

WR-35 Rev. 8/23/13

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



API 47 - 033	5780 County HARR	RISON	District TEN MIL	E			
Quad SALEM 7.5'	100	B. CARPENTER	Field/Pool Name	WOLF SUMMIT			
Farm name JUNKINS,			Well Number 23				
Operator (as registered v	with the OOG) H.G. ENERGY L	LC					
Address 5260 DuPON	IT ROAD City P.	ARKERSBURG	State WV	Zip 26101			
As Drilled location N.	AD 83/UTM Attach an as-dri op hole Northing 4,347,315 M	lled plat, profile view, an Eas	d deviation survey ting 542,622 M				
Landing Point	of Curve Northing	East	ting				
Botto	om Hole Northing 4,347,412 M	East	542,646 M				
Elevation (ft) 1,390'	GL Type of Well	I ■New □ Existing	Type of Repo	rt □Interim ■Final			
Permit Type 📱 Devi	ated Horizontal Horiz	contal 6A	Depth Type	□ Deep ■ Shallow			
Type of Operation Co	onvert 🗆 Deepen 📱 Drill	□ Plug Back □ Redri	illing Rework	□ Stimulate			
Well Type 🗆 Brine Dis	posal □ CBM □ Gas ■ Oil □ S	Secondary Recovery	olution Mining 🗆 S	Storage Other			
Type of Completion ■ Drilled with □ Cable	Single □ Multiple Fluids Pro	duced □ Brine □Gas	□ NGL	Other			
The second secon	e hole		hole 昌Air □Mu	ad			
Date permit issued		mmenced11/1/13					
	es began11/21/13						
Verbal plugging (Y/N)	N Date permission gran	ted	Granted by	Office of Oil and Gas			
Please note: Operator is	required to submit a plugging appl	lication within 5 days of v	verbal permission to	plug			
reshwater depth(s) ft Open mine(s) (1714) depths							
	None None			N The them of			
Freshwater depth(s) ft Salt water depth(s) ft Coal depth(s) ft		Open mine(s) (Y/N) d Void(s) encountered (Cavern(s) encountered	Y/N) depths				

Reviewed by:

Rev. 8/23/13							_		
API 47- 033	5780	_ Farm na	ame_JUNKINS	S, EARL &	BELVA	We	ll number_2	37	
CASING		Casing	Donah	New or	Grade wt/ft		Basket Depth(s)		nent circulate (Y/ N) ide details below*
STRINGS Conductor	Size 12 1/4"	Size	Depth	Used Used		LS	Depui(s)	1100	Sand In
Surface	 	11 5/8"		New	 	LS	64'		Y
Coal	8 3/4"	7"	837'	New	 	10			
Intermediate 1				-	-				
				 	<u> </u>				
Intermediate 2					 				
Intermediate 3				 	 				Y
Production	6 1/2"	4 1/2"	3204.05'	New	 	J-55			<u>Y</u>
Tubing				<u> </u>	<u> </u>				
Packer type and o	lepth set								
Comment Details	Circulated Est. 20 bbls to	surface on 7" su	rface cement job. Circ	culated Est. 10 b	bls to surface	on 4 1/2" ceme	nt job.		
CEMENT DATA	Class/Type of Cement	Numbe of Sack		,	Yield t³/sks)	Volume (ft.3)		ment (MD)	WOC (hrs)
Conductor		ļ							
Surface	Reg Neat	215	15.6	3	1.18	254	Sur	face	8
Coal									
Intermediate 1									
Intermediate 2									
Intermediate 3									
Production	50:50 Pozmix/ Econo	200/80	14.2/1	1.8 1.2	27/2.93	254/234	ş Su	rface	8
Tubing				<u> </u>					
Drillers TD (fi Deepest forma Plug back pro	ation penetrated Fifth	Sand		Loggers T Plug back					
Kick off depth	n (ft)_850'					. •			
Check all wire	eline logs run	昌 caliper 昌 neutron	density ensistivity		ed/directi a ray		nduction temperature	□soni	c
Well cored	⊐Yes No	Convention	onal Sidev	wall	W	ere cutting	s collected	■ Yes □	⊐ No
	HE CENTRALIZEF		ENT USED FO	R EACH C	ASING S	TRING _			
15 Centralizers every 64	from bottom on 4 1/2", Centralizer p	aced mid string on 7							
WAS WELL (COMPLETED AS S	HOT HOLE	□ Yes 🚇	No Di	ETAILS				
WAS WELL (COMPLETED OPE	N HOLE?	□ Yes 🖺 N	o DET	AILS _				
WEDE TO AC	ERS USED Yes	■ No	TYPE OF T	RACER(S)	USED				
WEIGHT INAC	PKO CODD 1 1 29	D 110	11110111						

API 47- 033 - 5780 Farm name_JUNKINS, EARL & BELVA Well number_237

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	12/3/13	3098'	3110'	48	Fifth Sand
-	12/0/10				
		.,,			
<u> </u>					
<u> </u>					
					
-					
				L	

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
1	12/5/13	10	1508	3495	1606	10,000	304	
<u> </u>								
-				<u> </u>				
								-:
			-			 		
								
-							<u> </u>	
			<u> </u>			<u> </u>		

Please insert additional pages as applicable.

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API 47- 033	_ 5780	Farm	name_JUNKII	NS, EARL	. & BELV	'A Wel	ll numbe	r_237		
PRODUCING Fifth Sand	FORMATION	(S)	<u>DEPTHS</u> 3052'-3067'	TVD	3014'-30	29' M	D			
Please insert ad	lditional pages a	as applicable.								
GAS TEST	□ Build up □	Drawdown	□ Open Flow		OIL TES	T 🗆 Flow	□ Pumj)		
SHUT-IN PRE	SSURE Surf	ace	_psi Botte	om Hole_		psi DURA	ATION	OF TE	ST	hrs
OPEN FLOW			NGL bpd	_ bpd	Water	GAS bpd 🗆 Est	MEASU timated	JRED □ Or	BY ifice	□ Pilot
LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN MD	FT DESC	CRIBE ROCK T			F 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3	NTITYAND -, GAS, H₂S, ETC
Sand/Shale	0	740	0	740				,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, 0.10, 1120, 210
Pittsburgh Coal	740	747	740	747						
Sand/Shale	747	2090	747	2112						
Big Lime	2090	2176	2112	2202						
Big Injun	2176	2230	2202	2260						
Shale	2230	2640	2260	2680						
Fifty Foot	2640	2680	2680	2720						
Shale	2680	2733	2720	2774						
Sand	2733	2890	2774	2932						
Shale	2890	3052	2932	3096						
Fifth Sand	3052	3067	3096	3110		Drilled direction	nal N 20	degrees	E a dis	tance of 399'
Shale	3067	3246	3110	3291						
TD	3246		3291							
 Please insert add Drilling Contrac										
Address 11565 S		,9	City	Vincent		State	ОН	Zip	45784	1
Logging Compa Address 777 Nor	my Weatherford th River Avenue	International	City	Weston		State	WV	Zip	26452	
Cementing Com	pany Baker Hug	ghes		Clarkshu						
Stimulating Con		ers Service Cor	p. City	Clarksburg		State	WV	_Zip	26301	
Address 109 Sou	th Graham Street		City	Zanesville		State	ОН	Zin	43701	
Please insert add		applicable.						_ = -1		
Completed by	Roger Heldman				Telep	hone 304-420	0-1107			
Signature/	111 11	//	Title O	perations Ma				31/14		

