

103-02638



HG Energy L.S.Hoyt 401 #4H Surveys Off to 13523ft MD Survey Geodetic Report (Def Survey)

Report Date: July 03, 2012 - 11:36 AM
 Client: HG
 Field: WV Wetzel County (NAD 27)
 Structure / Slot: HG Energy LS.Hoyt 401 Pad / L.S.Hoyt 401 #4H
 Well: L.S. Hoyt 401 #4H
 Borehole: Original Borehole
 UWI / API#: Unknown / Unknown
 Survey Name: HG Energy L.S.Hoyt 401 #4H Surveys Off to 13523R MD
 Survey Date: June 10, 2012
 Tert / AHD / DDI / ERD Ratio: 273.477' / 6779.715 ft / 6.627 / 0.909
 Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Foot
 Location Lat / Long: N 39° 36' 8.36975", W 80° 38' 35.19808"
 Location Grid N/E Y/X: N 403539.700 RUS, E 1677912.009 RUS
 CRS Grid Convergence Angle: -0.7290°
 Grid Scale Factor: 0.99994083

Survey / DLS Computation: Minimum Curvature / Lubinski
 Vertical Section Azimuth: 132.801° (Grid North)
 Vertical Section Origin: 0.000 R, 0.000 R
 TVD Reference Datum: Unknown
 TVD Reference Elevation: 1417.000 ft above MSL
 Seabed / Ground Elevation: 1400.000 ft above MSL
 Magnetic Declination: -8.627°
 Total Gravity Field Strength: 1000.0014 mgn (9.8 based)
 Total Magnetic Field Strength: 52652.053 nT
 Magnetic Dip Angle: 67.239°
 Declination Date: June 10, 2012
 Magnetic Declination Model: BGGM 2011
 North Reference: Grid North
 Grid Convergence Used: -0.7290°
 Total Corr Mag North->Grid North: -7.8975°
 Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azlm Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	Northing (RUS)	Easting (RUS)	Latitude (N/S °'")	Longitude (E/W °'")
SHL	0.00	0.00	0.00	0.00	-1417.00	0.00	0.00	0.00	N/A	403539.70	1677912.01	N 39 36 8.37	W 80 38 35.20
	105.00	0.37	279.30	105.00	-1312.00	-0.74	0.05	-0.33	0.35	403539.75	1677911.67	N 39 36 8.37	W 80 38 35.20
	205.00	0.44	251.60	205.00	-1212.00	-0.74	-0.01	-1.02	0.21	403539.69	1677910.99	N 39 36 8.37	W 80 38 35.21
	305.00	0.45	231.40	304.99	-1112.01	-0.74	-0.38	-1.69	0.16	403539.32	1677910.32	N 39 36 8.37	W 80 38 35.22
	405.00	0.33	173.60	404.99	-1012.01	-0.82	-0.91	-1.96	0.39	403538.79	1677910.05	N 39 36 8.36	W 80 38 35.22
	505.00	0.49	300.20	504.99	-912.01	-1.02	-0.98	-2.30	0.74	403538.72	1677909.71	N 39 36 8.36	W 80 38 35.23
	605.00	0.33	170.30	604.99	-812.01	-1.21	-1.05	-2.62	0.75	403538.65	1677909.39	N 39 36 8.36	W 80 38 35.23
	705.00	0.35	63.90	704.99	-712.01	-0.78	-1.30	-2.27	0.47	403538.40	1677909.74	N 39 36 8.36	W 80 38 35.23
	805.00	0.82	320.10	804.99	-612.01	-1.11	-0.82	-2.27	0.84	403538.68	1677909.74	N 39 36 8.36	W 80 38 35.23
	905.00	0.40	281.10	904.98	-512.02	-1.93	-0.31	-2.91	0.44	403539.39	1677909.10	N 39 36 8.37	W 80 38 35.24
	1005.00	0.05	170.40	1004.98	-412.02	-2.19	-0.28	-3.25	0.42	403539.42	1677908.78	N 39 36 8.37	W 80 38 35.24
	1105.00	0.38	63.60	1104.98	-312.02	-2.10	-0.13	-2.97	0.41	403539.57	1677909.04	N 39 36 8.37	W 80 38 35.24
	1205.00	0.88	357.30	1204.98	-212.02	-2.68	0.84	-2.74	0.74	403540.54	1677909.27	N 39 36 8.38	W 80 38 35.23
	1305.00	1.05	348.90	1304.98	-112.04	-3.89	2.50	-2.99	0.24	403542.20	1677909.02	N 39 36 8.39	W 80 38 35.24
