

103-02635



# HG Energy L.S. Hoyt 401 #1H Surveys Off to 13826ft MD Survey Geodetic Report (Def Survey)

Report Date: August 29, 2012 - 04:45 PM  
 Client: HG  
 Field: WV Wetzel County (NAD 27)  
 Structure / Slot: HG Energy L.S. Hoyt 401 #1H / L.S. Hoyt 401 #1H  
 Well: L.S. Hoyt 401 #1H  
 Borehole: Original Borehole  
 UWI / ASP#: Unknown / Unknown  
 Survey Name: HG Energy L.S. Hoyt 401 #1H Surveys Off to 13826ft MD  
 Survey Date: June 10, 2012  
 Tool / AHM / DOI / ERD Ratio: 261.692 / 0.021, 500 R / 0.528 / 0.932  
 Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet  
 Location Lat / Long: N 30° 36' 0.34054", W 80° 38' 35.37710"  
 Location Grid W/E Y/L: N 403530.933 RUS, E 1677897.958 RUS  
 CRS Grid Convergence Angle: -0.7291 °  
 Grid Scale Factor: 0.99994083

Survey / DLS Computations: Minimum Curvature / Lubinski  
 Vertical Section Azimuth: 294.650 ° (Grid North)  
 Vertical Section Origin: 0.002 R, 0.223 R  
 TVD Reference Datum: KB  
 TVD Reference Elevation: 1417.000 R above MSL  
 Seabed / Ground Elevation: 1400.000 R above MSL  
 Magnetic Declination: -6.627 °  
 Total Gravity Field Strength: 1000.014 mgn (9.8 based)  
 Total Magnetic Field Strength: 52652.055 nT  
 Magnetic Dip Angle: 67.238 °  
 Declination Date: June 10, 2012  
 Magnetic Declination Model: BGM04 2011  
 North Reference: Grid North  
 Grid Convergence Used: -0.7291 °  
 Total Cor Mag North->Grid North: -7.3974 °  
 Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Actm Grid (ft)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	BR (ft/100ft)	TR (ft/100ft)	Northing (MUS)	Easting (MUS)	Latitude (N/S ° ' ")	Longitude (W/E ° ' ")
	0.00	0.00	0.00	0.00	-1417.00	0.00	0.00	0.00	N/A	N/A	N/A	403530.93	1677897.95	N 30 36 0.34	W 80 38 35.37
	103.00	0.45	91.80	105.00	-1312.00	-0.37	0.05	0.03	0.43	0.43	0.00	403530.92	1677898.37	N 30 36 0.34	W 80 38 35.37
	205.00	0.19	146.60	205.00	-1212.00	-0.05	-0.10	1.12	0.37	-0.26	55.00	403530.77	1677895.85	N 30 36 0.34	W 80 38 35.37
	305.00	0.23	135.00	305.00	-1112.00	-1.20	-0.38	1.25	0.08	0.04	-11.00	403530.48	1677896.08	N 30 36 0.34	W 80 38 35.36
	405.00	0.34	79.50	405.00	-1012.00	-1.03	-0.47	1.79	0.28	0.11	-55.50	403530.40	1677898.52	N 30 36 0.34	W 80 38 35.36
	505.00	0.31	60.30	504.89	-912.01	-2.07	-0.37	2.34	0.03	-0.03	0.80	403530.50	1677900.08	N 30 36 0.34	W 80 38 35.35
	605.00	0.06	105.80	604.89	-812.01	-3.33	-0.39	2.83	0.32	-0.23	68.60	403530.43	1677900.35	N 30 36 0.34	W 80 38 35.35
	705.00	0.25	155.10	704.99	-712.01	-2.55	-0.66	2.73	0.17	0.17	-11.00	403530.22	1677900.47	N 30 36 0.33	W 80 38 35.34
	805.00	0.47	124.70	804.99	-612.01	-3.13	-1.09	3.18	0.28	0.22	-30.40	403530.78	1677900.90	N 30 36 0.33	W 80 38 35.34
	905.00	0.47	114.10	904.99	-512.01	-3.95	-1.49	3.87	0.09	0.00	-10.00	403530.30	1677901.51	N 30 36 0.33	W 80 38 35.33
	1005.00	0.25	120.10	1004.99	-412.01	-4.58	-1.77	4.44	0.22	-0.22	6.00	403530.11	1677902.17	N 30 36 0.32	W 80 38 35.32
	1105.00	0.55	147.50	1104.95	-312.02	-5.24	-2.30	4.90	0.38	0.33	27.40	403530.67	1677902.53	N 30 36 0.32	W 80 38 35.32
