'	-488.04'	-33.63'	489.20'	183.94°	0.95°
40	7851.00'	29.20°	168.70°	31'	7736.42'	495.79'	-502.73'	-30.68'	503.66'	183.49°	1.94°
41	7914.00'	30.30°	168.60°	63'	7791.12'	526.95'	-533.38'	-24.53'	533.94'	182.63°	1.75°
42	7978.00'	30.20°	168.70°	64'	7846.40'	559.08'	-564.99'	-18.19'	565.28'	181.84°	0.17°
43	8041.00'	29.80°	168.60°	63'	7900.96'	590.47'	-595.87'	-11.99'	595.99'	181.15°	0.64°
44	8105.00'	30.10°	168.50°	64'	7956.42'	622.31'	-627.19'	-5.64'	627.21'	180.52°	0.48°
45	8168.00'	30.00°	168.30°	63'	8010.95'	653.74'	-658.09'	0.70'	658.09'	179.94°	0.22°
46	8262.00'	29.70°	167.70°	94'	8092.48'	700.33'	-703.85'	10.43'	703.93'	179.15°	0.45°
47	8358.00'	29.00°	168.00°	96'	8176.15'	747.16'	-749.85'	20.33'	750.13'	178.45°	0.75°
48	8450.00'	30.40°	167.60°	92'	8256.07'	792.53'	-794.40'	29.97'	794.97'	177.84°	1.54°
49	8542.00'	29.90°	167.90°	92'	8335.62'	838.52'	-839.56'	39.77'	840.50'	177.29°	0.57°
50	8605.00'	29.80°	167.80°	63'	8390.26'	869.73'	-870.22'	46.37'	871.45'	176.95°	0.18°
51	8674.00'	30.00°	167.60°	69'	8450.08'	903.96'	-903.82'	53.70'	905.42'	176.60°	0.32°
52	8737.00'	29.20°	167.10°	63'	8504.86'	934.91'	-934.18'	60.51'	936.14'	176.29°	1.33°
53	8829.00'	29.90°	168.80°	92'	8584.89'	980.07'	-978.55'	69.98'	981.05'	175.91°	1.19°
54	8892.00'	29.40°	168.30°	63'	8639.64'	1011.13'	-1009.10'	76.16'	1011.97'	175.68°	0.89°
55	8923.00'	29.20°	167.90°	31'	8666.68'	1026.24'	-1023.94'	79.29'	1027.01'	175.57°	0.90°
56	9016.00'	29.40°	169.10°	93'	8747.78'	1071.59'	-1068.54'	88.36'	1072.19'	175.27°	0.67°
57	9108.00'	28.70°	169.40°	92'	8828.20'	1116.14'	-1112.43'	96.69'	1116.62'	175.03°	0.78°
58	9170.00'	28.90°	170.20°	62'	8882.54'	1145.95'	-1141.83'	101.98'	1146.37'	174.90°	0.70°
59	9304.00'	29.70°	172.80°	134'	8999.40'	1211.48'	-1206.67'	111.66'	1211.83'	174.71°	1.12°
60	9368.00'	28.90°	173.20°	64'	9055.21'	1242.80'	-1237.76'	115.47'	1243.13'	174.67°	1.29°
61	9432.00'	29.90°	171.80°	64'	9110.97'	1274.21'	-1268.90'	119.58'	1274.53'	174.62°	1.90°
62	9493.00'	29.00°	172.10°	61'	9164.08'	1304.20'	-1298.60'	123.78'	1304.49'	174.56°	1.50°
63	9558.00'	29.00°	172.50°	65'	9220.93'	1335.70'	-1329.83'	128.00'	1335.97'	174.50°	0.30°
64	9621.00'	28.90°	174.60°	63'	9276.06'	1366.19'	-1360.12'	131.43'	1366.46'	174.48°	1.62°
65	9685.00'	29.00°	172.20°	64'	9332.07'	1397.17'	-1390.89'	134.99'	1397.43'	174.46°	1.82°
66	9717.00'	28.00°	171.80°	32'	9360.19'	1412.43'	-1406.01'	137.12'	1412.68'	174.43°	3.18°
67	9748.00'	28.70°	171.40°	31'	9387.47'	1427.15'	-1420.58'	139.27'	1427.39'	174.40°	2.34°
68	9780.00'	29.00°	173.00°	32'	9415.50'	1442.58'	-1435.87'	141.36'	1442.81'	174.38°	2.59°
69	9812.00'	28.80°	174.00°	32'	9443.51'	1458.05'	-1451.24'	143.11'	1458.28'	174.37°	1.63°
70	9844.00'	29.20°	174.00°	32'	9471.50'	1473.56'	-1466.67'	144.73'	1473.79'	174.36°	1.25°
71	9876.00'	28.90°	175.00°	32'	9499.48'	1489.09'	-1482.13'	146.22'	1489.33'	174.37°	1.78°
72	9939.00'	29.50°	175.30°	63'	9554.47'	1519.81'	-1512.76'	148.82'	1520.06'	174.38°	0.98°