	1405.00	1.08	330.80	1404.94	-12.06	-5.54	4.21	-3.65	0.30	403543.91	1677908.36	N 39 36 8.41	W 80 38 35.25
	1505.00	1.11	332.10	1504.93	87.93	-7.35	5.89	-4.57	0.04	403545.59	1677907.44	N 39 36 8.43	W 80 38 35.26
	1605.00	1.11	333.30	1604.91	187.91	-9.17	7.91	-5.48	0.02	403547.31	1677906.65	N 39 36 8.44	W 80 38 35.27
	1705.00	0.66	14.40	1704.60	287.90	-10.31	8.95	-5.77	0.79	403548.65	1677906.24	N 39 36 8.46	W 80 38 35.27
	1805.00	1.11	9.30	1804.69	387.89	-11.08	10.38	-6.49	0.55	403550.08	1677906.52	N 39 36 8.47	W 80 38 35.27
	1905.00	1.20	348.30	1904.87	487.87	-12.49	12.35	-5.58	0.47	403552.05	1677906.43	N 39 36 8.49	W 80 38 35.27
	2005.00	0.77	350.20	2004.85	587.85	-13.90	14.03	-5.94	0.43	403553.73	1677906.00	N 39 36 8.51	W 80 38 35.28
	2105.00	0.88	349.30	2104.84	687.84	-15.12	15.53	-6.22	0.21	403555.23	1677905.79	N 39 36 8.52	W 80 38 35.28
	2205.00	0.72	32.60	2204.83	787.83	-16.92	16.90	-6.04	0.67	403556.60	1677905.97	N 39 36 8.54	W 80 38 35.28
	2305.00	0.78	27.30	2304.82	887.82	-18.21	18.04	-5.39	0.09	403557.74	1677906.62	N 39 36 8.55	W 80 38 35.27
	2405.00	0.17	317.30	2404.82	987.82	-16.64	18.75	-5.18	0.74	403558.45	1677906.83	N 39 36 8.55	W 80 38 35.27
	2505.00	0.90	350.90	2504.81	1087.81	-17.31	19.64	-5.40	0.76	403559.34	1677906.61	N 39 36 8.56	W 80 38 35.27
	2605.00	0.61	18.60	2604.80	1187.80	-18.14	20.92	-5.36	0.48	403560.62	1677906.65	N 39 36 8.58	W 80 38 35.27
	2705.00	0.26	88.80	2704.80	1287.80	-18.20	21.43	-4.96	0.58	403561.13	1677907.05	N 39 36 8.58	W 80 38 35.26
	2805.00	0.64	11.60	2804.80	1387.80	-18.33	21.98	-4.62	0.84	403561.68	1677907.39	N 39 36 8.59	W 80 38 35.26
	2905.00	0.63	366.90	2904.79	1487.79	-19.01	23.06	-4.54	0.16	403562.77	1677907.47	N 39 36 8.60	W 80 38 35.26
	3005.00	0.20	242.70	3004.79	1587.79	-19.47	23.54	-4.73	0.73	403563.24	1677907.28	N 39 36 8.60	W 80 38 35.26
	3105.00	0.42	70.80	3104.79	1687.79	-19.35	23.59	-4.64	0.62	403563.26	1677907.47	N 39 36 8.60	W 80 38 35.26
	3205.00	0.59	7.50	3204.79	1787.79	-19.48	24.22	-4.12	0.55	403563.92	1677907.89	N 39 36 8.61	W 80 38 35.25
	3305.00	0.49	21.90	3304.78	1887.78	-19.93	25.13	-3.90	0.17	403564.82	1677908.11	N 39 36 8.62	W 80 38 35.25
	3405.00	0.34	118.60	3404.78	1987.78	-19.60	25.38	-3.48	0.63	403565.08	1677908.63	N 39 36 8.62	W 80 38 35.25
	3505.00	0.36	157.70	3504.78	2087.78	-19.22	24.95	-3.10	0.23	403564.64	1677908.91	N 39 36 8.62	W 80 38 35.24
	3605.00	0.30	178.70	3604.78	2187.78	-18.75	24.39	-2.96	0.12	403564.99	1677909.05	N 39 36 8.61	W 80 38 35.24
	3705.00	0.19	232.20	3704.78	2287.78	-18.69	24.03	-3.08	0.25	403565.73	1677908.93	N 39 36 8.61	W 80 38 35.24
	3805.00	0.33	178.80	3804.78	2387.78	-18.41	23.64	-3.20	0.27	403566.34	1677908.80	N 39 36 8.60	W 80 38 35.24
	3905.00	0.10	252.90	3904.78	2487.78	-18.26	23.33	-3.26	0.32	403563.03	1677908.73	N 39 36 8.60	W 80 38 35.24
	4005.00	0.33	172.90	4004.77	2587.77	-18.08	23.02	-3.33	0.33	403562.72	1677908.66	N 39 36 8.60	W 80 38 35.24
