

HG Energy, LLC
Harrison County, West Virginia
J.M. Fultz #117R
J.M. Fultz #117R

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

23 April, 2014

RECEIVED
Oil and Gas
JUL 3 2014
The APPALACHIAN DIRECTIONAL COMPANY
WV Department of
Environmental Protection
06/27/2017

DDC
Survey Report - Geographic



Company: HG Energy, LLC	Local Co-ordinate Reference: Well J.M. Fultz #117R
Project: Harrison County, West Virginia	TVD Reference: WELL @ 1350.0usft (Decker #6)
Site: J.M. Fultz #117R	MD Reference: WELL @ 1350.0usft (Decker #6)
Well: J.M. Fultz #117R	North Reference: Grid
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Wellbore #1	Database: EDM 5000.1 Single User Db

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

Site	J.M. Fultz #117R				
Site Position:		Northing:	14,262,085.35 usft	Latitude:	39° 16' 19.700 N
From:	Lat/Long	Easting:	1,779,732.43 usft	Longitude:	80° 30' 27.800 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.31 °

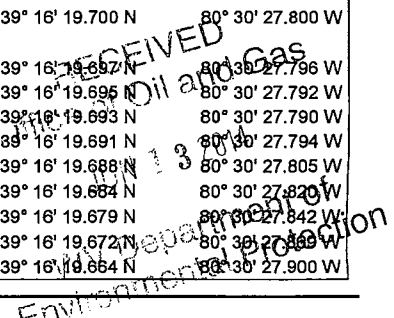
Well	J.M. Fultz #117R					
Well Position	+N-S	0.0 usft	Northing:	14,262,085.35 usft	Latitude:	39° 16' 19.700 N
	+E-W	0.0 usft	Easting:	1,779,732.43 usft	Longitude:	80° 30' 27.800 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,342.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/17/2014	-8.65	66.78	52,272

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		254.00

Survey Program	Date	4/23/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
850.0	3,228.0	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	14,262,085.35	1,779,732.43	39° 16' 19.700 N	80° 30' 27.800 W
850.0	0.00	0.01	850.0	0.0	0.0	14,262,085.35	1,779,732.43	39° 16' 19.700 N	80° 30' 27.800 W
FIRST MWD SURVEY @ 850' MD / 850' TVD									
923.0	0.70	128.40	923.0	-0.3	0.3	14,262,085.07	1,779,732.78	39° 16' 19.697 N	80° 30' 27.796 W
953.0	0.70	124.80	953.0	-0.5	0.6	14,262,084.86	1,779,733.07	39° 16' 19.695 N	80° 30' 27.792 W
983.0	0.40	196.30	983.0	-0.7	0.8	14,262,084.65	1,779,733.19	39° 16' 19.693 N	80° 30' 27.790 W
1,013.0	1.20	248.80	1,013.0	-0.9	0.4	14,262,084.44	1,779,732.87	39° 16' 19.691 N	80° 30' 27.794 W
1,043.0	2.00	252.80	1,043.0	-1.2	-0.4	14,262,084.17	1,779,732.08	39° 16' 19.688 N	80° 30' 27.805 W
1,073.0	3.00	251.00	1,073.0	-1.6	-1.6	14,262,083.76	1,779,730.83	39° 16' 19.684 N	80° 30' 27.820 W
1,103.0	3.90	251.00	1,102.9	-2.2	-3.3	14,262,083.17	1,779,729.13	39° 16' 19.679 N	80° 30' 27.842 W
1,133.0	4.60	251.70	1,132.8	-2.9	-5.4	14,262,082.46	1,779,727.02	39° 16' 19.672 N	80° 30' 27.869 W
1,163.0	5.10	251.00	1,162.7	-3.7	-7.6	14,262,081.65	1,779,724.62	39° 16' 19.664 N	80° 30' 27.900 W





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Well: J.M. Fultz #117R
Wellbore: Wellbore #1
Design: Wellbore #1

