

RECEIVED

DEC 15 2015

WV GEOLOGICAL SURVEY
MORGANTOWN, WV

HG Energy, LLC

Harrison County, West Virginia

W.F. Williams #232

W.F. Williams #232

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

13 April, 2015



DEC 15 2015

HP

Survey Report - Geographic



WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Company: HG Energy, LLC
Project: Harrison County, West Virginia
Site: W.F. Williams #232
Well: W.F. Williams #232
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well W.F. Williams #232
TVD Reference: Well @ 1176.0usft
MD Reference: Well @ 1176.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass

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

| | | | | | |
|------------------------------|--------------------|---------------------|--------------------|--------------------------|------------------|
| Site | W.F. Williams #232 | | | | |
| Site Position: | | Northing: | 14,261,928.48 usft | Latitude: | 39° 16' 18.000 N |
| From: | Lat/Long | Easting: | 1,782,476.95 usft | Longitude: | 80° 29' 52.900 W |
| Position Uncertainty: | 0.0 usft | Slot Radius: | 13-3/16 " | Grid Convergence: | 0.32 ° |

| | | | | | | |
|-----------------------------|--------------------|----------|----------------------------|--------------------|----------------------|------------------|
| Well | W.F. Williams #232 | | | | | |
| Well Position | +N/-S | 0.0 usft | Northing: | 14,261,928.48 usft | Latitude: | 39° 16' 18.000 N |
| | +E/-W | 0.0 usft | Easting: | 1,782,476.95 usft | Longitude: | 80° 29' 52.900 W |
| Position Uncertainty | | 0.0 usft | Wellhead Elevation: | 0.0 usft | Ground Level: | 1,168.0 usft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | Wellbore #1 | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2010 | 3/31/2015 | -8.70 | 66.68 | 52,155 |

| | | | | | |
|--------------------------|--------------------------------|---------------------|---------------------|----------------------|-----|
| 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 | 319.70 | |

| | | | | | |
|-----------------------|------------------|--------------------------|------------------|--------------------|--|
| Survey Program | Date | 4/9/2015 | | | |
| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description | |
| 500.0 | 2,940.0 | MWD Survey (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 | 14,261,928.48 | 1,782,476.95 | 39° 16' 18.000 N | 80° 29' 52.900 W |
| 500.0 | 0.00 | 0.00 | 500.0 | 0.0 | 0.0 | 14,261,928.48 | 1,782,476.95 | 39° 16' 18.000 N | 80° 29' 52.900 W |
| FIRST SURVEY @ 500' MD / 500' TVD | | | | | | | | | |
| 555.0 | 1.40 | 113.20 | 555.0 | -0.3 | 0.6 | 14,261,928.22 | 1,782,477.56 | 39° 16' 17.997 N | 80° 29' 52.892 W |
| 585.0 | 1.50 | 105.50 | 585.0 | -0.5 | 1.3 | 14,261,927.97 | 1,782,478.28 | 39° 16' 17.995 N | 80° 29' 52.883 W |
| 615.0 | 1.20 | 80.50 | 615.0 | -0.6 | 2.0 | 14,261,927.92 | 1,782,478.97 | 39° 16' 17.994 N | 80° 29' 52.874 W |
| 645.0 | 1.50 | 36.30 | 645.0 | -0.2 | 2.6 | 14,261,928.29 | 1,782,479.51 | 39° 16' 17.998 N | 80° 29' 52.867 W |
| 675.0 | 2.20 | 12.30 | 675.0 | 0.7 | 2.9 | 14,261,929.16 | 1,782,479.86 | 39° 16' 18.007 N | 80° 29' 52.863 W |
| 705.0 | 4.00 | 354.30 | 704.9 | 2.3 | 2.9 | 14,261,930.77 | 1,782,479.88 | 39° 16' 18.022 N | 80° 29' 52.862 W |
| 735.0 | 5.60 | 348.00 | 734.8 | 4.8 | 2.5 | 14,261,933.24 | 1,782,479.47 | 39° 16' 18.047 N | 80° 29' 52.867 W |
| 765.0 | 7.20 | 343.70 | 764.6 | 8.0 | 1.7 | 14,261,936.48 | 1,782,478.64 | 39° 16' 18.079 N | 80° 29' 52.878 W |
| 795.0 | 8.60 | 342.70 | 794.3 | 11.9 | 0.5 | 14,261,940.42 | 1,782,477.45 | 39° 16' 18.118 N | 80° 29' 52.893 W |



