Schlumberger

Noble Energy SHL-6E-HS Gyro+MWD 0' MD to 11284' MD Survey Report

(Def Survey)

Report Date:	April 11, 2012 - 09:28 AM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Noble Energy	**Vertical Section Azimuth:**	112.518 ° (Grid North)
Field:	WV Marshall County (NAD 27)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	CNX/Noble Energy SHL-6 Pad / SHL-6E-HS	**TVD Reference Datum:**	KB
Well:	SHL-6E-HS	**TVD Reference Elevation:**	853.920 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	831.020 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	-8.741 °
Survey Name:	Noble Energy SHL-6E-HS Gyro+MWD 0' MD to 11284' MD	**Total Field Strength:**	52840.990 nT
Survey Date:	February 15, 2012	**Magnetic Dip Angle:**	67.516 °
Tort / AHD / DDI / ERD Ratio:	203.493 ° / 6909.518 ft / 6.406 / 1.108	**Declination Date:**	April 17, 2012
Coordinate Reference System:	NAD27 West Virginia State Plane, Northern Zone, US Feet	**Magnetic Declination Model:**	BGGM 2011
Location Lat / Long:	N 39° 57' 22.22697", W 80° 34' 31.86095"	**North Reference:**	Grid North
Location Grid N/E Y/X:	N 532183.417 ftUS, E 1698499.552 ftUS	**Grid Convergence Used:**	-0.686 °
CRS Grid Convergence Angle:	-0.68593564 °	**Total Corr Mag North->Grid North:**	-8.055 °
Grid Scale Factor:	0.99995731	**Local Coord Referencad To:**	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL	0.00	0.00	0.00	0.00	-853.92	0.00	0.00	0.00	N/A	532183.42	1698499.55	N 39 57 22.23	W 80 34 31.86
	115.00	0.53	171.04	115.00	-738.92	0.28	-0.53	0.08	0.46	532182.89	1698499.63	N 39 57 22.22	W 80 34 31.86
	215.00	0.60	181.50	214.99	-638.93	0.71	-1.51	0.14	0.12	532181.91	1698499.69	N 39 57 22.21	W 80 34 31.86
	315.00	0.37	256.27	314.99	-538.93	0.63	-2.11	-0.19	0.62	532181.31	1698499.37	N 39 57 22.21	W 80 34 31.86
	415.00	0.23	254.43	414.99	-438.93	0.22	-2.24	-0.69	0.14	532181.18	1698498.88	N 39 57 22.20	W 80 34 31.87
	515.00	0.12	283.62	514.99	-338.93	-0.05	-2.27	-0.99	0.14	532181.15	1698498.56	N 39 57 22.20	W 80 34 31.87
	615.00	0.02	308.11	614.99	-238.93	-0.17	-2.23	-1.10	0.10	532181.19	1698498.45	N 39 57 22.20	W 80 34 31.87
	715.00	0.49	24.49	714.99	-138.93	-0.17	-1.83	-0.94	0.49	532181.59	1698498.61	N 39 57 22.21	W 80 34 31.87
	815.00	0.68	34.03	814.98	-38.94	-0.03	-0.95	-0.43	0.21	532182.47	1698499.12	N 39 57 22.22	W 80 34 31.87
	915.00	0.68	31.59	914.98	61.06	0.18	0.05	0.21	0.03	532183.47	1698499.76	N 39 57 22.23	W 80 34 31.86
	1015.00	1.33	13.42	1014.96	161.04	0.09	1.68	0.79	0.72	532185.10	1698500.34	N 39 57 22.24	W 80 34 31.85
	1115.00	1.35	11.11	1114.93	261.01	-0.33	3.97	1.29	0.06	532187.38	1698500.84	N 39 57 22.27	W 80 34 31.85
	1215.00	1.54	2.02	1214.90	360.98	-1.03	6.47	1.56	0.30	532189.88	1698501.11	N 39 57 22.29	W 80 34 31.84
	1315.00	1.25	352.61	1314.87	460.95	-2.05	8.89	1.47	0.37	532192.31	1698501.02	N 39 57 22.31	W 80 34 31.84
	1415.00	1.25	352.70	1414.85	560.93	-3.13	11.05	1.19	0.00	532194.47	1698500.74	N 39 57 22.34	W 80 34 31.85
	1515.00	1.24	350.26	1514.82	660.90	-4.25	13.20	0.87	0.05	532196.62	1698500.42	N 39 57 22.36	W 80 34 31.85
	1615.00	1.21	353.80	1614.80	760.88	-5.34	15.32	0.57	0.08	532198.73	1698500.12	N 39 57 22.38	W 80 34 31.86