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MD Reference: WELL @ 1350.0usft (Decker #6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude		
1,193.0	5.30	249.60	1,192.6	-4.6	-10.4	14,262,080.73	1,779,722.06	39° 16' 19.655 N	80° 30' 27.932 W		
1,223.0	5.80	252.20	1,222.4	-5.6	-13.1	14,262,079.78	1,779,719.32	39° 16' 19.646 N	80° 30' 27.967 W		
1,253.0	6.50	256.90	1,252.3	-6.4	-16.2	14,262,078.94	1,779,716.22	39° 16' 19.637 N	80° 30' 28.007 W		
1,283.0	7.40	261.90	1,282.0	-7.1	-19.8	14,262,078.28	1,779,712.65	39° 16' 19.631 N	80° 30' 28.052 W		
1,313.0	8.50	266.20	1,311.8	-7.5	-23.9	14,262,077.86	1,779,708.53	39° 16' 19.627 N	80° 30' 28.105 W		
1,343.0	9.50	267.70	1,341.4	-7.7	-28.6	14,262,077.61	1,779,703.84	39° 16' 19.625 N	80° 30' 28.164 W		
1,373.0	10.30	268.40	1,370.9	-7.9	-33.7	14,262,077.44	1,779,698.69	39° 16' 19.624 N	80° 30' 28.230 W		
1,403.0	11.00	267.80	1,400.4	-8.1	-39.3	14,262,077.25	1,779,693.15	39° 16' 19.622 N	80° 30' 28.300 W		
1,433.0	11.60	266.90	1,429.8	-8.4	-45.2	14,262,076.98	1,779,687.27	39° 16' 19.620 N	80° 30' 28.375 W		
1,463.0	11.90	266.20	1,459.2	-8.7	-51.3	14,262,076.61	1,779,681.18	39° 16' 19.616 N	80° 30' 28.453 W		
1,493.0	12.40	264.50	1,488.5	-9.3	-57.5	14,262,076.10	1,779,674.88	39° 16' 19.612 N	80° 30' 28.533 W		
1,523.0	12.80	262.90	1,517.8	-10.0	-64.0	14,262,075.38	1,779,668.38	39° 16' 19.605 N	80° 30' 28.615 W		
1,553.0	12.80	260.30	1,547.1	-10.9	-70.6	14,262,074.41	1,779,661.81	39° 16' 19.596 N	80° 30' 28.699 W		
1,583.0	12.90	256.60	1,576.3	-12.3	-77.2	14,262,073.07	1,779,655.27	39° 16' 19.583 N	80° 30' 28.782 W		
1,613.0	12.70	252.90	1,605.6	-14.0	-83.6	14,262,071.33	1,779,648.86	39° 16' 19.566 N	80° 30' 28.864 W		
1,643.0	11.90	250.30	1,634.9	-16.0	-89.6	14,262,069.32	1,779,642.80	39° 16' 19.546 N	80° 30' 28.941 W		
1,673.0	11.30	248.70	1,664.3	-18.1	-95.3	14,262,067.21	1,779,637.15	39° 16' 19.526 N	80° 30' 29.013 W		
1,703.0	10.90	248.80	1,693.7	-20.2	-100.7	14,262,065.11	1,779,631.76	39° 16' 19.505 N	80° 30' 29.082 W		
1,733.0	10.40	250.90	1,723.2	-22.2	-105.9	14,262,063.20	1,779,626.56	39° 16' 19.487 N	80° 30' 29.148 W		
1,763.0	10.20	251.70	1,752.7	-23.9	-110.9	14,262,061.48	1,779,621.48	39° 16' 19.470 N	80° 30' 29.213 W		
1,793.0	10.10	251.40	1,782.2	-25.5	-116.0	14,262,059.81	1,779,616.47	39° 16' 19.454 N	80° 30' 29.277 W		
1,823.0	9.90	251.50	1,811.8	-27.2	-120.9	14,262,058.15	1,779,611.53	39° 16' 19.438 N	80° 30' 29.340 W		
1,853.0	9.60	250.20	1,841.4	-28.9	-125.7	14,262,056.48	1,779,606.73	39° 16' 19.421 N	80° 30' 29.401 W		
1,883.0	9.60	246.90	1,870.9	-30.7	-130.4	14,262,054.68	1,779,602.07	39° 16' 19.404 N	80° 30' 29.460 W		
1,913.0	9.90	243.90	1,900.5	-32.8	-135.0	14,262,052.54	1,779,597.46	39° 16' 19.383 N	80° 30' 29.519 W		
1,943.0	10.30	242.80	1,930.0	-35.2	-139.7	14,262,050.18	1,779,592.75	39° 16' 19.360 N	80° 30' 29.579 W		
1,973.0	10.60	245.20	1,959.5	-37.6	-144.6	14,262,047.80	1,779,587.86	39° 16' 19.336 N	80° 30' 29.641 W		