73	9971.00'	28.80°	176.50°	32'	9582.42'	1535.38'	-1528.30'	149.94'	1535.64'	174.40°	2.85°
74	10035.00'	29.00°	175.90°	64'	9638.45'	1566.28'	-1559.17'	151.99'	1566.56'	174.43°	0.55°
75	10067.00'	28.90°	176.70°	32'	9666.45'	1581.74'	-1574.62'	152.99'	1582.04'	174.45°	1.25°
76	10098.00'	29.30°	177.20°	31'	9693.54'	1596.79'	-1589.68'	153.79'	1597.10'	174.47°	1.51°
77	10130.00'	28.90°	177.40°	32'	9721.50'	1612.32'	-1605.22'	154.52'	1612.64'	174.50°	1.29°
78	10193.00'	29.00°	178.50°	63'	9776.62'	1642.71'	-1635.70'	155.61'	1643.08'	174.57°	0.86°
79	10224.00'	29.00°	178.40°	31'	9803.74'	1657.68'	-1650.72'	156.02'	1658.08'	174.60°	0.16°

Srv. No.	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (deg/100 ')
							+N / -S (ft)	+E / -W (ft)	Distance (ft)	Azimuth (deg)	
80	10256.00'	28.70°	177.40°	32'	9831.77'	1673.07'	-1666.15'	156.58'	1673.49'	174.63°	1.78°
81	10288.00'	29.90°	176.50°	32'	9859.67'	1688.70'	-1681.79'	157.42'	1689.14'	174.65°	3.99°
82	10321.00'	30.20°	176.90°	33'	9888.24'	1705.20'	-1698.28'	158.37'	1705.65'	174.67°	1.09°
83	10353.00'	30.50°	177.00°	32'	9915.85'	1721.34'	-1714.43'	159.23'	1721.81'	174.69°	0.95°
84	10385.00'	30.30°	176.50°	32'	9943.45'	1737.50'	-1730.60'	160.15'	1737.99'	174.71°	1.01°
85	10416.00'	30.50°	178.90°	31'	9970.19'	1753.14'	-1746.27'	160.78'	1753.65'	174.74°	3.97°
86	10448.00'	30.50°	179.10°	32'	9997.76'	1769.30'	-1762.51'	161.06'	1769.85'	174.78°	0.32°
87	10480.00'	31.10°	178.00°	32'	10025.25'	1785.62'	-1778.89'	161.48'	1786.20'	174.81°	2.57°
88	10512.00'	31.40°	175.90°	32'	10052.61'	1802.18'	-1795.46'	162.36'	1802.79'	174.83°	3.53°
89	10544.00'	31.00°	174.80°	32'	10079.98'	1818.75'	-1811.98'	163.70'	1819.36'	174.84°	2.18°
90	10576.00'	30.30°	175.10°	32'	10107.51'	1835.06'	-1828.23'	165.14'	1835.68'	174.84°	2.24°
91	10608.00'	29.70°	174.30°	32'	10135.22'	1851.05'	-1844.16'	166.62'	1851.68'	174.84°	2.25°
92	10639.00'	29.50°	172.80°	31'	10162.18'	1866.36'	-1859.38'	168.34'	1866.98'	174.83°	2.48°
93	10671.00'	29.60°	172.30°	32'	10190.01'	1882.14'	-1875.03'	170.38'	1882.75'	174.81°	0.83°
94	10736.00'	29.00°	173.10°	65'	10246.70'	1913.95'	-1906.58'	174.43'	1914.54'	174.77°	1.10°
95	10768.00'	28.40°	172.30°	32'	10274.77'	1929.32'	-1921.82'	176.38'	1929.90'	174.76°	2.23°
96	10800.00'	30.20°	175.10°	32'	10302.67'	1944.97'	-1937.38'	178.09'	1945.55'	174.75°	7.07°
97	10832.00'	30.80°	175.10°	32'	10330.25'	1961.21'	-1953.57'	179.47'	1961.79'	174.75°	1.88°
98	10863.00'	31.10°	173.60°	31'	10356.83'	1977.14'	-1969.43'	181.04'	1977.73'	174.75°	2.67°
99	10895.00'	31.00°	171.40°	32'	10384.25'	1993.65'	-1985.79'	183.20'	1994.22'	174.73°	3.56°
100	10926.00'	31.80°	170.30°	31'	10410.71'	2009.78'	-2001.74'	185.77'	2010.34'	174.70°	3.17°
101	10990.00'	30.60°	169.80°	64'	10465.45'	2042.88'	-2034.39'	191.49'	2043.38'	174.62°	1.92°
102	11053.00'	29.90°	170.20°	63'	10519.87'	2074.56'	-2065.65'	197.01'	2075.02'	174.55°	1.16°
103	11085.00'	29.50°	171.00°	32'	10547.67'	2090.40'	-2081.29'	199.60'	2090.84'	174.52°	1.76°
