

HG Energy, LLC

Lincoln County, West Virginia

CC Griffith #123

CC Griffith #123

Wellbore #1

Design: Wellbore #1

HG Energy EOW Report

27 October, 2014



43-23467

HG Energy EOW Report



43-03467

Company: HG Energy, LLC	Local Co-ordinate Reference: Well CC Griffith #123
Project: Lincoln County, West Virginia	TVD Reference: Well @ 934.0usft (Decker #9)
Site: CC Griffith #123	MD Reference: Well @ 934.0usft (Decker #9)
Well: CC Griffith #123	North Reference: Grid
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Wellbore #1	Database: EDM Compass

Project	Lincoln 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	CC Griffith #123		
Site Position:		Northing:	13,881,477.94 usft
From:	Lat/Long	Easting:	1,365,655.12 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	38° 13' 25.800 N
		Longitude:	81° 57' 24.400 W
		Grid Convergence:	-0.59 °

Well	CC Griffith #123		
Well Position	+N/-S	0.0 usft	Northing: 13,881,477.93 usft
	+E/-W	0.0 usft	Easting: 1,365,655.12 usft
Position Uncertainty		0.0 usft	Wellhead Elevation: 0.0 usft
			Latitude: 38° 13' 25.800 N
			Longitude: 81° 57' 24.400 W
			Ground Level: 926.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/2/2014	-7.44	66.08	51,833

Design	Wellbore #1			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	
		Tie On Depth:		
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	121.25

Survey Program	Date	10/13/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
597.0	2,725.0	MWD (Wellbore #1)	MWD default	MWD - Standard

HG Energy EOW Report



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Well: CC Griffith #123	North Reference: Grid
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Wellbore #1	Database: EDM Compass

Survey											
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		
597.0	0.00	0.00	597.0	0.0	0.0	0.0	0.00	0.0	0.00		
FIRST SURVEY @ 597' MD / 597' TVD											
627.0	1.10	97.50	627.0	0.0	0.3	0.3	3.67	0.3	97.50		
657.0	1.10	81.80	657.0	0.0	0.9	0.7	1.00	0.9	92.28		
687.0	1.30	101.50	687.0	-0.1	1.5	1.3	1.52	1.5	92.36		
717.0	2.30	120.50	717.0	-0.4	2.3	2.2	3.84	2.4	100.57		
747.0	3.70	129.90	746.9	-1.4	3.6	3.8	4.93	3.8	110.77		
777.0	5.30	130.10	776.8	-2.9	5.4	6.1	5.33	6.1	118.07		
807.0	6.60	129.90	806.7	-4.9	7.8	9.2	4.33	9.2	122.08		
837.0	7.90	125.70	836.4	-7.2	10.8	12.9	4.68	12.9	123.70		
867.0	8.90	123.40	866.1	-9.7	14.4	17.3	3.52	17.3	123.89		
897.0	9.10	121.40	895.7	-12.2	18.3	22.0	1.24	22.0	123.57		
927.0	10.00	119.80	925.3	-14.7	22.6	27.0	3.13	27.0	123.02		
957.0	11.10	118.60	954.8	-17.4	27.4	32.5	3.74	32.5	122.37		
987.0	11.90	116.60	984.2	-20.2	32.7	38.4	2.98	38.4	121.62		
1,017.0	13.20	119.60	1,013.5	-23.2	38.5	44.9	4.85	44.9	121.12		
1,047.0	14.30	116.50	1,042.6	-26.6	44.8	52.1	4.41	52.1	120.69		
1,077.0	15.60	116.10	1,071.6	-30.0	51.7	59.8	4.35	59.8	120.12		
1,107.0	16.50	117.30	1,100.5	-33.7	59.1	68.0	3.20	68.1	119.71		
1,137.0	17.20	118.00	1,129.2	-37.8	66.8	76.7	2.43	76.7	119.48		
1,167.0	17.40	119.50	1,157.8	-42.1	74.6	85.6	1.63	85.7	119.40		
1,197.0	17.20	120.90	1,186.5	-46.5	82.3	94.5	1.54	94.6	119.48		
1,227.0	17.10	122.80	1,215.1	-51.2	89.9	103.4	1.90	103.4	119.68		
1,257.0	17.70	125.40	1,243.7	-56.2	97.3	112.3	3.27	112.4	120.03		
1,287.0	18.60	127.50	1,272.3	-61.8	104.8	121.7	3.71	121.7	120.53		
1,317.0	19.80	128.30	1,300.6	-67.9	112.6	131.4	4.09	131.5	121.08		