2,003.0	11.20	250.60	1,989.0	-39.7	-149.8	14,262,045.67	1,779,582.61	39° 16' 19.316 N	80° 30' 29.708 W		
2,033.0	11.70	255.20	2,018.4	-41.4	-155.5	14,262,043.93	1,779,576.92	39° 16' 19.299 N	80° 30' 29.781 W		
2,063.0	11.80	257.70	2,047.8	-42.9	-161.4	14,262,042.49	1,779,570.98	39° 16' 19.285 N	80° 30' 29.857 W		
2,093.0	12.70	259.50	2,077.1	-44.1	-167.7	14,262,041.24	1,779,564.74	39° 16' 19.273 N	80° 30' 29.936 W		
2,123.0	13.70	261.70	2,106.3	-45.2	-174.4	14,262,040.13	1,779,557.99	39° 16' 19.262 N	80° 30' 30.022 W		
2,153.0	14.40	262.80	2,135.4	-46.2	-181.7	14,262,039.15	1,779,550.77	39° 16' 19.253 N	80° 30' 30.114 W		
2,183.0	15.00	262.20	2,164.4	-47.2	-189.2	14,262,038.15	1,779,543.22	39° 16' 19.243 N	80° 30' 30.210 W		
2,213.0	15.70	259.50	2,193.4	-48.5	-197.0	14,262,036.88	1,779,535.38	39° 16' 19.231 N	80° 30' 30.310 W		
2,243.0	15.10	254.10	2,222.3	-50.3	-204.8	14,262,035.07	1,779,527.64	39° 16' 19.214 N	80° 30' 30.408 W		
2,273.0	13.20	248.80	2,251.4	-52.6	-211.7	14,262,032.77	1,779,520.68	39° 16' 19.191 N	80° 30' 30.497 W		
2,303.0	12.00	246.90	2,280.6	-55.0	-217.8	14,262,030.30	1,779,514.62	39° 16' 19.167 N	80° 30' 30.574 W		
2,333.0	12.10	245.40	2,310.0	-57.6	-223.5	14,262,027.77	1,779,508.89	39° 16' 19.143 N	80° 30' 30.647 W		
2,363.0	12.60	244.60	2,339.3	-60.3	-229.3	14,262,025.06	1,779,503.08	39° 16' 19.116 N	80° 30' 30.722 W		
2,393.0	12.90	245.80	2,368.5	-63.1	-235.4	14,262,022.28	1,779,497.07	39° 16' 19.089 N	80° 30' 30.798 W		
2,423.0	12.90	246.20	2,397.8	-65.8	-241.5	14,262,019.56	1,779,490.95	39° 16' 19.062 N	80° 30' 30.876 W		
2,453.0	12.70	246.70	2,427.0	-68.4	-247.6	14,262,016.90	1,779,484.86	39° 16' 19.037 N	80° 30' 30.954 W		
2,483.0	12.50	246.90	2,456.3	-71.0	-253.6	14,262,014.32	1,779,478.84	39° 16' 19.011 N	80° 30' 31.031 W		
2,513.0	12.00	245.80	2,485.6	-73.6	-259.4	14,262,011.77	1,779,473.01	39° 16' 18.986 N	80° 30' 31.105 W		
2,543.0	12.00	246.60	2,515.0	-76.1	-265.1	14,262,009.25	1,779,467.30	39° 16' 18.962 N	80° 30' 31.178 W		
2,573.0	12.30	249.50	2,544.3	-78.5	-271.0	14,262,006.90	1,779,461.45	39° 16' 18.939 N	80° 30' 31.252 W		
2,603.0	12.40	251.10	2,573.6	-80.6	-277.0	14,262,004.73	1,779,455.41	39° 16' 18.916 N	80° 30' 31.329 W		
2,633.0	12.50	253.20	2,602.9	-82.6	-283.2	14,262,002.75	1,779,449.25	39° 16' 18.899 N	80° 30' 31.408 W		
2,663.0	12.70	253.60	2,632.2	-84.5	-289.4	14,262,000.88	1,779,442.98	39° 16' 18.880 N	80° 30' 31.488 W		
2,693.0	12.60	251.10	2,661.5	-86.5	-295.7	14,261,998.89	1,779,436.72	39° 16' 18.861 N	80° 30' 31.567 W		
2,723.0	12.00	250.30	2,690.8	-88.6	-301.7	14,261,996.78	1,779,430.69	39° 16' 18.841 N	80° 30' 31.647 W		
2,753.0	11.50	251.90	2,720.1	-90.6	-307.5	14,261,994.80	1,779,424.91	39° 16' 18.821 N	80° 30' 31.718 W		
2,783.0	12.10	255.40	2,749.5	-92.3	-313.4	14,261,993.08	1,779,419.03	39° 16' 18.805 N	80° 30' 31.793 W		
2,813.0	13.20	258.90	2,778.8	-93.7	-319.8	14,261,991.63	1,779,412.62	39° 16' 18.791 N	80° 30' 31.874 W		