	1205.00	0.46	160.20	1204.96	-212.02	-5.99	-3.12	5.31	0.15	-0.10	12.70	403530.75	1677903.05	N 30 36 0.32	W 80 38 35.32
	1305.00	0.08	130.50	1304.97	-112.03	-7.04	-4.00	6.03	0.50	0.38	-29.70	403532.87	1677903.76	N 30 36 0.30	W 80 38 35.30
	1405.00	0.05	148.60	1404.96	-12.04	-8.42	-5.12	6.98	0.27	-0.01	18.10	403531.75	1677904.71	N 30 36 0.29	W 80 38 35.29
	1505.00	0.07	137.30	1504.95	87.95	-6.81	-6.19	7.77	0.23	-0.18	-11.30	403530.69	1677905.50	N 30 36 0.28	W 80 38 35.28
	1605.00	0.62	133.80	1604.95	187.85	-10.02	-6.83	8.49	0.15	-0.18	-3.50	403529.94	1677906.22	N 30 36 0.27	W 80 38 35.27
	1705.00	0.55	183.50	1704.94	287.94	-11.35	-7.71	8.95	0.28	0.03	29.70	403528.17	1677906.99	N 30 36 0.26	W 80 38 35.27
	1805.00	0.38	164.00	1804.94	387.94	-11.95	-6.46	9.16	0.17	-0.17	0.50	403528.39	1677908.91	N 30 36 0.26	W 80 38 35.26
	1905.00	0.51	142.30	1904.94	487.94	-12.59	-6.15	9.54	0.21	-0.13	-21.70	403527.72	1677907.28	N 30 36 0.25	W 80 38 35.26
	2005.00	0.46	146.10	2004.93	587.93	-13.57	-6.85	10.05	0.04	-0.03	3.80	403527.02	1677907.78	N 30 36 0.24	W 80 38 35.25
	2105.00	0.33	140.90	2104.93	687.93	-14.01	-10.43	10.47	0.15	-0.15	-5.20	403526.43	1677908.20	N 30 36 0.24	W 80 38 35.24
	2205.00	0.45	189.20	2204.93	787.93	-14.41	-11.04	10.56	0.34	0.12	18.00	403526.83	1677908.52	N 30 36 0.23	W 80 38 35.24
	2305.00	0.35	189.70	2304.93	887.93	-14.63	-11.73	10.47	0.10	-0.10	0.50	403525.15	1677908.20	N 30 36 0.23	W 80 38 35.24
	2405.00	0.38	197.10	2404.92	987.92	-14.80	-12.34	10.32	0.05	0.03	7.40	403524.53	1677908.05	N 30 36 0.22	W 80 38 35.25
	2505.00	0.13	224.40	2504.82	1087.82	-14.83	-12.74	10.14	0.27	-0.25	27.30	403524.13	1677907.88	N 30 36 0.22	W 80 38 35.25
	2605.00	0.00	178.40	2604.82	1187.82	-14.84	-12.80	10.07	0.09	-0.04	-46.00	403523.97	1677907.80	N 30 36 0.21	W 80 38 35.25
	2705.00	0.07	195.40	2704.82	1287.82	-14.89	-13.04	10.05	0.03	-0.02	18.00	403523.83	1677907.78	N 30 36 0.21	W 80 38 35.25
	2805.00	0.36	204.30	2804.82	1387.82	-14.93	-13.38	9.91	0.29	0.29	7.90	403523.49	1677907.64	N 30 36 0.21	W 80 38 35.25
	2905.00	0.28	178.00	2904.82	1487.82	-15.00	-13.81	9.79	0.17	-0.00	-28.30	403523.98	1677907.53	N 30 36 0.20	W 80 38 35.25
	3005.00	0.42	193.30	3004.82	1587.82	-15.31	-14.51	9.73	0.17	0.14	17.30	403522.36	1677907.46	N 30 36 0.20	W 80 38 35.25
	3105.00	0.43	214.50	3104.82	1687.82	-15.37	-15.10	9.42	0.10	0.03	21.20	403521.68	1677907.15	N 30 36 0.19	W 80 38 35.26
	3205.00	0.44	236.70	3204.81	1787.81	-15.15	-15.73	8.68	0.17	-0.01	22.30	403521.14	1677906.81	N 30 36 0.19	W 80 38 35.26
	3305.00	0.48	206.40	3304.81	1887.81	-14.97	-16.31	8.36	0.23	0.04	-26.30	403520.50	1677906.09	N 30 36 0.18	W 80 38 35.27
	3405.00	0.41	243.00	3404.81	1987.81	-14.76	-16.83	7.83	0.28	-0.07	35.50	403520.04	1677905.57	N 30 36 0.17	W 80 38 35.28
	3505.00	0.46	258.10	3504.80	2087.80	-14.25	-17.09	7.11	0.12	0.07	12.20	403519.78	1677904.84	N 30 36 0.17	W 80 38 35.29
	3605.00	0.64	295.00	3604.80	2187.80	-13.50	-17.29	6.15	0.16	0.16	4.40	403519.59	1677903.88	N 30 36 0.17	W 80 38 35.30