ME DIRE		20		SU	RVEY (CALCUI	LATION	PROG	GRAM	W 00 00	T	ARGET	DETAIL	S
OPER	RATOR:	1115	HG Ener	av. LLC			Supervis	ors:		v1.00.02	TARGET N	-s Di	rectional	
WELI				penter #237	7		Jeff Gibs	on .			TARGET E		rectional	
							L. PENNISI	R. BUHRN	MAN / S. HISER					
	TION:			County, W	V						TARGET R			
JOB	NUMBE	R:	AM-1386						- 1		and the second	ISPLACEMEN'	Т	
			COMIN	MENTS:				MAG DI	EC (-/+)	-8.63	TARGET C		orizontal	
									ORR.(-/+)	0.64	DIP AZ	VD II	Orizoniai	
									CORR.(-/+)	-7.99	DIP DEG UI	P+/DN-		
		DATE:	1/30	0/2014	TIME:	11:44 AM	GRID							
MINIMI	IM CURV		1100	NS(SPE-3362)			DIRECTION	20.00	TARGET T	RACKING		ICLINATION		
									TO CE			ECLOSURE	BUILD	WALK
SVY			TRUE					DLS/	ABOVE(+)	RIGHT(+)	DIR	DISTANCE	RATE/	RATE
NUM	MD	INC	AZM	TVD	SECT	N-S	E-W	100.00	BELOW(-)		(DEG AZ	(FEET)	°/100'	°/100'
TIE	850	0.0	0.0	850.00	0.00	0.00	0.00		-850.00	0.02	63.43	0.00		
1	914	2.5	109.5	913.98	0.01	-0.47	1.32	3.91	-913.98	1.41	109.50	1.40	3.91	3.19
2	925	2.6	112.9	924.97	0.00	-0.64	1.77	1.65	-924.97	1.90	109.95	1.89	0.91	1.37
3	955	2.8	111.1	954.94	-0.05	-1.17	3.08	0.72	-954.94	3.31	110.81	3.30	0.67	-0.28
4	985	2.7	83.9	984.90	0.25	-1.36	4.47	4.32	-984.90	4.68	106.93	4.67	-0.33	-4.31
5	1015	3.4	61.5	1014.86	1.23	-0.86	5.95	4.56	-1014.86	5.90	98.23	6.02	2.33	-3.95
6	1045	4.3	51.0	1044.79	2.86	0.27	7.61	3.80	-1044.79	7.07	87.96	7.61	3.00	-0.47
7	1075	5.1	36.3	1074.69	5.10	2.05	9.27	4.80	-1074.69	8.03	77.51	9.50	2.67	-0.80
8	1105	6.2	29.4	1104.55	7.98	4.54	10.86	4.30	-1104.55	8.67	67.31	11.77	3.67	-0.45
9	1135	6.2	29.6	1134.37	11.18	7.36	12.45	0.07	-1134.37	9.20	59.42	14.47	0.00	0.01
10	1165	6.0	23.4	1164.20	14.34	10.21	13.88 14.94	2.29 2.36	-1164.20 -1194.05	9.56	53.66	17.23	-0.67	-0.44
11	1195	5.6	17.6	1194.05	17.37 20.27	13.04 15.87	15.67	2.11	-1194.05	9.59 9.31	48.88	19.83	-1.33	-0.39
12	1225	5.6 6.2	11.1 11.3	1223.91 1253.75	23.32	18.90	16.26	2.00	-1223.91	8.84	44.62 40.72	22.30 24.93	0.00 2.00	-0.42 0.01
13 14	1255 1285	7.1	14.3	1283.75	26.77	22.28	17.04	3.21	-1283.54	8.41	37.40	28.05	3.00	0.01
15	1315	8.0	16.7	1313.28	30.70	26.08	18.10	3.18	-1313.28	8.10	34.76	31.74	3.00	0.23
16	1345	8.5	18.2	1342.97	35.00	30.19	19.39	1.81	-1342.97	7.91	32.72	35.88	1.67	0.14
17	1375	8.80	20.70	1372.63	39.51	34.44	20.89	1.60	-1372.63	7.87	31.25	40.28	1.00	0.25
18	1405	9.30	20.80	1402.26	44.23	38.85	22.57	1.67	-1402.26	7.93	30.15	44.93	1.67	0.01
19	1435	9.80	20.80	1431.84	49.20	43.50	24.33	1.67	-1431.84	8.00	29.22	49.85	1.67	0.00
20	1465	10.70	19.60	1461.36	54.54	48.51	26.17	3.08	-1461.36	8.02	28.35	55.12	3.00	-0.14
21	1495	11.70	19.30	1490.79	60.37	54.01	28.11	3.34	-1490.79	7.96	27.50	60.89	3.33	-0.04
22	1525	13.30	18.70	1520.08	66.86	60.15	30.23	5.35	-1520.08	7.85	26.68	67.32	5.33	-0.09
23	1555	13.90	19.80	1549.24	73.91	66.81	32.55	2.18	-1549.24	7.76	25.98	74.32	2.00	0.17
24	1585	14.00	20.80	1578.35	81.14	73.59	35.06	0.87	-1578.35	7.79	25.48	81.52	0.33	0.16
25	1615	13.30	21.80	1607.51	88.22	80.19	37.63	2.46	-1607.51	7.95	25.14	88.58	-2.33	0.16
26	1645	13.10	23.40	1636.71	95.07	86.51	40.26	1.39	-1636.71	8.26	24.96	95.42	-0.67	0.24
27	1675	12.80	23.60	1665.95	101.78	92.68	42.94	1.01	-1665.95	8.67	24.86	102.14	-1.00	0.03
28	1705	12.70	25.20	1695.21	108.38	98.71	45.68	1.22	-1695.21	9.18	24.83	108.76	-0.33	0.24
29	1735	12.80	23.40	1724.47	114.98	104.74	48.40	1.37	-1724.47	9.68	24.80	115.38	0.33	-0.26
30	1765	13.10	21.60	1753.71	121.69	110.95	50.97	1.68	~1753.71	9.97	24.68	122.10	1.00	-0.27
31	1795	13.00	20.60	1782.93	128.47	117.27	53.41	0.82	-1782.93	10.10	24.49	128.86	-0.33	-0.15
32	1825	13.20	20.10	1812.15	135.27	123.65	55.78	0.77	-1812.15	10.14	24.28	135.64	0.67	-0.08
33	1855	13.20	20.90	1841.36	142.12	130.06	58.18 60.59	0.61 1.26	-1841.36 -1870.55	10.20 10.25	24.10	142.48	0.00	0.12
34	1885	13.50	19.90	1870.55 1899.70	149.04 156.15	136.55 143.22	63.06	1.51	-1899.70	10.25	23.93 23.77	149.39 156.48	1.00	-0.15 0.14
35 36	1915 1945	13.90 14.20	20.80	1928.80	163.43	150.02	65.65	1.00	-1928.80	10.29	23.63	163.76	1.00	0.14
37	1975	15.00	20.80	1957.83	170.99	157.09	68,33	2.67	-1957.83	10.50	23.51	171.31	2.67	0.00
38	2005	15.50	22.90	1986.77	178.88	164.42	71.27	2.48	-1986.77	10.76	23.44	179.20	1.67	0.37
39	2035	16.50	23.90	2015.61	187.13	172.00	74.56	3.46	-2015.61	11.25	23.44	187.47	3.33	0.18
40	2065	16.70	25.30	2044.36	195.67	179.79	78.13	1.49	-2044.36	11.94	23.49	196.04	0.67	0.27
41	2095	16.50	23.60	2073.11	204.22	187.60	81.67	1.75	-2073.11	12.60	23.53	204.60	-0.67	-0.32
42	2125	16.80	23.00	2101.85	212.80	195.49	85.07	1.15	-2101.85	13.10	23.52	213.20	1.00	-0.11
43	2155	17.00	23.30	2130.56	221.51	203.51	88.50	0.73	-2130.56	13.58	23.50	221.92	0.67	0.06
44	2185	17.20	21.90	2159.23	230.32	211.65	91.89	1.53	-2159.23	13.98	23.47	230.74	0.67	-0.27
45	2215	17.50	22.00	2187.87	239.26	219.95	95.24	1.00	-2187.87	14.28	23.41	239.68	1.00	0.02
46	2245	18.10	23.30	2216.43	248.42	228.41	98.77	2.40	-2216.43	14.71	23.38	2 04 \$04		
47	2275	17.40	22.90	2245.00	257.55	236.83	102.36	2.37	-2245.00	15.20	23.37	258.00	-2.33	-0.08

A				SU	RVEY	CALCUI	LATION	PROG	RAM		TA	ARGET	DETAIL	S
HE DIRE	CT1000	THE COMP	anv							v1.00.02				
OPER	ATOR:	488000	HG Ener	gy, LLC			Supervis				TARGET N-	s Di	irectional	
WELL	.1		W.B. Ca	rpenter #237	7		Jeff Gibs				TARGET E-	W	1111111	
	-						L. PENNISI	/ R. BUHRN	IAN / S. HISER			de la casa		
	TION:	D.		County, W	V						TARGET RA			
JORI	NUMBE	K:	AM-1386	MENTS:							TARGET CL	SPLACEMEN'		
_			COM	ILIATO.				MAG DI	EC.(-/+)	-8.63	TARGET TV		orizontal	
									ORR.(-/+)	0.64	DIP AZ			
								TOTAL	CORR.(-/+)	-7.99	DIP DEG UP	P+/DN-		
		DATE:	1/3	0/2014	TIME:	11:44 AM	GRID				TARGET IN	CLINATION		
MINIMU	IM CURV			NS(SPE-3362)	PR	OPOSED D	DIRECTION	20.00	TARGET	TRACKING		OLIVATION		
SVY		7.22	TRUE					DLS/		ENTER	CLOSURE	CLOSURE		WALI
NUM	MD	INC	AZW	TVD	SECT	N-S	E-W	100.00	BELOW(-)	LEFT(-)	(DEG AZ)	(FEET)	°/100'	°/100
48	2305	16.40	20.30	2273.71	266.27	244.93	105.57	4.18	-2273.71	15.45	23.32	266.71	-3.33	-0.50
49	2335	15.70	18.50	2302.54	274.56	252.75	108.33	2.86	-2302.54	15.37	23.20	274.99	-2.33	-0.33
50	2365	15.20	20.40	2331.45	282.55	260.29	110.99	2.37	-2331.45	15.29	23.09	282.96	-1.67	0.34
51	2395	14.90	23.90	2360.42	290.33	267.50	113.92	3.19	-2360.42	15.58	23.07	290.75	-1.00	0.61
52	2425	14.40	26.50	2389.45	297.89	274.36	117.15	2.75	-2389.45	16.26	23.12	298.33	-1.67	0.44
53	2455	13.60	28.10	2418.56	305.08	280.81	120.47	2.96	-2418.56	17.18	23.22	305.57	-2.67	0.26
54	2485	12.90	25.50	2447.76	311.91	286.95	123.58	3.06	-2447.76	18.00	23.30	312.43	-2.33	-0.40
55	2515	12.10	22.90	2477.05	318.38	292.87	126.24	3.26	-2477.05	18.48	23.32	318.92	-2.67	-0.38
56	2545	10.80	19.10	2506.45	324.33	298.42	128.39	5.01	-2506.45	18.59	23.28	324.87	-4.33	-0.50
57	2575	9.90	16.70	2535.96	329.72	303.55	130.05	3.33	-2535.96 -2565.54	18.40	23.19	330.23	-3.00	-0.29
58	2605	9.30	15.00	2565.54	334.71 339.25	308.36 312.78	131.42 132.56	2.21 3.70	-2595.19	18.04 17.61	23.08	335.19	-2.00	-0.19 -0.10
59	2635	8.20 7.60	14.00 13.40	2595.19 2624.91	343.35	316.78	133.54	2.02	-2624.91	17.15	22.97 22.86	339.71 343.78	-3.67 -2.00	-0.10
60 61	2665 2695	7.60	10.50	2654.65	347.28	320.66	134.36	1.28	-2654.65	16.60	22.73	347.67	0.00	-0.05
62	2725	8.10	6.90	2684.36	351.29	324.71	134.97	2.34	-2684.36	15.79	22.57	351.65	1.67	-0.20
63	2755	7.80	2.10	2714.08	355.29	328.84	135.30	2.43	-2714.08	14.69	22.36	355.59	-1.00	-0.44
64	2785	8.00	356.80	2743.79	359.14	332.96	135.26	2.52	-2743.79	13.24	22.11	359.39	0.67	0.49
65	2815	8.30	355.40	2773.49	363.03	337.20	134.97	1.20	-2773.49	11.52	21.81	363.21	1.00	-0.13
66	2845	8.30	1.50	2803.18	367.05	341.53	134.85	2.93	-2803.18	9.93	21.55	367.19	0.00	-0.59
67	2875	8.30	10.70	2832.86	371.24	345.82	135.31	4.42	-2832.86	8.89	21.37	371.35	0.00	0.88
68	2905	8.50	11.60	2862.54	375.57	350.12	136.16	0.80	-2862.54	8.22	21.25	375.66	0.67	0.09
69	2935	8.70	6.70	2892.20	379.98	354.55	136.87	2.53	-2892.20	7.37	21.11	380.05	0.67	-0.49
70	2965	8.10	2.90	2921.88	384.20	358.91	137.24	2.72	-2921.88	6.23	20.93	384.25	-2.00	-0.37
71	2995	7.50	359.10	2951.60	388.05	362.98	137.32	2.64	-2951.60	4.91	20.72	388.08	-2.00	0.34
72	3025	6.90	354.20	2981.37	391.51	366.73	137.11	2.86	-2981.37	3.42	20.50	391.52	-2.00	-0.41
73	3055	6.30	348.10	3011.17	394.53	370.13	136.58	3.07	-3011.17	1.77	20.25	394.53	-2.00	-0.47
74	3085	5.70	341.50	3041.01	397.09	373.16	135.77	3.04	-3041.01	-0.03	19.99	397.09	-2.00	-0.46
75	3115	5.40	333.20	3070.87	399.22	375.83	134.66	2.85	-3070.87	-1.98	19.71	399.23	-1.00	-0.53
76	3145	4.90	335.30	3100.74	401.10	378.25	133.49	1.78	-3100.74	3.91	19.44	401.12	-1.67	0.13
77	3175	4.70	338.70	3130.64	402.93	380.56	132.51	1.16	-3130.64	5.63	19.20	402.97	-0.67	0.19
78	3205	4.30	335.70	3160.55	404.66	382.73	131.60	1.55	-3160.55	7.22	18.98	404.72	-1.33	-0.16
79	3235	3.80	332.30	3190.47	406.13	384.64	130.68	1.85	-3190.47	8.74	18.76	406.23	-1.67	-0.16
80	3291	3.80	332.30	3246.35	408.63	387.92	128.95	0.00	-3246.35	11.49	18.39	408.79	0.00	0.00
81														
82 83														
TD														