HARRISON COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 3200 W. STATE ST. MARTINSBURG, WV 26151
 304-261-3200
 www.hcp.wv.gov

33.05759



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Survey Report - Geographic

Company: HG Energy, LLC
Project: Harrison County, West Virginia
Site: J.M. Fultz #117R
Well: J.M. Fultz #117R
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well J.M. Fultz #117R
TVD Reference: WELL @ 1350.0usft (Decker #6)
MD Reference: WELL @ 1350.0usft (Decker #6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,843.0	13.90	261.00	2,807.9	-94.9	-328.7	14,261,990.40	1,779,405.70	39° 16' 18.779 N	80° 30' 31.963 W
2,873.0	13.90	260.30	2,837.1	-96.1	-333.8	14,261,989.23	1,779,398.59	39° 16' 18.768 N	80° 30' 32.053 W
2,903.0	13.70	257.30	2,866.2	-97.5	-340.9	14,261,987.84	1,779,391.57	39° 16' 18.754 N	80° 30' 32.142 W
2,933.0	13.20	251.50	2,895.4	-99.4	-347.6	14,261,985.98	1,779,384.86	39° 16' 18.736 N	80° 30' 32.228 W
2,963.0	12.10	248.80	2,924.7	-101.6	-353.7	14,261,983.75	1,779,378.68	39° 16' 18.714 N	80° 30' 32.307 W
2,993.0	11.40	252.10	2,954.0	-103.6	-359.5	14,261,981.70	1,779,372.93	39° 16' 18.695 N	80° 30' 32.380 W
3,023.0	10.40	255.00	2,983.5	-105.3	-364.9	14,261,980.09	1,779,367.49	39° 16' 18.679 N	80° 30' 32.449 W
3,053.0	9.50	254.70	3,013.0	-106.6	-369.9	14,261,978.74	1,779,362.48	39° 16' 18.666 N	80° 30' 32.513 W
3,083.0	9.20	253.20	3,042.6	-108.0	-374.6	14,261,977.39	1,779,357.80	39° 16' 18.653 N	80° 30' 32.573 W
3,113.0	8.40	252.60	3,072.3	-109.3	-379.0	14,261,976.04	1,779,353.41	39° 16' 18.640 N	80° 30' 32.629 W
3,143.0	6.90	251.00	3,102.0	-110.5	-382.8	14,261,974.80	1,779,349.62	39° 16' 18.628 N	80° 30' 32.677 W
3,173.0	5.60	247.60	3,131.8	-111.7	-385.9	14,261,973.66	1,779,346.56	39° 16' 18.616 N	80° 30' 32.716 W
3,228.0	5.60	247.60	3,186.6	-113.7	-390.8	14,261,971.61	1,779,341.60	39° 16' 18.596 N	80° 30' 32.779 W

