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State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

API 47-033-05748 County HARRISON District TEN MILE  
Quad SALEM 7.5' Pad Name W.B. CARPENTER Field/Pool Name WOLF SUMMIT  
Farm name JUNKINS, EARL & BELVA Well Number 133  
Operator (as registered with the OOG) H.G. ENERGY LLC  
Address 5260 DuPONT ROAD City PARKERSBURG State WV Zip 26101

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,347,635 M Easting 542,649 M  
Landing Point of Curve Northing \_\_\_\_\_ Easting \_\_\_\_\_  
Bottom Hole Northing 4,347,831 M Easting 542,472 M

Elevation (ft) 1,161' GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine  
Mud Type(s) and Additive(s)  
N/A

Date permit issued 5/31/13 Date drilling commenced 9/20/13 Date drilling ceased 9/27/13  
Date completion activities began 11/1/13 Date completion activities ceased 11/5/13  
Verbal plugging (Y/N) N Date permission granted \_\_\_\_\_ Granted by \_\_\_\_\_

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 50' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft None Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 533'-540' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N  
MAR 24 2014

WV Department of  
Environmental Protection

Reviewed by:

**04/04/2014**

API 47-033 - 05748 Farm name JUNKINS, EARL & BELVA Well number 133

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	12 1/4"	11 5/8"	30'	Used	LS		Sand In
Surface	8 3/4"	7"	640'	New	LS	64'	Y
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	6 1/2"	4 1/2"	3159.25'	New	J-55		Y
Tubing							
Packer type and depth set							

Comment Details Circulated Est. 10 bbls to surface on 7" surface cement job. Circulated Est. 10 bbls to surface on 4 1/2" cement job.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	Reg Neat	160	15.6	1.18	236	Surface	8
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	50:50 Pozmix/ Econo	200/80	14.2/11.8	1.27/2.93	254/234	450'	8
Tubing							

Drillers TD (ft) 3204' Loggers TD (ft) 3170'  
 Deepest formation penetrated Fifth Sand Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 700'

Check all wireline logs run  caliper  density  deviated/directional  induction  
 neutron  resistivity  gamma ray  temperature  sonic

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_  
15 Centralizers every 64' from bottom on 4 1/2", Centralizer placed mid string on 7"

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_



API 47- 033 - 05748 Farm name JUNKINS, EARL & BELVA Well number 133

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
Fifth Sand	2873'-2885'	TVD 3080'-3092' MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump  
 SHUT-IN PRESSURE Surface \_\_\_\_\_ psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs  
 OPEN FLOW Gas \_\_\_\_\_ mcfpd Oil \_\_\_\_\_ bpd NGL \_\_\_\_\_ bpd Water \_\_\_\_\_ bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
Sand/Shale	0	533	0	533	
Pittsburgh Coal	533	540	533	540	
Sand/Shale	540	1891	540	1960	
Big Lime	1891	1977	1960	2063	
Big Injun	1977	2035	2063	2134	
Shale	2035	2453	2134	2604	
Fifty Foot	2453	2462	2614	2624	
Shale	2462	2543	2624	2700	
Sand	2453	2702	2700	2886	
Shale	2702	2873	2886	3080	
Fifth Sand	2873	2885	3080	3092	Drilled directional N 36.5 deg W a distance of 882'
Shale	2885	2986	3092	3204	
TD	2986		3204		

Please insert additional pages as applicable.

Drilling Contractor Decker Drilling  
 Address 11565 State Route 676 City Vincent State OH Zip 45784

Logging Company Weatherford International  
 Address 777 North River Avenue City Weston State WV Zip 26452

Cementing Company Baker Hughes  
 Address 2228 Philippi Pike City Clarksburg State WV Zip 26301

Stimulating Company Universal Services Inc.  
 Address 2489 Baumen Rd City Wooster State OH Zip 44691

Please insert additional pages as applicable.

Completed by Roger Heldman Telephone 304-420-1107  
 Signature  Title Operations Manager Date 1/30/14

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

04/04/2014

**HG Energy, LLC**  
Harrison County, West Virginia  
W.B. Carpenter #133  
W.B. Carpenter #133

Wellbore #1

Survey: MWD

## **DDC Survey Report**

11 December, 2013



04/04/2014



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I Larry Wright, certify that I am employed by The Appalachian Directional Drilling Company (ADC). That I did on the day(s) of 9/23/13 thru 9/25/13 conduct or supervise the taking of a MWD Survey from a depth of 688 feet to a depth of 3204 feet, that the data is true, correct, complete and within the limitations of the tool as set forth by The Appalachian Directional Drilling Company (ADC).; that I am authorized and qualified to make this report; that this survey was conducted at the request of HG Energy, LLC for the W.B. Carpenter #133 API No. 47-033-05748 in Harrison, County WV; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by The Appalachian Directional Drilling Company (ADC).

Larry Wright

Digitally signed by Larry Wright  
DN: cn=Larry Wright, o=The  
Directional Drilling Company,  
ou=GM of Guidance Services,  
email=larryw@directionaldrillers  
.com, c=US  
Date: 2013.12.23 11:53:30 -06'00'

# **HG Energy, LLC**

**Harrison County, West Virginia**

**W.B. Carpenter #133**

**W.B. Carpenter #133**

**Wellbore #1**

**Design: Wellbore #1**

## **Survey Report - Geographic**

**07 January, 2014**



**04/04/2014**

**DDC**  
Survey Report - Geographic



<b>Company:</b> HG Energy, LLC	<b>Local Co-ordinate Reference:</b> Well W.B. Carpenter #133
<b>Project:</b> Harrison County, West Virginia	<b>TVD Reference:</b> WELL @ 1169.0usft (Decker #6)
<b>Site:</b> W.B. Carpenter #133	<b>MD Reference:</b> WELL @ 1169.0usft (Decker #6)
<b>Well:</b> W.B. Carpenter #133	<b>North Reference:</b> Grid
<b>Wellbore:</b> Wellbore #1	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Wellbore #1	<b>Database:</b> EDM 5000.1 Single User Db

<b>Project</b>	Harrison County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	W.B. Carpenter #133				
<b>Site Position:</b>		<b>Northing:</b>	14,263,828.01 usft	<b>Latitude:</b>	39° 16' 36.900 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,780,288.93 usft	<b>Longitude:</b>	80° 30' 20.600 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.31 °

<b>Well</b>	W.B. Carpenter #133					
<b>Well Position</b>	+N-S	0.0 usft	<b>Northing:</b>	14,263,828.01 usft	<b>Latitude:</b>	39° 16' 36.900 N
	+E-W	0.0 usft	<b>Easting:</b>	1,780,288.93 usft	<b>Longitude:</b>	80° 30' 20.600 W
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,161.0 usft	

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	12/11/2013	-8.64	66.81	52,318

