

HG Energy, LLC

Harrison County, West Virginia

W.B. Carpenter #242

W.B. Carpenter #242

Wellbore #1

Survey: MWD

DDC Survey Report

11 December, 2013

Received

JAN 21 2014

Office of Oil and Gas
WV Dept. of Environmental Protection



02/28/2014



I **Larry Wright**, certify that I am employed by **The Appalachian Directional Drilling Company (ADC)**. That I did on the day(s) of **9/3/13** thru **9/5/13** conduct or supervise the taking of a **MWD Survey** from a depth of **802** feet to a depth of **3362** 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 # 242** API No. **47-033-05751** 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.c
om, c=US
Date: 2013.12.12 16:11:57 -06'00'

Received

JAN 21 2014

Office of Oil and Gas
WV Dept. of Environmental Protection

• 1200 Heavy Haul Road • Morgan Town, WV 26501 •
• PH 304-777-2310 • FAX 304-777-2317 •

02/28/2014

DDC
Survey Report



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well W.B. Carpenter #242
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1315.0usft (Decker #6)
Site:	W.B. Carpenter #242	MD Reference:	WELL @ 1315.0usft (Decker #6)
Well:	W.B. Carpenter #242	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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

Site	W.B. Carpenter #242		
Site Position:		Northing:	14,264,015.98 usft
From:	Lat/Long	Easting:	1,779,517.54 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	39° 16' 38.800 N
		Longitude:	80° 30' 30.400 W
		Grid Convergence:	0.31 °

Well	W.B. Carpenter #242		
Well Position	+N/-S	0.0 usft	Northing: 14,264,015.98 usft
	+E/-W	0.0 usft	Easting: 1,779,517.54 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	39° 16' 38.800 N
		Longitude:	80° 30' 30.400 W
		Ground Level:	1,307.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/11/2013	-8.64	66.82	52,317

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	222.37	

Survey Program	Date	12/11/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
802.0	3,362.0	MWD (Wellbore #1)			

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)	
TIE IN @ 802' MD / 802' TVD										
802.0	0.00	0.00	802.0	0.0	0.0	0.0	0.00	0.00	0.00	
846.0	1.49	126.53	846.0	-0.3	0.5	-0.1	3.39	3.39	0.00	
876.0	1.89	106.62	876.0	-0.7	1.2	-0.3	2.35	1.33	-66.37	
906.0	1.41	123.32	906.0	-1.1	2.0	-0.6	2.25	-1.60	55.67	
936.0	1.19	171.22	936.0	-1.6	2.4	-0.4	3.58	-0.73	159.67	
966.0	2.02	209.01	966.0	-2.3	2.2	0.3	4.34	2.77	125.97	
996.0	3.12	222.90	995.9	-3.4	1.4	1.6	4.19	3.67	46.30	
1,026.0	4.22	225.62	1,025.9	-4.8	0.0	3.5	3.71	3.67	9.07	
1,056.0	5.41	229.62	1,055.8	-6.5	-1.8	6.0	4.12	3.97	13.33	

