

87-04769

HG Energy, LLC
Roane County, West Virginia
E. Smith #212
E. Smith #212

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

18 August, 2015

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Oil and Gas
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West Virginia Department of
Environmental Protection
10/23/2015

87.04769

HP
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well E. Smith #212
Project:	Roane County, West Virginia	TVD Reference:	WELL @ 1156.0usft (Decker #9)
Site:	E. Smith #212	MD Reference:	WELL @ 1156.0usft (Decker #9)
Well:	E. Smith #212	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Project	Roane 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	E. Smith #212				
Site Position:		Northing:	14,056,031.31 usft	Latitude:	38° 42' 24.700 N
From:	Lat/Long	Easting:	1,558,166.16 usft	Longitude:	81° 17' 18.000 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.18 °

Well	E. Smith #212					
Well Position	+N/-S	0.0 usft	Northing:	14,056,031.31 usft	Latitude:	38° 42' 24.700 N
	+E/-W	0.0 usft	Easting:	1,558,166.16 usft	Longitude:	81° 17' 18.000 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	1,148.0 usft

Wellbore	Wellbore #1				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/22/2015	-7.99	66.34	51,905

Design	Wellbore #1				
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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	23.10

Survey Program	Date	From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
	8/18/2015	500.0	2,572.0	DDC MWD (Wellbore #1)	MWD default	MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	14,056,031.31	1,558,166.16	38° 42' 24.700 N	81° 17' 18.000 W
500.0	0.00	0.00	500.0	0.0	0.0	14,056,031.31	1,558,166.16	38° 42' 24.700 N	81° 17' 18.000 W
First Survey @ 500' MD / 500' TVD									
588.0	0.62	113.68	588.0	-0.2	0.4	14,056,031.12	1,558,166.60	38° 42' 24.698 N	81° 17' 17.994 W
618.0	0.62	123.69	618.0	-0.3	0.7	14,056,030.97	1,558,166.88	38° 42' 24.697 N	81° 17' 17.991 W
648.0	0.80	91.08	648.0	-0.4	1.1	14,056,030.87	1,558,167.23	38° 42' 24.696 N	81° 17' 17.987 W
678.0	1.68	40.49	678.0	-0.1	1.6	14,056,031.20	1,558,167.72	38° 42' 24.699 N	81° 17' 17.980 W
708.0	3.49	25.59	708.0	1.0	2.2	14,056,032.36	1,558,168.40	38° 42' 24.710 N	81° 17' 17.972 W
738.0	5.39	22.38	737.9	3.2	3.2	14,056,034.49	1,558,169.33	38° 42' 24.731 N	81° 17' 17.960 W
768.0	7.69	19.69	767.7	6.4	4.4	14,056,037.68	1,558,170.55	38° 42' 24.763 N	81° 17' 17.945 W
798.0	9.50	20.00	797.3	10.6	5.9	14,056,041.90	1,558,172.07	38° 42' 24.805 N	81° 17' 17.926 W
828.0	10.91	18.10	826.9	15.6	7.6	14,056,046.92	1,558,173.80	38° 42' 24.855 N	81° 17' 17.904 W