104	11117.00'	29.30°	171.60°	32'	10575.55'	2106.10'	-2096.81'	201.97'	2106.52'	174.50°	1.11°
105	11148.00'	29.10°	171.90°	31'	10602.61'	2121.21'	-2111.78'	204.14'	2121.63'	174.48°	0.80°
106	11180.00'	29.30°	172.60°	32'	10630.54'	2136.82'	-2127.25'	206.25'	2137.23'	174.46°	1.24°
107	11211.00'	29.00°	174.00°	31'	10657.62'	2151.92'	-2142.25'	208.01'	2152.32'	174.45°	2.40°
108	11243.00'	29.50°	173.60°	32'	10685.53'	2167.56'	-2157.79'	209.70'	2167.96'	174.45°	1.68°
109	11308.00'	29.50°	174.30°	65'	10742.11'	2199.56'	-2189.62'	213.07'	2199.96'	174.44°	0.53°
110	11371.00'	30.10°	172.20°	63'	10796.78'	2230.87'	-2220.71'	216.76'	2231.26'	174.43°	1.91°
111	11403.00'	29.70°	172.00°	32'	10824.52'	2246.81'	-2236.51'	218.95'	2247.20'	174.41°	1.29°
112	11466.00'	29.40°	170.10°	63'	10879.33'	2277.86'	-2267.20'	223.78'	2278.21'	174.36°	1.56°
113	11530.00'	29.20°	170.30°	64'	10935.14'	2309.13'	-2298.06'	229.11'	2309.45'	174.31°	0.35°
114	11593.00'	28.80°	168.70°	63'	10990.24'	2339.60'	-2328.09'	234.67'	2339.89'	174.24°	1.39°
115	11656.00'	27.80°	169.50°	63'	11045.71'	2369.39'	-2357.42'	240.32'	2369.63'	174.18°	1.70°
116	11720.00'	28.00°	168.50°	64'	11102.27'	2399.25'	-2386.81'	246.04'	2399.46'	174.11°	0.80°
117	11752.00'	28.00°	169.00°	32'	11130.53'	2414.22'	-2401.55'	248.97'	2414.42'	174.08°	0.73°
118	11783.00'	28.80°	168.10°	31'	11157.79'	2428.91'	-2416.00'	251.90'	2429.09'	174.05°	2.93°
119	11816.00'	30.20°	167.40°	33'	11186.52'	2445.08'	-2431.88'	255.35'	2445.24'	174.01°	4.37°
120	11879.00'	30.00°	169.10°	63'	11241.02'	2476.55'	-2462.81'	261.78'	2476.68'	173.93°	1.39°
121	11943.00'	30.10°	170.10°	64'	11296.42'	2508.53'	-2494.33'	267.57'	2508.64'	173.88°	0.80°
122	11975.00'	30.00°	170.70°	32'	11324.12'	2524.53'	-2510.13'	270.24'	2524.63'	173.86°	0.99°
123	12038.00'	30.10°	170.50°	63'	11378.65'	2556.04'	-2541.25'	275.39'	2556.13'	173.82°	0.22°
124	12102.00'	29.40°	169.80°	64'	11434.21'	2587.75'	-2572.54'	280.82'	2587.82'	173.77°	1.22°
125	12165.00'	28.70°	170.50°	63'	11489.29'	2618.29'	-2602.68'	286.06'	2618.35'	173.73°	1.24°
126	12196.00'	29.20°	170.10°	31'	11516.41'	2633.28'	-2617.47'	288.59'	2633.33'	173.71°	1.73°
127	12229.00'	28.80°	170.60°	33'	11545.28'	2649.25'	-2633.24'	291.27'	2649.30'	173.69°	1.42°
128	12261.00'	29.20°	169.80°	32'	11573.27'	2664.74'	-2648.53'	293.91'	2664.79'	173.67°	1.74°
129	12293.00'	29.10°	169.40°	32'	11601.21'	2680.30'	-2663.86'	296.72'	2680.33'	173.64°	0.68°
130	12325.00'	28.80°	169.30°	32'	11629.21'	2695.75'	-2679.08'	299.59'	2695.78'	173.62°	0.95°

Srv. No.	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (deg/100 ')
							+N / -S (ft)	+E / -W (ft)	Distance (ft)	Azimuth (deg)	
131	12357.00'	28.50°	169.40°	32'	11657.30'	2711.06'	-2694.16'	302.42'	2711.08'	173.60°	0.95°
132	12421.00'	27.90°	169.30°	64'	11713.70'	2741.22'	-2723.88'	308.01'	2741.24'	173.55°	0.94°
133	12520.00'	25.90°	170.10°	99'	11801.98'	2785.92'	-2767.95'	316.03'	2785.93'	173.49°	2.05°
134	12560.00'	25.90°	170.10°	40'	11837.96'	2803.37'	-2785.16'	319.03'	2803.37'	173.47°	0.00°