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 TVD Reference: Well @ 1176.0usft
 MD Reference: Well @ 1176.0usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 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 | |
| 825.0 | 9.50 | 342.20 | 824.0 | 16.4 | -0.9 | 14,261,944.92 | 1,782,476.02 | 39° 16' 18.163 N | 80° 29' 52.911 W | |
| 855.0 | 9.50 | 340.80 | 853.5 | 21.1 | -2.5 | 14,261,949.62 | 1,782,474.45 | 39° 16' 18.209 N | 80° 29' 52.930 W | |
| 885.0 | 10.80 | 339.40 | 883.1 | 26.1 | -4.3 | 14,261,954.59 | 1,782,472.65 | 39° 16' 18.258 N | 80° 29' 52.953 W | |
| 915.0 | 12.10 | 338.20 | 912.5 | 31.7 | -6.5 | 14,261,960.14 | 1,782,470.49 | 39° 16' 18.313 N | 80° 29' 52.980 W | |
| 945.0 | 13.80 | 336.10 | 941.7 | 37.8 | -9.1 | 14,261,966.33 | 1,782,467.87 | 39° 16' 18.375 N | 80° 29' 53.013 W | |
| 975.0 | 14.60 | 335.30 | 970.8 | 44.6 | -12.1 | 14,261,973.04 | 1,782,464.85 | 39° 16' 18.441 N | 80° 29' 53.051 W | |
| 1,005.0 | 14.90 | 332.50 | 999.8 | 51.4 | -15.5 | 14,261,979.89 | 1,782,461.48 | 39° 16' 18.509 N | 80° 29' 53.093 W | |
| 1,035.0 | 15.40 | 325.60 | 1,028.8 | 58.1 | -19.5 | 14,261,986.60 | 1,782,457.45 | 39° 16' 18.576 N | 80° 29' 53.144 W | |
| 1,065.0 | 15.70 | 321.00 | 1,057.7 | 64.6 | -24.3 | 14,261,993.04 | 1,782,452.65 | 39° 16' 18.640 N | 80° 29' 53.205 W | |
| 1,095.0 | 15.20 | 318.80 | 1,086.6 | 70.7 | -29.4 | 14,261,999.16 | 1,782,447.50 | 39° 16' 18.700 N | 80° 29' 53.270 W | |
| 1,125.0 | 13.50 | 315.20 | 1,115.7 | 76.1 | -34.5 | 14,262,004.60 | 1,782,442.44 | 39° 16' 18.754 N | 80° 29' 53.333 W | |
| 1,155.0 | 12.10 | 312.90 | 1,144.9 | 80.7 | -39.3 | 14,262,009.23 | 1,782,437.67 | 39° 16' 18.800 N | 80° 29' 53.394 W | |
| 1,185.0 | 11.90 | 312.80 | 1,174.2 | 85.0 | -43.8 | 14,262,013.47 | 1,782,433.10 | 39° 16' 18.843 N | 80° 29' 53.452 W | |
| 1,215.0 | 12.10 | 313.10 | 1,203.6 | 89.2 | -48.4 | 14,262,017.72 | 1,782,428.53 | 39° 16' 18.885 N | 80° 29' 53.509 W | |
| 1,245.0 | 12.20 | 313.40 | 1,232.9 | 93.6 | -53.0 | 14,262,022.04 | 1,782,423.94 | 39° 16' 18.928 N | 80° 29' 53.568 W | |
| 1,275.0 | 12.10 | 314.40 | 1,262.2 | 97.9 | -57.6 | 14,262,026.42 | 1,782,419.39 | 39° 16' 18.971 N | 80° 29' 53.625 W | |
| 1,305.0 | 12.70 | 315.30 | 1,291.5 | 102.5 | -62.1 | 14,262,030.97 | 1,782,414.82 | 39° 16' 19.017 N | 80° 29' 53.683 W | |
| 1,365.0 | 12.10 | 311.30 | 1,350.2 | 111.3 | -71.5 | 14,262,039.80 | 1,782,405.46 | 39° 16' 19.105 N | 80° 29' 53.801 W | |
| 1,395.0 | 11.70 | 305.80 | 1,379.5 | 115.2 | -76.3 | 14,262,043.66 | 1,782,400.63 | 39° 16' 19.143 N | 80° 29' 53.863 W | |