#3.03467

HG Energy EOW Report



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 Well: CC Griffith #123
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well CC Griffith #123
 TVD Reference: Well @ 934.0usft (Decker #9)
 MD Reference: Well @ 934.0usft (Decker #9)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM Compass

43.03467

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
1,347.0	20.90	128.40	1,328.7	-74.3	120.8	141.8	3.67	141.8	121.61
1,377.0	22.40	126.10	1,356.6	-81.0	129.6	152.8	5.74	152.8	122.02
1,407.0	23.40	125.40	1,384.2	-87.8	139.0	164.4	3.45	164.5	122.28
1,437.0	24.20	125.00	1,411.7	-94.8	148.9	176.5	2.72	176.6	122.48
1,467.0	25.00	124.70	1,439.0	-102.0	159.2	189.0	2.70	189.0	122.64
1,497.0	25.40	124.20	1,466.1	-109.2	169.7	201.7	1.51	201.8	122.75
1,527.0	25.90	122.80	1,493.1	-116.3	180.6	214.7	2.62	214.8	122.80
1,557.0	26.50	121.30	1,520.1	-123.4	191.8	228.0	2.98	228.0	122.75
1,587.0	26.30	121.30	1,546.9	-130.3	203.2	241.3	0.67	241.4	122.67
1,617.0	26.20	121.30	1,573.8	-137.2	214.5	254.6	0.33	254.6	122.60
1,647.0	26.30	121.00	1,600.7	-144.1	225.9	267.8	0.55	267.9	122.53
1,677.0	25.30	120.60	1,627.8	-150.7	237.1	280.9	3.38	281.0	122.45
1,707.0	23.70	119.10	1,655.1	-156.9	247.9	293.3	5.72	293.4	122.34
1,737.0	23.50	119.50	1,682.5	-162.8	258.3	305.3	0.85	305.4	122.22
1,767.0	23.70	122.10	1,710.0	-169.0	268.7	317.3	3.53	317.4	122.17
1,797.0	25.10	125.80	1,737.4	-175.9	278.9	329.7	6.91	329.8	122.24
1,827.0	27.50	127.50	1,764.2	-183.8	289.6	342.9	8.38	343.0	122.41
1,857.0	29.70	129.10	1,790.6	-192.7	300.9	357.2	7.76	357.3	122.65
1,887.0	30.30	129.10	1,816.6	-202.2	312.5	372.0	2.00	372.2	122.91
1,917.0	30.10	128.70	1,842.5	-211.7	324.2	387.0	0.95	387.2	123.14
1,947.0	29.80	128.60	1,868.5	-221.0	335.9	401.9	1.01	402.1	123.34
1,977.0	28.30	127.30	1,894.7	-230.0	347.4	416.3	5.42	416.6	123.51
2,007.0	27.50	126.90	1,921.2	-238.5	358.6	430.3	2.74	430.7	123.62
2,037.0	27.90	126.90	1,947.8	-246.8	369.8	444.2	1.33	444.6	123.72
2,067.0	27.80	127.30	1,974.3	-255.3	380.9	458.1	0.71	458.6	123.83
2,097.0	26.20	125.10	2,001.0	-263.3	391.9	471.7	6.29	472.2	123.90
2,127.0	24.50	124.50	2,028.2	-270.7	402.5	484.5	5.73	485.0	123.92

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 Wellbore: Wellbore #1
 Design: Wellbore #1

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 TVD Reference: Well @ 934.0usft (Decker #9)
 MD Reference: Well @ 934.0usft (Decker #9)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM Compass