DDC
Survey Report



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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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)
1,086.0	6.59	230.81	1,085.6	-8.5	-4.3	9.1	3.95	3.93	3.97
1,116.0	7.78	228.39	1,115.4	-10.9	-7.1	12.8	4.09	3.97	-8.07
1,146.0	8.70	226.33	1,145.0	-13.8	-10.3	17.1	3.22	3.07	-6.87
1,176.0	9.18	222.81	1,174.7	-17.1	-13.5	21.8	2.43	1.60	-11.73
1,206.0	9.89	219.91	1,204.3	-20.9	-16.8	26.8	2.86	2.37	-9.67
1,236.0	10.81	218.42	1,233.8	-25.0	-20.2	32.1	3.19	3.07	-4.97
1,266.0	11.38	218.33	1,263.2	-29.6	-23.8	37.9	1.90	1.90	-0.30
1,296.0	11.91	221.32	1,292.6	-34.2	-27.7	43.9	2.68	1.77	9.97
1,326.0	12.39	221.10	1,321.9	-39.0	-31.8	50.3	1.61	1.60	-0.73
1,356.0	12.92	221.01	1,351.2	-43.9	-36.2	56.8	1.77	1.77	-0.30
1,386.0	13.10	221.71	1,380.4	-49.0	-40.6	63.6	0.80	0.60	2.33
1,416.0	13.71	224.70	1,409.6	-54.1	-45.4	70.5	3.08	2.03	9.97
1,446.0	14.41	229.01	1,438.7	-59.0	-50.7	77.8	4.20	2.33	14.37
1,476.0	15.60	233.62	1,467.7	-63.9	-56.8	85.5	5.62	3.97	15.37
1,506.0	16.92	238.72	1,496.5	-68.5	-63.7	93.6	6.48	4.40	17.00
1,536.0	17.49	239.20	1,525.1	-73.1	-71.4	102.1	1.96	1.90	1.60
1,566.0	18.50	238.41	1,553.7	-77.9	-79.3	111.0	3.46	3.37	-2.63
1,596.0	18.98	237.31	1,582.1	-83.0	-87.4	120.3	1.99	1.60	-3.67
1,626.0	20.21	233.01	1,610.4	-88.8	-95.7	130.1	6.32	4.10	-14.33
1,656.0	21.01	230.33	1,638.4	-95.3	-104.0	140.5	4.12	2.67	-8.93
1,686.0	22.50	229.01	1,666.3	-102.5	-112.4	151.5	5.23	4.97	-4.40
1,716.0	22.98	228.92	1,694.0	-110.2	-121.2	163.1	1.60	1.60	-0.30
1,746.0	23.51	228.13	1,721.5	-118.0	-130.1	174.8	2.05	1.77	-2.63
1,776.0	24.92	227.29	1,748.9	-126.3	-139.2	187.1	4.84	4.70	-2.80
1,806.0	26.10	227.29	1,776.0	-135.0	-148.6	199.9	3.93	3.93	0.00
1,836.0	27.42	226.02	1,802.7	-144.3	-158.5	213.4	4.79	4.40	-4.23
1,866.0	28.08	223.60	1,829.3	-154.2	-168.3	227.4	4.35	2.20	-8.07
1,896.0	28.52	222.02	1,855.7	-164.7	-178.0	241.6	2.90	1.47	-5.27
1,926.0	28.52	220.31	1,882.1	-175.4	-187.4	255.9	2.72	0.00	-5.70
1,956.0	28.39	222.81	1,908.5	-186.1	-196.9	270.2	3.99	-0.43	8.33
1,986.0	28.21	224.92	1,934.9	-196.4	-206.7	284.4	3.39	-0.60	7.03
2,016.0	28.70	228.00	1,961.2	-206.2	-217.1	298.7	5.16	1.63	10.27
2,046.0	29.49	231.29	1,987.5	-215.7	-228.2	313.1	5.95	2.63	10.97
2,076.0	30.28	231.42	2,013.5	-225.0	-239.9	327.9	2.64	2.63	0.43
2,106.0	30.72	230.59	2,039.3	-234.6	-251.7	343.0	2.03	1.47	-2.77
2,136.0	31.20	229.62	2,065.0	-244.5	-263.6	358.2	2.31	1.60	-3.23
2,166.0	31.90	229.40	2,090.6	-254.7	-275.5	373.8	2.36	2.33	-0.73
2,196.0	32.52	228.00	2,116.0	-265.2	-287.5	389.7	3.23	2.07	-4.67
2,226.0	32.61	227.82	2,141.3	-276.1	-299.5	405.8	0.44	0.30	-0.60
2,256.0	31.68	228.92	2,166.7	-286.7	-311.4	421.7	3.66	-3.10	3.67
2,286.0	30.50	228.13	2,192.4	-296.9	-323.0	437.1	4.16	-3.93	-2.63
2,316.0	29.31	225.71	2,218.4	-307.1	-334.0	452.0	5.65	-3.97	-8.07
2,346.0	27.82	223.51	2,244.7	-317.3	-344.0	466.3	6.08	-4.97	-7.33
2,376.0	26.81	220.53	2,271.4	-327.6	-353.2	480.1	5.67	-3.37	-9.93

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WV Dept of Environmental Protection