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	322.18	

<b>Survey Program</b>	<b>Date</b>	12/11/2013			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
688.0	3,204.0	MWD (Wellbore #1)			

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
688.0	0.00	0.00	688.0	0.0	0.0	14,263,828.01	1,780,288.93	39° 16' 36.900 N	80° 30' 20.600 W	
<b>TIE IN @ 688' MD / 688' TVD</b>										
718.0	0.22	311.10	718.0	0.0	0.0	14,263,828.05	1,780,288.89	39° 16' 36.900 N	80° 30' 20.601 W	
748.0	0.31	312.02	748.0	0.1	-0.1	14,263,828.14	1,780,288.79	39° 16' 36.901 N	80° 30' 20.602 W	
778.0	1.19	308.02	778.0	0.4	-0.5	14,263,828.39	1,780,288.48	39° 16' 36.904 N	80° 30' 20.606 W	
808.0	2.68	309.12	808.0	1.0	-1.2	14,263,829.02	1,780,287.69	39° 16' 36.910 N	80° 30' 20.616 W	
838.0	4.22	316.59	837.9	2.3	-2.5	14,263,830.27	1,780,286.39	39° 16' 36.922 N	80° 30' 20.632 W	
868.0	5.41	316.11	867.8	4.1	-4.3	14,263,832.09	1,780,284.65	39° 16' 36.941 N	80° 30' 20.654 W	
898.0	6.59	319.40	897.7	6.4	-6.4	14,263,834.42	1,780,282.55	39° 16' 36.964 N	80° 30' 20.681 W	
928.0	7.29	323.71	927.4	9.2	-8.6	14,263,837.26	1,780,280.30	39° 16' 36.992 N	80° 30' 20.709 W	
958.0	8.09	325.51	957.2	12.5	-11.0	14,263,840.53	1,780,277.98	39° 16' 37.024 N	80° 30' 20.738 W	
988.0	8.70	329.20	986.8	16.2	-13.3	14,263,844.22	1,780,275.62	39° 16' 37.061 N	80° 30' 20.768 W	



**DDC**  
Survey Report - Geographic



**Company:** HG Energy, LLC  
**Project:** Harrison County, West Virginia  
**Site:** W.B. Carpenter #133  
**Well:** W.B. Carpenter #133  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well W.B. Carpenter #133  
**TVD Reference:** WELL @ 1169.0usft (Decker #6)  
**MD Reference:** WELL @ 1169.0usft (Decker #6)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

**Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,018.0	9.18	336.01	1,016.5	20.3	-15.4	14,263,848.35	1,780,273.49	39° 16' 37.102 N	80° 30' 20.795 W
1,048.0	9.89	331.40	1,046.1	24.8	-17.7	14,263,852.80	1,780,271.28	39° 16' 37.146 N	80° 30' 20.823 W
1,078.0	10.99	332.89	1,075.6	29.6	-20.2	14,263,857.61	1,780,268.75	39° 16' 37.194 N	80° 30' 20.855 W
1,108.0	11.82	333.20	1,105.0	34.9	-22.9	14,263,862.90	1,780,266.06	39° 16' 37.246 N	80° 30' 20.889 W
1,138.0	12.30	333.42	1,134.3	40.5	-25.7	14,263,868.50	1,780,263.24	39° 16' 37.302 N	80° 30' 20.924 W
1,168.0	12.79	334.92	1,163.6	46.4	-28.5	14,263,874.38	1,780,260.40	39° 16' 37.360 N	80° 30' 20.960 W
1,198.0	13.32	336.32	1,192.8	52.5	-31.3	14,263,880.54	1,780,257.61	39° 16' 37.421 N	80° 30' 20.995 W
1,228.0	13.89	336.89	1,222.0	59.0	-34.1	14,263,887.01	1,780,254.81	39° 16' 37.485 N	80° 30' 21.030 W
1,258.0	14.90	337.99	1,251.0	65.9	-37.0	14,263,893.90	1,780,251.95	39° 16' 37.553 N	80° 30' 21.066 W
1,288.0	16.08	337.82	1,279.9	73.3	-40.0	14,263,901.33	1,780,248.93	39° 16' 37.627 N	80° 30' 21.104 W
1,318.0	18.11	337.60	1,308.6	81.5	-43.3	14,263,909.48	1,780,245.59	39° 16' 37.708 N	80° 30' 21.146 W
1,348.0	19.69	337.29	1,337.0	90.4	-47.1	14,263,918.48	1,780,241.86	39° 16' 37.797 N	80° 30' 21.193 W
1,378.0	20.48	334.70	1,365.2	99.9	-51.3	14,263,927.87	1,780,237.67	39° 16' 37.890 N	80° 30' 21.245 W
1,408.0	21.01	332.32	1,393.2	109.4	-56.0	14,263,937.37	1,780,232.93	39° 16' 37.984 N	80° 30' 21.305 W
1,438.0	21.01	328.72	1,421.2	118.7	-61.3	14,263,946.73	1,780,227.63	39° 16' 38.077 N	80° 30' 21.372 W
1,468.0	19.91	325.51	1,449.3	127.5	-67.0	14,263,955.54	1,780,221.95	39° 16' 38.164 N	80° 30' 21.443 W
1,498.0	19.20	323.93	1,477.6	135.7	-72.8	14,263,963.74	1,780,216.15	39° 16' 38.246 N	80° 30' 21.516 W
1,528.0	19.38	321.03	1,505.9	143.6	-78.8	14,263,971.59	1,780,210.12	39° 16' 38.324 N	80° 30' 21.593 W
1,558.0	19.91	319.40	1,534.2	151.3	-85.3	14,263,979.34	1,780,203.66	39° 16' 38.401 N	80° 30' 21.674 W
1,588.0	20.70	318.39	1,562.3	159.2	-92.1	14,263,987.19	1,780,196.82	39° 16' 38.479 N	80° 30' 21.761 W
1,618.0	21.40	318.22	1,590.3	167.2	-99.3	14,263,995.23	1,780,189.65	39° 16' 38.559 N	80° 30' 21.851 W
1,648.0	22.28	317.82	1,618.2	175.5	-106.7	14,264,003.53	1,780,182.18	39° 16' 38.641 N	80° 30' 21.946 W
1,678.0	23.29	318.70	1,645.8	184.2	-114.5	14,264,012.20	1,780,174.45	39° 16' 38.727 N	80° 30' 22.044 W
1,708.0	24.21	319.90	1,673.3	193.3	-122.4	14,264,021.36	1,780,166.57	39° 16' 38.818 N	80° 30' 22.143 W
1,738.0	25.80	321.91	1,700.5	203.2	-130.3	14,264,031.20	1,780,158.58	39° 16' 38.916 N	80° 30' 22.244 W
1,768.0	27.11	322.92	1,727.3	213.8	-138.5	14,264,041.79	1,780,150.44	39° 16' 39.021 N	80° 30' 22.347 W
1,798.0	28.78	323.62	1,753.8	225.1	-146.9	14,264,053.06	1,780,142.03	39° 16' 39.133 N	80° 30' 22.453 W
1,828.0	30.19	324.10	1,779.9	237.0	-155.6	14,264,064.99	1,780,133.32	39° 16' 39.251 N	80° 30' 22.563 W
1,858.0	31.68	324.72	1,805.7	249.5	-164.6	14,264,077.53	1,780,124.35	39° 16' 39.376 N	80° 30' 22.676 W
1,888.0	32.08	325.82	1,831.2	262.5	-173.6	14,264,090.55	1,780,115.32	39° 16' 39.505 N	80° 30' 22.790 W
1,918.0	32.52	325.03	1,856.5	275.7	-182.7	14,264,103.75	1,780,106.23	39° 16' 39.636 N	80° 30' 22.905 W
1,948.0	32.78	323.01	1,881.8	288.8	-192.2	14,264,116.84	1,780,096.72	39° 16' 39.766 N	80° 30' 23.025 W
1,978.0	33.09	322.83	1,906.9	301.8	-202.1	14,264,129.86	1,780,086.88	39° 16' 39.895 N	80° 30' 23.149 W
2,008.0	33.79	323.31	1,932.0	315.1	-212.0	14,264,143.07	1,780,076.95	39° 16' 40.026 N	80° 30' 23.275 W
2,038.0	34.32	324.50	1,956.8	328.6	-221.9	14,264,156.65	1,780,067.06	39° 16' 40.161 N	80° 30' 23.400 W
2,068.0	34.80	324.41	1,981.5	342.5	-231.8	14,264,170.49	1,780,057.16	39° 16' 40.299 N	80° 30' 23.525 W
2,098.0	35.11	324.19	2,006.1	356.4	-241.8	14,264,184.45	1,780,047.13	39° 16' 40.437 N	80° 30' 23.651 W
2,128.0	34.58	324.50	2,030.8	370.4	-251.8	14,264,198.38	1,780,037.14	39° 16' 40.575 N	80° 30' 23.777 W
2,158.0	33.71	323.01	2,055.6	383.9	-261.7	14,264,211.96	1,780,027.19	39° 16' 40.710 N	80° 30' 23.903 W
2,188.0	33.00	319.40	2,080.6	396.8	-272.1	14,264,224.81	1,780,016.86	39° 16' 40.838 N	80° 30' 24.034 W
2,218.0	32.30	319.71	2,105.9	409.1	-282.6	14,264,237.13	1,780,006.36	39° 16' 40.960 N	80° 30' 24.166 W
2,248.0	31.68	322.00	2,131.3	421.4	-292.6	14,264,249.45	1,779,996.33	39° 16' 41.083 N	80° 30' 24.293 W
2,278.0	31.20	324.81	2,156.9	434.0	-301.9	14,264,262.01	1,779,987.00	39° 16' 41.207 N	80° 30' 24.411 W
2,308.0	30.89	327.49	2,182.6	446.8	-310.6	14,264,274.86	1,779,978.38	39° 16' 41.335 N	80° 30' 24.520 W
2,338.0	30.72	330.61	2,208.4	460.0	-318.5	14,264,288.03	1,779,970.48	39° 16' 41.465 N	80° 30' 24.619 W
2,368.0	30.59	331.93	2,234.2	473.4	-325.8	14,264,301.44	1,779,963.13	39° 16' 41.598 N	80° 30' 24.712 W
2,398.0	29.49	332.41	2,260.2	486.7	-332.8	14,264,314.72	1,779,956.12	39° 16' 41.730 N	80° 30' 24.800 W
2,428.0	29.00	335.62	2,286.4	499.9	-339.2	14,264,327.89	1,779,949.70	39° 16' 41.861 N	80° 30' 24.881 W
2,458.0	27.60	335.53	2,312.8	512.8	-345.1	14,264,340.84	1,779,943.82	39° 16' 41.989 N	80° 30' 24.955 W
2,488.0	26.81	334.52	2,339.5	525.3	-350.9	14,264,353.27	1,779,938.03	39° 16' 42.112 N	80° 30' 25.028 W
2,518.0	26.19	332.63	2,366.3	537.2	-356.9	14,264,365.26	1,779,932.07	39° 16' 42.231 N	80° 30' 25.102 W
2,548.0	25.49	331.53	2,393.3	548.8	-363.0	14,264,376.81	1,779,925.95	39° 16' 42.346 N	80° 30' 25.180 W
2,578.0	24.30	328.63	2,420.5	559.7	-369.3	14,264,387.76	1,779,919.66	39° 16' 42.454 N	80° 30' 25.259 W
2,608.0	23.60	326.52	2,447.9	570.0	-375.8	14,264,398.04	1,779,913.13	39° 16' 42.556 N	80° 30' 25.341 W
2,638.0	22.59	324.02	2,475.5	579.7	-382.5	14,264,407.71	1,779,906.44	39° 16' 42.652 N	80° 30' 25.426 W

**DDC**  
Survey Report - Geographic



Company: HG Energy, LLC  
 Project: Harrison County, West Virginia  
 Site: W.B. Carpenter #133  
 Well: W.B. Carpenter #133  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference:  
 TVD Reference:  
 MD Reference:  
 North Reference:  
 Survey Calculation Method:  
 Database:

Well W.B. Carpenter #133  
 WELL @ 1169.0usft (Decker #6)  
 WELL @ 1169.0usft (Decker #6)  
 Grid  
 Minimum Curvature  
 EDM 5000.1 Single User Db

**Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,668.0	21.49	321.42	2,503.3	588.7	-389.3	14,264,416.67	1,779,899.62	39° 16' 42.741 N	80° 30' 25.512 W
2,698.0	20.30	318.83	2,531.4	596.9	-396.2	14,264,424.88	1,779,892.77	39° 16' 42.823 N	80° 30' 25.598 W
2,728.0	20.39	317.51	2,559.5	604.6	-403.1	14,264,432.65	1,779,885.81	39° 16' 42.900 N	80° 30' 25.686 W
2,758.0	21.01	316.11	2,587.6	612.4	-410.4	14,264,440.38	1,779,878.56	39° 16' 42.977 N	80° 30' 25.778 W
2,788.0	23.29	316.19	2,615.4	620.5	-418.2	14,264,448.54	1,779,870.72	39° 16' 43.058 N	80° 30' 25.877 W
2,818.0	26.28	316.41	2,642.6	629.6	-428.9	14,264,457.63	1,779,862.03	39° 16' 43.148 N	80° 30' 25.987 W
2,848.0	28.39	316.50	2,669.2	639.8	-436.4	14,264,467.62	1,779,852.54	39° 16' 43.247 N	80° 30' 26.107 W
2,878.0	29.49	315.93	2,695.5	650.1	-448.4	14,264,478.10	1,779,842.50	39° 16' 43.352 N	80° 30' 26.234 W
2,908.0	28.92	314.39	2,721.7	660.5	-456.8	14,264,488.48	1,779,832.18	39° 16' 43.455 N	80° 30' 26.365 W
2,938.0	28.21	311.49	2,748.0	670.2	-467.3	14,264,498.25	1,779,821.68	39° 16' 43.552 N	80° 30' 26.498 W
2,968.0	27.82	310.61	2,774.5	679.5	-477.9	14,264,507.50	1,779,811.06	39° 16' 43.644 N	80° 30' 26.632 W
2,998.0	27.60	306.79	2,801.1	688.2	-488.8	14,264,516.22	1,779,800.18	39° 16' 43.731 N	80° 30' 26.770 W
3,028.0	27.42	303.23	2,827.7	696.2	-500.1	14,264,524.17	1,779,788.83	39° 16' 43.810 N	80° 30' 26.914 W
3,042.0	27.31	301.77	2,840.1	699.6	-505.5	14,264,527.63	1,779,783.41	39° 16' 43.844 N	80° 30' 26.982 W
3,058.0	27.20	300.11	2,854.3	703.4	-511.8	14,264,531.39	1,779,777.12	39° 16' 43.882 N	80° 30' 27.062 W
3,088.0	26.81	298.53	2,881.1	710.1	-523.7	14,264,538.07	1,779,765.25	39° 16' 43.949 N	80° 30' 27.213 W
3,118.0	26.19	296.59	2,907.9	716.2	-535.6	14,264,544.26	1,779,753.38	39° 16' 44.011 N	80° 30' 27.363 W
3,148.0	25.17	295.80	2,935.0	722.0	-547.2	14,264,550.00	1,779,741.72	39° 16' 44.068 N	80° 30' 27.511 W
3,204.0	23.26	294.33	2,986.0	731.7	-568.0	14,264,559.74	1,779,720.92	39° 16' 44.165 N	80° 30' 27.775 W

TD @ 3204' MD / 2986' TVD

**Design Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,204.0	2,986.0	731.7	-568.0	TD @ 3204' MD / 2986' TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

**DDC**  
Survey Report



**Company:** HG Energy, LLC  
**Project:** Harrison County, West Virginia  
**Site:** W.B. Carpenter #133  
**Well:** W.B. Carpenter #133  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well W.B. Carpenter #133  
**TVD Reference:** WELL @ 1169.0usft (Decker #6)  
**MD Reference:** WELL @ 1169.0usft (Decker #6)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

<b>Project</b>	Harrison County, West Virginia	
<b>Map System:</b>	Universal Transverse Mercator	<b>System Datum:</b> Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN	
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)	

<b>Site</b>	W.B. Carpenter #133				
<b>Site Position:</b>	<b>Northing:</b>	14,263,828.01 usft	<b>Latitude:</b>	39° 16' 36.900 N	
<b>From:</b> Lat/Long	<b>Easting:</b>	1,780,288.93 usft	<b>Longitude:</b>	80° 30' 20.600 W	
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b> 13-3/16 "	<b>Grid Convergence:</b>	0.31 °	

<b>Well</b>	W.B. Carpenter #133				
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	14,263,828.01 usft	<b>Latitude:</b> 39° 16' 36.900 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,780,288.93 usft	<b>Longitude:</b> 80° 30' 20.600 W
<b>Position Uncertainty</b>	0.0 usft		<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b> 1,161.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	12/11/2013	-8.64	66.81	52,318

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	322.18	

<b>Survey Program</b>	<b>Date</b>	12/11/2013			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
688.0	3,204.0	MWD (Wellbore #1)			

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
<b>TIE IN @ 688' MD / 688' TVD</b>									
688.0	0.00	0.00	688.0	0.0	0.0	0.0	0.00	0.00	0.00
718.0	0.22	311.10	718.0	0.0	0.0	0.1	0.73	0.73	0.00
748.0	0.31	312.02	748.0	0.1	-0.1	0.2	0.30	0.30	3.07
778.0	1.19	308.02	778.0	0.4	-0.5	0.6	2.94	2.93	-13.33
808.0	2.68	309.12	808.0	1.0	-1.2	1.6	4.97	4.97	3.67
838.0	4.22	316.59	837.9	2.3	-2.5	3.3	5.34	5.13	24.90
868.0	5.41	316.11	867.8	4.1	-4.3	5.8	3.97	3.97	-1.60
898.0	6.59	319.40	897.7	6.4	-6.4	9.0	4.10	3.93	10.97
928.0	7.29	323.71	927.4	9.2	-8.6	12.6	2.91	2.33	14.37