	4105.00	0.39	149.60	4104.77	2687.77	-17.54	22.44	-3.12	0.16	403562.14	1677908.69	N 39 36 8.59	W 80 38 35.24
	4205.00	0.42	144.10	4204.77	2787.77	-18.95	21.85	-2.74	0.05	403561.54	1677909.27	N 39 36 8.59	W 80 38 35.24
	4305.00	0.37	25.70	4304.77	2887.77	-18.69	21.84	-2.38	0.68	403561.64	1677909.63	N 39 36 8.59	W 80 38 35.23
	4405.00	0.20	177.80	4404.77	2987.77	-18.66	21.96	-2.24	0.55	403561.65	1677909.77	N 39 36 8.59	W 80 38 35.23
	4505.00	0.56	62.70	4504.77	3087.77	-18.27	22.01	-1.79	0.67	403561.70	1677910.21	N 39 36 8.59	W 80 38 35.22
	4605.00	0.13	95.50	4604.76	3187.76	-19.01	22.22	-1.25	0.46	403561.92	1677910.68	N 39 36 8.59	W 80 38 35.22
	4705.00	0.27	100.30	4704.76	3287.76	-19.72	22.17	-0.90	0.14	403561.86	1677911.11	N 39 36 8.59	W 80 38 35.21
	4805.00	0.66	177.80	4804.76	3387.76	-19.12	21.55	-0.65	0.66	403561.25	1677911.36	N 39 36 8.58	W 80 38 35.21
	4905.00	1.00	180.60	4904.75	3487.75	-14.13	20.10	-0.64	0.34	403559.80	1677911.37	N 39 36 8.57	W 80 38 35.21
	5005.00	0.64	212.60	5004.74	3587.74	-13.44	18.78	-0.95	0.57	403558.46	1677911.06	N 39 36 8.56	W 80 38 35.21
	5105.00	0.63	175.10	5104.73	3687.73	-12.81	17.57	-1.19	0.51	403557.26	1677910.82	N 39 36 8.54	W 80 38 35.22
	5205.00	0.81	221.20	5204.73	3787.73	-12.26	16.44	-1.48	0.60	403556.14	1677910.63	N 39 36 8.53	W 80 38 35.22
	5305.00	0.21	159.00	5304.72	3887.72	-12.09	15.87	-1.76	0.54	403555.57	1677910.24	N 39 36 8.53	W 80 38 35.22
	5405.00	0.81	202.90	5404.72	3987.72	-11.67	15.05	-1.97	0.67	403554.75	1677910.04	N 39 36 8.52	W 80 38 35.23
	5505.00	0.29	135.20	5504.71	4087.71	-11.18	14.22	-2.07	0.75	403553.92	1677909.84	N 39 36 8.51	W 80 38 35.23
	5605.00	0.27	106.20	5604.71	4187.71	-10.72	13.97	-1.97	0.14	403553.67	1677910.34	N 39 36 8.51	W 80 38 35.22
	5705.00	0.41	149.10	5704.71	4287.71	-10.16	13.60	-1.26	0.28	403553.69	1677910.24	N 39 36 8.50	W 80 38 35.22
	5805.00	0.38	285.40	5804.71	4387.71	-10.04	13.27	-1.40	0.67	403553.82	1677910.68	N 39 36 8.50	W 80 38 35.22
	5905.00	0.70	258.30	5904.71	4487.71	-10.62	13.12	-2.33	0.33	403552.82	1677910.68	N 39 36 8.50	W 80 38 35.23
	6005.00	0.75	280.40	6004.70	4587.70	-11.23	12.93	-3.33	0.23	403552.51	1677910.68	N 39 36 8.50	W 80 38 35.24
	6105.00	0.48	231.42	6016.70	4687.70	-11.38	12.61	-3.65	0.21	403552.67	1677910.24	N 39 36 8.50	W 80 38 35.24
	6205.00	4.02	182.47	6060.68	4843.66	-10.13	11.30	-3.34	0.23	403551.00	1677908.67	N 39 36 8.48	W 80 38 35.24
	6305.00	7.55	163.43	6102.44	4685.44	-6.47	7.25	-2.11	8.41	403548.96	1677909.69	N 39 36 8.44	W 80 38 35.23
	6405.00	11.36	158.42	6143.68	4726.66	-0.37	0.75	0.20	8.27	403492.43	1677912.23	N 39 36 8.38	W 80 38 35.20
	6505.00	13.24	158.61	6185.67	4768.67	7.89	12.93	3.68	4.37	403531.93	1677916.67	N 39 36 8.29	W 80 38 35.15
	6605.00	12.44	158.82	6228.77	4811.77	19.89	16.67	7.12	1.82	403522.63	1677919.13	N 39 36 8.20	W 80 38 35.10
	6705.00	13.69	166.66	6273.59	4856.59	26.66	26.79	10.17	4.71	403516.61	1677921.26	N 39 36 8.01	W 80 38 35.08
	6805.00	13.27	178.28	6315.41	4898.41	33.35	33.35	11.49	6.36	403512.81</			