DDC
Survey Report



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Site:	W.B. Carpenter #242	MD Reference:	WELL @ 1315.0usft (Decker #6)
Well:	W.B. Carpenter #242	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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)
2,406.0	26.50	221.10	2,298.2	-337.7	-362.0	493.5	1.34	-1.03	1.90
2,436.0	25.62	222.42	2,325.1	-347.6	-370.8	506.7	3.51	-2.93	4.40
2,466.0	25.18	224.61	2,352.2	-356.9	-379.7	519.6	3.46	-1.47	7.30
2,496.0	24.39	225.23	2,379.5	-365.8	-388.6	532.1	2.77	-2.63	2.07
2,526.0	23.60	226.90	2,406.9	-374.3	-397.3	544.3	3.47	-2.63	5.57
2,556.0	23.51	224.92	2,434.4	-382.6	-405.9	556.3	2.65	-0.30	-6.60
2,586.0	22.98	223.82	2,461.9	-391.1	-414.2	568.1	2.28	-1.77	-3.67
2,616.0	22.90	221.01	2,489.6	-399.7	-422.1	579.8	3.66	-0.27	-9.37
2,646.0	23.51	221.93	2,517.2	-408.6	-429.9	591.6	2.37	2.03	3.07
2,676.0	23.51	222.20	2,544.7	-417.5	-438.0	603.6	0.36	0.00	0.90
2,706.0	23.20	224.39	2,572.2	-426.1	-446.1	615.5	3.07	-1.03	7.30
2,736.0	22.90	225.80	2,599.8	-434.4	-454.4	627.2	2.09	-1.00	4.70
2,766.0	23.20	223.39	2,627.4	-442.8	-462.7	638.9	3.30	1.00	-8.03
2,796.0	24.08	229.62	2,654.9	-451.0	-471.4	650.9	8.82	2.93	20.77
2,826.0	25.18	231.03	2,682.2	-459.0	-481.0	663.3	4.16	3.67	4.70
2,856.0	26.50	232.83	2,709.2	-467.1	-491.3	676.2	5.12	4.40	6.00
2,886.0	27.99	235.91	2,735.8	-475.1	-502.5	689.6	6.84	4.97	10.27
2,916.0	28.70	236.21	2,762.2	-483.0	-514.3	703.4	2.41	2.37	1.00
2,946.0	29.09	232.61	2,788.5	-491.4	-526.1	717.6	5.94	1.30	-12.00
2,976.0	29.00	230.59	2,814.7	-500.5	-537.5	732.0	3.28	-0.30	-6.73
3,006.0	28.61	228.30	2,841.0	-509.9	-548.5	746.3	3.90	-1.30	-7.63
3,036.0	28.21	223.69	2,867.4	-519.8	-558.7	760.6	7.43	-1.33	-15.37
3,066.0	26.89	217.49	2,894.0	-530.3	-567.8	774.4	10.52	-4.40	-20.67
3,096.0	25.62	209.50	2,920.9	-541.3	-575.1	787.5	12.51	-4.23	-26.63
3,126.0	25.00	203.91	2,948.1	-552.8	-580.9	799.8	8.23	-2.07	-18.63
3,156.0	24.52	197.01	2,975.3	-564.5	-585.2	811.5	9.76	-1.60	-23.00
3,186.0	23.99	192.09	3,002.7	-576.4	-588.3	822.4	6.96	-1.77	-16.40
3,203.0	23.78	190.45	3,018.2	-583.2	-589.7	828.3	4.10	-1.24	-9.65
3,216.0	23.51	188.31	3,030.1	-588.3	-590.5	832.6	6.92	-2.08	-16.46
3,246.0	23.29	182.60	3,057.7	-600.2	-591.7	842.2	7.59	-0.73	-19.03
3,276.0	22.98	178.60	3,085.2	-612.0	-591.8	850.9	5.34	-1.03	-13.33
3,306.0	22.59	174.91	3,112.9	-623.6	-591.1	859.1	4.94	-1.30	-12.30
TD @ 3362' MD / 3165' TVD									
3,362.0	22.02	167.77	3,164.7	-644.5	-588.0	872.4	4.94	-1.02	-12.75

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JAN 21 2014

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
802.0	802.0	0.0	0.0	TIE IN @ 802' MD / 802' TVD
3,362.0	3,164.7	-644.5	-588.0	TD @ 3362' MD / 3165' TVD

Office of Oil and Gas
WV Dept. of Environmental Protection

DDC
Survey Report



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Well:	W.B. Carpenter #242	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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Checked By: _____ Approved By: _____ Date: _____

Received

JAN 27 2014

Office of Oil and Gas
WV Dept. of Environmental Protection

HG Energy, LLC

Harrison County, West Virginia

W.B. Carpenter #242

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Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

07 January, 2014

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

Site	W.B. Carpenter #242				
Site Position:		Northing:	14,264,015.98 usft	Latitude:	39° 16' 38.800 N
From:	Lat/Long	Easting:	1,779,517.54 usft	Longitude:	80° 30' 30.400 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.31 °

Well	W.B. Carpenter #242					
Well Position	+N/-S	0.0 usft	Northing:	14,264,015.98 usft	Latitude:	39° 16' 38.800 N
	+E/-W	0.0 usft	Easting:	1,779,517.54 usft	Longitude:	80° 30' 30.400 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	usft	Ground Level:	1,307.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/11/2013	-8.64	66.82	52,317

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	222.37	

Survey Program	Date	12/11/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
802.0	3,362.0	MWD (Wellbore #1)			

Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude		
802.0	0.00	0.00	802.0	0.0	0.0	14,264,015.98	1,779,517.54	39° 16' 38.800 N	80° 30' 30.400 W		
TIE IN @ 802' MD / 802' TVD											
846.0	1.49	126.53	846.0	-0.3	0.5	14,264,015.64	1,779,518.00	39° 16' 38.797 N	80° 30' 30.394 W		
876.0	1.89	106.62	876.0	-0.7	1.2	14,264,015.27	1,779,518.79	39° 16' 38.793 N	80° 30' 30.384 W		
906.0	1.41	123.32	906.0	-1.1	2.0	14,264,014.92	1,779,519.57	39° 16' 38.789 N	80° 30' 30.374 W		
936.0	1.19	171.22	936.0	-1.6	2.4	14,264,014.41	1,779,519.93	39° 16' 38.784 N	80° 30' 30.370 W		
966.0	2.02	209.01	966.0	-2.3	2.2	14,264,013.64	1,779,519.72	39° 16' 38.777 N	80° 30' 30.372 W		
996.0	3.12	222.90	995.9	-3.4	1.4	14,264,012.58	1,779,518.91	39° 16' 38.766 N	80° 30' 30.383 W		
1,026.0	4.22	225.62	1,025.9	-4.8	0.0	14,264,011.21	1,779,517.56	39° 16' 38.753 N	80° 30' 30.400 W		
1,056.0	5.41	229.62	1,055.8	-6.5	-1.8	14,264,009.52	1,779,515.70	39° 16' 38.736 N	80° 30' 30.424 W		
1,086.0	6.59	230.81	1,085.6	-8.5	-4.3	14,264,007.52	1,779,513.29	39° 16' 38.717 N	80° 30' 30.455 W		
1,116.0	7.78	228.39	1,115.4	-10.9	-7.1	14,264,005.08	1,779,510.43	39° 16' 38.693 N	80° 30' 30.491 W		