DDC  
Survey Report



Company: HG Energy, LLC  
 Project: Harrison County, West Virginia  
 Site: W.B. Carpenter #133  
 Well: W.B. Carpenter #133  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well W.B. Carpenter #133  
 TVD Reference: WELL @ 1169.0usft (Decker #6)  
 MD Reference: WELL @ 1169.0usft (Decker #6).  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
958.0	8.09	325.51	957.2	12.5	-11.0	16.6	2.78	2.67	6.00
988.0	8.70	329.20	986.8	16.2	-13.3	21.0	2.71	2.03	12.30
1,018.0	9.18	336.01	1,016.5	20.3	-15.4	25.5	3.87	1.60	22.70
1,048.0	9.89	331.40	1,046.1	24.8	-17.7	30.4	3.47	2.37	-15.37
1,078.0	10.99	332.89	1,075.6	29.6	-20.2	35.8	3.78	3.67	4.97
1,108.0	11.82	333.20	1,105.0	34.9	-22.9	41.6	2.77	2.77	1.03
1,138.0	12.30	333.42	1,134.3	40.5	-25.7	47.7	1.61	1.60	0.73
1,168.0	12.79	334.92	1,163.6	48.4	-28.5	54.1	1.96	1.63	5.00
1,198.0	13.32	336.32	1,192.8	52.5	-31.3	60.7	2.06	1.77	4.67
1,228.0	13.89	336.89	1,222.0	59.0	-34.1	67.5	1.95	1.90	1.90
1,258.0	14.90	337.99	1,251.0	65.9	-37.0	74.7	3.49	3.37	3.67
1,288.0	16.08	337.82	1,279.9	73.3	-40.0	82.4	3.94	3.93	-0.57
1,318.0	18.11	337.60	1,308.6	81.5	-43.3	90.9	6.77	6.77	-0.73
1,348.0	19.69	337.29	1,337.0	90.4	-47.1	100.3	5.28	5.27	-1.03
1,378.0	20.48	334.70	1,365.2	99.9	-51.3	110.3	3.96	2.63	-8.63
1,408.0	21.01	332.32	1,393.2	109.4	-56.0	120.7	3.32	1.77	-7.93
1,438.0	21.01	328.72	1,421.2	118.7	-61.3	131.4	4.30	0.00	-12.00
1,468.0	19.91	325.51	1,449.3	127.5	-67.0	141.8	5.24	-3.67	-10.70
1,498.0	19.20	323.93	1,477.6	135.7	-72.8	151.8	2.95	-2.37	-5.27
1,528.0	19.38	321.03	1,505.9	143.6	-78.8	161.7	3.25	0.60	-9.67
1,558.0	19.91	319.40	1,534.2	151.3	-85.3	171.8	2.54	1.77	-5.43
1,588.0	20.70	318.39	1,562.3	159.2	-92.1	182.2	2.88	2.63	-3.37
1,618.0	21.40	318.22	1,590.3	167.2	-99.3	193.0	2.34	2.33	-0.57
1,648.0	22.28	317.82	1,618.2	175.5	-106.7	204.1	2.97	2.93	-1.33
1,678.0	23.29	318.70	1,645.8	184.2	-114.5	215.7	3.55	3.37	2.93
1,708.0	24.21	319.90	1,673.3	193.3	-122.4	227.8	3.46	3.07	4.00
1,738.0	25.80	321.91	1,700.5	203.2	-130.3	240.4	6.01	5.30	6.70
1,768.0	27.11	322.92	1,727.3	213.8	-138.5	253.8	4.62	4.37	3.37
1,798.0	28.78	323.62	1,753.8	225.1	-146.9	267.9	5.67	5.57	2.33
1,828.0	30.19	324.10	1,779.9	237.0	-155.6	282.6	4.77	4.70	1.60
1,858.0	31.68	324.72	1,805.7	249.5	-164.6	298.0	5.08	4.97	2.07
1,888.0	32.08	325.82	1,831.2	262.5	-173.6	313.8	2.35	1.33	3.67
1,918.0	32.52	325.03	1,856.5	275.7	-182.7	329.8	2.03	1.47	-2.63
1,948.0	32.78	323.01	1,881.8	288.8	-192.2	346.0	3.73	0.87	-6.73
1,978.0	33.09	322.83	1,906.9	301.8	-202.1	362.3	1.08	1.03	-0.60
2,008.0	33.79	323.31	1,932.0	315.1	-212.0	378.9	2.49	2.33	1.60
2,038.0	34.32	324.50	1,956.8	328.6	-221.9	395.7	2.84	1.77	3.97
2,068.0	34.80	324.41	1,981.5	342.5	-231.8	412.7	1.61	1.60	-0.30
2,098.0	35.11	324.19	2,006.1	356.4	-241.8	429.8	1.12	1.03	-0.73
2,128.0	34.58	324.50	2,030.8	370.4	-251.8	447.0	1.86	-1.77	1.03
2,158.0	33.71	323.01	2,055.6	383.9	-261.7	463.8	4.02	-2.90	-4.97
2,188.0	33.00	319.40	2,080.6	396.8	-272.1	480.3	7.03	-2.37	-12.03
2,218.0	32.30	319.71	2,105.9	409.1	-282.6	496.4	2.40	-2.33	1.03
2,248.0	31.68	322.00	2,131.3	421.4	-292.6	512.3	4.54	-2.07	7.63

DDC  
Survey Report



Company: HG Energy, LLC  
 Project: Harrison County, West Virginia  
 Site: W.B. Carpenter #133  
 Well: W.B. Carpenter #133  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well W.B. Carpenter #133  
 TVD Reference: WELL @ 1169.0usft (Decker #6)  
 MD Reference: WELL @ 1169.0usft (Decker #6)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
2,278.0	31.20	324.81	2,156.9	434.0	-301.9	528.0	5.14	-1.60	9.37	
2,308.0	30.89	327.49	2,182.6	448.8	-310.6	543.4	4.72	-1.03	8.93	
2,338.0	30.72	330.61	2,208.4	460.0	-318.5	558.7	5.36	-0.57	10.40	
2,368.0	30.59	331.93	2,234.2	473.4	-325.8	573.8	2.28	-0.43	4.40	
2,398.0	29.49	332.41	2,260.2	486.7	-332.8	588.5	3.75	-3.67	1.60	
2,428.0	29.00	335.62	2,286.4	499.9	-339.2	602.9	5.48	-1.63	10.70	
2,458.0	27.60	335.53	2,312.8	512.8	-345.1	616.7	4.67	-4.67	-0.30	
2,488.0	26.81	334.52	2,339.5	525.3	-350.9	630.1	3.05	-2.63	-3.37	
2,518.0	26.19	332.63	2,366.3	537.2	-356.9	643.2	3.49	-2.07	-6.30	
2,548.0	25.49	331.53	2,393.3	548.8	-363.0	656.1	2.83	-2.33	-3.67	
2,578.0	24.30	328.63	2,420.5	559.7	-369.3	668.6	5.68	-3.97	-9.67	
2,608.0	23.60	326.52	2,447.9	570.0	-375.8	680.7	3.69	-2.33	-7.03	
2,638.0	22.59	324.02	2,475.5	579.7	-382.5	692.5	4.69	-3.37	-8.33	
2,668.0	21.49	321.42	2,503.3	588.7	-389.3	703.7	4.90	-3.67	-8.67	
2,698.0	20.30	318.83	2,531.4	596.9	-396.2	714.4	5.02	-3.97	-8.63	
2,728.0	20.39	317.51	2,559.5	604.6	-403.1	724.8	1.56	0.30	-4.40	
2,758.0	21.01	316.11	2,587.6	612.4	-410.4	735.4	2.64	2.07	-4.67	
2,788.0	23.29	316.19	2,615.4	620.5	-418.2	746.6	7.60	7.60	0.27	
2,818.0	26.28	316.41	2,642.6	629.6	-426.9	759.1	9.97	9.97	0.73	
2,848.0	28.39	316.50	2,669.2	639.6	-436.4	772.8	7.03	7.03	0.30	
2,878.0	29.49	315.93	2,695.5	650.1	-446.4	787.3	3.78	3.67	-1.90	
2,908.0	28.92	314.39	2,721.7	660.5	-456.8	801.8	3.14	-1.90	-5.13	
2,938.0	28.21	311.49	2,748.0	670.2	-467.3	816.0	5.19	-2.37	-9.67	
2,968.0	27.82	310.61	2,774.5	679.5	-477.9	829.8	1.89	-1.30	-2.93	
2,998.0	27.60	306.79	2,801.1	688.2	-488.8	843.3	5.97	-0.73	-12.73	
3,028.0	27.42	303.23	2,827.7	696.2	-500.1	856.6	5.51	-0.60	-11.87	
3,042.0	27.31	301.77	2,840.1	699.6	-505.5	862.6	4.86	-0.79	-10.43	
3,058.0	27.20	300.11	2,854.3	703.4	-511.8	869.5	4.80	-0.69	-10.38	
3,088.0	26.81	298.53	2,881.1	710.1	-523.7	882.0	2.72	-1.30	-5.27	
3,118.0	26.19	296.59	2,907.9	716.2	-535.6	894.2	3.55	-2.07	-6.47	
3,148.0	25.17	295.80	2,935.0	722.0	-547.2	905.9	3.59	-3.40	-2.63	
TD @ 3204' MD / 2986' TVD										
3,204.0	23.26	294.33	2,986.0	731.7	-568.0	926.3	3.58	-3.41	-2.63	