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Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well E. Smith #212
Project:	Roane County, West Virginia	TVD Reference:	WELL @ 1156.0usft (Decker #9)
Site:	E. Smith #212	MD Reference:	WELL @ 1156.0usft (Decker #9)
Well:	E. Smith #212	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
858.0	12.51	16.38	856.2	21.4	9.4	14,056,052.74	1,558,175.60	38° 42' 24.912 N	81° 17' 17.882 W
888.0	14.01	16.21	885.4	28.0	11.4	14,056,059.34	1,558,177.53	38° 42' 24.978 N	81° 17' 17.858 W
918.0	15.38	14.71	914.4	35.4	13.4	14,056,066.68	1,558,179.55	38° 42' 25.050 N	81° 17' 17.832 W
948.0	16.70	13.87	943.3	43.4	15.4	14,056,074.71	1,558,181.59	38° 42' 25.130 N	81° 17' 17.807 W
978.0	17.19	15.28	972.0	51.9	17.6	14,056,083.17	1,558,183.80	38° 42' 25.213 N	81° 17' 17.780 W
1,008.0	17.72	16.69	1,000.6	60.5	20.1	14,056,091.82	1,558,186.28	38° 42' 25.299 N	81° 17' 17.749 W
1,038.0	17.72	20.39	1,029.2	69.2	23.0	14,056,100.47	1,558,189.18	38° 42' 25.385 N	81° 17' 17.712 W
1,068.0	18.12	22.68	1,057.7	77.7	26.4	14,056,109.06	1,558,192.57	38° 42' 25.470 N	81° 17' 17.670 W
1,098.0	18.60	24.89	1,086.2	86.4	30.2	14,056,117.70	1,558,196.38	38° 42' 25.555 N	81° 17' 17.622 W
1,128.0	19.71	24.01	1,114.5	95.4	34.3	14,056,126.66	1,558,200.45	38° 42' 25.644 N	81° 17' 17.571 W
1,158.0	20.42	22.60	1,142.7	104.8	38.4	14,056,136.12	1,558,204.52	38° 42' 25.738 N	81° 17' 17.520 W
1,188.0	20.81	22.60	1,170.8	114.6	42.4	14,056,145.87	1,558,208.58	38° 42' 25.834 N	81° 17' 17.469 W
1,218.0	21.30	22.90	1,198.8	124.5	46.6	14,056,155.81	1,558,212.75	38° 42' 25.933 N	81° 17' 17.417 W
1,248.0	21.79	23.70	1,226.7	134.6	50.9	14,056,165.93	1,558,217.11	38° 42' 26.033 N	81° 17' 17.362 W
1,278.0	22.40	24.71	1,254.5	144.9	55.6	14,056,176.22	1,558,221.73	38° 42' 26.135 N	81° 17' 17.304 W
1,308.0	23.11	24.89	1,282.1	155.4	60.4	14,056,186.75	1,558,226.60	38° 42' 26.239 N	81° 17' 17.243 W
1,338.0	23.42	25.28	1,309.7	166.2	65.5	14,056,197.48	1,558,231.63	38° 42' 26.345 N	81° 17' 17.180 W
1,368.0	24.08	24.27	1,337.2	177.1	70.5	14,056,208.45	1,558,236.69	38° 42' 26.454 N	81° 17' 17.117 W
1,398.0	24.61	24.40	1,364.5	188.4	75.6	14,056,219.72	1,558,241.78	38° 42' 26.565 N	81° 17' 17.053 W
1,428.0	25.59	24.01	1,391.7	200.0	80.8	14,056,231.33	1,558,247.00	38° 42' 26.680 N	81° 17' 16.988 W
1,458.0	26.20	24.09	1,418.7	212.0	86.2	14,056,243.29	1,558,252.34	38° 42' 26.799 N	81° 17' 16.921 W
1,488.0	27.00	23.39	1,445.5	224.3	91.6	14,056,255.59	1,558,257.75	38° 42' 26.921 N	81° 17' 16.853 W
1,518.0	28.19	23.17	1,472.1	237.0	97.1	14,056,268.35	1,558,263.24	38° 42' 27.047 N	81° 17' 16.784 W
1,548.0	29.12	24.09	1,498.4	250.2	102.8	14,056,281.53	1,558,269.01	38° 42' 27.177 N	81° 17' 16.712 W
1,578.0	30.18	24.49	1,524.5	263.7	108.9	14,056,295.06	1,558,275.11	38° 42' 27.311 N	81° 17' 16.636 W
1,608.0	31.42	24.89	1,550.2	277.7	115.4	14,056,309.02	1,558,281.53	38° 42' 27.450 N	81° 17' 16.555 W