	1715.00	1.05	357.65	1714.78	860.86	-6.23	17.28	0.42	0.18	532200.70	1698499.97	N 39 57 22.40	W 80 34 31.86
	1815.00	1.08	342.02	1814.76	960.84	-7.23	19.10	0.09	0.29	532202.51	1698499.64	N 39 57 22.42	W 80 34 31.86
	1915.00	1.05	334.57	1914.75	1060.83	-8.52	20.82	-0.59	0.14	532204.24	1698498.96	N 39 57 22.43	W 80 34 31.87
	2015.00	0.83	342.84	2014.73	1160.81	-9.66	22.34	-1.20	0.26	532205.75	1698498.35	N 39 57 22.45	W 80 34 31.88
	2115.00	0.90	342.76	2114.72	1260.80	-10.63	23.78	-1.65	0.07	532207.20	1698497.91	N 39 57 22.46	W 80 34 31.89
	2315.00	1.01	309.56	2314.70	1460.78	-13.32	26.40	-3.47	0.28	532209.82	1698496.08	N 39 57 22.49	W 80 34 31.91
	2415.00	0.78	297.13	2414.68	1560.76	-14.84	27.28	-4.76	0.30	532210.69	1698494.80	N 39 57 22.50	W 80 34 31.93
	2515.00	0.82	297.44	2514.67	1660.75	-16.23	27.92	-6.00	0.04	532211.33	1698493.56	N 39 57 22.50	W 80 34 31.94
Final Gyro	2815.00	0.76	317.06	2614.88	1760.74	-17.55	28.73	-7.08	0.28	532212.15	1698492.47	N 39 57 22.51	W 80 34 31.98
	2694.00	0.84	313.11	2693.66	1839.74	-18.57	29.51	-7.86	0.12	532212.93	1698491.69	N 39 57 22.52	W 80 34 31.97
	2741.00	1.31	12.62	2740.65	1886.73	-18.98	30.27	-8.00	2.43	532213.69	1698491.56	N 39 57 22.53	W 80 34 31.97
	2788.00	4.41	37.24	2787.59	1933.67	-18.61	32.23	-6.79	6.95	532215.65	1698492.77	N 39 57 22.54	W 80 34 31.95
	2835.00	7.72	40.83	2834.32	1980.40	-17.16	36.06	-3.63	7.09	532219.48	1698495.92	N 39 57 22.58	W 80 34 31.91
	2883.00	10.98	46.91	2881.67	2027.75	-14.26	41.63	1.82	7.09	532225.04	1698501.37	N 39 57 22.64	W 80 34 31.84
	2930.00	12.69	52.39	2927.67	2073.75	-9.84	47.83	9.18	4.35	532231.25	1698508.73	N 39 57 22.70	W 80 34 31.75
	2978.00	14.77	56.59	2974.30	2120.38	-3.79	54.42	18.46	4.80	532237.84	1698518.02	N 39 57 22.77	W 80 34 31.63
	3025.00	17.67	55.34	3019.43	2165.51	3.44	61.78	29.34	6.21	532245.19	1698528.89	N 39 57 22.84	W 80 34 31.49
	3072.00	20.08	52.34	3063.90	2209.98	11.32	70.77	41.59	5.53	532254.18	1698541.14	N 39 57 22.93	W 80 34 31.34
	3119.00	22.63	55.56	3107.67	2253.75	20.26	80.81	55.44	5.97	532264.23	1698554.99	N 39 57 23.03	W 80 34 31.16
	3166.00	25.57	55.95	3150.57	2296.65	30.78	91.61	71.30	6.26	532275.02	1698570.85	N 39 57 23.14	W 80 34 30.96
	3214.00	27.69	56.71	3193.47	2339.55	42.76	103.53	89.21	4.47	532286.94	1698588.76	N 39 57 23.26	W 80 34 30.73
	3261.00	30.33	56.76	3234.57	2380.65	55.58	116.03	108.27	5.62	532299.44	1698607.82	N 39 57 23.39	W 80 34 30.49
	3308.00	33.94	58.35	3274.36	2420.44	69.56	129.81	129.12	7.69	532313.22	1698628.67	N 39 57 23.53	W 80 34 30.22
	3355.00	36.70	55.14	3312.71	2458.79	84.44	145.11	151.57	6.06	532328.52	1698651.12	N 39 57 23.68	W 80 34 29.94
	3403.00	39.37	54.10	3350.51	2496.59	100.15	162.24	175.68	5.72	532345.65	1698675.22	N 39 57 23.85	W 80 34 29.63
	3450.00	39.02	53.81	3388.94	2533.02	115.84	179.72	199.69	0.84	532363.13	1698699.24	N 39 57 24.03	W 80 34 29.32
	3545.00	40.29	54.52	3460.08	2606.16	147.46	215.20	248.85	1.42	532398.61	1698748.39	N 39 57 24.38	W 80 34 28.70
	3641.00	40.51	53.05	3533.19	2679.27	179.75	251.96	299.04	1.02	532435.37	1698798.58	N 39 57 24.75	W 80 34 28.06