TD @ 3228' MD / 3187' TVD

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
850.0	850.0	0.0	0.0	FIRST MWD SURVEY @ 850' MD / 850' TVD
3,228.0	3,186.6	-113.7	-390.8	TD @ 3228' MD / 3187' TVD

Checked By: _____ Approved By: _____ Date: _____

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Geo Datum:	NAD83 West Virginia - HARN		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	J.M. Fultz #117R				
Site Position:	Northing:	14,262,085.35 usft	Latitude:	39° 16' 19.700 N	
From:	Lat/Long	Easting:	1,779,732.43 usft	Longitude:	80° 30' 27.800 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.31 °

Well	J.M. Fultz #117R					
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	+E-W	0.0 usft	Easting:	1,779,732.43 usft	Longitude:	80° 30' 27.800 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,342.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	4/17/2014	(°)	(°)	(nT)
			-8.65	66.78	52,272

Design	Wellbore #1			
Audit Notes:				
Version:	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	254.00

Survey Program	Date	4/23/2014		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
850.0	3,228.0	MWD (Wellbore #1)	MWD default	MWD - Standard

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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	
850.0	0.00	0.00	850.0	0.0	0.0	0.0	0.00	0.0	0.00	
FIRST MWD SURVEY @ 850' MD / 850' TVD										
923.0	0.70	128.40	923.0	-0.3	0.3	-0.3	0.96	0.4	128.40	
953.0	0.70	124.80	953.0	-0.5	0.6	-0.5	0.15	0.8	127.59	
983.0	0.40	196.30	983.0	-0.7	0.8	-0.5	2.29	1.0	132.49	
1,013.0	1.20	248.80	1,013.0	-0.9	0.4	-0.2	3.36	1.0	154.19	
1,043.0	2.00	252.80	1,043.0	-1.2	-0.4	0.7	2.69	1.2	196.51	
1,073.0	3.00	251.00	1,073.0	-1.6	-1.6	2.0	3.34	2.3	224.99	
1,103.0	3.90	251.00	1,102.9	-2.2	-3.3	3.8	3.00	4.0	236.54	
1,133.0	4.60	251.70	1,132.8	-2.9	-5.4	6.0	2.34	6.1	241.87	
1,163.0	5.10	251.00	1,162.7	-3.7	-7.8	8.5	1.68	8.6	244.63	
1,193.0	5.30	249.60	1,192.6	-4.6	-10.4	11.2	0.79	11.4	245.98	
1,223.0	5.80	252.20	1,222.4	-5.6	-13.1	14.1	1.87	14.2	247.00	
1,253.0	6.50	256.90	1,252.3	-6.4	-16.2	17.3	2.87	17.4	248.41	
1,283.0	7.40	261.90	1,282.0	-7.1	-19.8	21.0	3.61	21.0	250.32	
1,313.0	8.50	266.20	1,311.8	-7.5	-23.9	25.0	4.17	25.0	252.60	
1,343.0	9.50	267.70	1,341.4	-7.7	-28.6	29.6	3.42	29.6	254.86	
1,373.0	10.30	268.40	1,370.9	-7.9	-33.7	34.6	2.70	34.7	256.80	
1,403.0	11.00	267.80	1,400.4	-8.1	-39.3	40.0	2.36	40.1	258.35	
1,433.0	11.60	266.90	1,429.8	-8.4	-45.2	45.7	2.08	45.9	259.50	
1,463.0	11.90	266.20	1,459.2	-8.7	-51.3	51.7	1.11	52.0	260.33	
1,493.0	12.40	264.50	1,488.5	-9.3	-57.5	57.9	2.05	58.3	260.87	
1,523.0	12.80	262.90	1,517.8	-10.0	-64.0	64.3	1.77	64.8	261.15	
1,553.0	13.80	260.30	1,547.1	-10.9	-70.6	70.9	1.92	71.5	261.19	
1,583.0	12.90	256.60	1,576.3	-12.3	-77.2	77.6	2.76	78.1	260.96	
1,613.0	12.70	252.90	1,605.6	-14.0	-83.6	84.2	2.81	84.7	260.47	