DDC
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well W.B. Carpenter #242
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1315.0usft (Decker #6)
Site:	W.B. Carpenter #242	MD Reference:	WELL @ 1315.0usft (Decker #6)
Well:	W.B. Carpenter #242	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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
1,146.0	8.70	226.33	1,145.0	-13.8	-10.3	14,264,002.17	1,779,507.27	39° 16' 38.664 N	80° 30' 30.532 W
1,176.0	9.18	222.81	1,174.7	-17.1	-13.5	14,263,998.84	1,779,504.01	39° 16' 38.631 N	80° 30' 30.573 W
1,206.0	9.89	219.91	1,204.3	-20.9	-16.8	14,263,995.11	1,779,500.73	39° 16' 38.595 N	80° 30' 30.615 W
1,236.0	10.81	218.42	1,233.8	-25.0	-20.2	14,263,990.93	1,779,497.33	39° 16' 38.553 N	80° 30' 30.659 W
1,266.0	11.38	218.33	1,263.2	-29.6	-23.8	14,263,986.41	1,779,493.74	39° 16' 38.509 N	80° 30' 30.705 W
1,296.0	11.91	221.32	1,292.6	-34.2	-27.7	14,263,981.76	1,779,489.86	39° 16' 38.463 N	80° 30' 30.755 W
1,326.0	12.39	221.10	1,321.9	-39.0	-31.8	14,263,977.01	1,779,485.70	39° 16' 38.416 N	80° 30' 30.808 W
1,356.0	12.92	221.01	1,351.2	-43.9	-36.2	14,263,972.05	1,779,481.39	39° 16' 38.368 N	80° 30' 30.863 W
1,386.0	13.10	221.71	1,380.4	-49.0	-40.6	14,263,966.98	1,779,476.92	39° 16' 38.318 N	80° 30' 30.920 W
1,416.0	13.71	224.70	1,409.6	-54.1	-45.4	14,263,961.92	1,779,472.16	39° 16' 38.268 N	80° 30' 30.981 W
1,446.0	14.41	229.01	1,438.7	-59.0	-50.7	14,263,956.94	1,779,466.84	39° 16' 38.219 N	80° 30' 31.049 W
1,476.0	15.60	233.62	1,467.7	-63.9	-56.8	14,263,952.10	1,779,460.78	39° 16' 38.171 N	80° 30' 31.127 W
1,506.0	16.92	238.72	1,496.5	-68.5	-63.7	14,263,947.44	1,779,453.80	39° 16' 38.126 N	80° 30' 31.216 W
1,536.0	17.49	239.20	1,525.1	-73.1	-71.4	14,263,942.87	1,779,446.19	39° 16' 38.081 N	80° 30' 31.313 W
1,566.0	18.50	238.41	1,553.7	-77.9	-79.3	14,263,938.06	1,779,438.27	39° 16' 38.034 N	80° 30' 31.414 W
1,596.0	18.98	237.31	1,582.1	-83.0	-87.4	14,263,932.94	1,779,430.11	39° 16' 37.984 N	80° 30' 31.518 W
1,626.0	20.21	233.01	1,610.4	-88.8	-95.7	14,263,927.18	1,779,421.86	39° 16' 37.927 N	80° 30' 31.623 W
1,656.0	21.01	230.33	1,638.4	-95.3	-104.0	14,263,920.63	1,779,413.58	39° 16' 37.863 N	80° 30' 31.729 W
1,686.0	22.50	229.01	1,666.3	-102.5	-112.4	14,263,913.43	1,779,405.11	39° 16' 37.792 N	80° 30' 31.837 W
1,716.0	22.98	228.92	1,694.0	-110.2	-121.2	14,263,905.82	1,779,396.36	39° 16' 37.717 N	80° 30' 31.949 W
1,746.0	23.51	228.13	1,721.5	-118.0	-130.1	14,263,897.98	1,779,387.49	39° 16' 37.640 N	80° 30' 32.063 W
1,776.0	24.92	227.29	1,748.9	-126.3	-139.2	14,263,889.70	1,779,378.39	39° 16' 37.559 N	80° 30' 32.179 W
1,806.0	26.10	227.29	1,776.0	-135.0	-148.6	14,263,880.93	1,779,368.90	39° 16' 37.473 N	80° 30' 32.300 W
1,836.0	27.42	226.02	1,802.7	-144.3	-158.5	14,263,871.66	1,779,359.08	39° 16' 37.382 N	80° 30' 32.426 W
1,866.0	28.08	223.60	1,829.3	-154.2	-168.3	14,263,861.75	1,779,349.24	39° 16' 37.284 N	80° 30' 32.552 W
1,896.0	28.52	222.02	1,855.7	-164.7	-178.0	14,263,851.32	1,779,339.57	39° 16' 37.181 N	80° 30' 32.675 W
1,926.0	28.52	220.31	1,882.1	-175.4	-187.4	14,263,840.53	1,779,330.15	39° 16' 37.075 N	80° 30' 32.796 W
1,956.0	28.39	222.81	1,908.5	-186.1	-196.9	14,263,829.84	1,779,320.67	39° 16' 36.970 N	80° 30' 32.917 W
1,986.0	28.21	224.92	1,934.9	-196.4	-206.7	14,263,819.59	1,779,310.81	39° 16' 36.869 N	80° 30' 33.043 W
2,016.0	28.70	228.00	1,961.2	-206.2	-217.1	14,263,809.75	1,779,300.45	39° 16' 36.773 N	80° 30' 33.176 W
2,046.0	29.49	231.29	1,987.5	-215.7	-228.2	14,263,800.31	1,779,289.34	39° 16' 36.680 N	80° 30' 33.318 W
2,076.0	30.28	231.42	2,013.5	-225.0	-239.9	14,263,790.97	1,779,277.66	39° 16' 36.588 N	80° 30' 33.467 W
2,106.0	30.72	230.59	2,039.3	-234.6	-251.7	14,263,781.39	1,779,265.83	39° 16' 36.494 N	80° 30' 33.618 W
2,136.0	31.20	229.62	2,065.0	-244.5	-263.6	14,263,771.49	1,779,253.99	39° 16' 36.397 N	80° 30' 33.770 W
2,166.0	31.90	229.40	2,090.6	-254.7	-275.5	14,263,761.30	1,779,242.05	39° 16' 36.297 N	80° 30' 33.922 W
2,196.0	32.52	228.00	2,116.0	-265.2	-287.5	14,263,750.74	1,779,230.04	39° 16' 36.193 N	80° 30' 34.076 W
2,226.0	32.61	227.82	2,141.3	-276.1	-299.5	14,263,739.92	1,779,218.06	39° 16' 36.087 N	80° 30' 34.229 W
2,256.0	31.68	228.92	2,166.7	-286.7	-311.4	14,263,729.32	1,779,206.13	39° 16' 35.982 N	80° 30' 34.381 W
2,286.0	30.50	228.13	2,192.4	-296.9	-323.0	14,263,719.06	1,779,194.52	39° 16' 35.882 N	80° 30' 34.530 W
2,316.0	29.31	225.71	2,218.4	-307.1	-334.0	14,263,708.85	1,779,183.59	39° 16' 35.781 N	80° 30' 34.669 W
2,346.0	27.82	223.51	2,244.7	-317.3	-344.0	14,263,698.64	1,779,173.52	39° 16' 35.681 N	80° 30' 34.798 W
2,376.0	26.81	220.53	2,271.4	-327.6	-353.2	14,263,688.42	1,779,164.30	39° 16' 35.580 N	80° 30' 34.916 W
2,406.0	26.50	221.10	2,298.2	-337.7	-362.0	14,263,678.24	1,779,155.50	39° 16' 35.480 N	80° 30' 35.029 W
2,436.0	25.62	222.42	2,325.1	-347.6	-370.8	14,263,668.40	1,779,146.73	39° 16' 35.383 N	80° 30' 35.141 W
2,466.0	25.18	224.61	2,352.2	-356.9	-379.7	14,263,659.07	1,779,137.87	39° 16' 35.292 N	80° 30' 35.255 W
2,496.0	24.39	225.23	2,379.5	-365.8	-388.6	14,263,650.17	1,779,128.99	39° 16' 35.204 N	80° 30' 35.368 W
2,526.0	23.60	226.90	2,406.9	-374.3	-397.3	14,263,641.70	1,779,120.21	39° 16' 35.121 N	80° 30' 35.480 W
2,556.0	23.51	224.92	2,434.4	-382.6	-405.9	14,263,633.36	1,779,111.60	39° 16' 35.039 N	80° 30' 35.590 W
2,586.0	22.98	223.82	2,461.9	-391.1	-414.2	14,263,624.90	1,779,103.32	39° 16' 34.956 N	80° 30' 35.696 W
2,616.0	22.90	221.01	2,489.6	-399.7	-422.1	14,263,616.27	1,779,095.43	39° 16' 34.871 N	80° 30' 35.797 W
2,646.0	23.51	221.93	2,517.2	-408.6	-429.9	14,263,607.41	1,779,087.61	39° 16' 34.783 N	80° 30' 35.898 W
2,676.0	23.51	222.20	2,544.7	-417.5	-438.0	14,263,598.53	1,779,079.59	39° 16' 34.696 N	80° 30' 36.000 W
2,706.0	23.20	224.39	2,572.2	-426.1	-446.1	14,263,589.87	1,779,071.43	39° 16' 34.611 N	80° 30' 36.104 W
2,736.0	22.90	225.80	2,599.8	-434.4	-454.4	14,263,581.58	1,779,063.12	39° 16' 34.529 N	80° 30' 36.211 W
2,766.0	23.20	223.39	2,627.4	-442.8	-462.7	14,263,573.22	1,779,054.87	39° 16' 34.447 N	80° 30' 36.316 W