103-02638

Comments	MD (ft)	Incl (°)	Azim (Grid) (°)	TYD (ft)	TYD98 (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100m)	Northing (ft)	Easting (ft)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	6544.00	27.90	214.34	6524.17	6107.17	67.28	-103.39	-19.57	7.28	403434.31	1677892.44	N 39 38 7.33	W 80 38 35.43
	6568.00	31.68	214.68	6563.23	6146.23	60.47	-125.78	-32.21	6.19	403415.92	1677879.80	N 39 38 7.14	W 80 38 35.69
	6631.00	35.68	214.99	6598.20	6181.20	63.89	-142.87	-45.60	9.77	403396.64	1677866.51	N 39 38 6.74	W 80 38 35.78
	6676.00	39.22	217.64	6633.12	6216.12	66.71	-164.42	-61.34	8.78	403375.29	1677850.67	N 39 38 6.45	W 80 38 35.95
	6719.00	40.07	217.98	6667.00	6250.00	69.16	-186.81	-78.53	2.03	403353.10	1677833.48	N 39 38 6.22	W 80 38 36.17
	6764.00	39.46	217.05	6701.59	6284.59	71.63	-209.44	-96.08	1.69	403330.27	1677816.95	N 39 38 6.29	W 80 38 36.39
	6806.00	38.80	218.98	6734.17	6317.17	74.60	-230.61	-112.02	1.57	403308.11	1677800.00	N 39 38 6.08	W 80 38 36.69
	6849.00	38.25	219.07	6767.82	6350.82	76.73	-251.71	-128.51	3.29	403288.01	1677783.50	N 39 38 5.87	W 80 38 36.60
	6892.00	37.57	221.18	6801.74	6384.74	77.07	-271.91	-145.63	3.40	403267.81	1677766.48	N 39 38 5.72	W 80 38 37.01
	6935.00	37.07	220.40	6835.94	6418.94	78.87	-291.63	-162.58	1.54	403248.08	1677749.44	N 39 38 5.47	W 80 38 37.23
	6979.00	37.83	218.55	6870.69	6453.69	81.58	-312.93	-178.65	8.70	403228.74	1677733.37	N 39 38 5.25	W 80 38 37.43
	7024.00	36.57	207.77	6908.01	6489.01	87.52	-337.17	-192.98	8.91	403202.55	1677717.06	N 39 38 5.01	W 80 38 37.61
	7068.00	41.21	203.35	6938.01	6521.01	95.60	-361.72	-204.68	7.88	403178.00	1677707.35	N 39 38 4.77	W 80 38 37.75
	7109.00	42.40	198.78	6970.08	6553.08	106.68	-388.62	-214.48	10.58	403151.11	1677697.55	N 39 38 4.60	W 80 38 37.87
	7151.00	43.72	191.60	7000.77	6583.77	120.42	-416.40	-221.49	8.06	403123.32	1677690.54	N 39 38 4.23	W 80 38 37.96
	7195.00	43.47	188.65	7032.64	6615.64	136.82	-446.27	-226.79	4.81	403093.48	1677685.24	N 39 38 3.93	W 80 38 38.02
	7237.00	42.45	189.26	7063.38	6646.38	152.78	-474.55	-231.22	2.69	403065.18	1677680.81	N 39 38 3.65	W 80 38 38.07
	7280.00	42.80	168.59	7096.02	6678.02	169.48	-503.39	-235.18	4.59	403036.34	1677678.85	N 39 38 3.37	W 80 38 38.12
	7323.00	43.89	181.06	7128.30	6709.30	188.08	-532.82	-237.08	8.88	403006.91	1677674.94	N 39 38 3.07	W 80 38 38.14
	7368.00	45.35	174.90	7168.35	6741.35	210.35	-564.38	-238.95	10.14	402977.36	1677670.08	N 39 38 2.79	W 80 38 38.12
	7410.00	48.87	170.21	7187.47	6770.47	233.62	-594.37	-232.01	8.82	402946.37	1677665.00	N 39 38 2.47	W 80 38 38.07
	7454.00	49.27	167.16	7216.88	6798.88	260.14	-626.45	-228.57	7.61	402913.28	1677660.45	N 39 38 2.16	W 80 38 37.88
	7498.00	49.85	162.74	7244.13	6827.13	287.19	-657.31	-217.27	8.13	402882.43	1677654.75	N 39 38 1.85	W 80 38 37.57
	7538.00	52.41	158.99	7270.50	6853.50	319.30	-687.97	-208.00	12.27	402851.77	1677648.02	N 39 38 1.55	W 80 38 37.72
	7582.00	55.82	151.63	7298.27	6879.27	349.49	-720.06	-196.48	12.83	402821.68	1677641.54	N 39 38 1.23	W 80 38 37.51
	7627.00	58.98	148.18	7326.48	6903.48	385.75	-762.84	-171.43	9.25	402788.90	1677634.59	N 39 38 0.91	W 80 38 37.27
	7669.00	62.78	147.30	7349.92	6923.92	421.19	-808.45	-151.84	9.18	402755.69	1677626.18	N 39 38 0.60	W 80 38 37.01
	7714.00	66.74	146.51	7369.11	6943.11	460.65	-817.95	-129.62	8.99	402721.80	1677622.40	N 39 38 0.27	W 80 38 36.72
	7756.00	69.28	144.35	7375.85	6958.85	498.65	-850.01	-107.52	7.86	402689.75	1677618.49	N 39 35 59.96	W 80 38 36.43
	7800.00	72.21	142.24	7390.38	6973.38	539.48	-883.30	-82.69	6.09	402656.46	1677614.92	N 39 35 59.63	W 80 38 36.11
	7844.00	74.13	139.38	7403.10	6986.10	581.18	-918.92	-58.08	7.63	402623.83	1677611.54	N 39 35 59.31	W 80 38 35.77
	7888.00	75.89	136.74	7414.45	6997.45	623.51	-947.53	-27.66	7.14	402592.22	1677608.35	N 39 35 59.00	W 80 38 35.40
	7929.00	77.62	134.66	7423.81	6998.81	663.38	-976.07	0.24	6.53	402563.69	1677612.25	N 39 35 58.72	W 80 38 35.04
	7973.00	78.98	131.89	7432.73	6991.73	706.48	-1005.52	31.69	7.10	402534.24	1677614.70	N 39 35 58.44	W 80 38 34.63
	8018.00	83.42	129.98	7439.52	6972.52	750.89	-1034.68	65.33	10.57	402505.18	1677617.34	N 39 35 58.15	W 80 38 34.20