HG Energy, LLC

Harrison County, West Virginia W.B. Carpenter #237 W.B. Carpenter #237

Wellbore #1

Survey: MWD

DDC Survey Report

11 December, 2013





I Larry Wright, certify that I am employed by The Appalachian Directional Drilling Company (ADC). That I did on the day(s) of 11/04/13 thru 11/06/13 conduct or supervise the taking of a MWD Survey from a depth of 850 feet to a depth of 3291 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 #237 API No. 47-033-05780 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, e=US Date: 2013.12.12 16:25:40-06'00'

Survey Report



Company:

HG Energy, LLC

Project:

Harrison County, West Virginia

Site: Well: W.B. Carpenter #237 W.B. Carpenter #237

Wellbore: Design:

Wellbore #1 Wellbore #1

Local Co-ordinate Reference:

TVD Reference: MD Reference:

North Reference:

Survey Calculation Method: Database:

Well W.B. Carpenter #237

WELL @ 1393.0usft (Decker #6)

WELL @ 1393.0usft (Decker #6)

Grid

Minimum Curvature

EDM 5000.1 Single User Db

Project

Harrison County, West Virginia

Map System: Geo Datum: Map Zone:

Universal Transverse Mercator NAD83 West Virginia - HARN

Zone 17N (84 W to 78 W)

System Datum:

Mean Sea Level

Site

From:

W.B. Carpenter #237

Site Position:

Northing: Easting:

14,262,785.77 usft

Latitude:

Longitude:

39° 16' 26.600 N 80° 30' 21.800 W

Position Uncertainty:

Position Uncertainty

Lat/Long

0.0 usft Slot Radius:

1,780,200.29 usft 13-3/16 "

Grid Convergence:

0.31 °

Well Well Position W.B. Carpenter #237

+N/-S +E/-W

0.0 usft 0.0 usft 0.0 usft

Northing: Easting:

Wellhead Elevation:

14,262,785.77 usft 1,780,200.29 usft

-8.64

Latitude: Longitude:

39° 16' 26.600 N 80° 30' 21.800 W

Ground Level: usft

1,385.0 usft

Wellbore Wellbore #1

Magnetics

Model Name

Wellbore #1

Sample Date

12/11/2013

Declination (°)

Dip Angle (°)

Field Strength (nT)

52.315

Design

Audit Notes:

Version:

1.0

Phase:

IGRF2010

ACTUAL

Tie On Depth:

0.0

Vertical Section:

Depth From (TVD)

+N/-S (usft)

+E/-W

Direction

66.81

(usft)

12/11/2013

0.0

0.0

(usft) 0.0 (°)

18.39

Survey Program From

(usft)

850.0

To

(usft)

Survey (Wellbore)

Tool Name

Description

3,291.0 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)
TIE IN @ 850	O' MD / 850' TVD								
850.0	0.00	0.00	850.0	0.0	0.0	0.0	0.00	0.00	0.00
914.0	2.50	109.50	914.0	-0.5	1.3	0.0	3.91	3.91	0.00
925.0	2.60	112.90	925.0	-0.6	1.8	-0.1	1.65	0.91	30.91
955.0	2.80	111.10	954.9	-1.2	3.1	-0.1	0.72	0.67	-6.00
985.0	2.70	83.90	984.9	-1.4	4.5	0.1	4.32	-0.33	-90.67
1,015.0	3.40	61.50	1,014.9	-0.9	6.0	1.1	4.56	2.33	-74.67
1,045.0	4.30	51.00	1,044.8	0.3	7.6	2.7	3.80	3.00	-35.00
1,075.0	5.10	36.30	1,074.7	2.1	9.3	4.9	4.80	2.67	-49.00
1,105.0	6.20	29.40	1,104.5	4.5	10.9	7.7	4.30	3.67	-23.00

DDC Survey Report



Company: Project:

HG Energy, LLC

Harrison County, West Virginia

Site: Well:

W.B. Carpenter #237 W.B. Carpenter #237

Wellbore: Design:

Wellbore #1 Wellbore #1 Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference:

Survey Calculation Method:

Database:

Well W.B. Carpenter #237

WELL @ 1393.0usft (Decker #6)

WELL @ 1393.0usft (Decker #6)