1,638.0	32.08	25.11	1,575.7	292.0	122.0	14,056,323.32	1,558,288.20	38° 42' 27.591 N	81° 17' 16.471 W
1,668.0	33.32	25.90	1,601.0	306.6	129.0	14,056,337.95	1,558,295.18	38° 42' 27.736 N	81° 17' 16.384 W
1,698.0	34.20	25.68	1,625.9	321.6	136.3	14,056,352.96	1,558,302.43	38° 42' 27.885 N	81° 17' 16.293 W
1,728.0	35.00	24.98	1,650.6	337.0	143.6	14,056,368.36	1,558,309.72	38° 42' 28.037 N	81° 17' 16.202 W
1,758.0	35.00	23.87	1,675.2	352.7	150.7	14,056,384.02	1,558,316.84	38° 42' 28.192 N	81° 17' 16.113 W
1,788.0	34.51	23.79	1,699.8	368.4	157.6	14,056,399.67	1,558,323.75	38° 42' 28.347 N	81° 17' 16.026 W
1,818.0	34.60	23.17	1,724.6	384.0	164.4	14,056,415.28	1,558,330.53	38° 42' 28.502 N	81° 17' 15.941 W
1,848.0	34.29	22.77	1,749.3	399.6	171.0	14,056,430.90	1,558,337.15	38° 42' 28.657 N	81° 17' 15.858 W
1,878.0	34.29	22.77	1,774.1	415.2	177.5	14,056,446.48	1,558,343.69	38° 42' 28.811 N	81° 17' 15.776 W
1,908.0	34.60	23.17	1,798.8	430.8	184.1	14,056,462.11	1,558,350.31	38° 42' 28.966 N	81° 17' 15.693 W
1,938.0	34.69	22.77	1,823.5	446.5	190.8	14,056,477.81	1,558,356.97	38° 42' 29.121 N	81° 17' 15.610 W
1,968.0	33.98	22.11	1,848.3	462.1	197.3	14,056,493.45	1,558,363.43	38° 42' 29.276 N	81° 17' 15.529 W
1,998.0	34.11	21.89	1,873.1	477.7	203.6	14,056,509.02	1,558,369.72	38° 42' 29.430 N	81° 17' 15.450 W
2,028.0	33.10	21.98	1,898.1	493.1	209.8	14,056,524.42	1,558,375.92	38° 42' 29.583 N	81° 17' 15.372 W
2,058.0	32.30	21.27	1,923.4	508.2	215.7	14,056,539.49	1,558,381.89	38° 42' 29.732 N	81° 17' 15.298 W
2,088.0	31.99	22.20	1,948.8	523.0	221.6	14,056,554.31	1,558,387.80	38° 42' 29.879 N	81° 17' 15.224 W
2,118.0	32.08	21.58	1,974.2	537.8	227.6	14,056,569.08	1,558,393.74	38° 42' 30.025 N	81° 17' 15.149 W
2,148.0	31.60	22.51	1,999.7	552.4	233.5	14,056,583.75	1,558,399.68	38° 42' 30.170 N	81° 17' 15.075 W
2,178.0	30.80	22.68	2,025.3	566.8	239.5	14,056,598.10	1,558,405.65	38° 42' 30.312 N	81° 17' 15.000 W
2,208.0	30.40	22.11	2,051.2	580.9	245.3	14,056,612.22	1,558,411.46	38° 42' 30.452 N	81° 17' 14.927 W
2,238.0	30.31	21.49	2,077.1	595.0	250.9	14,056,626.29	1,558,417.10	38° 42' 30.591 N	81° 17' 14.857 W
2,268.0	30.71	21.98	2,102.9	609.1	256.6	14,056,640.44	1,558,422.74	38° 42' 30.731 N	81° 17' 14.786 W
2,298.0	31.29	23.30	2,128.6	623.4	262.5	14,056,654.70	1,558,428.68	38° 42' 30.872 N	81° 17' 14.712 W
2,328.0	31.82	23.79	2,154.2	637.8	268.8	14,056,669.09	1,558,434.96	38° 42' 31.015 N	81° 17' 14.633 W
2,358.0	32.79	24.58	2,179.5	652.4	275.4	14,056,683.71	1,558,441.53	38° 42' 31.160 N	81° 17' 14.551 W
2,388.0	32.61	24.40	2,204.8	667.2	282.1	14,056,698.46	1,558,448.24	38° 42' 31.306 N	81° 17' 14.467 W
2,418.0	31.02	23.17	2,230.3	681.6	288.5	14,056,712.93	1,558,454.63	38° 42' 31.449 N	81° 17' 14.387 W
2,448.0	29.70	22.51	2,256.2	695.6	294.3	14,056,726.91	1,558,460.51	38° 42' 31.587 N	81° 17' 14.313 W
2,478.0	27.88	21.67	2,282.4	709.0	299.8	14,056,740.29	1,558,465.95	38° 42' 31.720 N	81° 17' 14.245 W