DDC
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well W.B. Carpenter #242
Project:	Harrison County, West Virginia	TVD Reference:	WELL @ 1315.0usft (Decker #6)
Site:	W.B. Carpenter #242	MD Reference:	WELL @ 1315.0usft (Decker #6)
Well:	W.B. Carpenter #242	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,796.0	24.08	229.62	2,654.9	-451.0	-471.4	14,263,564.96	1,779,046.15	39° 16' 34.366 N	80° 30' 36.428 W
2,826.0	25.18	231.03	2,682.2	-459.0	-481.0	14,263,556.98	1,779,036.52	39° 16' 34.288 N	80° 30' 36.551 W
2,856.0	26.50	232.83	2,709.2	-467.1	-491.3	14,263,548.92	1,779,026.23	39° 16' 34.208 N	80° 30' 36.682 W
2,886.0	27.99	235.91	2,735.8	-475.1	-502.5	14,263,540.93	1,779,015.06	39° 16' 34.130 N	80° 30' 36.825 W
2,916.0	28.70	236.21	2,762.2	-483.0	-514.3	14,263,532.98	1,779,003.25	39° 16' 34.052 N	80° 30' 36.976 W
2,946.0	29.09	232.61	2,788.5	-491.4	-526.1	14,263,524.54	1,778,991.47	39° 16' 33.969 N	80° 30' 37.126 W
2,976.0	29.00	230.59	2,814.7	-500.5	-537.5	14,263,515.50	1,778,980.05	39° 16' 33.880 N	80° 30' 37.272 W
3,006.0	28.61	228.30	2,841.0	-509.9	-548.5	14,263,506.10	1,778,969.07	39° 16' 33.788 N	80° 30' 37.412 W
3,036.0	28.21	223.69	2,867.4	-519.8	-558.7	14,263,496.19	1,778,958.81	39° 16' 33.691 N	80° 30' 37.544 W
3,066.0	26.89	217.49	2,894.0	-530.3	-567.8	14,263,485.68	1,778,949.78	39° 16' 33.587 N	80° 30' 37.659 W
3,096.0	25.62	209.50	2,920.9	-541.3	-575.1	14,263,474.65	1,778,942.45	39° 16' 33.479 N	80° 30' 37.753 W
3,126.0	25.00	203.91	2,948.1	-552.8	-580.9	14,263,463.21	1,778,936.69	39° 16' 33.366 N	80° 30' 37.827 W
3,156.0	24.52	197.01	2,975.3	-564.5	-585.2	14,263,451.46	1,778,932.30	39° 16' 33.250 N	80° 30' 37.884 W
3,186.0	23.99	192.09	3,002.7	-576.4	-588.3	14,263,439.54	1,778,929.20	39° 16' 33.132 N	80° 30' 37.924 W
3,203.0	23.78	190.45	3,018.2	-583.2	-589.7	14,263,432.79	1,778,927.85	39° 16' 33.066 N	80° 30' 37.942 W
3,216.0	23.51	188.31	3,030.1	-588.3	-590.5	14,263,427.65	1,778,927.00	39° 16' 33.015 N	80° 30' 37.953 W
3,246.0	23.29	182.60	3,057.7	-600.2	-591.7	14,263,415.80	1,778,925.87	39° 16' 32.898 N	80° 30' 37.968 W
3,276.0	22.98	178.60	3,085.2	-612.0	-591.8	14,263,404.02	1,778,925.74	39° 16' 32.781 N	80° 30' 37.971 W
3,306.0	22.59	174.91	3,112.9	-623.6	-591.1	14,263,392.43	1,778,926.40	39° 16' 32.666 N	80° 30' 37.963 W
3,362.0	22.02	167.77	3,164.7	-644.5	-588.0	14,263,371.45	1,778,929.58	39° 16' 32.459 N	80° 30' 37.924 W