	3705.00	0.65	252.80	3704.69	2287.89	-12.88	-17.54	5.06	0.06	0.01	-7.70	403519.33	1677902.79	N 30 36 0.17	W 80 38 35.31
	3805.00	0.31	271.50	3804.69	2387.89	-12.02	-17.71	4.24	0.37	-0.34	16.70	403519.17	1677901.89	N 30 36 0.17	W 80 38 35.32
	3905.00	0.54	261.00	3904.69	2487.89	-11.41	-17.77	3.51	0.24	0.23	-10.50	403519.10	1677901.24	N 30 36 0.16	W 80 38 35.33
	4003.00	0.57	255.10	4004.88	2587.88	-10.67	-17.97	2.86	0.09	0.03	-5.60	403518.90	1677900.30	N 30 36 0.16	W 80 38 35.34
	4103.00	0.70	251.20	4104.67	2687.87	-9.85	-18.32	1.44	0.21	0.21	-3.90	403518.55	1677899.17	N 30 36 0.16	W 80 38 35.36
	4205.00	0.46	245.80	4204.87	2787.87	-9.04	-18.70	0.27	0.14	-0.12	-5.40	403518.10	1677898.00	N 30 36 0.15	W 80 38 35.37
	4305.00	0.30	220.50	4304.86	2887.86	-8.54	-19.21	0.41	0.36	0.36	403517.98	1677897.51	N 30 36 0.15	W 80 38 35.38	
	4405.00	0.18	272.80	4404.86	2987.86	-8.44	-19.40	-0.75	0.24	-0.12	52.40	403517.47	1677896.98	N 30 36 0.15	W 80 38 35.39
	4503.00	0.20	303.50	4504.85	3087.85	-8.13	-19.20	-1.05	0.10	0.02	30.80	403517.57	1677896.05	N 30 36 0.15	W 80 38 35.39
	4605.00	0.70	335.70	4604.85	3187.85	-7.47	-18.65	-1.45	0.54	0.50	32.20	403518.23	1677895.08	N 30 36 0.16	W 80 38 35.40
	4705.00	0.59	349.00	4704.85	3287.85	-6.65	-17.56	-1.81	0.18	-0.11	12.30	403519.29	1677895.92	N 30 36 0.17	W 80 38 35.40
	4805.00	1.00	350.70	4804.84	3387.84	-5.73	-18.14	-2.07	0.50	0.50	2.70	403520.73	1677895.08	N 30 36 0.18	W 80 38 35.40
	4905.00	1.02	343.00	4904.82	3487.82	-4.81	-18.25	-2.49	0.18	-0.07	-7.70	403522.52	1677895.25	N 30 36 0.20	W 80 38 35.41
	5003.00	0.62	350.30	5004.81	3587.81	-3.54	-12.97	-2.84	0.41	-0.40	7.30	403523.90	1677894.80	N 30 36 0.21	W 80 38 35.41
	5105.00	0.58	351.40	5104.81	3687.81	-2.91	-11.95	-3.00	0.05	-0.08	1.10	403524.92	1677894.73	N 30 36 0.22	W 80 38 35.42
	5205.00	0.21	330.70	5204.81	3787.81	-2.46	-11.31	-3.17	0.37	-0.35	-30.70	403525.56	1677894.57	N 30 36 0.23	W 80 38 35.42
	5305.00	0.18	168.20	5304.81	3887.81	-2.39	-11.29	-3.29	0.17	-0.05	-162.50	403526.99	1677894.51	N 30 36 0.23	W 80 38 35.42
	5405.00	0.11	253.10	5404.81	3987.81	-2.42	-11.45	-3.29	0.39	-0.05	64.90	403526.42	1677894.44	N 30 36 0.23	W 80 38 35.42
	5505.00	0.29	315.00	5504.80	4087.80	-2.11	-11.30	-3.56	0.26	0.18	62.80	403525.58	1677894.16	N 30 36 0.23	W 80 38 35.42
	5605.00	0.23	320.70	5604.80	4187.80	-1.88	-10.98	-3.86	0.08	-0.08	4.80	403525.91	1677893.57	N 30 36 0.23	W 80 38 35.43
	5705.00	0.39	315.70	5704.80	4287.80	-1.17	-10.58	-4.23	0.16	0.16	-6.00	403526.31	1677893.51	N 30 36 0.24	W 80 38 35.43
	5805.00	0.15	12.10	5804.80	4387.80	-0.90	-10.16	-4.43	0.33	-0.23	56.40	403526.69	1677893.30	N 30 36 0.24	W 80 38 35.43
	5905.00	0.38	333.30	5904.80	4487.80	-0.71	-10.05	-4.47	0.77	0.59	-121.25	403526.82	1677893.28	N 30 36 0.24	W 80 38 35.44
	6018.00	0.40	3.50	5915.80	4496.80	-0.40	-9.56	-4.59	0.25	0.05	38.23	403527.31	1677893.17	N 30 36 0.24	W 80 38 35.44
	6005.00	0.40	7.30	6005.00	4586.80	-0.15	-8.93	-4.60	0.03	0.00	4.22	403527.94			