87.04769

HP
Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well E. Smith #212
Project:	Roane County, West Virginia	TVD Reference:	WELL @ 1156.0usft (Decker #9)
Site:	E. Smith #212	MD Reference:	WELL @ 1156.0usft (Decker #9)
Well:	E. Smith #212	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,508.0	25.81	20.30	2,309.2	721.6	304.6	14,056,752.94	1,558,470.80	38° 42' 31.845 N	81° 17' 14.184 W
2,572.0	25.81	20.30	2,366.8	747.8	314.3	14,056,779.07	1,558,480.47	38° 42' 32.104 N	81° 17' 14.063 W
TD @ 2572' MD / 2367' TVD									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.0	500.0	0.0	0.0	First Survey @ 500' MD / 500' TVD
2,572.0	2,366.8	747.8	314.3	TD @ 2572' MD / 2367' TVD

Checked By: _____ Approved By: _____ Date: _____

87-04769

HG Energy, LLC

Roane County, West Virginia

E. Smith #212

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Wellbore #1

Design: Wellbore #1

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		Grid Convergence:	-0.18 °

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	+E/-W	0.0 usft	Easting:	1,558,166.16 usft	Longitude:	81° 17' 18.000 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	1,148.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/22/2015	-7.99	66.34	51,905

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	23.10	

Survey Program	Date 8/18/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
500.0	2,572.0	DDC MWD (Wellbore #1)	MWD default	MWD - Standard

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Well: E. Smith #212	North Reference: Grid
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Wellbore #1	Database: Compass

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.0	0.00	
First Survey @ 500' MD / 500' TVD										
588.0	0.62	113.68	588.0	-0.2	0.4	0.0	0.70	0.5	113.68	
618.0	0.62	123.69	618.0	-0.3	0.7	0.0	0.36	0.8	115.70	
648.0	0.80	91.08	648.0	-0.4	1.1	0.0	1.45	1.2	112.48	
678.0	1.68	40.49	678.0	-0.1	1.6	0.5	4.42	1.6	94.03	
708.0	3.49	25.59	708.0	1.0	2.2	1.8	6.39	2.5	64.91	
738.0	5.39	22.38	737.9	3.2	3.2	4.2	6.38	4.5	44.96	
768.0	7.69	19.69	767.7	6.4	4.4	7.6	7.73	7.7	34.54	
798.0	9.50	20.00	797.3	10.6	5.9	12.1	6.04	12.1	29.16	
828.0	10.91	18.10	826.9	15.6	7.6	17.4	4.83	17.4	26.06	
858.0	12.51	16.38	856.2	21.4	9.4	23.4	5.46	23.4	23.76	
888.0	14.01	16.21	885.4	28.0	11.4	30.2	5.00	30.2	22.07	
918.0	15.38	14.71	914.4	35.4	13.4	37.8	4.74	37.8	20.73	
948.0	16.70	13.87	943.3	43.4	15.4	46.0	4.47	46.1	19.57	
978.0	17.19	15.28	972.0	51.9	17.6	54.6	2.13	54.8	18.78	
1,008.0	17.72	16.69	1,000.6	60.5	20.1	63.5	2.26	63.8	18.39	
1,038.0	17.72	20.39	1,029.2	69.2	23.0	72.6	3.75	72.9	18.41	
1,068.0	18.12	22.68	1,057.7	77.7	26.4	81.9	2.70	82.1	18.76	
1,098.0	18.60	24.89	1,086.2	86.4	30.2	91.3	2.82	91.5	19.28	
1,128.0	19.71	24.01	1,114.5	95.4	34.3	101.2	3.82	101.3	19.78	
1,158.0	20.42	22.60	1,142.7	104.8	38.4	111.5	2.86	111.6	20.10	
1,188.0	20.81	22.60	1,170.8	114.6	42.4	122.0	1.30	122.2	20.32	
1,218.0	21.30	22.90	1,198.8	124.5	46.6	132.8	1.67	132.9	20.52	
1,248.0	21.79	23.70	1,226.7	134.6	50.9	143.8	1.90	143.9	20.73	
1,278.0	22.40	24.71	1,254.5	144.9	55.6	155.1	2.40	155.2	20.98	