TD @ 3362' MD / 3165' TVD

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,362.0	3,164.7	-644.5	-588.0	TD @ 3362' MD / 3165' TVD

Checked By: _____ Approved By: _____ Date: _____

Received

JAN 21 2014

Office of Oil and Gas
WV Dept. of Environmental Protection

W.B. Carpenter #242
 Harrison County, West Virginia
 Q130709 & AM-13690
 Design #2

Company Name: HG Energy, LLC
 W.B. Carpenter #242
 Harrison County, West Virginia
 Rig: Original Well Elev
 Created By: TIFFANI MIZELL
 Date: 08/30/2013



HG Energy

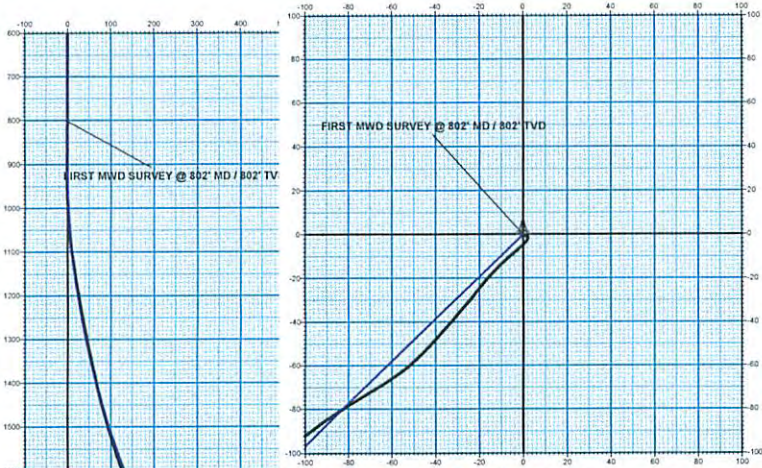
WELL DETAILS: W.B. Carpenter #242

Ground Level: 1307.0
 +N/-S +E/-W Northing Easting Latitude Longitude
 0.0 0.0 284763.24 1714526.2039° 16' 38.800 N 80° 30' 30.400 W