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
688.0	688.0	0.0	0.0	TIE IN @ 688' MD / 688' TVD
3,204.0	2,986.0	731.7	-568.0	TD @ 3204' MD / 2986' TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

W.B. Carpenter #133  
 Harrison County, West Virginia  
 Q130662 & AM-13736  
 Design #1

Company Name: HG Energy, LLC  
 W.B. Carpenter #133  
 Harrison County, West Virginia  
 Created By: James Dawson  
 Date: 09/30/2013

WELL DETAILS: W.B. Carpenter #133

Ground Level: 1161.0  
 +N-S +E/W Northing Easting Latitude Longitude  
 0.0 0.0 284562.37 1715294.3 39° 16' 36.900 N 80° 30' 20.600 W

PROJECT DETAILS: Harrison County, West Virginia

Geodetic System: US State Plane 1927 (Exact solution)  
 Datum: NAD 1927 (NADCON CONUS)  
 Ellipsoid: Clarke 1866  
 Zone: West Virginia North 4701  
 System Datum: Mean Sea Level

M G T Azimuths to Grid North



Correction: -7.99°

Magnetic Field  
 Strength: 52362.5snT  
 Dip Angle: 66.85°  
 Date: 7/31/2013  
 Model: IGRF2010



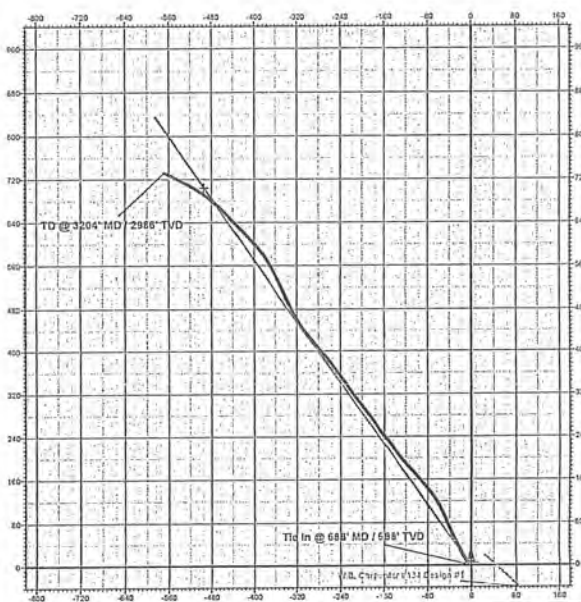
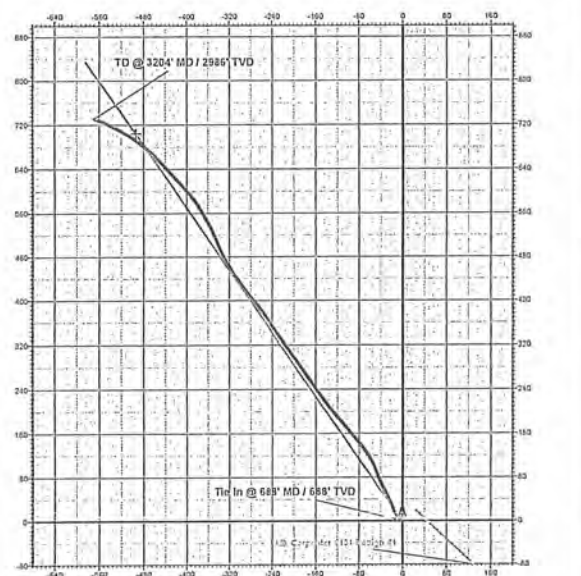
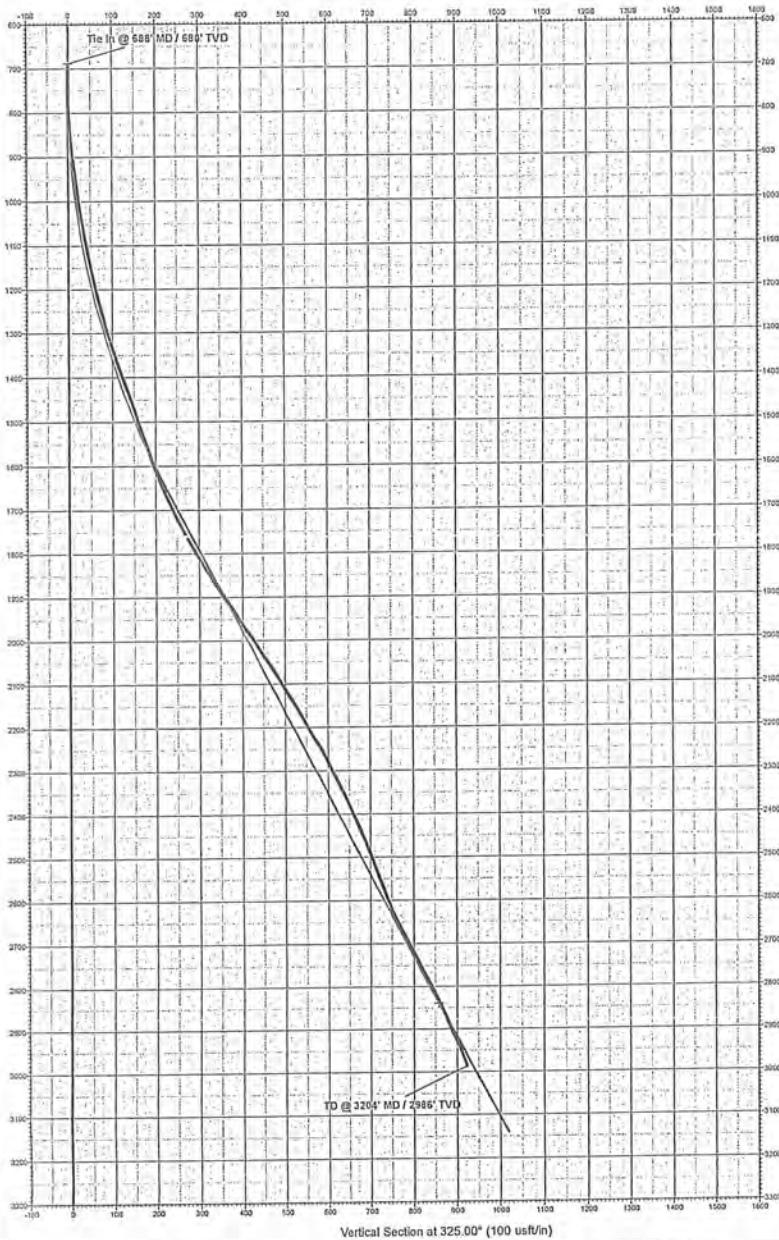
HG Energy