	3735.00	41.21	53.73	3604.28	2750.36	211.30	288.64	348.40	0.88	532472.04	1698847.94	N 39 57 25.12	W 80 34 27.43
	3830.00	41.52	55.28	3675.58	2821.66	244.56	325.08	399.52	1.13	532508.49	1698899.05	N 39 57 25.49	W 80 34 26.78
	3923.00	40.02	54.23	3746.01	2892.09	276.96	360.12	449.12	1.77	532543.52	1698948.65	N 39 57 25.84	W 80 34 26.15
	4015.00	39.55	54.76	3816.71	2962.79	308.14	394.31	497.04	0.63	532577.71	1698996.57	N 39 57 26.18	W 80 34 25.54
	4107.00	39.57	55.27	3887.64	3033.72	339.62	427.91	545.05	0.35	532611.31	1699044.58	N 39 57 26.52	W 80 34 24.93
	4200.00	40.37	55.02	3958.91	3104.99	371.82	462.05	594.07	0.86	532645.45	1699093.60	N 39 57 26.86	W 80 34 24.30
	4292.00	42.57	53.80	4027.84	3173.92	404.00	497.52	643.60	2.55	532680.91	1699143.13	N 39 57 27.22	W 80 34 23.67
	4384.00	43.67	55.21	4095.00	3241.08	437.31	534.02	694.80	1.59	532717.41	1699194.32	N 39 57 27.59	W 80 34 23.02
	4476.00	41.04	54.44	4162.98	3309.06	470.45	569.71	745.47	2.91	532753.11	1699244.99	N 39 57 27.94	W 80 34 22.38
	4567.00	39.86	54.82	4232.23	3378.31	501.83	603.89	793.61	1.32	532787.28	1699293.12	N 39 57 28.29	W 80 34 21.76
	4660.00	42.07	54.84	4302.45	3448.53	534.42	639.01	843.44	2.38	532822.40	1699342.96	N 39 57 28.64	W 80 34 21.13
	4751.00	43.66	55.01	4369.14	3515.22	567.59	674.58	894.11	1.75	532857.97	1699393.62	N 39 57 29.00	W 80 34 20.48
	4843.00	41.96	54.77	4436.63	3582.71	601.07	710.53	945.25	1.88	532893.92	1699444.76	N 39 57 29.36	W 80 34 19.83
	4936.00	41.02	54.44	4506.30	3652.38	633.80	746.22	995.47	1.04	532929.80	1699494.98	N 39 57 29.72	W 80 34 19.19
	5030.00	40.95	53.73	4577.26	3723.34	666.07	782.38	1045.40	0.50	532965.76	1699544.91	N 39 57 30.08	W 80 34 18.56
	5122.00	41.75	54.70	4646.32	3792.40	698.01	817.92	1094.71	1.11	533001.30	1699594.21	N 39 57 30.44	W 80 34 17.93
	5214.00	40.76	53.45	4715.48	3861.58	729.76	853.51	1143.84	1.40	533036.88	1699643.34	N 39 57 30.80	W 80 34 17.30
	5305.00	40.01	53.49	4784.80	3930.88	760.09	888.60	1191.22	0.82	533071.98	1699690.71	N 39 57 31.15	W 80 34 16.70
	5397.00	39.09	54.98	4855.74	4001.82	790.87	922.84	1238.74	1.44	533106.22	1699738.24	N 39 57 31.49	W 80 34 16.10
	5492.00	39.15	54.05	4929.44	4075.52	822.63	957.84	1287.55	0.62	533141.01	1699787.04	N 39 57 31.84	W 80 34 15.48
	5587.00	39.25	54.00	5003.06	4149.14	854.01	992.91	1336.14	0.11	533176.28	1699835.63	N 39 57 32.20	W 80 34 14.86
	5680.00	38.49	55.32	5075.47	4221.55	885.06	1026.67	1383.74	1.21	533210.04	1699883.23	N 39 57 32.54	W 80 34 14.25
	5776.00	39.70	55.17	5149.97	4296.05	917.78	1061.18	1433.48	1.26	533244.55	1699932.97	N 39 57 32.88	W 80 34 13.62
	5870.00	42.19	54.07	5220.97	4367.05	950.51	1096.86	1483.69	2.76	533280.22	1699983.18	N 39 57 33.24	W 80 34 12.98
	5965.00	43.49	53.75	5290.63	4436.71	984.15	1134.91	1535.89	1.39	533318.27	1700035.37	N 39 57 33.62	W 80 34 12.31
	6059.00	43.90	53.83	5358.59	4504.67	1017.88	1173.27	1588.28	0.44	533356.63	1700087.76	N 39 57 34.01	W 80 34 11.65
	6153.00	42.50	54.58	5427.12	4573.20	1051.65	1210.91	1640.47	1.59	533394.27	1700139.95	N 39 57 34.39	W 80 34 10.98
	6248.00	41.54	54.40	5497.69	4643.77	1085.33	1247.84	1692.23	1.02	533431.20	1700191.71	N 39 57 34.76	W 80 34 10.32