	8063.00	86.74	127.80	7443.48	6958.48	795.81	-1062.72	100.23	8.79	402477.05	1678012.23	N 39 35 57.88	W 80 38 33.75
	8108.00	87.15	127.83	7445.87	6928.87	840.37	-1090.27	135.73	0.91	402449.80	1678047.73	N 39 35 57.61	W 80 38 33.29
	8152.00	88.76	126.85	7447.44	6930.44	884.14	-1116.94	170.69	4.28	402422.83	1678082.69	N 39 35 57.35	W 80 38 32.84
	8195.00	88.73	126.47	7448.39	6931.39	928.89	-1142.61	205.17	0.89	402397.18	1678117.17	N 39 35 57.10	W 80 38 32.39
	8239.00	89.78	126.56	7448.97	6931.97	970.69	-1169.40	240.07	5.30	402370.38	1678152.06	N 39 35 56.84	W 80 38 31.94
	8284.00	90.00	129.00	7449.08	6932.06	1016.58	-1197.58	275.15	1.11	402342.19	1678187.14	N 39 35 56.57	W 80 38 31.49
	8328.00	90.21	129.80	7448.88	6931.98	1059.50	-1225.51	309.16	1.68	402314.27	1678221.14	N 39 35 56.30	W 80 38 31.05
	8373.00	89.90	129.39	7448.94	6931.94	1104.43	-1254.19	343.82	1.14	402285.69	1678255.61	N 39 35 56.02	W 80 38 30.60
	8417.00	89.38	129.78	7449.21	6932.21	1148.38	-1282.23	377.73	1.48	402257.55	1678289.72	N 39 35 55.75	W 80 38 30.18
	8460.00	89.21	129.34	7449.74	6932.74	1191.29	-1309.81	410.88	1.10	402230.17	1678322.88	N 39 35 55.48	W 80 38 29.74
	8502.00	89.28	128.05	7450.30	6933.30	1233.18	-1335.86	443.96	3.08	402203.02	1678355.84	N 39 35 55.22	W 80 38 29.31
	8545.00	89.48	127.89	7450.77	6933.77	1277.02	-1362.93	478.34	0.58	402176.85	1678390.32	N 39 35 54.96	W 80 38 28.87
	8591.00	89.45	128.70	7451.19	6934.19	1321.88	-1390.62	513.68	1.80	402148.97	1678425.63	N 39 35 54.69	W 80 38 28.41
	8635.00	89.52	129.04	7451.59	6934.59	1365.77	-1418.43	547.91	0.79	402121.38	1678460.89	N 39 35 54.42	W 80 38 27.97
	8679.00	89.55	129.64	7451.94	6934.94	1409.89	-1446.29	581.97	1.14	402093.50	1678493.94	N 39 35 54.14	W 80 38 27.53
	8723.00	89.38	129.48	7452.38	6935.38	1453.81	-1474.28	615.91	0.41	402065.51	1678527.88	N 39 35 53.88	W 80 38 27.09
	8768.00	89.16	129.27	7452.83	6935.83	1498.53	-1503.46	651.47	0.63	402036.33	1678563.44	N 39 35 53.59	W 80 38 26.63
	8811.00	89.24	129.02	7453.51	6936.51	1541.44	-1529.98	684.04	0.61	402008.82	1678598.00	N 39 35 53.34	W 80 38 26.21
	8856.00	89.38	127.70	7454.05	6937.05	1583.30	-1557.90	719.32	2.95	401981.89	1678633.28	N 39 35 53.06	W 80 38 25.78
	8900.00	89.86	126.89	7454.42	6937.42	1630.09	-1584.58	754.32	1.95	401955.24	1678668.28	N 39 35 52.81	W 80 38 25.31
	8945.00	90.07	125.76	7454.53	6937.53	1674.81	-1611.22	790.57	2.67	401928.68	1678702.64	N 39 35 52.55	W 80 38 24.84
	8989.00	89.93	124.32	7454.63	6937.63	1717.41	-1635.90	825.78	3.38	401903.90	1678737.74	N 39 35 52.31	W 80 38 24.39
	9033.00	89.90	122.53	7454.80	6937.80	1761.81	-1660.69	863.34	3.98	401876.11	1678775.29	N 39 35 52.07	W 80 38 23.90
	9078.00	89.62	121.19	7454.78	6937.78	1805.99	-1684.44	901.56	3.04	401849.38	1678813.51	N 39 35 51.84	W 80 38 23.41
	9120.00	89.52	120.88	7455.10	6938.10	1847.10	-1708.10	937.64	0.78	401833.71	1678849.49	N 39 35 51.63	W 80 38 22.94
	9160.00	89.65	120.22	7455.42	6938.42	1886.19	-1726.43	971.99	1.65	401813.38	1678883.94	N 39 35 51.43	W 80 38 22.50
	9203.00	89.62	120.60	7455.74	6938.74	1928.19	-1748.19	1009.07	0.90	401791.62	1678921.02	N 39 35 51.22	W 80 38 22.02
	9247.00	89.88	121.20	7455.94	6938.94	1971.24	-1770.79	1046.83	1.47	401769.02	1678958.77	N 39 35 51.00	W 80 38 21.54
	9291.00	89.79	121.28	7456.07	6939.07	2014.35	-1793.61	1084.45	0.24	401748.20	1678996.39	N 39 35 50.78	W 80 38 21.05
	9334.00	89.78	121.27	7456.26	6939.26	2056.48	-1815.93	1121.20	0.14	401723.88	1679033.14	N 39 35 50.56	W 80 38 20.58
	9378.00	89.89	121.30	7456.40	6939.40	2097.84	-1837.74	1157.09	0.32	401702.07	1679069.03	N 39 35 50.35	W 80 38 20.12
	9419.00	89.52	122.60	7456.63	6939.63	2139.88	-1860.48	1193.59	2.90	401679.35	1679105.63	N 39 35 50.13	W 80 38 19.65
	9461.00	89.66	121.55	7456.93	6939.93	2181.12	-1882.73	1229.20	2.29	401657.08	1679141.13	N 39 35 49.92	W 80 38 19.19
	9503.00	89.88	121.89	7457.11	6940.11	2222.34	-1904.85	1264.91	1.65	401634.97	1679176.84	N 39 35 49.70	W 80 38 18.73
	9548.00	89.63	121.75	7457.23	6940.23	2266.52	-1928.81	1303.12	0.14	401611.21	1679212.05	N 39 35 49.47	W 80 38 18.24
	9590.00	90.14	121.75	7457.24	6940.24	2307.75	-						