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E/W	Northing	Easting	Latitude	Longitude
Target W.B. Carpenter #133 -plan hole target center	2840.0	704.6	-52.3	289266.95	1714891.36	39° 16' 43.800 N	80° 30' 26.973 W

ANNOTATIONS

MD	Inc	Adj	TVD	+N-S	+E/W	Vsect	Departure	Annotation
3204.0	23.26	254.33	2566.0	731.7	-568.0	925.2	949.9	TD @ 3204' MD / 2566' TVD



04/04/2014

Prepared for:  
H G Energy



INVOICE #: 16022  
 WELL NAME: W B Carpenter #133  
 STATE & COUNTY: WV / Harrison  
 TOWNSHIP/FIELD: Wolfe Summit  
 DATE of SERVICE: 11/5/2013  
 CUSTOMER PO#

Description	Notes	Amount
FLUID PUMP CHARGE 0-3000 PSI MIN CHARGE 4 HRS		1
BLENDER CHARGE 0-10 BPM		1
MILEAGE CHARGE PER UNIT ONE WAY	2 Units @ 70 Miles	140
IC ACID 15%		300
PRO HIB II		0.5
ACID DELIVERY		2
PRO CLA LOK (KCL SUBSTITUTE)		20
PRO NE-21		10
PRO GEL 4		250
BUFFER I		50
BUFFER II		50
BIO CLEAR 750		2
AP BREAKER		22
BXL-A		15
BXL-10C		15
SAND 20/40 ECONCPRCP		100
SAND DELIVERY / TON MILES		350
DATA VAN		1

Customer Approval: \_\_\_\_\_

W.B. Carpenter #133  
 Harrison County, West Virginia  
 Q130662 & AM-13736  
 Design #1

Company Name: HG Energy, LLC  
 W.B. Carpenter #133  
 Harrison County, West Virginia  
 Created By: James Dawson  
 Date: 09/30/2013



# HG Energy

WELL DETAILS: W.B. Carpenter #133	
Ground Level: 1161.0	
+N-S 0.0	+E-W 0.0
Northing 28462.37	Easting 1716294.63
Latitude 39° 16' 36.900 N	Longitude 80° 30' 26.600 W
PROJECT DETAILS: Harrison County, West Virginia	
Geodetic System: US State Plane 1927 (Exact solution)	
Datum: NAD 1927 (NADCON CONUS)	
Ellipsoid: Clarke 1866	
Zone: West Virginia North 4701	
System Datum: Mean Sea Level	