Minimum Curvature

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)
1,135.0	6.20	29.60	1,134.4	7.4	12.5	10.9	0.07	0.00	0.67
1,165.0	6.00	23.40	1,164.2	10.2	13.9	14.1	2.29	-0.67	-20.67
1,195.0	5.60	17.60	1,194.0	13.0	14.9	17.1	2.36	-1.33	-19.33
1,225.0	5.60	11.10	1,223.9	15.9	15.7	20.0	2.11	0.00	-21,67
1,255.0	6.20	11.30	1,253.7	18.9	16.3	23.1	2.00	2.00	0.67
1,285.0	7.10	14.30	1,283.5	22.3	17.0	26.5	3.21	3.00	10.00
1,315.0	8.00	16.70	1,313.3	26.1	18.1	30.5	3.18	3.00	8.00
1,345.0	8.50	18.20	1,343.0	30.2	19.4	34.8	1.81	1.67	5.00
1,375.0	8.80	20.70	1,372.6	34.4	20.9	39.3	1.60	1.00	8,33
1,405.0	9.30	20.80	1,402.3	38.9	22.6	44.0	1.67	1.67	0.33
1,435.0	9.80	20.80	1,431.8	43.5	24.3	49.0	1.67	1.67	0.00
1,465.0	10.70	19.60	1,461.4	48.5	26.2	54.3	3.08	3.00	-4.00
1,495.0	11.70	19.30	1,490.8	54.0	28.1	60.1	3.34	3.33	-1.00
1,525.0	13.30	18.70	1,520.1	60.1	30,2	66.6	5.35	5.33	-2.00
1,555.0	13.90	19.80	1,549.2	66.8	32.6	73.7	2.18	2.00	3.67
1,585.0	14.00	20.80	1,578.4	73.6	35.1	80.9	0.87	0.33	3.33
1,615.0	13.30	21.80	1,607.5	80.2	37.6	88.0	2.46	-2.33	3.33
1,645.0	13.10	23.40	1,636.7	86.5	40.3	94.8	1.39	-0.67	5.33
1,675.0	12.80	23.60	1,666.0	92.7	42.9	101.5	1.01	-1.00	0.67
1,705.0	12.70	25.20	1,695.2	98.7	45.7	108.1	1.22	-0.33	5.33
1,735.0	12.80	23.40	1,724.5	104.7	48.4	114.7	1.37	0.33	-6.00
1,765.0	13.10	21.60	1,753.7	111.0	51.0	121.4	1.68	1.00	-6.00
1,795.0	13.00	20.60	1,782.9	117.3	53.4	128.1	0.82	-0.33	-3.33
1,825.0	13.20	20.10	1,812.2	123.6	55.8	134.9	0.77	0.67	-1.67
1,855.0	13.20	20.90	1,841.4	130.1	58.2	141.8	0.61	0.00	2.67
1,885.0	13.50	19.90	1,870.6	136.6	60.6	148.7	1.26	1.00	-3.33
1,915.0	13.90	20.80	1,899.7	143.2	63.1	155.8	1.51	1.33	3.00
1,945.0	14.20	20.80	1,928.8	150.0	65.6	163.1	1.00	1.00	0.00
1,975.0	15.00	20.80	1,957.8	157.1	68.3	170.6	2.67	2.67	0.00
2,005.0	15.50	22.90	1,986.8	164.4	71.3	178.5	2.48	1.67	7.00
2,035.0	16.50	23.90	2,015.6	172.0	74.6	186.7	3.46	3.33	3.33
2,065.0	16.70	25.30	2,044.4	179.8	78.1	195.3	1.49	0.67	4.67
2,095.0	16.50	23.60	2,073.1	187.6	81.7	203.8	1.75	-0.67	-5.67
2,125.0	16.80	23,00	2,101.9	195.5	85.1	212.3	1.15	1.00	-2.00
2,155.0	17.00	23,30	2,130.6	203.5	88.5	221.0	0.73	0.67	1.00
2,185.0	17.20	21.90	2,159.2	211.7	91.9	229.8	1.53	0.67	-4.67
2,215.0	17.50	22.00	2,187.9	220.0	95.2	238.8	1.00	1.00	0.33
2,245.0	18.10	23.30	2,216.4	228.4	98.8	247.9	2.40	2.00	4.33
2,275.0	17.40	22.90	2,245.0	236.8	102.4	257.0	2.37	-2.33	-1.33
2,305.0	16.40	20.30	2,273.7	244.9	105.6	265.7	4.18	-3.33	-8.67
2,335.0	15.70	18.50	2,302.5	252.8	108.3	274.0	2.86	-2.33	-6.00
2,365.0	15.20	20.40	2,331.5	260.3	111.0	282.0	2.37	-1.67	6.33
2,395.0	14.90	23.90	2,360.4	267.5	113.9	289.8	3.19	-1.00	11.67
2,425.0	14.40	26.50	2,389.4	274.4	117.1	297.3	2.75	-1.67	8.67

Survey Report



Company: Project: HG Energy, LLC

Harrison County, West Virginia

Site: Well: W.B. Carpenter #237 W.B. Carpenter #237

Wellbore: Design: Wellbore #1 Wellbore #1 Local Co-ordinate Reference:

TVD Reference:

North Reference:

Survey Calculation Method:

Database:

Well W.B. Carpenter #237

WELL @ 1393.0usft (Decker #6)

WELL @ 1393.0usft (Decker #6)