| 1,425.0 | 11.40 | 304.00 | 1,408.9 | 118.6 | -81.2 | 14,262,047.10 | 1,782,395.70 | 39° 16' 19.177 N | 80° 29' 53.925 W | |
| 1,455.0 | 11.00 | 303.80 | 1,438.3 | 121.9 | -86.1 | 14,262,050.35 | 1,782,390.87 | 39° 16' 19.210 N | 80° 29' 53.986 W | |
| 1,485.0 | 10.60 | 302.70 | 1,467.8 | 124.9 | -90.8 | 14,262,053.43 | 1,782,386.17 | 39° 16' 19.240 N | 80° 29' 54.046 W | |
| 1,515.0 | 10.60 | 304.90 | 1,497.3 | 128.0 | -95.4 | 14,262,056.50 | 1,782,381.58 | 39° 16' 19.271 N | 80° 29' 54.104 W | |
| 1,545.0 | 10.50 | 311.60 | 1,526.8 | 131.4 | -99.7 | 14,262,059.89 | 1,782,377.27 | 39° 16' 19.305 N | 80° 29' 54.159 W | |
| 1,575.0 | 9.80 | 315.60 | 1,556.3 | 135.0 | -103.5 | 14,262,063.53 | 1,782,373.44 | 39° 16' 19.341 N | 80° 29' 54.207 W | |
| 1,605.0 | 9.80 | 317.20 | 1,585.9 | 138.7 | -107.0 | 14,262,067.23 | 1,782,369.92 | 39° 16' 19.378 N | 80° 29' 54.252 W | |
| 1,635.0 | 10.80 | 322.30 | 1,615.4 | 142.8 | -110.5 | 14,262,071.33 | 1,782,366.47 | 39° 16' 19.418 N | 80° 29' 54.295 W | |
| 1,665.0 | 11.80 | 325.70 | 1,644.8 | 147.6 | -113.9 | 14,262,076.08 | 1,782,363.02 | 39° 16' 19.466 N | 80° 29' 54.339 W | |
| 1,695.0 | 11.80 | 325.40 | 1,674.2 | 152.7 | -117.4 | 14,262,081.14 | 1,782,359.55 | 39° 16' 19.516 N | 80° 29' 54.383 W | |
| 1,725.0 | 12.00 | 322.60 | 1,703.5 | 157.7 | -121.0 | 14,262,086.15 | 1,782,355.91 | 39° 16' 19.565 N | 80° 29' 54.428 W | |
| 1,755.0 | 13.30 | 314.40 | 1,732.8 | 162.6 | -125.4 | 14,262,091.04 | 1,782,351.55 | 39° 16' 19.614 N | 80° 29' 54.484 W | |
| 1,785.0 | 14.30 | 313.20 | 1,761.9 | 167.5 | -130.6 | 14,262,095.99 | 1,782,346.39 | 39° 16' 19.663 N | 80° 29' 54.549 W | |
| 1,815.0 | 14.30 | 317.60 | 1,791.0 | 172.8 | -135.8 | 14,262,101.26 | 1,782,341.19 | 39° 16' 19.716 N | 80° 29' 54.615 W | |
| 1,845.0 | 13.20 | 323.00 | 1,820.1 | 178.2 | -140.3 | 14,262,106.73 | 1,782,336.63 | 39° 16' 19.770 N | 80° 29' 54.672 W | |
| 1,875.0 | 13.20 | 324.00 | 1,849.4 | 183.8 | -144.4 | 14,262,112.24 | 1,782,332.55 | 39° 16' 19.825 N | 80° 29' 54.724 W | |
| 1,905.0 | 13.40 | 323.70 | 1,878.6 | 189.3 | -148.5 | 14,262,117.81 | 1,782,328.48 | 39° 16' 19.880 N | 80° 29' 54.775 W | |
| 1,935.0 | 13.30 | 323.70 | 1,907.7 | 194.9 | -152.6 | 14,262,123.40 | 1,782,324.38 | 39° 16' 19.935 N | 80° 29' 54.827 W | |
| 1,965.0 | 13.10 | 322.90 | 1,936.9 | 200.4 | -156.7 | 14,262,128.89 | 1,782,320.29 | 39° 16' 19.990 N | 80° 29' 54.879 W | |
| 1,995.0 | 12.50 | 322.00 | 1,966.2 | 205.7 | -160.7 | 14,262,134.16 | 1,782,316.24 | 39° 16' 20.042 N | 80° 29' 54.930 W | |
| 2,025.0 | 12.30 | 319.80 | 1,995.5 | 210.7 | -164.8 | 14,262,139.16 | 1,782,312.18 | 39° 16' 20.092 N | 80° 29' 54.981 W | |