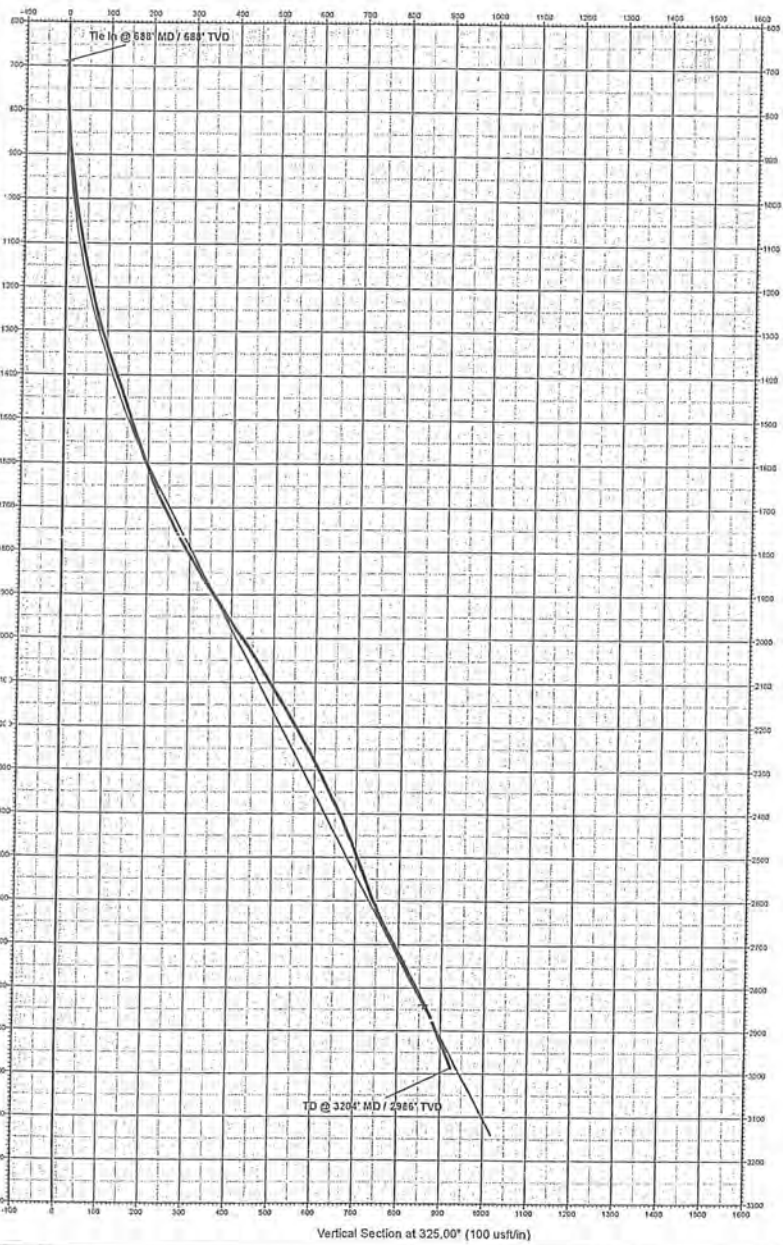
M G T Azimuths to Grid North

Correction: -7.99°

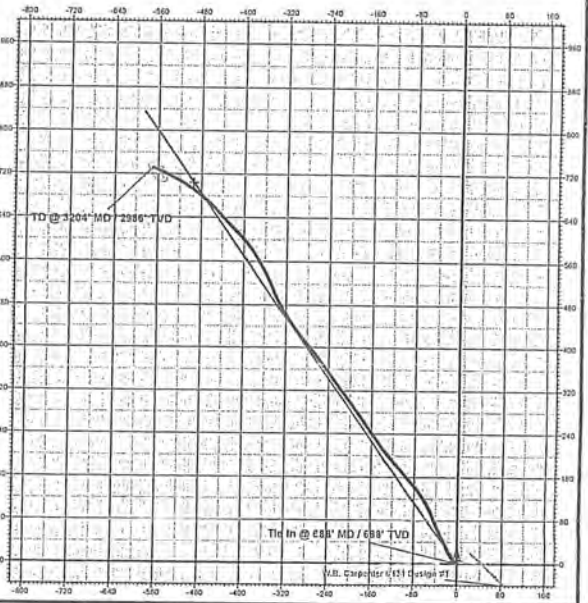
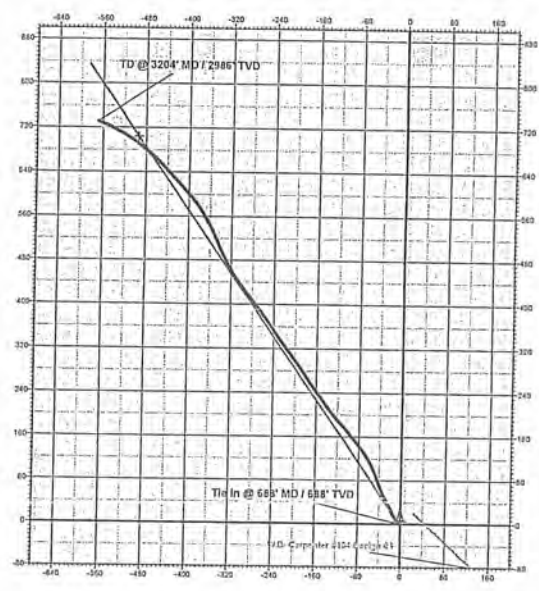
Magnetic Field Strength: 52362.5snT  
 Dip Angle: 66.85°  
 Date: 7/31/2013  
 Model: IGRF2010

DESIGN TARGET DETAILS						
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude
Target W.B. Carpenter #133	2846.0	704.5	-493.3	285265.85	1714801.35	39° 16' 43.808 N
- plan hits target center						

ANNOTATIONS							
MD	Inc	Azi	TVD	+N-S	+E-W	Vsect	Departure
3204.0	23.26	294.33	2986.0	731.7	-568.0	926.2	840.9
							Annotation
							TD @ 3204' MD / 2986' TVD



Vertical Section at 325.00' (100 usf/in)





DDC  
Survey Report



Company: HG Energy, LLC  
 Project: Harrison County, West Virginia  
 Site: W.B. Carpenter #133  
 Well: W.B. Carpenter #133  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well W.B. Carpenter #133  
 TVD Reference: WELL @ 1169.0usft (Decker #6)  
 MD Reference: WELL @ 1169.0usft (Decker #6)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
2,278.0	31.20	324.81	2,156.9	434.0	-301.9	528.0	5.14	-1.60	9.37	
2,308.0	30.89	327.49	2,182.6	446.8	-310.6	543.4	4.72	-1.03	8.93	
2,338.0	30.72	330.61	2,208.4	460.0	-318.5	558.7	5.36	-0.57	10.40	
2,368.0	30.59	331.93	2,234.2	473.4	-325.8	573.8	2.28	-0.43	4.40	
2,398.0	29.49	332.41	2,260.2	486.7	-332.8	588.5	3.75	-3.67	1.60	
2,428.0	29.00	335.62	2,286.4	499.9	-339.2	602.9	5.48	-1.63	10.70	
2,458.0	27.60	335.53	2,312.8	512.8	-345.1	616.7	4.67	-4.67	-0.30	
2,488.0	26.81	334.52	2,339.5	525.3	-350.9	630.1	3.05	-2.63	-3.37	
2,518.0	26.19	332.63	2,366.3	537.2	-356.9	643.2	3.49	-2.07	-6.30	
2,548.0	25.49	331.53	2,393.3	548.8	-363.0	656.1	2.83	-2.33	-3.67	
2,578.0	24.30	328.63	2,420.5	559.7	-369.3	668.6	5.68	-3.97	-9.67	
2,608.0	23.60	326.52	2,447.9	570.0	-375.8	680.7	3.69	-2.33	-7.03	
2,638.0	22.59	324.02	2,475.5	579.7	-382.5	692.5	4.69	-3.37	-8.33	
2,668.0	21.49	321.42	2,503.3	588.7	-389.3	703.7	4.90	-3.67	-8.67	
2,698.0	20.30	318.83	2,531.4	596.9	-396.2	714.4	5.02	-3.97	-8.63	
2,728.0	20.39	317.51	2,559.5	604.6	-403.1	724.8	1.56	0.30	-4.40	
2,758.0	21.01	316.11	2,587.6	612.4	-410.4	735.4	2.64	2.07	-4.67	
2,788.0	23.29	316.19	2,615.4	620.5	-418.2	746.6	7.60	7.60	0.27	
2,818.0	26.28	316.41	2,642.6	629.6	-426.9	759.1	9.97	9.97	0.73	
2,848.0	28.39	316.50	2,669.2	639.6	-436.4	772.8	7.03	7.03	0.30	
2,878.0	29.49	315.93	2,695.5	650.1	-446.4	787.3	3.78	3.67	-1.90	
2,908.0	28.92	314.39	2,721.7	660.5	-456.8	801.8	3.14	-1.90	-5.13	
2,938.0	28.21	311.49	2,748.0	670.2	-467.3	816.0	5.19	-2.37	-9.67	
2,968.0	27.82	310.61	2,774.5	679.5	-477.9	829.8	1.89	-1.30	-2.93	
2,998.0	27.60	306.79	2,801.1	688.2	-488.8	843.3	5.97	-0.73	-12.73	
3,028.0	27.42	303.23	2,827.7	696.2	-500.1	856.6	5.51	-0.60	-11.87	
3,042.0	27.31	301.77	2,840.1	699.6	-505.5	862.6	4.86	-0.79	-10.43	
3,058.0	27.20	300.11	2,854.3	703.4	-511.8	869.5	4.80	-0.69	-10.38	
3,088.0	26.81	298.53	2,881.1	710.1	-523.7	882.0	2.72	-1.30	-5.27	
3,118.0	26.19	296.59	2,907.9	716.2	-535.6	894.2	3.55	-2.07	-6.47	
3,148.0	25.17	295.80	2,935.0	722.0	-547.2	905.9	3.59	-3.40	-2.63	
TD @ 3204' MD / 2986' TVD										
3,204.0	23.26	294.33	2,986.0	731.7	-568.0	926.3	3.58	-3.41	-2.63	

57A →

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
688.0	688.0	0.0	0.0	TIE IN @ 688' MD / 688' TVD
3,204.0	2,986.0	731.7	-568.0	TD @ 3204' MD / 2986' TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_