Environmental Protection
 M.V. Department
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 Office of Oil and Gas
 JUN 11 2 8 2014

33.05159

DDC
HG Energy EOW Report



Company: HG Energy, LLC
 Project: Harrison County, West Virginia
 Site: J.M. Fultz #117R
 Well: J.M. Fultz #117R
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well J.M. Fultz #117R
 TVD Reference: WELL @ 1350.0usft (Decker #6)
 MD Reference: WELL @ 1350.0usft (Decker #6)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.1 Single User Db

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
1,643.0	11.90	250.30	1,634.9	-16.0	-89.6	90.6	3.24	91.1	259.86
1,673.0	11.30	248.70	1,664.3	-18.1	-95.3	96.6	2.27	97.0	259.22
1,703.0	10.90	248.80	1,693.7	-20.2	-100.7	102.3	1.33	102.7	258.63
1,733.0	10.40	250.90	1,723.2	-22.2	-105.9	107.9	2.11	108.2	258.18
1,763.0	10.20	251.70	1,752.7	-23.9	-110.9	113.2	0.82	113.5	257.86
1,793.0	10.10	251.40	1,782.2	-25.5	-116.0	118.5	0.38	118.7	257.58
1,823.0	9.90	251.50	1,811.8	-27.2	-120.9	123.7	0.67	123.9	257.32
1,853.0	9.60	250.20	1,841.4	-28.9	-125.7	128.8	1.24	129.0	257.07
1,883.0	9.60	246.90	1,870.9	-30.7	-130.4	133.8	1.83	133.9	256.75
1,913.0	9.90	243.90	1,900.5	-32.8	-135.0	138.8	1.97	138.9	256.34
1,943.0	10.30	242.80	1,930.0	-35.2	-139.7	144.0	1.48	144.0	255.87
1,973.0	10.60	245.20	1,959.5	-37.6	-144.6	149.3	1.76	149.4	255.44
2,003.0	11.20	250.60	1,989.0	-39.7	-149.8	154.9	3.95	155.0	255.17
2,033.0	11.70	255.20	2,018.4	-41.4	-155.5	160.9	3.47	160.9	255.08
2,063.0	11.80	257.70	2,047.8	-42.9	-161.4	167.0	1.73	167.0	255.13
2,093.0	12.70	259.50	2,077.1	-44.1	-167.7	173.3	3.26	173.4	255.26
2,123.0	13.70	261.70	2,106.3	-45.2	-174.4	180.1	3.73	180.2	255.47
2,153.0	14.40	262.80	2,135.4	-46.2	-181.7	187.4	2.50	187.4	255.73
2,183.0	15.00	262.20	2,164.4	-47.2	-189.2	194.9	2.06	195.0	255.99
2,213.0	15.70	259.50	2,193.4	-48.5	-197.0	202.8	3.33	202.9	256.18
2,243.0	15.10	254.10	2,222.3	-50.3	-204.8	210.7	5.18	210.9	256.21
2,273.0	13.20	248.80	2,251.4	-52.6	-211.7	218.0	7.66	218.2	256.05
2,303.0	12.00	246.90	2,280.6	-55.0	-217.8	224.5	4.23	224.7	255.82
2,333.0	12.10	245.40	2,310.0	-57.6	-223.5	230.7	1.10	230.8	255.56
2,363.0	12.60	244.60	2,339.3	-60.3	-229.3	237.1	1.76	237.1	255.27
2,393.0	12.90	245.80	2,368.5	-63.1	-235.4	243.6	1.33	243.7	255.00
2,423.0	12.90	246.20	2,397.8	-65.8	-241.5	250.3	0.30	250.3	254.76