Grid

Minimum Curvature

EDM 5000.1 Single User Db

2,485.0 13.60 28.10 2,418.6 280.8 120.5 304.5 2.96 -2.67 2,485.0 12.90 25.50 2,447.8 286.9 123.6 311.3 3.06 -2.33 2,515.0 12.10 22.90 2,477.0 292.9 126.2 317.7 3.26 -2.67 2,545.0 10.80 19.10 2,508.5 298.4 128.4 323.7 5.01 -4.33 2,575.0 9.90 16.70 2,536.0 303.5 130.0 329.1 3.33 -3.00 2,605.0 9.30 15.00 2,565.5 308.4 131.4 334.1 2.21 -2.00 2,635.0 8.20 14.00 2,595.2 312.8 132.6 338.6 3.70 -3.67 2,685.0 7.60 10.50 2,654.6 320.7 134.4 346.7 1.28 0.00 2,725.0 8.10 6.90 2,684.4 324.7 135.0 350.7 2.34 1.67	leasured 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)
2,493.0 12,10 22,90 2,477.0 292.9 126.2 317.7 3.26 -2.67 2,545.0 10.80 19.10 2,506.5 298.4 128.4 323.7 5.01 -4.33 2,575.0 9.90 16.70 2,536.0 303.5 130.0 329.1 3.33 -3.00 2,605.0 9.30 15.00 2,565.5 308.4 131.4 334.1 2.21 -2.00 2,635.0 8.20 14.00 2,595.2 312.8 132.6 338.6 3.70 -3.67 2,665.0 7.60 13.40 2,624.9 316.8 133.5 342.7 2.02 -2.00 2,695.0 7.60 10.50 2,654.6 320.7 134.4 346.7 128 0.00 2,725.0 8.10 6.90 2,684.4 324.7 135.0 350.7 2.34 1.67 2,785.0 7.80 2.10 2,714.1 328.8 135.3 356.6 2.52 0.67 </td <td>2,455.0</td> <td></td> <td>28.10</td> <td>2,418.6</td> <td>280.8</td> <td>120.5</td> <td>304.5</td> <td>2.96</td> <td>-2.67</td> <td>5.33</td>	2,455.0		28.10	2,418.6	280.8	120.5	304.5	2.96	-2.67	5.33
2,515.0 12.10 22.90 2,477.0 292.9 126.2 317.7 3.26 -2.67 2,545.0 10.80 19.10 2,506.5 288.4 128.4 323.7 5.01 -4.33 2,575.0 9.90 16.70 2,536.0 303.5 130.0 329.1 3.33 -3.00 2,605.0 9.30 15.00 2,565.5 308.4 131.4 334.1 2.21 -2.00 2,635.0 8.20 14.00 2,595.2 312.8 132.6 338.6 3.70 -3.67 2,665.0 7.60 13.40 2,624.9 316.8 133.5 342.7 2.02 -2.00 2,695.0 7.60 10.50 2,654.6 320.7 134.4 346.7 1.28 0.00 2,725.0 8.10 6.90 2,684.4 324.7 135.0 350.7 2.34 1.67 2,755.0 7.80 2.10 2,714.1 328.8 135.3 354.7 2.43 -1.00 2,785.0 8.30 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6,70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,935.0 8.70 6,70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.9 2.72 -2.00 3,025.0 6.90 354.20 2,981.0 3,011.2 370.1 136.6 394.3 30.9 3.00 -2.00 3,025.0 6.90 354.20 2,981.0 3,011.2 370.1 136.6 394.3 30.9 1.78 2.85 -1.00 3,015.0 5.40 333.20 3,010.7 378.3 133.5 401.0 1.78 -2.00 3,015.0 5.40 333.20 3,010.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 5.20 1.00 1.78 1.15 1.15 1.15 1.15 1.15 1.15 1.15 1.1	2.485.0	12 90	25.50	2.447.8	286.9	123.6	311.3	3.06	-2.33	-8.67
2,545.0 10.80 19.10 2,506.5 298.4 128.4 323.7 5.01 4.33 2,575.0 9.90 16.70 2,536.0 303.5 130.0 329.1 3.33 -3.00 2,605.0 9.30 15.00 2,565.5 308.4 131.4 334.1 2.21 -2.00 2,605.0 9.30 15.00 2,565.5 308.4 131.4 334.1 2.21 -2.00 2,605.0 7.60 13.40 2,624.9 316.8 133.5 342.7 2.02 -2.00 2,605.0 7.60 10.50 2,654.6 320.7 134.4 346.7 1.28 0.00 2,725.0 8.10 6.90 2,684.4 324.7 135.0 350.7 2.34 1.67 2,755.0 7.80 2.10 2,714.1 328.8 135.3 354.7 2.43 -1.00 2,785.0 8.30 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,905.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,905.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,905.0 8.70 6.70 2,992.0 358.9 137.2 383.9 2.72 -2.00 2,905.0 6.30 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,025.0 6.30 348.10 3,011.2 370.1 136.6 394.3 30.7 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 3.07 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 1.26 7.16 7.16 7.16 7.16 7.16 7.16 7.16 7.1						126.2	317.7	3.26	-2.67	-8.67
2,575.0 9,90 16.70 2,536.0 303.5 130.0 329.1 3.33 -3.00 2,605.0 9.30 15.00 2,565.5 308.4 131.4 334.1 2.21 -2.00 2,665.0 9.30 15.00 2,565.5 308.4 131.4 334.1 2.21 -2.00 2,665.0 7.60 13.40 2,624.9 316.8 133.5 342.7 2.02 -2.00 2,695.0 7.60 10.50 2,654.6 320.7 134.4 346.7 1.28 0.00 2,725.0 8.10 6.90 2,684.4 324.7 135.0 350.7 2.34 1.67 2,755.0 7.80 2.10 2,714.1 328.8 135.3 354.7 2.43 -1.00 2,785.0 8.00 356.80 2,743.8 333.0 135.3 354.7 2.43 -1.00 2,845.0 8.30 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,935.0 8.10 2.90 2,921.9 358.9 137.2 383.9 2.72 -2.00 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 30.7 -2.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67 4.32 4.32 4.32 4.32 4.32 4.32 4.32 4.32						128.4	323.7	5.01	-4.33	-12.67
2,605.0 9.30 15.00 2,565.5 308.4 131.4 334.1 2.21 -2.00 2,635.0 8.20 14.00 2,595.2 312.8 132.6 338.6 3.70 -3.67 2,665.0 7.60 13.40 2,624.9 316.8 133.5 342.7 2.02 -2.00 2,695.0 7.60 10.50 2,654.6 320.7 134.4 346.7 1.28 0.00 2,725.0 8.10 6.90 2,684.4 324.7 135.0 350.7 2.34 1.67 2,755.0 7.80 2.10 2,714.1 328.8 135.3 354.7 2.43 -1.00 2,785.0 8.00 356.80 2,743.8 333.0 135.3 358.6 2.52 0.67 2,815.0 8.30 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,876.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,905.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,965.0 8.10 2.90 2,921.9 358.9 137.2 383.9 2.72 -2.00 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,055.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16							329.1	3.33	-3.00	-8.00
2,665.0 7.60 13.40 2,624.9 316.8 133.5 342.7 2.02 -2.00 2,695.0 7.60 10.50 2,654.6 320.7 134.4 346.7 1.28 0.00 2,725.0 8.10 6.90 2,684.4 324.7 135.0 350.7 2.34 1.67 2,755.0 7.80 2.10 2,714.1 328.8 135.3 354.7 2.43 -1.00 2,785.0 8.00 356.80 2,743.8 333.0 135.3 358.6 2.52 0.67 2,815.0 8.30 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,905.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67									-2.00	-5.67
2,665.0 7.60 13.40 2,624.9 316.8 133.5 342.7 2.02 -2.00 2,695.0 7.60 10.50 2,654.6 320.7 134.4 346.7 1.28 0.00 2,725.0 8.10 6.90 2,684.4 324.7 135.0 350.7 2.34 1.67 2,755.0 7.80 2.10 2,714.1 328.8 135.3 354.7 2.43 -1.00 2,785.0 8.00 356.80 2,743.8 333.0 135.3 358.6 2.52 0.67 2,815.0 8.30 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,935.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67	2 635 0	8 20	14.00	2,595.2	312.8	132.6	338.6	3.70	-3.67	-3.33
2,695.0 7,60 10.50 2,654.6 320.7 134.4 346.7 1.28 0.00 2,725.0 8.10 6.90 2,684.4 324.7 135.0 350.7 2.34 1.67 2,755.0 7.80 2.10 2,714.1 328.8 135.3 354.7 2.43 -1.00 2,785.0 8.00 356.80 2,743.8 333.0 135.3 358.6 2.52 0.67 2,815.0 8.30 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,845.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,875.0 8.30 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67					316.8	133.5	342.7	2.02	-2.00	-2.00
2,725.0 8.10 6.90 2,684.4 324.7 135.0 350.7 2.34 1.67 2,755.0 7.80 2.10 2,714.1 328.8 135.3 354.7 2.43 -1.00 2,785.0 8.00 356.80 2,743.8 33.0 135.3 358.6 2.52 0.67 2,815.0 8.30 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,955.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00				100	320.7	134.4	346.7	1.28	0.00	-9.67
2,755.0 7.80 2.10 2,714.1 328.8 135.3 354.7 2.43 -1.00 2,785.0 8.00 356.80 2,743.8 333.0 135.3 358.6 2.52 0.67 2,815.0 8.30 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,905.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 <td></td> <td></td> <td></td> <td></td> <td></td> <td>135.0</td> <td>350.7</td> <td>2.34</td> <td>1.67</td> <td>-12.00</td>						135.0	350.7	2.34	1.67	-12.00
2,763.0 8.00 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,905.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,965.0 8.10 2.90 2,921.9 358.9 137.2 383.9 2.72 -2.00 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 3.07 -2.00 3,185.0 5.70 341.50 3,041.0 373.2 135.8 <td< td=""><td>7.51</td><td></td><td></td><td></td><td></td><td>135.3</td><td>354.7</td><td>2.43</td><td>-1.00</td><td>-16.00</td></td<>	7.51					135.3	354.7	2.43	-1.00	-16.00
2,815.0 8.30 355.40 2,773.5 337.2 135.0 362.6 1.20 1.00 2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,905.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,965.0 8.10 2.90 2,921.9 358.9 137.2 383.9 2.72 -2.00 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 <td< td=""><td>2 785 0</td><td>8.00</td><td>356.80</td><td>2,743.8</td><td>333.0</td><td>135.3</td><td>358.6</td><td>2.52</td><td>0.67</td><td>-17.67</td></td<>	2 785 0	8.00	356.80	2,743.8	333.0	135.3	358.6	2.52	0.67	-17.67
2,845.0 8.30 1.50 2,803.2 341.5 134.9 366.6 2.93 0.00 2,875.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,905.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,965.0 8.10 2.90 2,921.9 358.9 137.2 383.9 2.72 -2.00 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 3.07 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 <t< td=""><td></td><td></td><td></td><td>2,773.5</td><td>337.2</td><td>135.0</td><td>362.6</td><td>1.20</td><td>1.00</td><td>-4.67</td></t<>				2,773.5	337.2	135.0	362.6	1.20	1.00	-4.67
2,875.0 8.30 10.70 2,832.9 345.8 135.3 370.8 4.42 0.00 2,905.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,965.0 8.10 2.90 2,921.9 358.9 137.2 383.9 2.72 -2.00 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 3.07 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5					341.5	134.9	366.6	2.93	0.00	20.33
2,905.0 8.50 11.60 2,862.5 350.1 136.2 375.2 0.80 0.67 2,935.0 8.70 6.70 2,892.2 354.5 136.9 379.6 2.53 0.67 2,965.0 8.10 2.90 2,921.9 358.9 137.2 383.9 2.72 -2.00 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 3.07 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67					345.8	135.3	370.8	4.42	0.00	30.67
2,935.0 8.70 2,905.2 358.9 137.2 383.9 2.72 -2.00 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 3.07 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67						136.2	375.2	0.80	0.67	3.00
2,965.0 8.10 2.90 2,921.9 358.9 137.2 383.9 2.72 -2.00 2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 3.07 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67	2 935 0	8.70	6.70	2,892.2	354.5	136.9	379.6	2.53	0.67	-16.33
2,995.0 7.50 359.10 2,951.6 363.0 137.3 387.8 2.64 -2.00 3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 3.07 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67			2.90	2,921.9	358.9	137.2	383.9	2.72	-2.00	-12.67
3,025.0 6.90 354.20 2,981.4 366.7 137.1 391.3 2.86 -2.00 3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 3.07 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67				2,951.6	363.0	137.3	387.8	2.64	-2.00	-12.67
3,055.0 6.30 348.10 3,011.2 370.1 136.6 394.3 3.07 -2.00 3,085.0 5.70 341.50 3,041.0 373.2 135.8 396.9 3.04 -2.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67				2,981.4	366.7	137.1	391.3	2.86	-2.00	-16.33
3,085.0 5.70 341.30 3,071.5 375.8 134.7 399.1 2.85 -1.00 3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67	100110			3,011.2	370.1	136.6	394.3	3.07	-2.00	-20.33
3,115.0 5.40 333.20 3,070.9 375.8 134.7 399.1 2.85 -1.00 3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67 4.70	3.085.0	5.70	341.50	3,041.0	373.2	135.8	396.9	3.04		-22.00
3,145.0 4.90 335.30 3,100.7 378.3 133.5 401.0 1.78 -1.67 3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67				3,070.9	375.8	134.7	399.1	2.85	-1.00	-27.67
3,175.0 4.70 338.70 3,130.6 380.6 132.5 402.9 1.16 -0.67					378.3	133.5	401.0	1.78	-1.67	7.00
0,110.0					380.6	132.5	402.9	1.16	-0.67	11.33
4,244	3,205.0	4.30	335.70	The state of the s		131.6	404.7	1.55	-1.33	-10.00
3,235.0 3.80 332.30 3,190.5 384.6 130.7 406.2 1.85 -1.67	3,235.0	3.80	332.30	3,190.5	384.6	130.7	406.2	1.85	-1.67	-11.33
TD @ 3291' MD / 3246' TVD		ID / 3246' TVD								0.00

urvey Annotations					
Mea	sured	Vertical	Local Coor	dinates	
De	epth	Depth	+N/-S	÷E/-W	
(u	sft)	(usft)	(usft)	(usft)	Comment
	850.0	850.0	0.0	0.0	TIE IN @ 850' MD / 850' TVD
	3,291.0	3,246.3	387.9	129.0	TD @ 3291' MD / 3246' TVD

Checked By:	Approved By:	Date:

HG Energy, LLC

Harrison County, West Virginia W.B. Carpenter #237 W.B. Carpenter #237

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

07 January, 2014



Survey Report - Geographic



Company: Project:

HG Energy, LLC

Harrison County, West Virginia

Site: Well: W.B. Carpenter #237 W.B. Carpenter #237

Wellbore: Design:

Wellbore #1 Wellbore #1 Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference:

Survey Calculation Method:

Database:

Well W.B. Carpenter #237

WELL @ 1393.0usft (Decker #6)

WELL @ 1393.0usft (Decker #6)

Grid

Minimum Curvature

EDM 5000.1 Single User Db

Harrison County, West Virginia Project

Map System: Geo Datum:

Universal Transverse Mercator NAD83 West Virginia - HARN

Zone 17N (84 W to 78 W)

System Datum:

Mean Sea Level

Map Zone: Site

W.B. Carpenter #237

Site Position: From:

Lat/Long

Northing: Easting: Slot Radius: 14,262,785.77 usft 1,780,200.29 usft

Latitude: Longitude:

Grid Convergence:

39° 16' 26.600 N 80° 30' 21.800 W

0.31 °

Well

Position Uncertainty:

W.B. Carpenter #237

+N/-S +E/-W 0.0 usft 0.0 usft

Northing: Easting:

14,262,785.77 usft 1,780,200.29 usft

13-3/16 "

Latitude: Longitude:

39° 16' 26.600 N 80° 30' 21.800 W

Position Uncertainty

Well Position

0.0 usft

0.0 usft

Wellhead Elevation:

usft

Ground Level:

1,385.0 usft

0.0

Wellbore #1 Wellbore

Magnetics **Model Name**

Sample Date

Depth From (TVD)

(usft)

Declination (°) -8.64 Dip Angle (°)

Field Strength (nT)

66.81

52,315

Wellbore #1 Design

Audit Notes:

Version:

Vertical Section:

1.0

IGRF2010

Phase:

0.0

12/11/2013

ACTUAL

+N/-S

(usft)

0.0

Tie On Depth: +E/-W

(usft)

0.0

Direction (°)

18.39

12/11/2013 Date Survey Program

> From (usft)

To (usft)

Survey (Wellbore)

Tool Name

Description

850.0

3,291.0 MWD (Wellbore #1)

urvey									
Measured Depth (usft)	Inclination (°)	Azimuth	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
850.0	0.00	0.00	850.0	0.0	0.0	14,262,785.77	1,780,200.29	39° 16′ 26.600 N	80° 30' 21.800 W
TIE IN @	850' MD / 850	' TVD							
914.0	2.50	109.50	914.0	-0.5	1.3	14,262,785.31	1,780,201.61	39° 16' 26.595 N	80° 30' 21.783 W
925.0	2.60	112.90	925.0	-0.6	1.8	14,262,785.13	1,780,202.06	39° 16' 26.594 N	80° 30' 21.778 W
955.0	2.80	111.10	954.9	-1.2	3.1	14,262,784.60	1,780,203.37	39° 16' 26.588 N	80° 30' 21.761 W
985.0	2.70	83.90	984.9	-1.4	4.5	14,262,784.41	1,780,204.76	39° 16' 26.586 N	80° 30' 21.743 W
1,015.0	3.40	61.50	1,014.9	-0.9	6.0	14,262,784.91	1,780,206.24	39° 16' 26.591 N	80° 30' 21.724 W
1,045.0	4.30	51.00	1,044.8	0.3	7.6	14,262,786.05	1,780,207.90	39° 16' 26,602 N	80° 30' 21.703 W
	5.10	36.30	1,074.7	2.1	9.3	14,262,787.83	1,780,209.56	39° 16' 26.620 N	80° 30' 21.682 W
1,075.0	6.20	29.40	1,104.5	4.5	10.9	14,262,790.31	1,780,211.15	39° 16' 26.644 N	80° 30' 21.662 W
1,105.0				7.4	12.5	14,262,793.13	1,780,212.74	39° 16' 26.672 N	80° 30' 21.641 W
1,135.0 1,165.0	6.20	29.60 23.40	1,134.4 1,164.2	10.2	13.9	14,262,795.98	1,780,214.17	39° 16' 26.700 N	80° 30' 21.623 W