43-03467

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
2,157.0	23.70	123.80	2,055.5	-277.5	412.6	496.7	2.83	497.3	123.93
2,187.0	22.70	123.60	2,083.1	-284.1	422.4	508.5	3.34	509.1	123.92
2,217.0	21.70	122.90	2,110.9	-290.3	431.9	519.9	3.45	520.4	123.91
2,247.0	20.10	121.30	2,138.9	-296.0	441.0	530.6	5.66	531.1	123.87
2,277.0	18.50	120.50	2,167.2	-301.1	449.5	540.5	5.41	541.0	123.82
2,307.0	17.80	117.90	2,195.7	-305.7	457.6	549.8	3.57	550.3	123.74
2,337.0	17.60	118.90	2,224.3	-310.0	465.7	558.9	1.21	559.4	123.65
2,367.0	18.90	119.70	2,252.8	-314.6	473.9	568.3	4.41	568.8	123.58
2,397.0	19.60	122.10	2,281.1	-319.7	482.3	578.2	3.52	578.7	123.54
2,427.0	20.20	122.90	2,309.3	-325.2	490.9	588.4	2.20	588.9	123.52
2,457.0	20.20	122.00	2,337.5	-330.7	499.7	598.8	1.04	599.2	123.50
2,487.0	18.80	120.50	2,365.8	-335.9	508.2	608.8	4.96	609.2	123.46
2,517.0	18.00	119.50	2,394.2	-340.7	516.4	618.2	2.87	618.7	123.41
2,547.0	17.10	119.00	2,422.8	-345.1	524.3	627.3	3.04	627.7	123.35
2,577.0	16.00	116.90	2,451.6	-349.1	531.9	635.8	4.17	636.2	123.28
2,607.0	14.70	117.10	2,480.5	-352.7	539.0	643.7	4.34	644.1	123.20
2,637.0	13.70	113.90	2,509.6	-355.9	545.6	651.1	4.24	651.4	123.11
2,667.0	12.70	113.30	2,538.8	-358.6	551.9	657.8	3.36	658.2	123.02
2,725.0	12.70	113.30	2,595.4	-363.7	563.6	670.5	0.00	670.7	122.83

TD @ 2725' MD / 2595' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
597.0	597.0	0.0	0.0	FIRST SURVEY @ 597' MD / 597' TVD
2,725.0	2,595.4	-363.7	563.6	TD @ 2725' MD / 2595' TVD

HG Energy EOW Report



Company: HG Energy, LLC
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Well: CC Griffith #123
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well CC Griffith #123
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MD Reference: Well @ 934.0usft (Decker #9)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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43-03467

Checked By: _____ Approved By: _____ Date: _____

43-03467

HG Energy, LLC

Lincoln County, West Virginia

CC Griffith #123

CC Griffith #123

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

27 October, 2014



12/12/2014

43-03467

Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well CC Griffith #123
Project:	Lincoln County, West Virginia	TVD Reference:	Well @ 934.0usft (Decker #9)
Site:	CC Griffith #123	MD Reference:	Well @ 934.0usft (Decker #9)
Well:	CC Griffith #123	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Project	Lincoln 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	CC Griffith #123				
Site Position:		Northing:	13,881,477.94 usft	Latitude:	38° 13' 25.800 N
From:	Lat/Long	Easting:	1,365,655.12 usft	Longitude:	81° 57' 24.400 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.59 °

Well	CC Griffith #123					
Well Position	+N/-S	0.0 usft	Northing:	13,881,477.93 usft	Latitude:	38° 13' 25.800 N
	+E/-W	0.0 usft	Easting:	1,365,655.12 usft	Longitude:	81° 57' 24.400 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	926.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/2/2014	-7.44	66.08	51,833

Design	Wellbore #1				
Audit Notes:		Phase:	ACTUAL	Tie On Depth:	
Version:	1.0				
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	121.25	

Survey Program	Date	10/13/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
597.0	2,725.0	MWD (Wellbore #1)	MWD default	MWD - Standard	