103-02638

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	Northing (NUS)	Easting (EUS)	Latitude (N/S °'")	Longitude (E/W °'")
	10769.00	91.34	127.89	7454.82	6037.62	3477.06	-2642.74	2291.69	7.33	400897.12	1680203.66	N 39 35 42.64	W 80 38 5.50
	10812.00	91.37	130.26	7453.80	6036.60	3519.97	-2669.84	2325.06	5.51	400870.02	1680226.93	N 39 35 42.29	W 80 38 5.07
	10855.00	90.48	130.43	7453.11	6036.11	3562.92	-2697.67	2357.83	2.11	400842.19	1680259.69	N 39 35 42.01	W 80 38 4.64
	10898.00	90.41	130.21	7452.77	6035.77	3605.58	-2725.49	2390.61	0.54	400814.37	1680302.47	N 39 35 41.73	W 80 38 4.22
	10943.00	91.10	128.90	7452.18	6035.18	3625.81	-2746.15	2425.30	3.29	400785.72	1680337.10	N 39 35 41.48	W 80 38 3.77
	10988.00	91.24	127.77	7451.26	6034.26	3695.66	-2762.05	2460.59	2.63	400767.62	1680372.45	N 39 35 41.18	W 80 38 3.32
	11033.00	91.64	127.15	7450.17	6033.17	3740.45	-2809.41	2496.30	1.63	400730.46	1680408.16	N 39 35 40.82	W 80 38 2.88
	11078.00	91.79	126.47	7448.92	6031.92	3783.20	-2835.17	2530.71	1.68	400704.71	1680442.67	N 39 35 40.57	W 80 38 2.41
	11117.00	91.44	126.85	7447.78	6030.78	3823.91	-2859.35	2563.60	1.74	400680.63	1680476.65	N 39 35 40.43	W 80 38 1.99
	11161.00	91.38	123.82	7446.68	6029.68	3867.46	-2884.47	2599.90	4.61	400655.40	1680511.76	N 39 35 40.19	W 80 38 1.52
	11205.00	91.96	122.64	7445.40	6028.40	3910.63	-2908.54	2636.71	3.19	400631.33	1680546.56	N 39 35 39.96	W 80 38 1.05
	11248.00	92.13	121.97	7443.86	6026.86	3953.07	-2931.48	2673.06	1.38	400608.40	1680581.02	N 39 35 39.73	W 80 38 0.58
	11294.00	91.99	121.93	7442.21	6025.21	3995.22	-2955.60	2712.06	0.32	400584.08	1680623.90	N 39 35 39.50	W 80 38 0.08
	11337.00	92.13	121.38	7440.68	6023.68	4040.38	-2978.36	2748.64	1.32	400561.53	1680660.48	N 39 35 39.28	W 80 37 59.81
	11380.00	92.33	121.93	7438.99	6021.99	4082.54	-3000.91	2785.22	1.36	400538.98	1680697.05	N 39 35 39.06	W 80 37 59.13
	11421.00	92.41	121.78	7437.30	6020.30	4122.76	-3022.53	2820.01	0.41	400517.36	1680731.55	N 39 35 38.85	W 80 37 58.69
	11466.00	92.10	120.89	7435.63	6018.63	4166.83	-3045.91	2858.42	2.09	400493.98	1680770.25	N 39 35 38.63	W 80 37 58.19
	11509.00	92.27	120.82	7433.89	6016.89	4208.86	-3067.85	2895.30	0.43	400471.94	1680807.14	N 39 35 38.41	W 80 37 57.72
	11553.00	92.13	120.66	7432.20	6015.20	4251.66	-3090.43	2933.09	0.43	400449.46	1680844.92	N 39 35 38.20	W 80 37 57.23
	11597.00	91.75	120.88	7430.71	6013.71	4294.88	-3112.84	2970.87	0.97	400426.95	1680882.69	N 39 35 37.98	W 80 37 56.75
	11641.00	91.79	121.29	7429.35	6012.35	4337.94	-3135.64	3008.63	0.94	400404.25	1680920.35	N 39 35 37.76	W 80 37 56.28
	11682.00	91.27	122.63	7428.25	6011.25	4378.19	-3167.34	3043.30	3.50	400382.66	1680956.12	N 39 35 37.55	W 80 37 55.81
	11725.00	91.07	123.67	7427.38	6010.38	4420.57	-3180.85	3079.29	2.46	400359.05	1680991.12	N 39 35 37.32	W 80 37 55.35
	11769.00	90.83	124.94	7426.65	6009.65	4464.08	-3205.84	3115.64	2.94	400334.26	1681027.45	N 39 35 37.08	W 80 37 54.68
	11814.00	90.65	125.09	7426.10	6009.10	4508.66	-3231.46	3152.49	0.71	400308.44	1681064.30	N 39 35 36.83	W 80 37 54.41
	11859.00	90.62	124.49	7425.68	6008.68	4553.22	-3257.13	3189.44	1.33	400282.77	1681101.26	N 39 35 36.58	W 80 37 53.93
	11904.00	90.41	124.70	7425.32	6008.32	4597.76	-3282.68	3226.48	0.63	400257.22	1681138.30	N 39 35 36.33	W 80 37 53.45
	11947.00	90.34	124.31	7425.04	6008.04	4640.31	-3307.04	3261.92	0.92	400232.86	1681173.73	N 39 35 36.10	W 80 37 53.00
	11991.00	90.00	125.09	7424.91	6007.91	4683.87	-3332.09	3298.09	1.93	400207.82	1681209.90	N 39 35 35.85	W 80 37 52.53
	12034.00	89.66	125.66	7425.03	6008.03	4726.51	-3356.96	3333.15	1.64	400182.62	1681244.96	N 39 35 35.61	W 80 37 52.08
	12077.00	89.79	125.59	7425.24	6008.24	4769.17	-3382.03	3368.11	0.34	400157.88	1681278.91	N 39 35 35.37	W 80 37 51.63