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HP
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Project: Roane County, West Virginia
Site: E. Smith #212
Well: E. Smith #212
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well E. Smith #212
TVD Reference: WELL @ 1156.0usft (Decker #9)
MD Reference: WELL @ 1156.0usft (Decker #9)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass

69270.28

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)		TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)	
1,308.0	23.11	24.89		1,282.1	155.4	60.4	166.7	2.38	166.8	21.25	
1,338.0	23.42	25.28		1,309.7	166.2	65.5	178.5	1.15	178.6	21.50	
1,368.0	24.08	24.27		1,337.2	177.1	70.5	190.6	2.58	190.7	21.71	
1,398.0	24.61	24.40		1,364.5	188.4	75.6	203.0	1.78	203.0	21.87	
1,428.0	25.59	24.01		1,391.7	200.0	80.8	215.7	3.31	215.7	22.01	
1,458.0	26.20	24.09		1,418.7	212.0	86.2	228.8	2.04	228.8	22.12	
1,488.0	27.00	23.39		1,445.5	224.3	91.6	242.2	2.86	242.3	22.21	
1,518.0	28.19	23.17		1,472.1	237.0	97.1	256.1	3.98	256.1	22.27	
1,548.0	29.12	24.09		1,498.4	250.2	102.8	270.5	3.43	270.5	22.34	
1,578.0	30.18	24.49		1,524.5	263.7	108.9	285.3	3.59	285.4	22.44	
1,608.0	31.42	24.89		1,550.2	277.7	115.4	300.7	4.19	300.7	22.56	
1,638.0	32.08	25.11		1,575.7	292.0	122.0	316.5	2.23	316.5	22.68	
1,668.0	33.32	25.90		1,601.0	306.6	129.0	332.7	4.37	332.7	22.82	
1,698.0	34.20	25.68		1,625.9	321.6	136.3	349.3	2.96	349.3	22.96	
1,728.0	35.00	24.98		1,650.6	337.0	143.6	366.3	2.98	366.3	23.07	
1,758.0	35.00	23.87		1,675.2	352.7	150.7	383.5	2.12	383.5	23.13	
1,788.0	34.51	23.79		1,699.8	368.4	157.6	400.6	1.64	400.6	23.16	
1,818.0	34.60	23.17		1,724.6	384.0	164.4	417.7	1.21	417.7	23.17	
1,848.0	34.29	22.77		1,749.3	399.6	171.0	434.6	1.28	434.6	23.17	
1,878.0	34.29	22.77		1,774.1	415.2	177.5	451.5	0.00	451.5	23.15	
1,908.0	34.60	23.17		1,798.8	430.8	184.1	468.5	1.28	468.5	23.14	
1,938.0	34.69	22.77		1,823.5	446.5	190.8	485.6	0.82	485.6	23.14	
1,968.0	33.98	22.11		1,848.3	462.1	197.3	502.5	2.67	502.5	23.12	
1,998.0	34.11	21.89		1,873.1	477.7	203.6	519.3	0.60	519.3	23.08	
2,028.0	33.10	21.98		1,898.1	493.1	209.8	535.9	3.37	535.9	23.04	
2,058.0	32.30	21.27		1,923.4	508.2	215.7	552.1	2.96	552.1	23.00	
2,088.0	31.99	22.20		1,948.8	523.0	221.6	568.0	1.95	568.0	22.97	