Survey										
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	13,881,477.93	1,365,655.12	38° 13' 25.800 N	81° 57' 24.400 W	
597.0	0.00	0.00	597.0	0.0	0.0	13,881,477.93	1,365,655.12	38° 13' 25.800 N	81° 57' 24.400 W	
FIRST SURVEY @ 597' MD / 597' TVD										
627.0	1.10	97.50	627.0	0.0	0.3	13,881,477.89	1,365,655.40	38° 13' 25.800 N	81° 57' 24.396 W	
657.0	1.10	81.80	657.0	0.0	0.9	13,881,477.89	1,365,655.97	38° 13' 25.800 N	81° 57' 24.389 W	
687.0	1.30	101.50	687.0	-0.1	1.5	13,881,477.86	1,365,656.59	38° 13' 25.799 N	81° 57' 24.382 W	
717.0	2.30	120.50	717.0	-0.4	2.3	13,881,477.49	1,365,657.44	38° 13' 25.796 N	81° 57' 24.371 W	
747.0	3.70	129.90	746.9	-1.4	3.6	13,881,476.57	1,365,658.70	38° 13' 25.787 N	81° 57' 24.355 W	
777.0	5.30	130.10	776.8	-2.9	5.4	13,881,475.05	1,365,660.51	38° 13' 25.772 N	81° 57' 24.332 W	
807.0	6.60	129.90	806.7	-4.9	7.8	13,881,473.05	1,365,662.89	38° 13' 25.752 N	81° 57' 24.302 W	
837.0	7.90	125.70	836.4	-7.2	10.8	13,881,470.74	1,365,665.89	38° 13' 25.730 N	81° 57' 24.264 W	
867.0	8.90	123.40	866.1	-9.7	14.4	13,881,468.26	1,365,669.50	38° 13' 25.706 N	81° 57' 24.218 W	