33.05759

DDC
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 Design: Wellbore #1

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 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.1 Single User Db

MD (usft)	Inc (")	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Closure Distance (usft)	Closure Azimuth (°)
2,453.0	12.70	246.70	2,427.0	-68.4	-247.6	256.8	0.76	256.9	254.54
2,483.0	12.50	246.90	2,456.3	-71.0	-253.6	263.3	0.68	263.3	254.35
2,513.0	12.00	245.80	2,485.6	-73.6	-259.4	269.6	1.84	269.6	254.16
2,543.0	12.00	246.60	2,515.0	-76.1	-265.1	275.8	0.55	275.8	253.99
2,573.0	12.30	249.50	2,544.3	-78.5	-271.0	282.1	2.27	282.1	253.85
2,603.0	12.40	251.10	2,573.6	-80.6	-277.0	288.5	1.19	288.5	253.77
2,633.0	12.50	253.20	2,602.9	-82.6	-283.2	295.0	1.55	295.0	253.74
2,663.0	12.70	253.60	2,632.2	-84.5	-289.4	301.5	0.73	301.5	253.73
2,693.0	12.60	251.10	2,661.5	-86.5	-295.7	308.1	1.85	308.1	253.70
2,723.0	12.00	250.30	2,690.8	-88.6	-301.7	314.5	2.08	314.5	253.64
2,753.0	11.50	251.90	2,720.1	-90.6	-307.5	320.6	1.99	320.6	253.59
2,783.0	12.10	255.40	2,749.5	-92.3	-313.4	326.7	3.11	326.7	253.59
2,813.0	13.20	258.90	2,778.8	-93.7	-319.8	333.3	4.47	333.3	253.67
2,843.0	13.90	261.00	2,807.9	-94.9	-326.7	340.2	2.85	340.2	253.80
2,873.0	13.90	260.30	2,837.1	-96.1	-333.8	347.4	0.56	347.4	253.94
2,903.0	13.70	257.30	2,866.2	-97.5	-340.9	354.5	2.48	354.5	254.04
2,933.0	13.20	251.50	2,895.4	-99.4	-347.6	361.5	4.79	361.5	254.04
2,963.0	12.10	248.80	2,924.7	-101.6	-353.7	368.0	4.16	368.0	253.98
2,993.0	11.40	252.10	2,954.0	-103.6	-359.5	374.1	3.23	374.1	253.92
3,023.0	10.40	255.00	2,983.5	-105.3	-364.9	379.8	3.80	379.8	253.91
3,053.0	9.50	254.70	3,013.0	-106.6	-369.9	385.0	3.00	385.0	253.92
3,083.0	9.20	253.20	3,042.6	-108.0	-374.6	389.9	1.29	389.9	253.92
3,113.0	8.40	252.60	3,072.3	-109.3	-379.0	394.5	2.68	394.5	253.91
3,143.0	6.90	251.00	3,102.0	-110.5	-382.8	398.5	5.05	398.5	253.89
3,173.0	5.60	247.60	3,131.8	-111.7	-385.9	401.7	4.50	401.7	253.86
3,228.0	5.60	247.60	3,166.6	-113.7	-390.8	407.0	0.00	407.0	253.77

TD @ 3228' MD / 3187' TVD

33-05754

DDC
HG Energy EOW Report



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Project: Harrison County, West Virginia
Site: J.M. Fultz #117R
Well: J.M. Fultz #117R
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well J.M. Fultz #117R
TVD Reference: WELL @ 1350.0usft (Decker #6)
MD Reference: WELL @ 1350.0usft (Decker #6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
850.0	850.0	0.0	0.0	FIRST MWD SURVEY @ 850' MD / 850' TVD
3,228.0	3,186.6	-113.7	-390.8	TD @ 3228' MD / 3187' TVD

Checked By: _____ Approved By: _____ Date: _____

33-05759