HP
HG Energy EOW Report



87-04769

Company: HG Energy, LLC
Project: Roane County, West Virginia
Site: E. Smith #212
Well: E. Smith #212
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well E. Smith #212
TVD Reference: WELL @ 1156.0usft (Decker #9)
MD Reference: WELL @ 1156.0usft (Decker #9)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
2,118.0	32.08	21.58	1,974.2	537.8	227.6	583.9	1.14	583.9	22.94
2,148.0	31.60	22.51	1,999.7	552.4	233.5	599.8	2.29	599.8	22.91
2,178.0	30.80	22.68	2,025.3	566.8	239.5	615.3	2.68	615.3	22.91
2,208.0	30.40	22.11	2,051.2	580.9	245.3	630.6	1.65	630.6	22.89
2,238.0	30.31	21.49	2,077.1	595.0	250.9	645.7	1.09	645.7	22.87
2,268.0	30.71	21.98	2,102.9	609.1	256.6	661.0	1.57	661.0	22.84
2,298.0	31.29	23.30	2,128.6	623.4	262.5	676.4	2.98	676.4	22.84
2,328.0	31.82	23.79	2,154.2	637.8	268.8	692.1	1.96	692.1	22.85
2,358.0	32.79	24.58	2,179.5	652.4	275.4	708.1	3.53	708.1	22.88
2,388.0	32.61	24.40	2,204.8	667.2	282.1	724.3	0.68	724.3	22.92
2,418.0	31.02	23.17	2,230.3	681.6	288.5	740.1	5.72	740.1	22.94
2,448.0	29.70	22.51	2,256.2	695.6	294.3	755.3	4.54	755.3	22.94
2,478.0	27.88	21.67	2,282.4	709.0	299.8	769.8	6.21	769.8	22.92
2,508.0	25.81	20.30	2,309.2	721.6	304.6	783.3	7.20	783.3	22.89
2,572.0	25.81	20.30	2,366.8	747.8	314.3	811.1	0.00	811.1	22.80

TD @ 2572' MD / 2367' TVD

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.0	500.0	0.0	0.0	First Survey @ 500' MD / 500' TVD
2,572.0	2,366.8	747.8	314.3	TD @ 2572' MD / 2367' TVD

Checked By: _____ Approved By: _____ Date: _____

ENVIRONMENTAL PROTECTION
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87.04769

Company Name: HG Energy, LLC
 E. Smith #212
 Roane County, West Virginia
 Rig: Decker #9
 Created By: Shane Robbins
 Date: 8/18/2015

E. Smith #212
 Roane County, West Virginia
 Q150620 & AM-150535
 Design #1



The DIRECTIONAL DRILLING COMPANY

PROJECT DETAILS:	
Geodetic System:	Roane County, West Virginia
Datum:	Universal Transverse Mercator
Ellipsoid:	NAD83 West Virginia - HARN
Zone:	GRS 1980
System Origin:	Zone 17N (84 W to 75 W) Mean Sea Level