Comments	MD (ft)	Incl (ft)	Azim Grid (°)	TVD (ft)	TVSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft)	BR (ft)	TR (ft)	Northing (ft)	Easting (ft)	Latitude (N/S)	Longitude (W/E)
	7322.00	63.00	7170.42	5783.42	182.42	262.42	-301.79	-31.87	1.50	1.05	1.05	40322.70	1677570.50	N 30 36 5.51	W 00 39 36.51
	7385.00	63.00	253.00	1706.41	5778.41	176.05	-303.01	-300.06	0.09	0.09	10.68	40323.00	1677570.50	N 30 36 5.51	W 00 39 36.51
	7410.00	64.80	255.00	7222.00	5905.00	233.00	-301.55	-305.30	0.97	10.68	10.68	40323.34	1677502.40	N 30 36 5.31	W 00 39 40.38
	7454.00	55.90	283.00	7247.12	5930.12	232.07	-307.11	-431.10	10.22	2.50	12.05	403229.78	1677488.08	N 30 36 8.25	W 00 39 40.54
	7497.00	57.00	288.00	7270.73	5953.73	232.33	-306.85	-406.94	8.97	3.72	8.77	403227.23	1677430.53	N 30 36 8.22	W 00 39 41.29
	7542.00	59.90	7394.11	7294.11	6232.11	314.99	-319.89	-519.89	6.99	6.99	10.68	403225.30	1677392.30	N 30 36 8.21	W 00 39 41.79
	7584.00	63.10	270.50	7314.15	5977.15	323.37	-309.98	-542.20	7.83	7.82	0.48	403225.49	1677352.49	N 30 36 8.21	W 00 39 42.58
	7628.00	68.00	271.10	7332.36	5915.36	353.00	-309.40	-582.32	11.21	11.14	1.36	403227.40	1677315.46	N 30 36 8.21	W 00 39 42.77
	7672.00	71.00	275.00	7347.77	5930.77	401.00	-307.20	-623.46	10.74	6.82	6.86	403229.50	1677274.31	N 30 36 8.23	W 00 39 43.29
	7716.00	73.10	279.00	7361.33	5944.33	439.92	-302.09	-664.89	9.88	4.77	9.09	403234.00	1677232.78	N 30 36 8.27	W 00 39 43.83
	7761.00	74.30	280.30	7374.00	5957.00	430.77	-304.85	-707.50	3.70	2.44	2.69	403242.04	1677190.22	N 30 36 8.34	W 00 39 44.37
	7802.00	78.20	294.40	7394.48	5987.48	518.03	-295.37	-749.27	10.83	4.88	10.00	403250.52	1677151.51	N 30 36 8.42	W 00 39 44.87
	7847.00	78.30	285.30	7394.41	5977.41	681.72	-274.01	-788.37	9.65	6.87	6.87	403202.85	1677109.41	N 30 36 8.53	W 00 39 45.41
	7893.00	80.00	292.00	7402.78	5985.78	806.50	-258.13	-830.71	11.05	6.43	9.76	403208.78	1677067.07	N 30 36 8.66	W 00 39 45.85
	7936.00	82.00	294.50	7409.26	5992.26	870.50	-242.26	-871.50	6.47	4.00	3.78	403206.82	1677029.29	N 30 36 8.66	W 00 39 46.47
	7978.00	84.00	298.90	7413.83	5996.83	951.85	-222.80	-909.20	7.59	4.88	5.85	403314.29	1676989.50	N 30 36 8.03	W 00 39 46.95
	8021.00	85.00	297.00	7417.42	6000.42	733.30	-203.37	-943.37	3.20	2.38	2.14	403333.51	1676952.42	N 30 36 8.21	W 00 39 47.42
	8065.00	86.00	293.00	7420.33	6003.33	777.29	-182.29	-983.85	4.91	2.73	4.00	403354.59	1676913.91	N 30 36 8.41	W 00 39 47.82
	8108.00	88.40	301.00	7422.05	6005.05	818.22	-161.38	-1019.10	6.63	3.90	5.37	403375.50	1676878.70	N 30 36 8.62	W 00 39 48.37
	8148.00	89.40	302.40	7422.85	6005.85	800.13	-136.05	-1054.67	2.78	2.38	1.43	403397.82	1676843.13	N 30 36 8.63	W 00 39 48.83