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	6346.00	41.64	52.97	5570.99	4717.07	1118.99	1288.37	1744.65	0.97	533469.73	1700244.12	N 39 57 35.14	W 80 34 9.66
	6440.00	40.65	54.93	5641.78	4787.66	1151.23	1322.77	1794.64	1.73	533506.13	1700294.11	N 39 57 35.51	W 80 34 9.02
	6487.00	42.16	64.68	5677.07	4823.15	1170.04	1338.33	1821.46	14.08	533521.68	1700320.93	N 39 57 35.67	W 80 34 8.68
	6535.00	44.40	73.95	5712.04	4858.12	1194.01	1349.87	1852.19	14.03	533533.23	1700351.66	N 39 57 35.78	W 80 34 8.28
	6582.00	44.61	79.83	5745.58	4891.66	1220.77	1357.34	1884.25	8.78	533540.69	1700383.72	N 39 57 35.86	W 80 34 7.87
	6630.00	44.28	85.56	5779.86	4925.94	1249.90	1361.61	1917.56	8.39	533544.97	1700417.03	N 39 57 35.91	W 80 34 7.45
	6677.00	43.16	90.32	5813.84	4959.92	1279.42	1362.79	1950.00	7.39	533546.15	1700449.47	N 39 57 35.92	W 80 34 7.03
	6724.00	43.77	94.70	5847.96	4994.04	1309.79	1361.37	1982.29	6.54	533544.73	1700481.75	N 39 57 35.91	W 80 34 6.62
	6771.00	45.03	99.02	5881.54	5027.62	1341.44	1357.43	2014.92	6.97	533540.79	1700514.38	N 39 57 35.88	W 80 34 6.20
	6819.00	46.69	103.38	5914.98	5061.06	1375.20	1350.72	2048.69	7.38	533534.08	1700548.15	N 39 57 35.82	W 80 34 5.76
	6866.00	48.78	107.10	5946.59	5092.67	1409.69	1341.57	2082.23	7.35	533524.92	1700581.69	N 39 57 35.73	W 80 34 5.33
	6916.00	50.44	110.07	5979.00	5125.08	1447.68	1329.42	2118.31	5.61	533512.78	1700617.77	N 39 57 35.61	W 80 34 4.86
	6960.00	52.09	112.34	6006.53	5152.61	1481.99	1317.00	2150.30	5.50	533500.36	1700649.76	N 39 57 35.49	W 80 34 4.45
	7008.00	53.15	114.67	6035.67	5181.75	1520.12	1301.79	2185.27	4.44	533485.14	1700684.73	N 39 57 35.35	W 80 34 4.00
	7055.00	56.97	118.53	6062.59	5208.67	1558.53	1284.52	2219.69	10.55	533467.88	1700719.15	N 39 57 35.18	W 80 34 3.56
	7104.00	61.04	121.83	6087.83	5233.91	1600.13	1263.39	2255.97	10.11	533446.75	1700755.43	N 39 57 34.98	W 80 34 3.09
	7151.00	64.20	124.80	6109.44	5255.52	1641.11	1240.46	2290.83	8.76	533423.82	1700790.28	N 39 57 34.76	W 80 34 2.64
	7197.00	68.17	126.21	6128.01	5274.09	1682.11	1216.02	2325.08	9.07	533399.38	1700824.53	N 39 57 34.52	W 80 34 2.19
	7244.00	72.34	126.78	6143.89	5289.97	1725.03	1189.71	2360.63	8.95	533373.07	1700860.08	N 39 57 34.26	W 80 34 1.73
	7292.00	75.76	129.99	6157.08	5303.16	1769.40	1161.05	2396.79	9.60	533344.42	1700896.23	N 39 57 33.98	W 80 34 1.26
	7339.00	77.85	133.16	6167.81	5313.89	1812.65	1130.69	2431.01	7.93	533314.05	1700930.45	N 39 57 33.69	W 80 34 0.82
	7387.00	80.05	136.04	6177.01	5323.09	1856.29	1097.61	2464.55	7.46	533280.98	1700963.99	N 39 57 33.36	W 80 34 0.38
	7434.00	82.28	138.93	6184.23	5330.31	1898.38	1063.38	2495.92	7.71	533246.75	1700995.36	N 39 57 33.03	W 80 33 59.97
	7481.00	85.81	140.88	6189.11	5335.19	1939.88	1027.63	2526.02	8.57	533211.00	1701025.46	N 39 57 32.68	W 80 33 59.58
	7528.00	89.07	141.76	6191.20	5337.28	1981.02	990.98	2555.36	7.18	533174.35	1701054.80	N 39 57 32.32	W 80 33 59.20
	7622.00	89.90	140.50	6192.05	5338.13	2063.53	917.80	2614.35	1.61	533101.18	1701113.78	N 39 57 31.60	W 80 33 58.43
	7713.00	89.90	140.50	6192.21	5338.29	2143.90	847.58	2672.23	0.00	533030.96	1701171.66	N 39 57 30.92	W 80 33 57.68
	7809.00	90.14	140.27	6192.18	5338.26	2228.76	773.63	2733.44	0.35	532957.01	1701232.87	N 39 57 30.19	W 80 33 56.88
	7905.00	89.62	140.89	6192.38	5338.46	2313.48	699.47	2794.40	0.84	532882.85	1701293.83	N 39 57 29.47	W 80 33 56.09
	8001.00	89.69	141.10	6192.95	5339.03	2397.86	624.87	2854.82	0.23	532808.26	1701354.25	N 39 57 28.74	W 80 33 55.30
	8095.00	90.07	141.31	6193.15	5339.23	2480.32	551.61	2913.72	0.46	532735.00	1701413.14	N 39 57 28.02	W 80 33 54.53
	8189.00	90.45	142.16	6192.72	5338.80	2562.36	477.80	2971.93	0.99	532661.20	1701471.35	N 39 57 27.30	W 80 33 53.77
	8283.00	90.34	142.82	6192.08	5338.16	2643.79	403.24	3029.16	0.71	532586.64	1701528.58	N 39 57 26.57	W 80 33 53.03