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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
897.0	9.10	121.40	895.7	-12.2	18.3	13,881,465.75	1,365,673.46	38° 13' 25.681 N	81° 57' 24.168 W	
927.0	10.00	119.80	925.3	-14.7	22.6	13,881,463.22	1,365,677.75	38° 13' 25.657 N	81° 57' 24.114 W	
957.0	11.10	118.60	954.8	-17.4	27.4	13,881,460.54	1,365,682.54	38° 13' 25.631 N	81° 57' 24.054 W	
987.0	11.90	116.60	984.2	-20.2	32.7	13,881,457.78	1,365,687.84	38° 13' 25.604 N	81° 57' 23.987 W	
1,017.0	13.20	119.60	1,013.5	-23.2	38.5	13,881,454.70	1,365,693.59	38° 13' 25.574 N	81° 57' 23.915 W	
1,047.0	14.30	116.50	1,042.6	-26.6	44.8	13,881,451.35	1,365,699.88	38° 13' 25.542 N	81° 57' 23.835 W	
1,077.0	15.60	116.10	1,071.6	-30.0	51.7	13,881,447.92	1,365,706.82	38° 13' 25.508 N	81° 57' 23.748 W	
1,107.0	16.50	117.30	1,100.5	-33.7	59.1	13,881,444.20	1,365,714.23	38° 13' 25.472 N	81° 57' 23.655 W	
1,137.0	17.20	118.00	1,129.2	-37.8	66.8	13,881,440.16	1,365,721.93	38° 13' 25.433 N	81° 57' 23.558 W	
1,167.0	17.40	119.50	1,157.8	-42.1	74.6	13,881,435.87	1,365,729.75	38° 13' 25.392 N	81° 57' 23.459 W	
1,197.0	17.20	120.90	1,186.5	-46.5	82.3	13,881,431.38	1,365,737.46	38° 13' 25.348 N	81° 57' 23.362 W	
1,227.0	17.10	122.80	1,215.1	-51.2	89.9	13,881,426.71	1,365,744.97	38° 13' 25.303 N	81° 57' 23.267 W	
1,257.0	17.70	125.40	1,243.7	-56.2	97.3	13,881,421.68	1,365,752.40	38° 13' 25.254 N	81° 57' 23.173 W	
1,287.0	18.60	127.50	1,272.3	-61.8	104.8	13,881,416.13	1,365,759.91	38° 13' 25.200 N	81° 57' 23.078 W	
1,317.0	19.80	128.30	1,300.6	-67.9	112.6	13,881,410.07	1,365,767.70	38° 13' 25.140 N	81° 57' 22.980 W	
1,347.0	20.90	128.40	1,328.7	-74.3	120.8	13,881,403.59	1,365,775.88	38° 13' 25.077 N	81° 57' 22.877 W	
1,377.0	22.40	126.10	1,356.6	-81.0	129.6	13,881,396.90	1,365,784.69	38° 13' 25.012 N	81° 57' 22.765 W	
1,407.0	23.40	125.40	1,384.2	-87.8	139.0	13,881,390.08	1,365,794.16	38° 13' 24.945 N	81° 57' 22.646 W	
1,437.0	24.20	125.00	1,411.7	-94.8	148.9	13,881,383.10	1,365,804.06	38° 13' 24.877 N	81° 57' 22.521 W	
1,467.0	25.00	124.70	1,439.0	-102.0	159.2	13,881,375.97	1,365,814.31	38° 13' 24.808 N	81° 57' 22.391 W	
1,497.0	25.40	124.20	1,466.1	-109.2	169.7	13,881,368.74	1,365,824.84	38° 13' 24.738 N	81° 57' 22.258 W	
1,527.0	25.90	122.80	1,493.1	-116.3	180.6	13,881,361.58	1,365,835.67	38° 13' 24.668 N	81° 57' 22.122 W	
1,557.0	26.50	121.30	1,520.1	-123.4	191.8	13,881,354.55	1,365,846.90	38° 13' 24.600 N	81° 57' 21.980 W	
1,587.0	26.30	121.30	1,546.9	-130.3	203.2	13,881,347.62	1,365,858.29	38° 13' 24.532 N	81° 57' 21.836 W	
1,617.0	26.20	121.30	1,573.8	-137.2	214.5	13,881,340.73	1,365,869.63	38° 13' 24.465 N	81° 57' 21.693 W	
1,647.0	26.30	121.00	1,600.7	-144.1	225.9	13,881,333.86	1,365,880.99	38° 13' 24.398 N	81° 57' 21.550 W	
1,677.0	25.30	120.60	1,627.8	-150.7	237.1	13,881,327.18	1,365,892.20	38° 13' 24.333 N	81° 57' 21.409 W	
1,707.0	23.70	119.10	1,655.1	-156.9	247.9	13,881,320.98	1,365,902.99	38° 13' 24.273 N	81° 57' 21.273 W	
1,737.0	23.50	119.50	1,682.5	-162.8	258.3	13,881,315.11	1,365,913.46	38° 13' 24.216 N	81° 57' 21.141 W	
1,767.0	23.70	122.10	1,710.0	-169.0	268.7	13,881,308.96	1,365,923.78	38° 13' 24.157 N	81° 57' 21.011 W	
1,797.0	25.10	125.80	1,737.4	-175.9	278.9	13,881,302.03	1,365,934.04	38° 13' 24.089 N	81° 57' 20.881 W	
1,827.0	27.50	127.50	1,764.2	-183.8	289.6	13,881,294.09	1,365,944.70	38° 13' 24.012 N	81° 57' 20.746 W	
1,857.0	29.70	129.10	1,790.6	-192.7	300.9	13,881,285.18	1,365,955.97	38° 13' 23.925 N	81° 57' 20.604 W	
1,887.0	30.30	129.10	1,816.6	-202.2	312.5	13,881,275.72	1,365,967.61	38° 13' 23.832 N	81° 57' 20.457 W	
1,917.0	30.10	128.70	1,842.5	-211.7	324.2	13,881,266.25	1,365,979.35	38° 13' 23.740 N	81° 57' 20.309 W	
1,947.0	29.80	128.60	1,868.5	-221.0	335.9	13,881,256.89	1,365,991.05	38° 13' 23.649 N	81° 57' 20.161 W	
1,977.0	28.30	127.30	1,894.7	-230.0	347.4	13,881,247.93	1,366,002.53	38° 13' 23.561 N	81° 57' 20.016 W	
2,007.0	27.50	126.90	1,921.2	-238.5	358.6	13,881,239.46	1,366,013.73	38° 13' 23.479 N	81° 57' 19.874 W	
2,037.0	27.90	126.90	1,947.8	-246.8	369.8	13,881,231.09	1,366,024.88	38° 13' 23.397 N	81° 57' 19.733 W	
2,067.0	27.80	127.30	1,974.3	-255.3	380.9	13,881,222.64	1,366,036.06	38° 13' 23.314 N	81° 57' 19.592 W	
2,097.0	26.20	125.10	2,001.0	-263.3	391.9	13,881,214.59	1,366,047.04	38° 13' 23.236 N	81° 57' 19.453 W	
2,127.0	24.50	124.50	2,028.2	-270.7	402.5	13,881,207.26	1,366,057.59	38° 13' 23.165 N	81° 57' 19.320 W	
2,157.0	23.70	123.80	2,055.5	-277.5	412.6	13,881,200.38	1,366,067.72	38° 13' 23.098 N	81° 57' 19.192 W	
2,187.0	22.70	123.60	2,083.1	-284.1	422.4	13,881,193.82	1,366,077.55	38° 13' 23.034 N	81° 57' 19.068 W	
2,217.0	21.70	122.90	2,110.9	-290.3	431.9	13,881,187.61	1,366,087.03	38° 13' 22.973 N	81° 57' 18.949 W	
2,247.0	20.10	121.30	2,138.9	-296.0	441.0	13,881,181.92	1,366,096.10	38° 13' 22.918 N	81° 57' 18.834 W	
2,277.0	18.50	120.50	2,167.2	-301.1	449.5	13,881,176.82	1,366,104.60	38° 13' 22.868 N	81° 57' 18.727 W	
2,307.0	17.80	117.90	2,195.7	-305.7	457.6	13,881,172.26	1,366,112.76	38° 13' 22.824 N	81° 57' 18.624 W	
2,337.0	17.60	118.90	2,224.3	-310.0	465.7	13,881,167.92	1,366,120.78	38° 13' 22.782 N	81° 57' 18.523 W	
2,367.0	18.90	119.70	2,252.8	-314.6	473.9	13,881,163.32	1,366,128.97	38° 13' 22.737 N	81° 57' 18.420 W	
2,397.0	19.60	122.10	2,281.1	-319.7	482.3	13,881,158.24	1,366,137.45	38° 13' 22.688 N	81° 57' 18.313 W	
2,427.0	20.20	122.90	2,309.3	-325.2	490.9	13,881,152.75	1,366,146.06	38° 13' 22.635 N	81° 57' 18.204 W	
2,457.0	20.20	122.00	2,337.5	-330.7	499.7	13,881,147.20	1,366,154.81	38° 13' 22.581 N	81° 57' 18.094 W	
2,487.0	18.80	120.50	2,365.8	-335.9	508.2	13,881,142.00	1,366,163.36	38° 13' 22.530 N	81° 57' 17.986 W	
2,517.0	18.00	119.50	2,394.2	-340.7	516.4	13,881,137.26	1,366,171.56	38° 13' 22.484 N	81° 57' 17.883 W	