	8190.00	89.90	301.90	7423.11	6006.11	902.04	-118.71	-1100.23	1.69	1.19	-1.19	403420.17	1676807.57	N 30 36 7.95	W 00 39 49.29
	8235.00	91.50	303.30	7423.76	6006.76	945.70	-82.47	-1123.14	3.95	2.44	3.11	403449.00	1676769.00	N 30 36 7.26	W 00 39 49.76
	8277.00	91.00	303.70	7421.81	6004.81	988.78	-62.29	-1163.15	1.72	1.43	0.95	403487.58	1676734.05	N 30 36 7.91	W 00 39 50.23
	8320.00	90.70	305.10	7420.84	6003.84	1031.49	-44.70	-1198.41	6.90	-2.09	6.59	403524.17	1676699.40	N 30 36 7.75	W 00 39 50.65
	8362.00	90.90	306.00	7420.36	6003.36	1073.00	-19.81	-1232.23	1.28	0.48	1.19	403557.00	1676665.50	N 30 36 7.90	W 00 39 51.12
	8404.00	91.00	305.80	7419.44	6002.44	1114.05	5.32	-1265.88	1.81	1.87	0.71	403594.19	1676631.83	N 30 36 8.23	W 00 39 51.55
	8448.00	91.10	305.50	7418.43	6001.43	1156.22	30.41	-1299.54	1.52	-1.19	-0.95	403627.28	1676598.27	N 30 36 8.40	W 00 39 51.99
	8491.00	91.80	305.90	7417.31	6000.31	1200.90	59.98	-1333.84	2.05	1.59	-1.33	403661.97	1676561.97	N 30 36 8.73	W 00 39 52.45
	8537.00	90.80	302.40	7416.23	5999.23	1246.56	82.79	-1373.89	7.85	-1.98	-7.61	403698.05	1676523.92	N 30 36 8.90	W 00 39 52.94
	8582.00	91.80	301.60	7414.15	5997.15	1304.38	129.41	-1448.50	1.37	1.02	-0.91	403740.27	1676484.32	N 30 36 9.44	W 00 39 53.50
	8627.00	90.70	302.70	7412.23	5995.23	1422.18	176.22	-1522.99	1.77	-1.25	1.25	403781.00	1676443.04	N 30 36 9.98	W 00 39 54.03
	8672.00	89.50	302.90	7412.09	5995.09	1510.53	224.43	-1597.79	1.37	-1.35	0.22	403821.29	1676403.04	N 30 36 10.36	W 00 39 54.83
	8717.00	91.30	305.00	7411.47	5994.47	1597.84	273.01	-1669.95	3.10	2.07	2.41	403860.87	1676362.08	N 30 36 10.83	W 00 39 55.78
	8762.00	90.10	304.40	7410.41	5993.41	1684.00	322.54	-1741.47	1.54	-1.38	-0.89	403900.30	1676318.37	N 30 36 11.31	W 00 39 56.58
	8807.00	89.80	305.50	7410.41	5993.41	1771.40	372.85	-1813.60	1.27	-0.23	1.25	403940.80	1676274.24	N 30 36 11.80	W 00 39 56.61
	8852.00	90.70	307.00	7409.85	5992.85	1857.00	424.68	-1883.40	2.00	0.92	2.04	403981.72	1676229.45	N 30 36 12.30	W 00 39 59.51
	8897.00	89.00	307.40	7410.19	5993.19	1946.48	478.79	-1954.70	1.94	-1.89	-0.44	404023.63	1676183.15	N 30 36 12.83	W 00 39 03.43
	8942.00	88.90	307.10	7413.23	5996.23	2030.44	531.20	-2022.31	2.50	-2.47	-0.35	404065.84	1676135.84	N 30 36 13.33	W 00 39 1.30
	8987.00	88.00	305.80	7416.42	5999.42	2114.49	582.14	-2090.20	2.31	2.24	-0.59	404108.97	1676087.58	N 30 36 13.83	W 00 39 2.18
	9032.00	86.50	305.60	7417.05	6000.05	2197.05	637.74	-2154.82	1.64	1.63	-0.23	404154.58	1676042.04	N 30 36 14.08	W 00 39 2.82
	9077.00	86.30	305.80	7417.13	6000.13	2197.70	631.90	-2157.92	2.60	1.95	-1.71	404198.78	1676000.78	N 30 36 14.31	W 00 39 3.05
	9122.00	82.30	305.80	7416.11	5999.11	2242.34	695.18	-2194.48	4.47	4.44	-0.44	404245.01	1675953.41	N 30 36 14.57	W 00 39 3.52