	8378.00	90.17	143.92	6191.65	5337.73	2725.34	327.00	3085.84	1.17	532510.41	1701585.26	N 39 57 25.82	W 80 33 52.29
	8472.00	90.31	143.68	6191.26	5337.34	2805.68	251.15	3141.36	0.30	532434.56	1701840.77	N 39 57 25.08	W 80 33 51.56
	8567.00	90.31	143.92	6190.75	5336.83	2886.86	174.49	3197.47	0.25	532357.90	1701696.88	N 39 57 24.33	W 80 33 50.83
	8661.00	89.52	144.86	6190.89	5336.97	2966.69	98.07	3252.20	1.31	532281.48	1701751.61	N 39 57 23.58	W 80 33 50.12
	8756.00	88.28	145.05	6192.71	5338.79	3046.85	20.31	3308.74	1.32	532203.73	1701806.14	N 39 57 22.82	W 80 33 49.40
	8851.00	88.86	144.86	6195.08	5341.16	3127.01	-57.44	3361.27	0.64	532125.98	1701860.67	N 39 57 22.05	W 80 33 48.69
	8945.00	88.90	145.00	6196.92	5343.00	3206.35	-134.36	3415.27	0.15	532049.06	1701914.67	N 39 57 21.30	W 80 33 47.99
	9040.00	89.14	145.65	6198.54	5344.62	3286.18	-212.48	3469.31	0.73	531970.95	1701968.71	N 39 57 20.54	W 80 33 47.28
	9135.00	88.56	145.13	6200.45	5346.53	3365.95	-290.65	3523.26	0.82	531892.78	1702022.65	N 39 57 19.77	W 80 33 46.58
	9229.00	88.66	144.67	6202.73	5348.81	3445.31	-367.53	3577.29	0.50	531815.90	1702076.69	N 39 57 19.02	W 80 33 45.87
	9324.00	88.59	144.26	6205.01	5351.09	3525.90	-444.82	3632.49	0.44	531738.62	1702131.88	N 39 57 18.26	W 80 33 45.15
	9419.00	88.66	144.33	6207.29	5353.37	3606.64	-521.94	3687.92	0.10	531661.50	1702187.31	N 39 57 17.50	W 80 33 44.43
	9515.00	89.04	143.46	6209.22	5355.30	3688.58	-599.48	3744.48	0.99	531583.96	1702243.86	N 39 57 16.74	W 80 33 43.69
	9610.00	89.07	143.00	6210.78	5356.86	3770.25	-675.57	3801.34	0.49	531507.87	1702300.72	N 39 57 16.00	W 80 33 42.95
	9704.00	89.11	142.49	6212.27	5358.35	3851.45	-750.36	3858.23	0.54	531433.07	1702357.61	N 39 57 15.27	W 80 33 42.21
	9799.00	89.08	141.91	6213.78	5359.86	3933.98	-825.44	3916.45	0.61	531358.02	1702415.83	N 39 57 14.53	W 80 33 41.45
	9894.00	89.07	140.77	6215.31	5361.39	4017.20	-899.61	3975.79	1.20	531283.65	1702475.16	N 39 57 13.80	W 80 33 40.67
	9988.00	89.00	140.86	6216.89	5362.97	4099.95	-972.46	4035.17	0.12	531211.00	1702534.54	N 39 57 13.09	W 80 33 39.90
	10083.00	89.17	141.91	6218.41	5364.49	4183.14	-1046.68	4094.45	1.12	531136.79	1702593.82	N 39 57 12.36	W 80 33 39.13
	10178.00	89.28	143.15	6219.69	5365.77	4265.39	-1122.07	4152.24	1.31	531061.40	1702651.60	N 39 57 11.63	W 80 33 38.38
	10272.00	89.00	143.85	6221.11	5367.19	4345.97	-1197.62	4208.14	0.80	530985.85	1702707.51	N 39 57 10.89	W 80 33 37.65
	10368.00	88.18	144.04	6223.47	5369.55	4427.86	-1275.21	4264.63	0.88	530908.27	1702763.99	N 39 57 10.13	W 80 33 36.91
	10463.00	88.29	143.57	6226.39	5372.47	4509.01	-1351.84	4320.70	0.51	530831.64	1702820.06	N 39 57 9.38	W 80 33 36.18
	10558.00	88.77	143.13	6228.83	5374.91	4590.55	-1428.03	4377.39	0.69	530755.45	1702876.75	N 39 57 8.63	W 80 33 35.44
	10653.00	89.56	143.68	6230.21	5376.29	4672.07	-1504.29	4434.02	1.01	530679.19	1702933.37	N 39 57 7.88	W 80 33 34.70
	10747.00	89.91	143.68	6230.65	5376.73	4752.51	-1580.03	4489.69	0.37	530603.46	1702989.05	N 39 57 7.14	W 80 33 33.97
	10842.00	89.46	143.54	6231.17	5377.25	4833.88	-1656.50	4546.06	0.50	530526.99	1703045.40	N 39 57 6.39	W 80 33 33.24
	10937.00	89.49	142.11	6232.04	5378.12	4915.87	-1732.19	4603.46	1.51	530451.30	1703102.80	N 39 57 5.65	W 80 33 32.49
	11031.00	89.63	142.70	6232.76	5378.84	4997.37	-1806.67	4660.80	0.65	530376.83	1703160.14	N 39 57 4.92	W 80 33 31.74
	11124.00	89.53	142.02	6233.45	5379.53	5078.03	-1880.31	4717.59	0.74	530303.19	1703216.93	N 39 57 4.20	W 80 33 31.00
Final Survey 11Apr12	11202.00	89.53	141.42	6234.09	5380.17	5146.12	-1941.54	4765.91	0.77	530241.96	1703265.25	N 39 57 3.60	W 80 33 30.37
Projection to Bit	11284.00	89.53	141.42	6234.76	5380.84	5217.90	-2005.64	4817.05	0.00	530177.87	1703316.38	N 39 57 2.97	W 80 33 29.71