PROJECT DETAILS: Harrison County, West Virginia

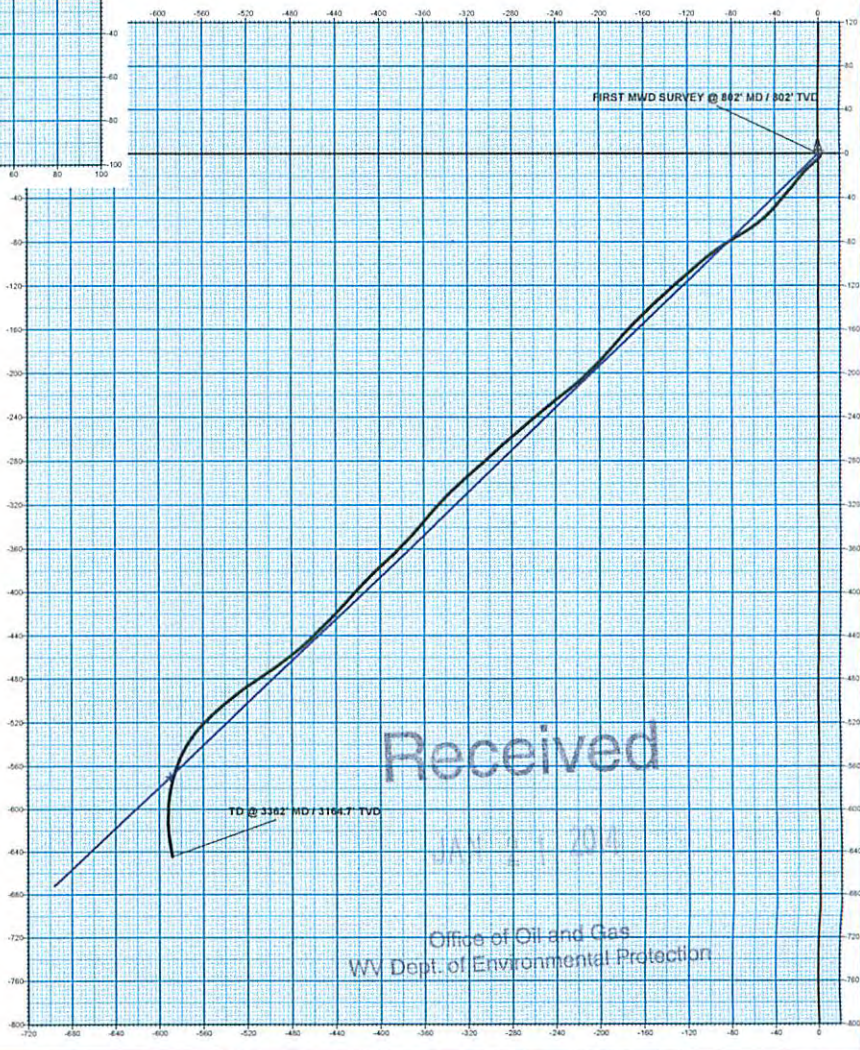
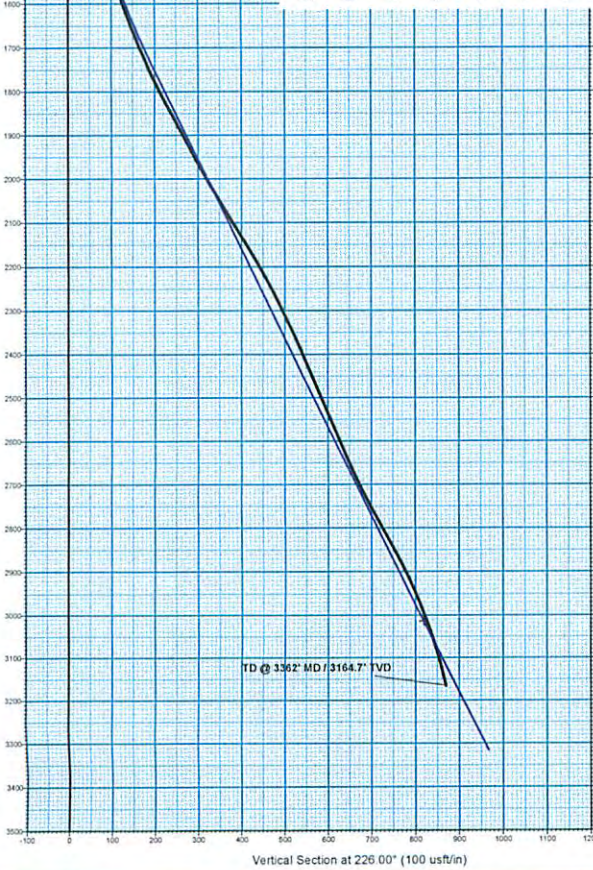
Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: West Virginia North 4701
 System Datum: Mean Sea Level

M G T Azimuths to Grid North
 Correction: -7.99°
 Magnetic Field
 Strength: 52357.2snT
 Dip Angle: 66.85°
 Date: 8/14/2013
 Model: IGRF2010



DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBH - W.B. Carpenter #242 D8014.5	-569.6	-589.9	284193.62	1713936.34	39° 16' 33.105 N	80° 30' 37.819 W	
- plan hits target center							

ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation	
802.0	0.00	0.00	802.0	0.0	0.0	0.0	0.0	FIRST MWD SURVEY @ 802' MD / 802' TVD	
3362.0	22.02	167.77	3164.7	-644.5	-589.0	870.7	803.2	TD @ 3362' MD / 3164.7' TVD	



02/28/2014