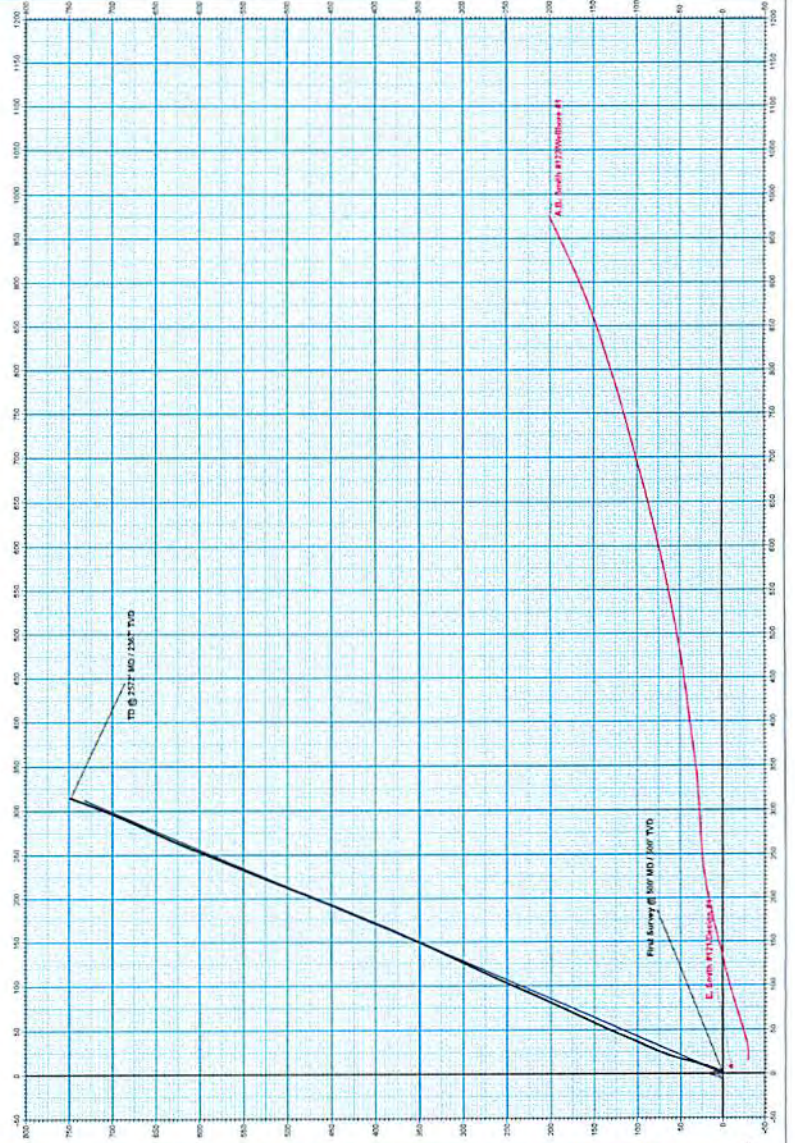
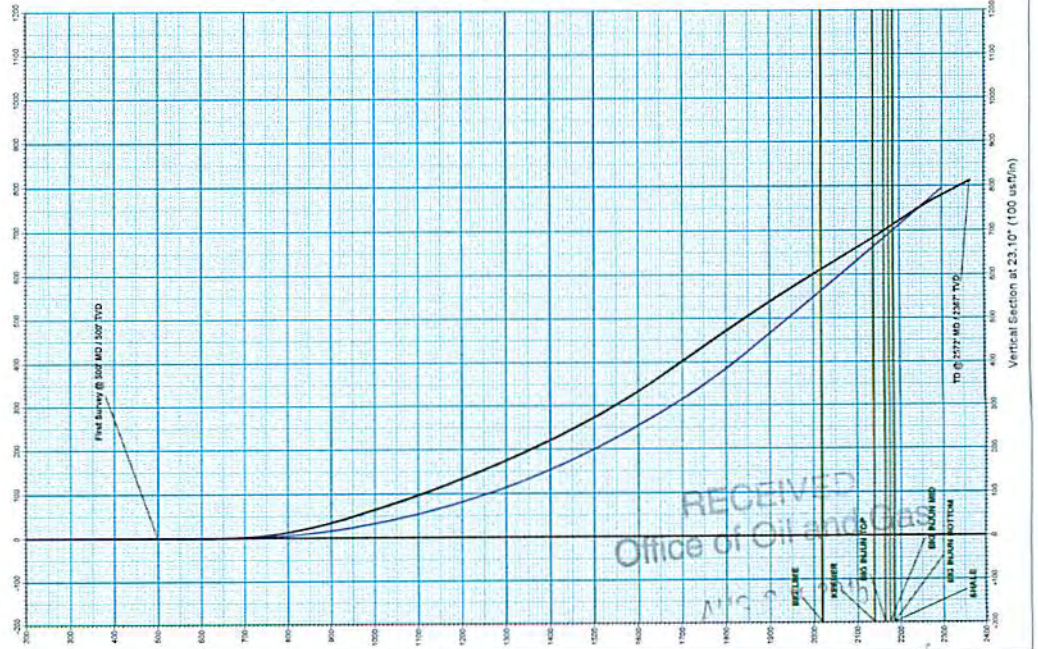
DESIGN TARGET DETAILS	
Name:	E. Smith #212
Target E. Smith #212	2175.0
Northing	636.3
Easting	271.4165666737
Longitude	81° 17' 14.650 W
Latitude	39° 42' 31.000 N
*Join this target center	

ANNOTATIONS								
MD	AS	TVD	*NLS	*EHW	Vertical Dependent Annotations			
800.0	0.00	800.0	0.0	0.0	First Survey @ 500' MD / 500' TVD			
2872.0	25.81	2539.2	2366.8	747.8	811.1	813.1	813.1	TD @ 2572' MD / 2357' TVD

WELL DETAILS:	
Well Name:	E. Smith #212
Ground Level:	1148.0
Northing:	1425231.31
Easting:	1653164.16
Longitude:	81° 17' 18.650 W
Latitude:	39° 42' 24.700 N

Azimuths to Grid North
 Correction: -7.81°
 Magnetic Field
 Strength: 51904.7snT
 Dip Angle: 66.34°
 Date: 7/22/2015
 Model: IGRF2015

HG Energy



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 Environmental Protection

10/23/2015