Survey Report - Geographic DDC

W 009.12.008 008 W 262.15.008 008 W 262.15.008 008 W 863.12.008 008 W 162.12.008 008 W 262.12.008 008 W 262.12.008	abuited butted self-self-self-self-self-self-self-self-	Map Easting (usft) (usf	GFM (fieu) (fieu	14.9 (Azin 20.2) 32.6 (Azin 20.2) 32.6 (Azin 20.2) 22.6 ((Hau) (Hau) 0.61 0.61 6.81 6.82 6.85 6.86 6.86 6.86 6.86 6.86 6.86 6.86	dertical http://decin.com/	(°) 03.71 01.11 02.71 01.11 02.11 02.11 02.41 02.41 07.31 07.31 07.02 08.02 08.02 08.02 08.02 08.02 08.02	molination (°) (°) 6.60 6.20 6.20 6.20 6.20 6.20 8.60 8.60 8.80 9.30 9.30 17.70 19.30	meseured the part of the part
W 60° 12' 60° 08 W 60° 12' 60° 08 W 60° 30' 21,609 W 60° 30' 21,609 W 60° 30' 21,309 W 60° 30' 21,309 W 716,12' 90° 908 W 716,12' 90° 908 W 60° 30' 21,309 W 60° 30' 21,309 W 716,12' 90° 908 W 716,12' 90° 908 W 716,12' 90° 908 W 716,13' 90° 908 W 716,13' 90° 908 W 716,13' 90° 908 W 716,13' 90° 908	89° 16' 26' 78' N 857, 35° 16' 26' 78' N 899° 16' 26' 99' N 89° 16' 26' 99' N 89° 16' 25' 99' N 89° 16' N 89° 16' N 89	82.815,087,1 80.815,087,1 80.815,087,1 80.815,087,1 80.815,087,1 80.815,087,1 80.825,087,1 74.855,087,1 74.855,087,1 82.065,087,1 83.855,087,1 83.855,087,1 84.855,087,1	28.867,262,41 28.108,262,41 78.408,262,41 80.808,262,41 88.118,262,41 80.818,262,41 80.818,262,41 80.818,262,41 80.818,262,41 80.818,262,41 80.818,262,41 80.818,262,41 80.818,262,41 80.818,262,41	6.41 6.31 6.31 7.31 6.07 6.02 6.02 6.02 6.42 6.43 6.43 6.43 6.43 7.63 7.63 7.63 7.63 7.63 7.63	0.81 6.81 6.81 6.82 7.82 5.08 4.48 6.88 6.88 6.84 6.84 6.85 7.06	0.461,1 6.622,1 6.682,1 6.6	07.11 01.11 01.11 06.01 06.02 07.02 08.02 07.02 08.03 09.03 09.03 09.03 09.03	06.8 07.7 08.8 08.8 08.9 08.9 07.01	0.391,1 0.322,1 0.382,1 0.382,1 0.318,1 0.348,1 0.304,1 0.304,1 0.364,1
W 502,15,008 W 502,15,008 W 502,15,008 W 502,15,008 W 503,15,008 W 503,15,008 W 503,15,008 W 503,15,008 W 503,15,008 W 503,15,008 W 503,15,008 W 503,15,008 M 503,15,008 M 503,15,008 M 503,15,008 M 503,15,008 M 503,15,008 M 503,15,008 M 503,15,008	38. 40, 20, 30, 30, 30, 30, 30, 30, 30, 30, 30, 3	86.815.087,1 86.815.087,1 86.815.087,1 86.815.087,1 87.1087,1	28.108,282,41 78.408,282,41 80.808,282,41 80.808,282,41 80.818,282,41 80.818,282,41 80.488,282,41 80.818,282,41 80.818,282,41 80.818,283,41 80.818,283,41 80.818,283,41 80.818,	7.31 6.31 0.71 1.81 1.81 0.2 6.02 6.02 6.42 2.62 2.63 2.02 2.03	6.81 6.81 6.82 6.82 6.85 6.84 6.85 6.84 6.85 6.84	6.852,1 7.832,1 6.882,1 6.818,1 6.818,1 6.304,1 8.184,1 8.184,1 8.184,1 8.084,1 7.052,1	01.11 06.11 06.41 07.01 07.02 08.02 08.02 08.02 09.02 09.02	05.8 00.8 00.8 00.8 00.9 00.9 00.9 00.01 00.01	0.252,1 0.282,1 0.282,1 0.246,1 0.264,1 0.264,1 0.264,1 0.264,1 0.264,1
W 502.15.908 W 502.15.908 W 502.15.908 W 508.215.908 W 508.215.908 W 508.205.12.908 W 508.205.12.908 W 508.205.12.908 W 508.205.12.908 W 508.205.12.908 M 508.205.12.908 M 508.205.12.908	39° 16' 26' 86' N 887,35' 91' 86; 99° 16' 26,85' 90' 39° 16' 26' 85' 90' 90' 90' 90' 90' 90' 90' 90' 90' 90	6.312,087,1 6.312,087,1 6.312,087,1 8.612,087,1 6.152	78.408,282,41 80.808,282,41 88.118,282,41 80.818,282,41 12.028,282,41 82.628,282,41 87.628,282,41 87.628,282,41 88.288,282,41 88.288,282,41	6.31 1.81 1.81 6.02 6.02 5.52 6.43 5.64 7.82 5.05 1.83 5.05	6.81 5.22 5.05 7.45 6.85 6.84 6.84 6.84 6.84 6.94 6.95 7.00	7.635,1 6.685,1 6.616,1 6.646,1 6.204,1 6.184,1 7.134,1 8.064,1 7.023,1	06.71 06.41 07.01 07.02 07.02 08.02 08.02 09.02 09.01 09.01	07.07 00.8 00.8 00.8 06.9 06.9 07.01 07.01	0.282,1 0.282,1 0.218,1 0.204,1 0.204,1 0.264,1 0.284,1 0.284,1
W 582.12.08 08 W 582.12.08 08 W 583.21.58 W 80 80 W 51.58 W 80 80 80 51.58 W 80 80 80 80 80 80 80 80 80 80 80 80 80	M 618'92'91'98'98'98'98'98'98'98'98'98'98'98'98'98'	2.5.5.087,1 80.612,087,1 80.612,087,1 80.612,087,1 80.522,087,1 50.622,087,1 74.825,087,1 74.825,087,1 78.262,087,1 78.262,087,1 78.262,087,1	38.118,232,41 38.118,232,41 39.218,232,41 15.028,232,41 82.628,232,41 87.928,232,41 87.928,232,41 86.238,232,41 88.238,232,41	0.71 1.81 4.01 6.02 6.02 6.52 6.43 5.63 7.83 2.02 3.26	6.32 7.05 7.05 7.05 8.85 8.84 8.84 0.43 6.03	6.882,1 6.818,1 6.848,1 6.378,1 8.184,1 8.184,1 8.084,1 1.033,1	14,30 16,70 18,20 20,60 20,80 19,60 19,30 19,30	01.7 00.8 03.8 08.9 08.9 07.01	0.282,1 0.212,1 0.242,1 0.272,1 0.254,1 0.284,1 0.384,1
80° 30' 21.568 W 80° 30' 21.568 W 80° 30' 21.349 W 80° 30' 21.349 W 80° 30' 21.349 W 80° 30' 21.446 W 80° 30' 21.446 W 80° 30' 21.446 W 80° 30' 21.349 W 80° 30' 21.348 W 80° 30' 21.348 W 80° 30' 21.348 W 80° 30' 21.348 W	N 768,92'91'968'N 768,92'91'98'99'99'99'99'99'99'99'99'99'99'99'99'	85.815,087,1 86.815,087,1 86.152,087,1 86.252,087,1 74.852,087,1 74.852,087,1 74.852,087,1 78.852,087,1 86.852,087,1	28.118,232,41 39.218,232,41 12.028,232,41 50.428,232,41 82.628,232,41 87.928,232,41 87.928,232,41 88.238,232,41	1.81 4.01 6.02 6.02 6.52 6.43 5.63 7.83 5.02 8.35	7.02 2.02 4.46 6.85 6.84 6.84 7.09	6.616,1 0.646,1 6.276,1 6.204,1 8.164,1 4.184,1 7.026,1	07.81 02.81 07.02 08.02 08.02 08.01 06.61 07.81	00.8 03.8 08.9 08.9 07.01 07.11	0.218,1 0.248,1 0.278,1 0.264,1 0.284,1 0.384,1
M 162.21 Se *08 M 20° 30' 21.559 M 20° 30' 21.349	N 768,52'91'98'8'99'99'99'99'99'99'99'99'99'99'99'9	86.615,087,1 61.155,087,1 61.255,087,1 63.455,087,1 74.655,087,1 74.855,087,1 76.855,087,1 78.555,087,1 78.555,087,1	68.218,262,41 12.028,262,41 68.628,262,41 87.628,262,41 87.628,262,41 87.628,262,41 88.238,262,41	4.91 2.02 3.52 2.62 2.63 2.08 2.08 3.26	2.08 4.48 6.88 6.84 0.48 1.09	0.848,1 6.204,1 8.184,1 4.184,1 4.184,1 1.028,1	05.81 07.02 08.02 08.02 09.60 19.60 19.30	08.8 08.9 08.9 07.01	0.878,1 0.878,1 0.804,1 0.884,1 0.884,1
V 563.15 °08 °08 V 013.15 °08 °08 V 784.12 °08 °08 V 484.12 °08 °08 V 114.15 °08 °08 V 114.15 °08 °08 V 185.15 °08 °08 V 185.15 °08 °08 V 365.15 °08 °08 V 365.15 °08 °08 V 755.15 °08 V 75	0 66.92,91,866 0 699,91,91,91,91,91,91,91,91,91,91,91,91,9	61.152,087,1 68.525,087,1 58.452,087,1 74.652,087,1 74.852,087,1 58.505,087,1 78.505,087,1	12.028,282,41 63.628,282,41 82.628,282,41 87.688,282,41 87.688,282,41 85.288,288,41	9.02 9.22 8.42 2.62 2.63 2.08 3.26	6.88 6.88 8.84 0.48 1.09	8.124,1 8.124,1 4.134,1 8.094,1 1.023,1	20.70 20.80 20.80 19.60 19.30 19.30	08.8 08.9 08.9 07.01	0.304,1 0.304,1 0.384,1 0.384,1
W 79°, 71, 487 W 60°, 30°, 71, 464 W 186, 73°, 74, 41, 41, 41, 41, 41, 41, 41, 41, 41, 4	79° 16' 727.029 79° 16' 727.137 79° 16' 75' 75' 79° 16' 75' 79° 16' 75' 79° 16' 75'	88.SSS,087,1 S8.ASS,087,1 7A.8SS,087,1 1A.8SS,087,1 S8.0SS,087,1 A8.SSS,087,1	82,628,232,41 82,628,232,41 87,688,232,41 87,688,232,41 26,348,232,41 88,288,232,41	5.25 24.3 26.2 20.2 30.2 32.6	6.88 6.84 6.46 7.09	8.184,1 8.184,1 4.184,1 8.094,1 1.053,1	20.80 20.80 19.60 19.30	08.6 08.0 07.01	0.804,1 0.884,1 0.884,1
V +04,15° 00° 00° V +44,14° 00° 00° 00° V +14,15° 00° 00° V +14,15° 00° 00° V +14,15° 00° 00° V +15,15° 00° 00° 00° V +15,15° 00° 00° 00° 00° 00° 00° 00° 00° 00° 0	39° 16' 27' 28' 88' 89' 16' 27' 193' 98' 39° 16' 27' 259' 98' 98' 16' 27' 259' 98' 16' 27' 259' 98' 16' 27' 259' 98' 16' 27' 25	23.452,087,1 74.852,087,1 74.852,087,1 53.085,087,1 48.285,087,1	82.628,232,41 62.458,232,41 87.628,232,41 26.248,232,41 88.288,232,41	24.3 2.6.2 2.82 3.02 3.26	6.84 6.46 7.09	8.184,1 4.184,1 8.094,1 1.022,1	20.80 19.60 19.30 07.81	08.6 07.01 07.11	1,435.0 1,495.0
00°30°21,464 W 00°30°21,464 W 00°30°21,414 W 00°30°21,21,349 W 00°30°21,2134 W 00°30°21,2134 W 00°30°21,2134 W 00°30°21,2134 W 00°30°21,2134 W	39° 16' 27' 28' 88' 89' 16' 27' 193' 98' 39° 16' 27' 259' 98' 98' 16' 27' 259' 98' 16' 27' 259' 98' 16' 27' 259' 98' 16' 27' 25	7,780,226.41 1,780,228.41 23.052,087,1 48.252,087,1	97.268,236,17 87.268,236,14 14,262,845.92 86,238,536,41	2.62 7.82 3.08 3.26	6.84 0.48 1.08	4.194,1 8.094,1 1.053,1	09.91 08.91 07.81	07.01 07.11	0.884,1
00° 30° 21,41,4 W W 188.15° 30° 30° 21.349 W 80° 30° 21.318 W 30° 30° 21.282 W 212.242	39° 16' 27,193 W 39° 16' 27,326 W 39° 16' 27,326 W	14,822,087,1 28,082,087,1 48,282,087,1	14,262,839.78 14,262,852.58 14,262,852.58	2.02 3.0.2 3.2.6	0.43 1.08	1,490.8	05.91 07.81	07.11	0.264,1
M 188, 12, 308 08 08 09 08 1,349 W 08° 30° 21,349 W 08° 30° 21,242 W 08° 30° 21,242 W 08° 30° 21,212 W 08° 30° 21,212 W	39° 16' 27.259 N 39° 16' 27.356 N	1,780,232.84	14,262,845.92	3.0£ 32.6	1.09	1,520.1	18.70		
80° 30' 21,349 W 80° 30' 21,282 W 80° 30' 21,282 W 80° 30' 21,242 W	39° 16' 27.326 N								0.02011
80° 30' 21.231 80° 30' 21.24 W 521.21.24 W 51.21.24 W 21.21.24		1,780,235.35	14,262,859,36				19.80	13.90	0.888,1
W 282.12'08'08 W 742.12'08'08 W 212.12'08'08			THE RESERVE AND ADDRESS.	1.88	9.67	4.878,1	20,80	14.00	0.388,1
M 742.12 '05 °08 I	N 198.72'81 °98	26.782,087,1	14,262,865.96	37.6	S.08	8.709,1	21.80	13.30	0.818,1
N 212.12 V	39° 16' 22,453 N	1,780,240.56	14,262,872.29	6.04	3.98	7,636.7	23.40	13.10	1,645.0
	39° 16' 27.57 44 N	1,780,243.24	14,262,878.45	6.24	7.26	0.888,1	23.60	12.80	0.878,1
	39° 16' 27.573 N	79.245.97,1	14,262,884.48	7.84	7.89	1,695.2	25.20	12.70	0.307,1
	39° 16' 27.633 N 39° 16' 27.694 N	55,145,087,1	14,262,890.51	4.84	7.401	1,724.5	23.40	12.80	0.367,1
**************************************	39° 16' 27.75 N	1,780,251.77	27.898,232,41	51.0	0.111	7.837,1	21.60	13,10	0.297,1
	39° 16' 27.819 N	1,780,256.07	14,262,903.04	53.4	2,711	1,782.9	20.60	13.00	0.267,1
전(() '() 전기 () '() 전기 () () () () () () () () () () () () ()	39° 16' 27.883 N	74.832,087,1	24,262,909,41	55.8	123.6	1,512.2	20.10	13.20	1,825.0
M 855 LEWINGS - 11	39° 16' 27.947 N	88.092,087,1	14,262,915.84	Z.83	1.081	4.148,1	20.90	13.20	1,855.0
	39° 16' 28.013 N	35.63.35	14,262,928.99	5.09	3.881	5.078,1	19.90	13.50	0.888,1
	39° 16' 28.080 N	1,780,265.94	14,262,935.80	1,89 9,89	143.2	7.668,1	20.80	13.90	0.819,1
	39° 16' 28.150 N	1,780,268.62	78.249,262,41	6.89	0.031	8,826,1	20.80	14.20	1,945.0
	39° 16' 28.222 N	1,780,271.56	14,262,950.19	5.17	4.481	8,726,1	20.80	15.00	1,975.0
7 700 TUTAN MINITIPA	39° 16' 28.297 N	1,780,274.85	14,262,957.78	0.4√	172.0	8.886,1	22.90	15.50	2,005.0
	39° 16' 28.373 N	24.87S,087,1	76,265,965.57	1.87	8.671	2,015.6	23.90	16.50	2,035.0
	39° 16' 28.450 N	76.182,087,1	76.879,362,41	7.18	9,781	2,044.4	25.30	07.81	2,065.0
	39°16'28.528 N	1,780,285.36	14,262,981.26	1.28	6.261	1.670,2 2,101,9	23.60	08.91	2,095.0
	39° 16' 28.607 N	97.88S,087,1	82.689,282,41	6.88	203.5	2,130.6	23.30 23.30	08.81	2,125.0
N 919'02'06'80	39°16'28.688 N	81.292,087,1	14,262,997.43	9.19	7.112	2,159.2	21.90	00.71	2,155.0
V 678.02 '08 °08	39° 16' 28.770 N	1,780,295.53	14,263,005.72	2.26	220.0	6,781,S	22.00	02.71	2,185.0
	39° 16' 28.853 N	1,780,299.06	91,263,014.19	8.86	228.4	2,216.4	23.30	01.81	2,245.0
	39° 16' 28,936 N	1,780,302.65	14,263,022.60	102.4	8.86.8	2,245.0	22.90	04.71	2,275.0
	39° 16' 29.016 N	1,780,305.86	14,263,030.70	9.201	244.9	7.273,7	20.30	04.81	2,305.0
	39° 16' 29.093 N	1,780,308.62	14,263,038.53	108.3	8,282	2,302.5	18.50	07.81	0.355.0
	39° 16' 29,168	1,780,311.28	14,263,046.06	0.111	260.3	2,155,5	20.40	15,20	2,365.0
41777 77477 777	39° 16' 29.239 N	12.416,087,1	14,263,053.27	9.511	267.5	2,360.4	23.90	14.90	2,395.0
11242 21302031	39° 16' 29.370 /	77.03E,087,1	14,263,060.14	1.711	274.4	₽.988,Z	26.50	14.40	2,425.0
	39°16'29.430 /	1,780,323.87	27.270,582,41	120.5	8.085	2,418.6	28.10	13.60	2,455.0
	39° 16' 29,489 /	1,780,326.53	14,263,078.64	126.2	292.9	2,447.8	25.50	12.90	2,485.0
******	39° 16' 29.544 N	88.828,087,1	14,263,084.19	128.4	4.892	2,506,5	22.90	12.10	2,515.0
	39° 16' 29.594 N	45.055,087,1	ZE.680,E82,41	130.0	3.505	2,536.0	01.81	08.01	2,545.0
V 701.20, 20, 20, 107 V	39° 16' 29.642 N	17.166,087,1	51,263,094,13	4.181	₽.808	2,565.5	15.00	9.90	2,575.0
	39° 16' 29.685 N	38.288,087,1	14,263,098.55	132.6	8.212.8	2,595.2	14.00	02.8	2,605.0
V 80° 30' 20.079 V	39° 16' 29,725 N	1,780,333.83	14,263,102.56	133.5	8.816	9.429,S	13,40	09.7	2,635.0
	39° 16' 29.763 N	39.458,087,1	14,263,106.44	134.4	7.028	2,654.6	10.50	09.7	0,695,0
1 80° 30' 20.060 V	39° 16' 29.803 N	1,780,335.27	14,263,110.48	135.0	7.458	P.489, Z	06.9	01.8	2,725.0
	39° 16' 29.844 N	1,780,335.59	14,263,114.62	135.3	8.828	1.417,5	2,10	08.7	2,755.0
	39° 16' 29.885 N	1,780,335.55	14,263,118.74	135.3	0.888	8.547,5	356.80	00.8	2,785.0