43.03467

Survey Report - Geographic



Company:	HG Energy, LLC	Local Co-ordinate Reference:	Well CC Griffith #123
Project:	Lincoln County, West Virginia	TVD Reference:	Well @ 934.0usft (Decker #9)
Site:	CC Griffith #123	MD Reference:	Well @ 934.0usft (Decker #9)
Well:	CC Griffith #123	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
2,547.0	17.10	119.00	2,422.8	-345.1	524.3	13,881,132.84	1,366,179.46	38° 13' 22.441 N	81° 57' 17.783 W	
2,577.0	16.00	116.90	2,451.6	-349.1	531.9	13,881,128.83	1,366,187.00	38° 13' 22.402 N	81° 57' 17.688 W	
2,607.0	14.70	117.10	2,480.5	-352.7	539.0	13,881,125.23	1,366,194.08	38° 13' 22.367 N	81° 57' 17.599 W	
2,637.0	13.70	113.90	2,509.6	-355.9	545.6	13,881,122.05	1,366,200.71	38° 13' 22.337 N	81° 57' 17.515 W	
2,667.0	12.70	113.30	2,538.8	-358.6	551.9	13,881,119.31	1,366,206.99	38° 13' 22.310 N	81° 57' 17.436 W	
2,725.0	12.70	113.30	2,595.4	-363.7	563.6	13,881,114.27	1,366,218.70	38° 13' 22.262 N	81° 57' 17.289 W	
TD @ 2725' MD / 2595' TVD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
597.0	597.0	0.0	0.0	FIRST SURVEY @ 597' MD / 597' TVD	
2,725.0	2,595.4	-363.7	563.6	TD @ 2725' MD / 2595' TVD	