	12121.00	89.72	125.80	7425.43	6008.43	4812.83	-3407.70	3403.84	0.50	400132.21	1681316.54	N 39 35 35.12	W 80 37 51.17
	12165.00	89.49	125.97	7425.73	6008.73	4856.51	-3433.49	3439.49	0.65	400106.42	1681351.29	N 39 35 34.87	W 80 37 50.71
	12208.00	89.38	125.80	7426.16	6009.16	4899.20	-3459.69	3474.32	0.47	400081.22	1681386.12	N 39 35 34.62	W 80 37 50.26
	12250.00	89.35	125.90	7426.62	6009.62	4940.89	-3483.29	3508.36	0.25	400056.62	1681420.16	N 39 35 34.39	W 80 37 49.82
	12293.00	89.46	126.05	7427.07	6010.07	4983.58	-3508.65	3543.16	0.42	400031.37	1681454.95	N 39 35 34.14	W 80 37 49.37
	12339.00	89.65	125.16	7427.47	6010.47	5026.21	-3533.33	3580.56	1.95	400004.59	1681492.35	N 39 35 33.88	W 80 37 48.89
	12384.00	89.42	125.27	7427.88	6010.88	5073.82	-3561.28	3617.32	0.58	399978.64	1681529.11	N 39 35 33.63	W 80 37 48.42
	12429.00	89.35	124.69	7428.36	6011.36	5116.40	-3587.07	3654.19	1.30	399952.85	1681565.88	N 39 35 33.38	W 80 37 47.94
	12473.00	89.31	124.65	7428.88	6011.88	5161.95	-3612.10	3690.38	0.13	399927.82	1681602.16	N 39 35 33.13	W 80 37 47.48
	12513.00	89.66	125.36	7429.23	6012.23	5201.58	-3635.05	3723.14	1.98	399904.88	1681634.82	N 39 35 32.91	W 80 37 47.05
	12557.00	89.73	125.08	7429.47	6012.47	5245.20	-3660.42	3759.08	0.66	399879.50	1681670.86	N 39 35 32.67	W 80 37 46.59
	12602.00	89.66	125.12	7429.71	6012.71	5289.79	-3686.30	3795.90	0.18	399853.63	1681707.88	N 39 35 32.41	W 80 37 46.12
	12643.00	89.62	125.74	7430.00	6013.00	5330.45	-3710.06	3829.31	1.65	399829.86	1681741.08	N 39 35 32.18	W 80 37 45.68
	12688.00	89.93	125.39	7430.22	6013.22	5376.09	-3736.24	3865.91	1.20	399803.69	1681777.68	N 39 35 31.93	W 80 37 45.21
	12733.00	89.25	125.07	7430.64	6013.64	5419.70	-3762.19	3902.07	1.67	399777.74	1681814.44	N 39 35 31.68	W 80 37 44.74
	12779.00	89.24	124.30	7431.15	6014.15	5465.23	-3788.37	3940.49	1.67	399751.56	1681852.26	N 39 35 31.42	W 80 37 44.26
	12824.00	89.69	124.04	7431.67	6014.67	5509.72	-3813.64	3977.72	1.15	399725.29	1681889.49	N 39 35 31.18	W 80 37 43.77
	12869.00	89.62	124.75	7431.84	6014.84	5554.24	-3839.06	4014.85	1.59	399700.87	1681926.62	N 39 35 30.93	W 80 37 43.29
	12914.00	89.45	125.25	7432.20	6015.20	5598.82	-3864.67	4051.71	1.17	399675.07	1681963.47	N 39 35 30.68	W 80 37 42.82
	12958.00	89.90	125.72	7432.45	6015.45	5642.48	-3890.41	4087.54	1.48	399649.63	1681999.30	N 39 35 30.43	W 80 37 42.36
	13002.00	90.10	126.91	7432.45	6015.45	5688.18	-3916.47	4122.99	2.74	399623.47	1682034.75	N 39 35 30.18	W 80 37 41.90
	13045.00	90.34	128.62	7432.29	6015.29	5729.01	-3942.60	4160.98	4.02	399597.14	1682069.74	N 39 35 29.92	W 80 37 41.46
	13089.00	90.72	130.21	7431.88	6014.88	5772.93	-3970.74	4190.87	3.72	399569.21	1682102.73	N 39 35 29.65	W 80 37 41.02
	13132.00	90.69	130.82	7431.35	6014.35	5815.89	-3998.67	4223.66	1.42	399541.27	1682135.41	N 39 35 29.38	W 80 37 40.60
	13174.00	90.68	130.98	7430.89	6013.89	5857.66	-4026.17	4255.41	0.46	399513.78	1682167.15	N 39 35 29.11	W 80 37 40.19
	13220.00	90.62	130.81	7430.40	6013.40	5903.84	-4054.28	4290.18	0.38	399483.67	1682201.82	N 39 35 28.82	W 80 37 39.74
	13264.00	90.72	130.17	7429.89	6012.89	5947.60	-4084.85	4323.64	1.47	399455.10	1682235.38	N 39 35 28.54	W 80 37 39.31
	13308.00	90.27	129.65	7429.61	6012.61	5991.74	-4113.05	4357.41	1.74	399426.90	1682269.15	N 39 35 28.27	W 80 37 38.87
	13351.00	90.17	128.65	7429.34	6012.34	6034.64	-4140.14	4390.60	2.34	399399.82	1682302.64	N 39 35 28.00	W 80 37 38.44
	13395.00	90.17	127.21	7429.21	6012.21	6078.48	-4167.15	4425.63	3.05	399372.80	1682337.27	N 39 35 27.74	W 80 37 38.00
Final Surveys	13440.00	90.48	126.48	7428.98	6011.98	6123.24	-4194.13	4461.65	1.80	399345.83	1682373.28	N 39 35 27.48	W 80 37 37.53
Projection to TD	13523.00	90.48	125.08	7428.26	6011.26	6205.61	-4242.64	4528.89	1.68	399297.32	1682440.62	N 39 35 27.01	W 80 37 36.66