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Survey Tool Type	Borehole / Survey
	0.000	22.900	Act Stns	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy SHL-6E-HS Gyro+MWD 0' MD to 11284' MD
	22.900	22.900	Act Stns	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy SHL-6E-HS Gyro+MWD 0' MD to 11284' MD
	22.900	2615.000	Act Stns	SLB_NSG+MSHOT	Original Borehole / Noble Energy SHL-6E-HS Gyro+MWD 0' MD to 11284' MD
	2615.000	7622.000	Act Stns	SLB_MWD-STD	Original Borehole / Noble Energy SHL-6E-HS Gyro+MWD 0' MD to 11284' MD
	7622.000	11202.000	Act Stns	SLB_MWD+DMAG	Original Borehole / Noble Energy SHL-6E-HS Gyro+MWD 0' MD to 11284' MD
	11202.000	11284.000	Act Stns	SLB_BLIND+TREND	Original Borehole / Noble Energy SHL-6E-HS Gyro+MWD 0' MD to 11284' MD

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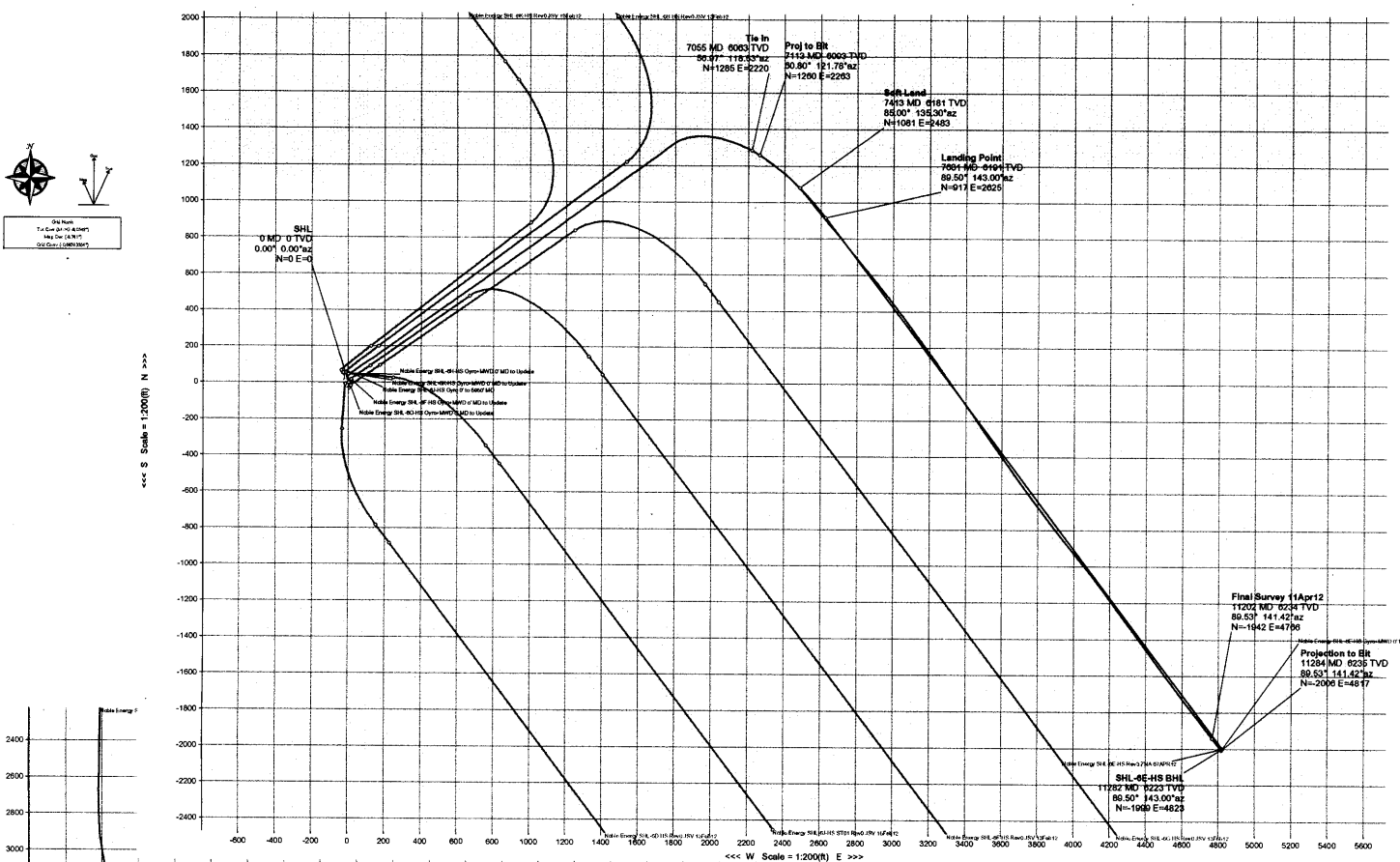
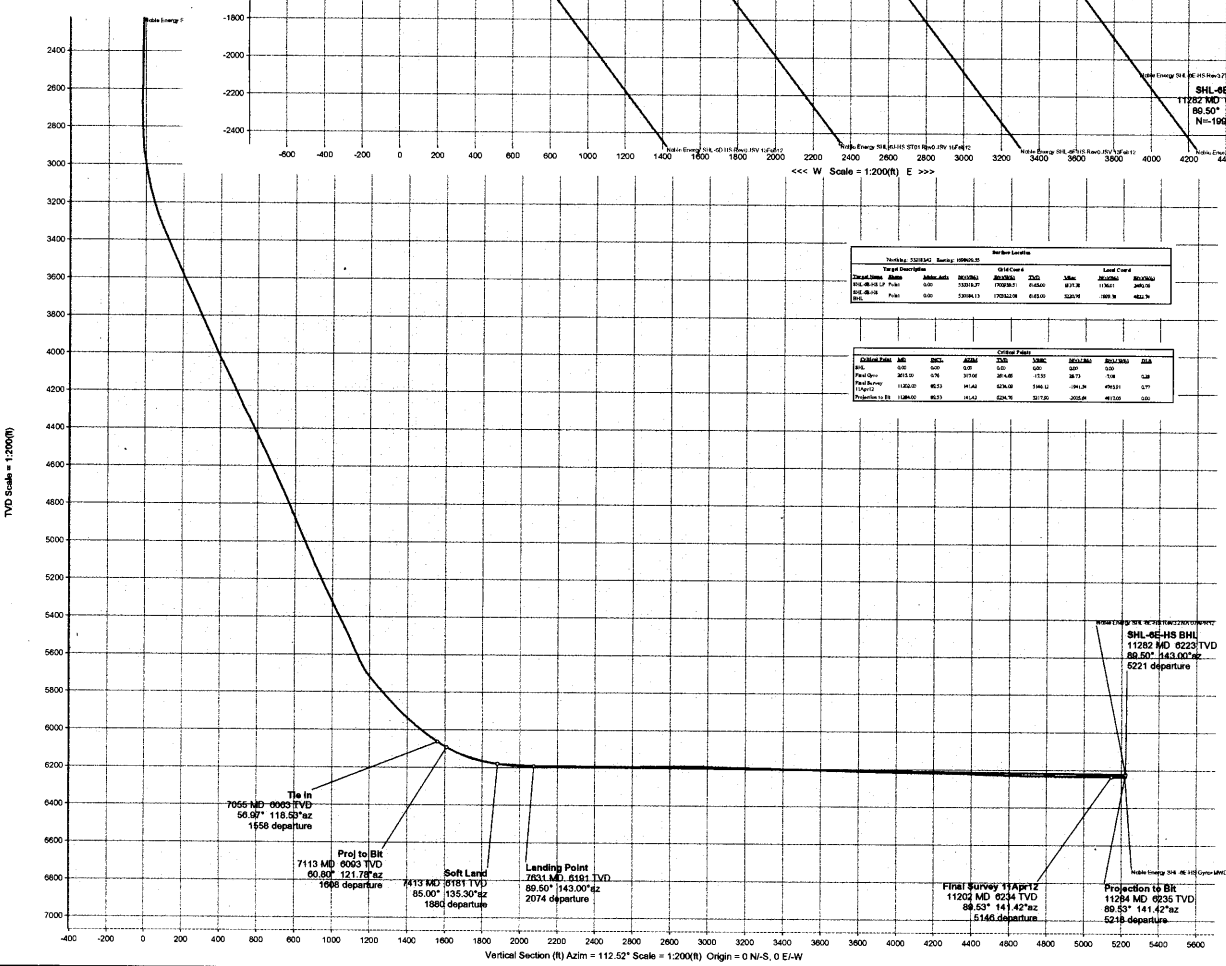
PATHFINDER
A Schlumberger Company