Checked By: _____ Approved By: _____ Date: _____

CC Griffith #123
 Lincoln County, West Virginia
 Q141068 & AM-141036
 Design #1

Company Name: HG Energy, LLC
 CC Griffin #123
 Lincoln County, West Virginia
 Rpt: Decker #9
 Created By: Jerry Arsenault
 Date: 10/13/2014

PROJECT DETAILS: Lincoln County, West Virginia
 Geodetic System: Universal Transverse Mercator
 Datum: GAD68 West Virginia - HARN
 Ellipsoid: Zone 17N (84 W to 78 W)
 System Datum: Mean Sea Level

DESIGN TARGET DETAILS
 Name: CC Griffin #123
 Target: CC Griffin #123
 Type: Plan this target center
 TD: 2412.0
 *NLS *Elev: 158147.23
 *Northing: 154555.12
 *Easting: 5512188114.23
 *Longitude: 81° 57' 12.481 W
 *Latitude: 38° 12' 22.488 N

WELL DETAILS: CC Griffin #123

*NLS *Elev	158147.23	*Easting	5512188114.23
*Northing	154555.12	*Longitude	81° 57' 12.481 W
Grade Level	38° 12' 22.488 N		

ANNOTATIONS

NO	Inc	AI	TD	*NLS	*Elev	Vertical	Dependent	Annotation
2725.0	12.10	11.30	2556.4	-247	63.6	67.2	TD @ 2725 MD / 2556 TD	