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)	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
	17.000	6985.000		Act Stns	30.000	30.000	SLB_FREE GYRO
	6985.000	13440.000		Act Stns	30.000	30.000	SLB_MWD-STD
	13440.000	13523.000		Act Stns	30.000	30.000	SLB_BLIND+TREND

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WV Department of
Environmental Protection
11/22/2013

103-02638

HG

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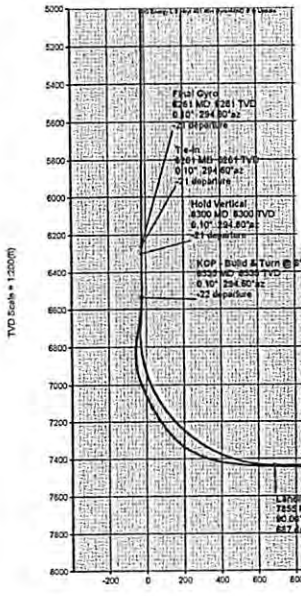
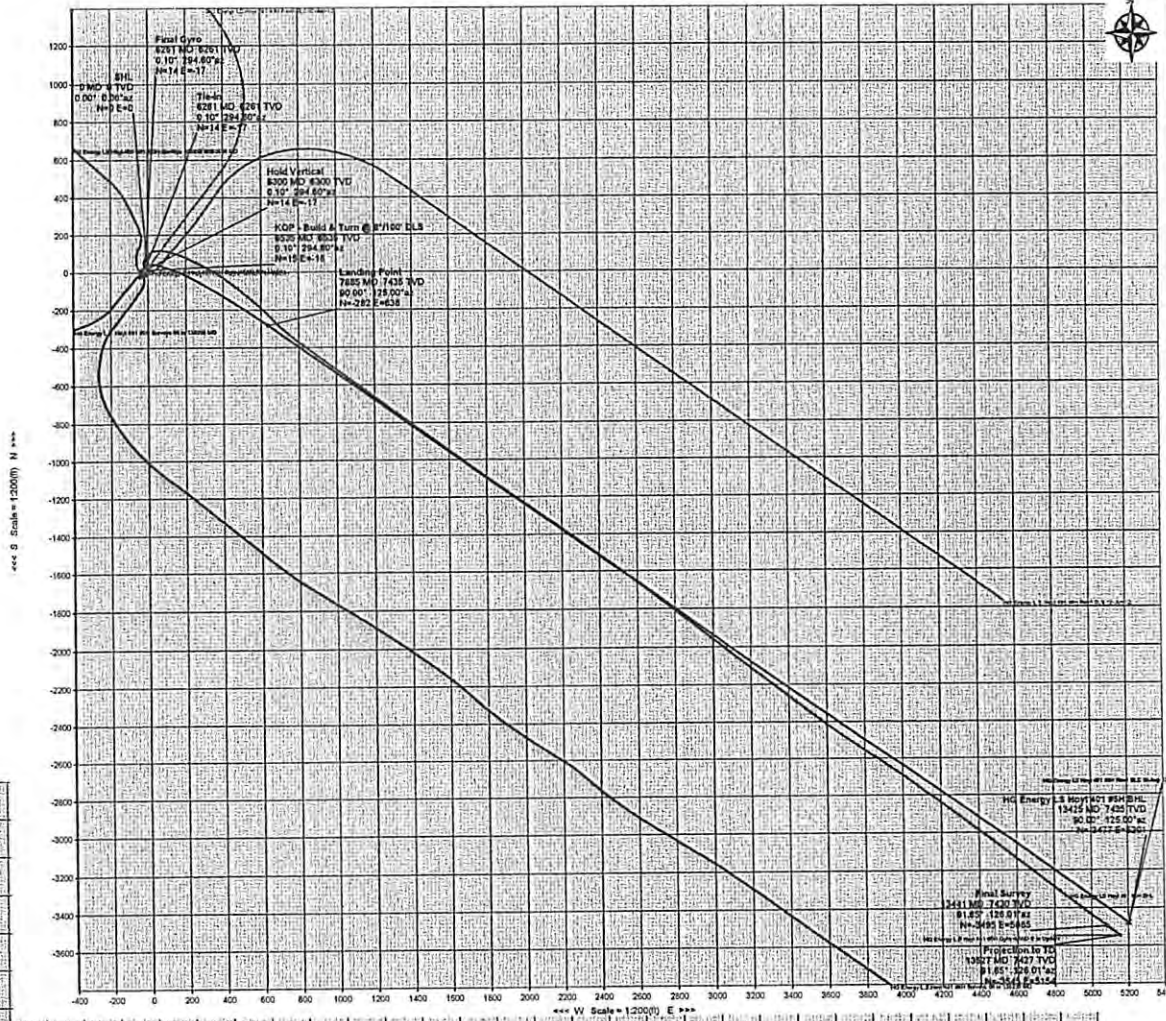
WELL	L.S. Hoyt 401 #5H	FIELD	WV Wetzel County (NAD 27)	STRUCTURE	HAD 105
Maping Parameters	Block: 80021 011	Dip: 87.238° Mag Dec: -8.627°	Date: June 12, 2012 FC: 32931-64T	Surface Location Lat: N 39 34 8.43 Long: W 81 24 34.814	Wellbore Stat: L.S. Hoyt 401 #5H Plan: Rev1 31.9 (8-Aug-12)
				Heading: 342227 True Virginia State Plane, Natchez Zone, U.S. Feet Grid Cont: -8.729° Scale Fact: 0.9994033	TVD Ref: 8314178 above MSL Dry Date: June 12, 2012



Grid North
Tot Cor (-1.0) (-7.8978°)
Mag Dec (-8.627°)
Grid Conv (-0.729°)

Legend

- Vertical Section (ft) Azim = 123.76° Scale = 1:2000 (ft) Origin = 0 N-S, 0 E-W
- Horizontal Section (ft) Azim = 123.76° Scale = 1:2000 (ft) Origin = 0 N-S, 0 E-W
- Wellbore Path (ft) Azim = 123.76° Scale = 1:2000 (ft) Origin = 0 N-S, 0 E-W
- Wellbore Path (ft) Azim = 123.76° Scale = 1:2000 (ft) Origin = 0 N-S, 0 E-W
- Wellbore Path (ft) Azim = 123.76° Scale = 1:2000 (ft) Origin = 0 N-S, 0 E-W
- Wellbore Path (ft) Azim = 123.76° Scale = 1:2000 (ft) Origin = 0 N-S, 0 E-W
- Wellbore Path (ft) Azim = 123.76° Scale = 1:2000 (ft) Origin = 0 N-S, 0 E-W
- Wellbore Path (ft) Azim = 123.76° Scale = 1:2000 (ft) Origin = 0 N-S, 0 E-W
- Wellbore Path (ft) Azim = 123.76° Scale = 1:2000 (ft) Origin = 0 N-S, 0 E-W
- Wellbore Path (ft) Azim = 123.76° Scale = 1:2000 (ft) Origin = 0 N-S, 0 E-W



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OCT 29 2013