Survey Report - Geographic



Company: Project: HG Energy, LLC

Harrison County, West Virginia

Site: Well: W.B. Carpenter #237 W.B. Carpenter #237

Wellbore: Design: Wellbore #1
Wellbore #1

Local Co-ordinate Reference:

TVD Reference:
MD Reference:
North Reference:

Survey Calculation Method:

Database:

Well W.B. Carpenter #237

WELL @ 1393.0usft (Decker #6)

WELL @ 1393.0usft (Decker #6)

Grid

Minimum Curvature

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
2,845.0	8.30	1.50	2,803.2	341.5	134.9	14,263,127.30	1,780,335.15	39° 16′ 29.969 N	80° 30' 20.061 W
2,875.0	8.30	10.70	2,832.9	345.8	135.3	14,263,131.59	1,780,335.60	39° 16' 30.012 N	80° 30' 20.055 V
2,905.0		11.60	2,862.5	350.1	136.2	14,263,135.89	1,780,336.45	39° 16' 30.054 N	80° 30' 20.044 V
2,935.0	8.70	6.70	2,892.2	354.5	136.9	14,263,140.32	1,780,337.16	39° 16' 30.098 N	80° 30' 20.034 V
2,965.0	8.10	2.90	2,921.9	358.9	137.2	14,263,144.68	1,780,337.53	39° 16' 30.141 N	80° 30' 20.029 V
2,995.0	7.50	359.10	2,951.6	363.0	137.3	14,263,148.75	1,780,337.61	39° 16' 30.181 N	80° 30' 20.028 V
3,025.0		354.20	2,981.4	366.7	137.1	14,263,152.50	1,780,337.40	39° 16' 30.219 N	80° 30' 20.030 V
3,055.0	6.30	348.10	3,011.2	370.1	136.6	14,263,155.91	1,780,336.88	39° 16' 30.252 N	80° 30' 20.037 V
3,085.0	5.70	341.50	3,041.0	373.2	135.8	14,263,158.93	1,780,336.06	39° 16' 30.282 N	80° 30' 20.047 V
3,115.0		333.20	3,070.9	375.8	134.7	14,263,161.60	1,780,334.95	39° 16' 30.309 N	80° 30' 20.061 V
3,145.0	4.90	335.30	3,100.7	378.3	133.5	14,263,164.03	1,780,333.78	39° 16′ 30.333 N	80° 30' 20.076 V
3,175.0	4.70	338.70	3,130.6	380.6	132.5	14,263,166.34	1,780,332.80	39° 16′ 30.356 N	80° 30' 20.088 V
3,205.0	4.30	335.70	3,160.5	382.7	131.6	14,263,168.51	1,780,331.89	39° 16' 30.377 N	80° 30' 20.099 V
3,235.0	3.80	332.30	3,190.5	384.6	130.7	14,263,170.41	1,780,330.97	39° 16' 30.396 N	80° 30' 20.111 W
3,291.0	3.80	332.30	3,246.3	387.9	129.0	14,263,173.70	1,780,329.24	39° 16' 30.428 N	80° 30' 20.133 V

Design Annota	ations				
	Measured	Vertical	Local Cool	rdinates	
	Depth (usft)	Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
	3,291.0	3,246.3	387.9	129.0	TD @ 3291' MD / 3246' TVD

Checked By:	Approved By:	Da	ate:

W.B. Carpenter #237 Harrison County, West Virginia Q130959 & AM-13862 Design #1 Company Name: HG Energy, LLC W.B. Carpenter #237 Harrison County, West Virginia Rig: Decker #6 Created By: James Dawson Date: 11/06/2013

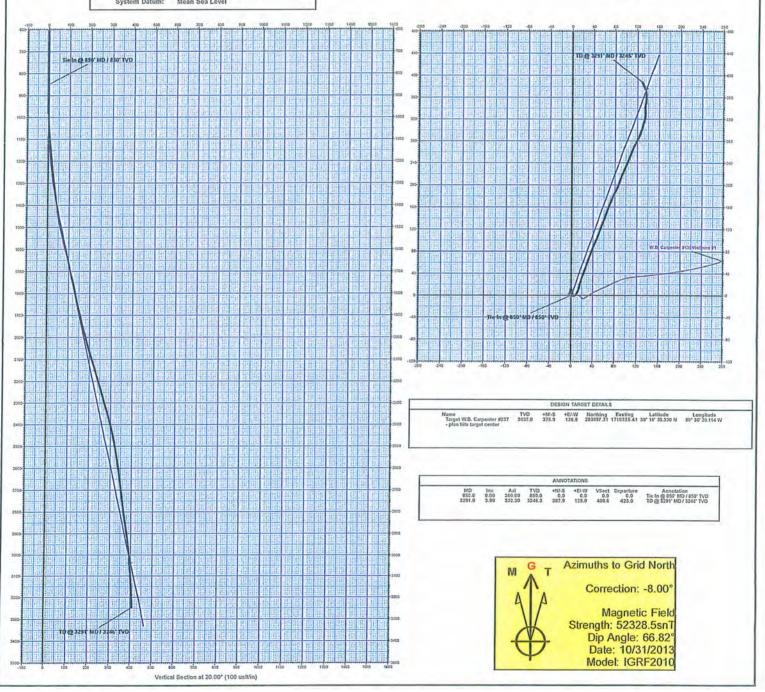


	WE	ELL DETAILS:	W.B. Ca	rpenter #237	
+N/-S 0,0	+EI-W 0.0	Ground Le Northing 283521.43	Easting	385.0 Latitude 33* 16* 26.600 N	Longitude 80° 30° 21.800 W

PROJECT DETAILS: Harrison County, West Virginia

Geodetic System: US State Plane 1927 (Exact solution)
NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1886
Zone: West Virginia North 4701
System Datum: Mean Sea Level

HG Energy



PRODUCERS SERVICE CORP.		
	-	
		
Notes	Amount	Units
	1	EA
		EA
2 Units @ 70 Wiles		MI
		GAL GAL
		HR
	20	GAL
	10	GAL
		LB
		LB
		LB LB
		LB
	15	GAL
	15	GAL
	100	CWT
	1	STAGE
	 	
	Senvice Corp.	Notes Amount 1 2 Units @ 70 Miles 0 300 0.5 2 20 10 250 50 50 1 222

Customer Approval:			