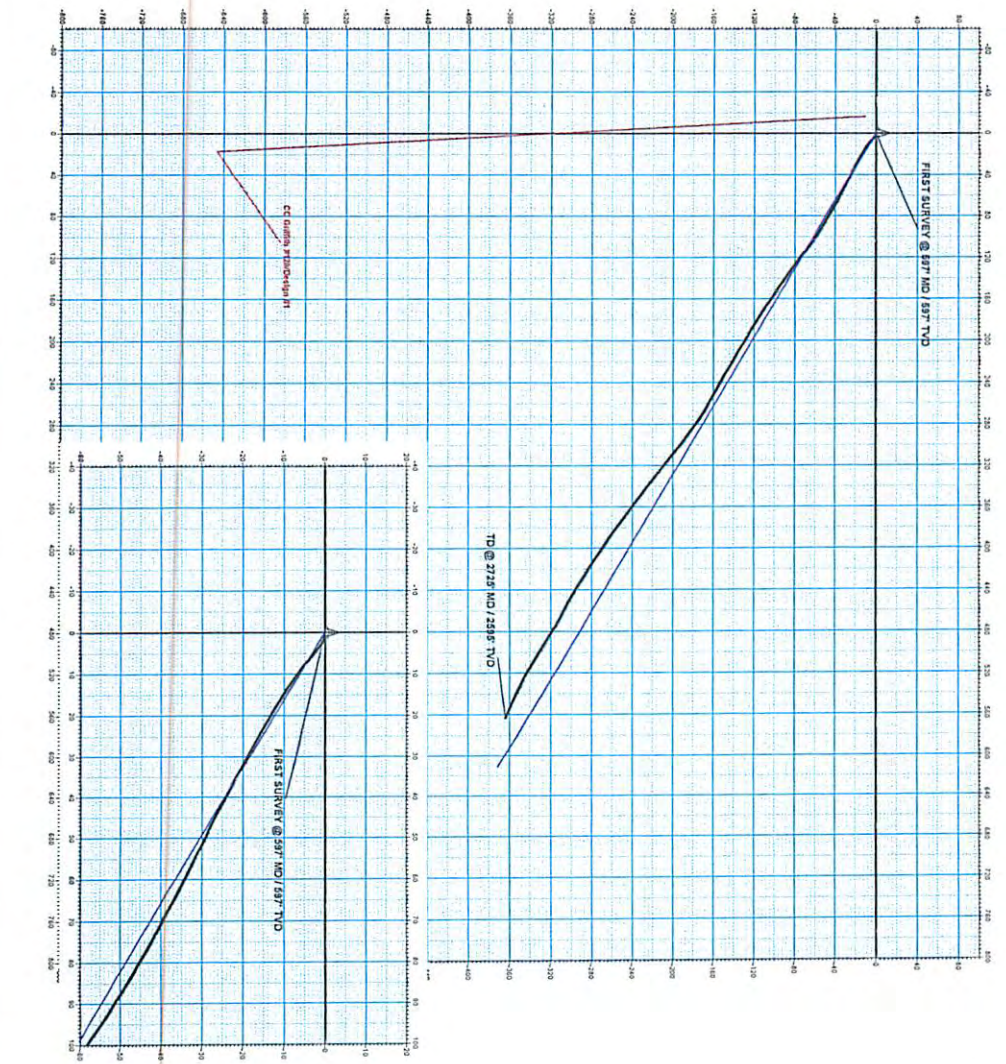
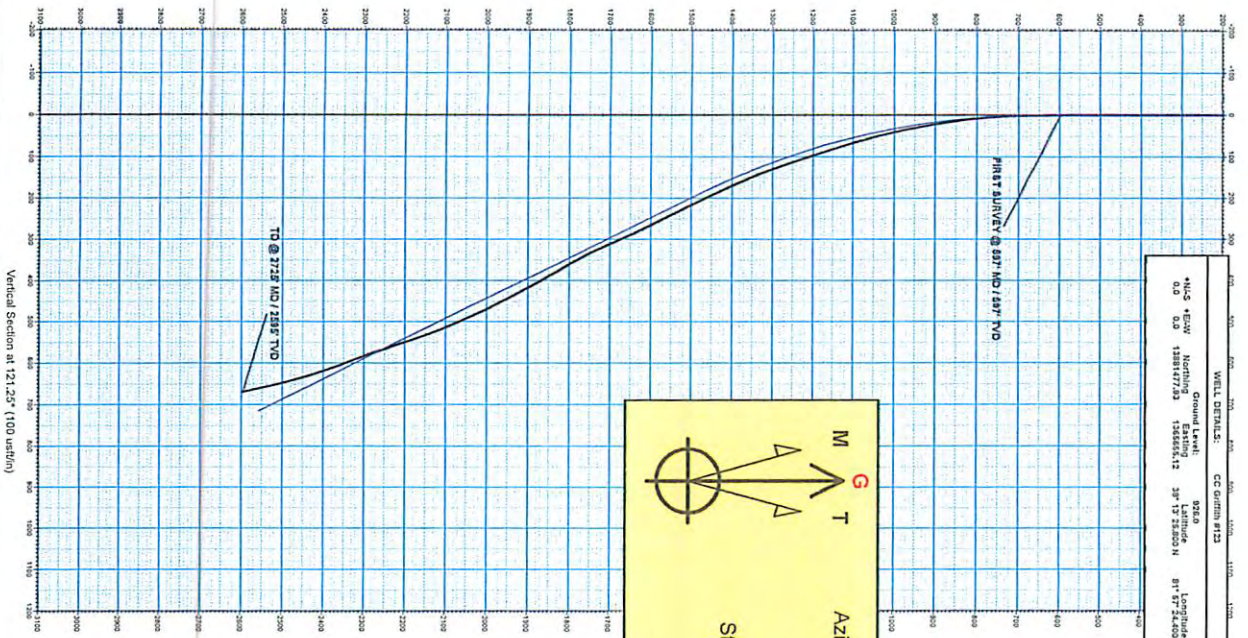
HG Energy



43.03467

M **G** **T**

Azimuths to Grid North
 Correction: -6.85°
 Magnetic Field Strength: 51833.55NT
 Dip Angle: 66.08°
 Date: 10/2/2014
 Model: IGRF2010



Vertical Section at 121.25° (100 width)