	9167.00	82.90	305.60	7414.05	5997.05	2299.94	694.41	-2230.96	1.41	1.33	0.44	404291.24	1675905.91	N 30 36 14.62	W 00 39 3.99
	9212.00	83.50	308.10	7411.85	5994.85	2352.82	730.82	-2265.72	1.68	1.40	0.70	404342.45	1675852.45	N 30 36 15.07	W 00 39 4.44
	9257.00	81.80	308.00	7409.69	5992.69	2371.11	734.31	-2299.64	3.62	-3.81	-0.24	404397.13	1675806.24	N 30 36 15.31	W 00 39 4.88
	9302.00	81.90	305.90	7408.29	5991.29	2412.74	769.85	-2333.02	0.24	0.00	-0.24	404456.77	1675756.24	N 30 36 15.55	W 00 39 5.31
	9347.00	80.40	305.70	7407.43	5990.43	2455.38	794.10	-2368.49	3.52	-3.49	-0.47	404520.92	1675702.92	N 30 36 15.79	W 00 39 5.78
	9392.00	80.90	305.90	7406.91	5989.91	2501.01	811.00	-2405.79	1.17	1.00	0.43	404591.62	1675645.00	N 30 36 16.00	W 00 39 6.25
	9437.00	81.20	305.50	7405.12	5988.12	2543.87	836.09	-2440.71	1.18	0.70	-0.93	404672.91	1675587.18	N 30 36 16.29	W 00 39 6.70
	9482.00	81.30	305.00	7405.14	5988.14	2589.35	862.08	-2477.45	1.13	0.22	-1.11	404765.87	1675520.44	N 30 36 16.55	W 00 39 7.17
	9527.00	81.30	304.80	7404.16	5987.16	2631.00	900.65	-2512.70	0.48	0.00	-0.47	404863.47	1675455.47	N 30 36 16.78	W 00 39 7.62
	9572.00	81.50	304.80	7403.09	5986.09	2674.00	911.70	-2549.82	0.45	0.45	0.00	404966.57	1675392.07	N 30 36 17.03	W 00 39 8.09
	9617.00	82.00	304.70	7401.81	5984.81	2716.54	935.68	-2593.32	1.21	1.19	-0.24	405075.00	1675321.58	N 30 36 17.28	W 00 39 8.53
	9662.00	82.50	304.80	7400.85	5983.85	2760.27	960.78	-2619.48	3.42	-3.41	0.23	405191.57	1675248.43	N 30 36 17.50	W 00 39 9.00
	9707.00	80.50	304.40	7400.45	5983.45	2805.02	983.31	-2655.50	0.89	0.00	-0.89	405315.12	1675172.40	N 30 36 17.78	W 00 39 9.45
	9752.00	81.10	304.80	7399.83	5982.83	2849.76	1011.65	-2693.54	1.00	1.00	0.00	405446.67	1675093.36	N 30 36 18.00	W 00 39 9.95
	9797.00	81.80	305.40	7399.05	5981.85	2896.46	1045.43	-2737.07	1.90	1.22	1.46	405585.24	1675002.24	N 30 36 18.23	W 00 39 10.39
	9842.00	81.80	305.40	7398.37	5981.37	2937.85	1064.07	-2785.51	0.24	0.24	0.00	405730.87	1674900.87	N 30 36 18.23	W 00 39 11.27
	9887.00	80.80	304.00	7395.12	5978.12	3082.24	1135.30	-2868.27	2.32	-2.25	-0.58	405882.10	1674789.10	N 30 36 19.20	W 00 39 12.21
	9932.00	80.40	303.20	7393.59	5976.59	3160.83	1183.13	-2942.01	1.82	-0.22	-1.91	406042.91	1674669.91	N 30 36 19.88	W 00 39 13.16
	9977.00	80.30	304.00	7393.05	5976.05	3234.50	1231.61	-3011.97	1.27	0.83	0.95	406210.41	1674545.41	N 30 36 20.13	W 00 39 14.06
	10022.00	80.10	304.50	7394.64	5977.64	3316.00	1278.85	-3081.40	1.12	0.95	0.60	406385.69	1674418.69	N 30 36 20.59	W 00 39 14.95
	10067.00	80.20	301.30	7393.03	5976.03	3405.81	1327.22	-3156.11	3.73	-1.01	-3.60	406568.01	1674291.01	N 30 36 21.05	W 00 39 15.92
	10112.00	80.80	300.20	7393.09	5976.09	3494.74	1372.21	-3231.74	1.30	0.34	-1.25</				