WELL	FIELD	STRUCTURE
SHL-6E-HS	WV Marshall County (NAD 27)	Nabors M59

Magnetic Parameters						Surface Location						Miscellaneous			
Model:	BGGM 2011	Dip:	67.516°	Date:	April 17, 2012	Lat:	N 39 57 22.227	Northing:	532183.42 ftUS	Grid Conv:	-0.68592564°	Slot:	SHL-6E-HS	TVD Ref:	KB(853.93ft above MSL)
		Mag Dec:	-8.741°	FS:	52841.0nT	Lon:	W 80 34 31.861	Easting:	1698499.55 ftUS	Scale Fact:	0.99995731	Plan:	MWD Surveys	Srvy Date:	February 15, 2012

NAD27 West Virginia State Plane, Northern Zone, US Feet





Surface Location

Northing: 532183.42 Easting: 1698499.55

Target Name	Shape	Inclin. Azim.	Grid Coord NORTHING	Grid Coord EASTING	TVD	Local Coord NORTHING	Local Coord EASTING
SHL-6E-HS LP	Point	0.00	532318.27	1700938.31	6181.00	1081.30	2483.16
SHL-6E-HS BHL	Point	0.00	530184.13	1703522.08	6181.00	-1009.78	4822.76

Critical Points

Critical Point	MD	INCL.	AZIM	TVD	VSEC	NOTH/SOU	EAST/WES	DLS
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tie In	7055.00	50.97	118.53	5841.00	1558.12	-1285.30	2220.00	0.00
Proj to Bit	7112.00	50.80	121.78	5841.00	1608.12	-1260.00	2263.00	5.00
Soft Land	7413.00	85.00	135.30	6181.00	1880.12	-1081.30	2483.16	9.00
Landing Point	7931.00	89.50	143.00	6191.00	2074.12	-917.00	2625.00	1.50
Final Survey 11Apr12	11202.00	89.53	141.42	6234.00	5146.12	-1042.00	4706.00	0.79
Projection to Bit	11284.00	89.53	141.42	6234.70	5217.95	-1005.69	4817.00	0.00

Legend

- Noble Energy SHL-6E-HS Gyro-MWD 0' MD to 11284' MD
- Noble Energy SHL-6E-HS Rev0.JSV 15Feb12
- Noble Energy SHL-6D-HS Gyro-MWD 0' MD to Update
- Noble Energy SHL-6D-HS Gyro-0' to 5450' MD
- Noble Energy SHL-6F-HS Rev0.JSV 15Feb12
- Noble Energy SHL-6E-HS Rev2.JSA 01APR12
- Noble Energy SHL-6C-HS Rev0.JSV 15Feb12
- Noble Energy SHL-6H-HS Rev0.JSV 15Feb12
- Noble Energy SHL-6K-HS Gyro-MWD 0' MD to Update
- Noble Energy SHL-6G-HS Rev0.JSV 15Feb12
- Noble Energy SHL-6I-HS Gyro-MWD 0' MD to Update
- Noble Energy SHL-6F-HS Gyro-MWD 0' MD to Update
- Noble Energy SHL-6J-HS ST01 Rev0.JSV 15Feb12

Drawn By:	J.Venners
Date Created:	April 11, 2012 09:29:10 AM
Checked By:	
Checked Date:	
Approved By:	
Approved Date:	