103-02635

Comments	MD (ft)	Incl (°)	Azim Grd (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	BR (ft/100ft)	TR (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ° ' ")	Longitude (E/W ° ° ' ")
	13210.00	89.78	312.14	7375.28	8958.28	5953.25	2739.35	-5207.05	0.91	0.47	0.78	406278.08	1672291.00	N 39 36 34.75	W 00 39 42.35
	13254.00	90.17	311.61	7375.30	8958.30	5926.07	2768.72	-5239.82	1.82	0.93	-1.20	406305.42	1672288.24	N 39 36 35.04	W 00 39 42.77
	13298.00	90.52	312.57	7375.04	8958.04	5958.84	2799.21	-5272.47	2.32	0.90	2.18	406334.91	1672282.59	N 39 36 35.32	W 00 39 43.20
	13342.00	90.34	313.07	7374.71	8957.71	6011.48	2828.12	-5304.74	1.21	-0.41	1.14	406364.82	1672280.32	N 39 36 35.62	W 00 39 43.61
	13386.00	90.02	311.99	7374.72	8957.72	6054.16	2857.89	-5337.18	2.95	-1.64	-2.45	406394.56	1672280.90	N 39 36 35.91	W 00 39 44.03
	13430.00	89.78	311.88	7374.98	8957.98	6098.98	2887.27	-5369.90	0.40	0.32	-0.25	406423.96	1672282.17	N 39 36 36.19	W 00 39 44.45
	13474.00	89.87	310.90	7375.06	8958.06	6139.83	2916.39	-5402.91	2.28	0.48	-2.23	406453.05	1672285.18	N 39 36 36.48	W 00 39 44.88
	13517.00	89.72	310.55	7375.18	8958.18	6181.93	2944.38	-5435.54	1.41	-0.58	-1.28	406481.05	1672282.52	N 39 36 36.75	W 00 39 45.30
	13561.00	89.93	310.78	7375.32	8958.32	6224.97	2972.97	-5468.97	1.09	0.48	0.90	406509.85	1672289.10	N 39 36 37.03	W 00 39 45.73
	13605.00	90.41	311.15	7375.16	8958.16	6268.91	3002.47	-5502.95	1.35	1.07	0.82	406538.16	1672295.12	N 39 36 37.31	W 00 39 46.17
	13650.00	90.38	312.02	7374.88	8957.88	6311.78	3031.87	-5535.86	1.98	-0.67	1.98	406566.39	1672292.22	N 39 36 37.60	W 00 39 46.60
	13695.00	90.05	312.14	7374.47	8957.47	6355.53	3061.83	-5569.25	0.00	0.60	0.27	406596.51	1672288.82	N 39 36 37.89	W 00 39 47.03
Final Surveys	13738.00	90.55	312.83	7374.02	8957.02	6397.28	3090.87	-5600.98	1.83	-0.23	1.60	406627.55	1672297.11	N 39 36 38.17	W 00 39 47.44
Protection to TD	13828.00	90.55	312.83	7373.18	8956.18	6482.54	3150.69	-5695.50	0.00	0.00	0.00	406687.37	1672232.58	N 39 36 38.78	W 00 39 48.27

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 \*\*\* 3-D 95.000% Confidence 2.7055 sigma  
 Survey Program:

Description	MD From (ft)	MD To (ft)	EQU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey	
	0.000	17.000		Act Stns	30.000	30.000	SLB_FREE GYRO-Depth Only	Original Borehole / HG Energy L.S. Hoyt 401 #1H Surveys 0ft to
	17.000	6537.000		Act Stns	30.000	30.000	SLB_FREE GYRO	Original Borehole / HG Energy L.S. Hoyt 401 #1H Surveys 0ft to
	6537.000	13738.000		Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / HG Energy L.S. Hoyt 401 #1H Surveys 0ft to
	13738.000	13828.000		Act Stns	30.000	30.000	SLB_BLIND-TREND	Original Borehole / HG Energy L.S. Hoyt 401 #1H Surveys 0ft to

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11/22/2013

103-02635

HG

**PATHFINDER**  
A Schlumberger Company

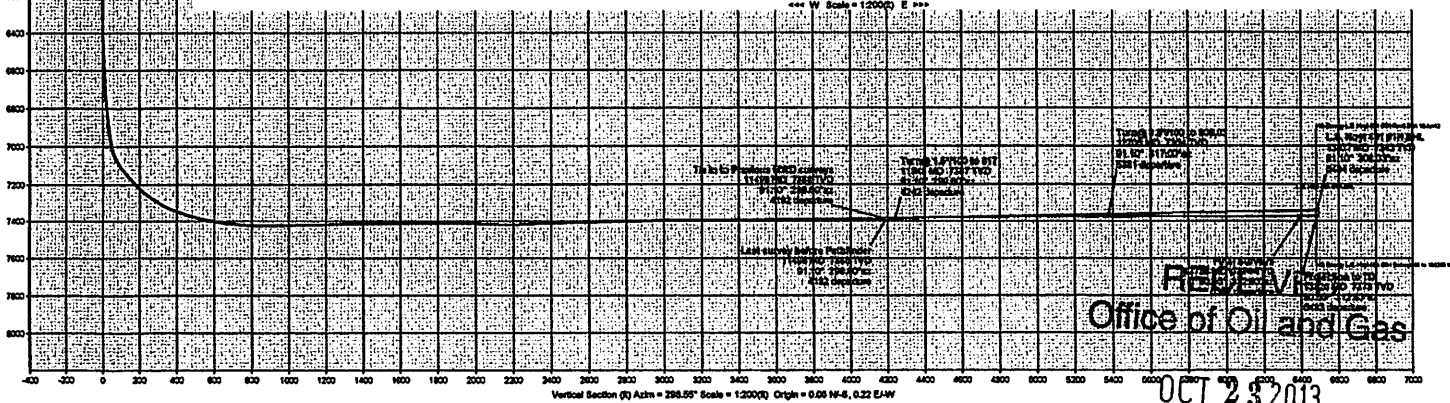
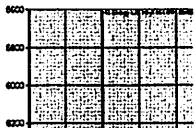
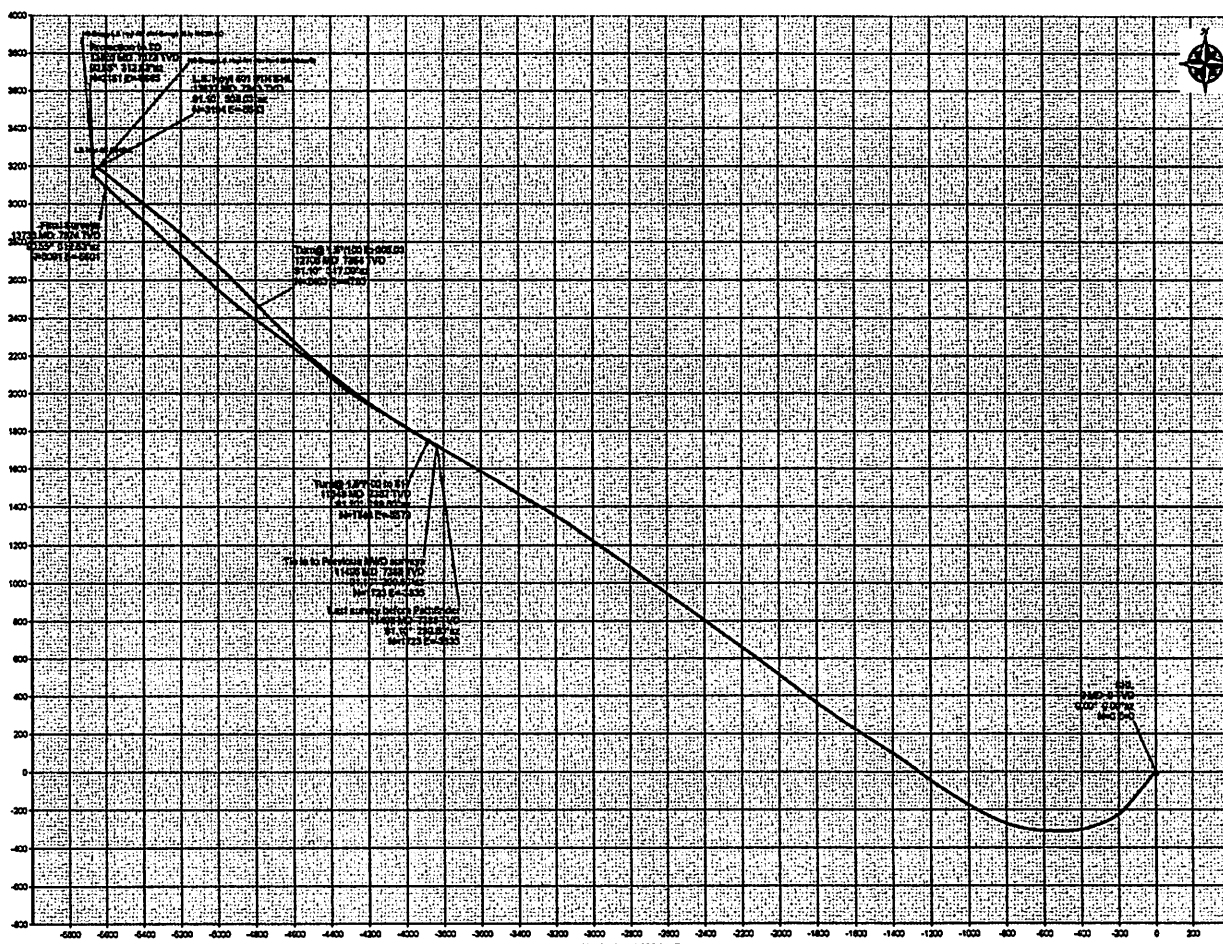
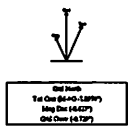
WELL <b>L.S. Hoyt 401 #1H</b>	FIELD <b>WV Wetzel County (NAD 27)</b>	STRUCTURE <b>HAD 105</b>
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Magnetic Parameters MAGN: BOGUS 011 Dip: 47.23° Mag Dec: -4.47°	Date: June 16, 2013 Dip: 75° Dip Dec: 234.127	Surface Location Lat: N 39 34 8.241 Lon: W 80 33 53.977	Method: MAGNETIC MAGN: BOGUS 011 Dip: 47.23° Mag Dec: -4.47°	Structure Str: L.S. Hoyt 401 #1H Plan: MWD Survey	TVD Ref: 228 (1175 above MSL) Key Date: June 16, 2013
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Critical Points								
Critical Point	MD	INCL	AZIM	TVD	YSEC	N(G)/R(G)	E(G)/SH(G)	DLS
Tie-In	0.00	0.00	0.00	0.00	0.00	0.06	0.22	
Last survey before Pathfinder	11498.00	91.10	299.60	7347.84	4192.41	1722.82	-3135.22	2.84
Final Surveys	13738.00	90.55	312.83	7374.02	6397.26	3090.87	-5600.96	1.62
Projection to TD	13824.00	90.55	312.83	7373.18	6482.54	3150.69	-5665.50	0.00

**Legend**

--- MWD Survey  
--- MWD Survey (to be used as a tie-in to MWD Survey)



Office of Oil and Gas

OCT 25 2013

WV Department of Environmental Protection

Drawn By: J. Blum  
Checked By: Joseph D. Blum  
Approved By: [Signature]