| 2,055.0 | 12.50 | 316.50 | 2,024.8 | 215.5 | -169.1 | 14,262,143.95 | 1,782,307.88 | 39° 16' 20.140 N | 80° 29' 55.035 W | |
| 2,085.0 | 12.40 | 314.40 | 2,054.1 | 220.1 | -173.6 | 14,262,148.56 | 1,782,303.34 | 39° 16' 20.185 N | 80° 29' 55.093 W | |
| 2,115.0 | 11.70 | 309.40 | 2,083.4 | 224.3 | -178.3 | 14,262,152.75 | 1,782,298.69 | 39° 16' 20.227 N | 80° 29' 55.152 W | |
| 2,145.0 | 10.90 | 301.00 | 2,112.9 | 227.7 | -183.0 | 14,262,156.14 | 1,782,293.91 | 39° 16' 20.261 N | 80° 29' 55.212 W | |
| 2,175.0 | 10.20 | 294.80 | 2,142.4 | 230.2 | -187.9 | 14,262,158.71 | 1,782,289.07 | 39° 16' 20.287 N | 80° 29' 55.274 W | |
| 2,205.0 | 10.10 | 293.70 | 2,171.9 | 232.4 | -192.7 | 14,262,160.88 | 1,782,284.25 | 39° 16' 20.308 N | 80° 29' 55.335 W | |
| 2,235.0 | 9.50 | 290.20 | 2,201.4 | 234.3 | -197.4 | 14,262,162.80 | 1,782,279.51 | 39° 16' 20.328 N | 80° 29' 55.395 W | |
| 2,265.0 | 8.40 | 279.90 | 2,231.1 | 235.5 | -201.9 | 14,262,164.03 | 1,782,275.03 | 39° 16' 20.340 N | 80° 29' 55.452 W | |
| 2,295.0 | 7.20 | 270.40 | 2,260.8 | 235.9 | -206.0 | 14,262,164.42 | 1,782,270.99 | 39° 16' 20.344 N | 80° 29' 55.503 W | |
| 2,325.0 | 5.40 | 266.30 | 2,290.6 | 235.9 | -209.2 | 14,262,164.34 | 1,782,267.70 | 39° 16' 20.343 N | 80° 29' 55.545 W | |
| 2,355.0 | 3.60 | 262.50 | 2,320.5 | 235.6 | -211.6 | 14,262,164.13 | 1,782,265.36 | 39° 16' 20.341 N | 80° 29' 55.575 W | |
| 2,385.0 | 2.40 | 288.10 | 2,350.5 | 235.7 | -213.1 | 14,262,164.20 | 1,782,263.83 | 39° 16' 20.342 N | 80° 29' 55.594 W | |
| 2,415.0 | 2.00 | 311.60 | 2,380.5 | 236.3 | -214.1 | 14,262,164.74 | 1,782,262.84 | 39° 16' 20.348 N | 80° 29' 55.607 W | |
| 2,445.0 | 4.30 | 1.40 | 2,410.4 | 237.7 | -214.5 | 14,262,166.21 | 1,782,262.48 | 39° 16' 20.362 N | 80° 29' 55.611 W | |
| 2,475.0 | 6.00 | 356.60 | 2,440.3 | 240.4 | -214.5 | 14,262,168.90 | 1,782,262.41 | 39° 16' 20.389 N | 80° 29' 55.612 W | |

HP
Survey Report - Geographic



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Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well W.F. Williams #232
TVD Reference: Well @ 1176.0usft
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|------------------|------------------|
| 2,505.0 | 6.72 | 352.00 | 2,470.1 | 243.7 | -214.9 | 14,262,172.21 | 1,782,262.07 | 39° 16' 20.421 N | 80° 29' 55.616 W |
| 2,535.0 | 6.20 | 351.70 | 2,499.9 | 247.1 | -215.3 | 14,262,175.55 | 1,782,261.60 | 39° 16' 20.455 N | 80° 29' 55.622 W |
| 2,565.0 | 5.80 | 350.40 | 2,529.8 | 250.2 | -215.8 | 14,262,178.65 | 1,782,261.11 | 39° 16' 20.485 N | 80° 29' 55.628 W |
| 2,595.0 | 6.00 | 347.00 | 2,559.6 | 253.2 | -216.4 | 14,262,181.67 | 1,782,260.50 | 39° 16' 20.515 N | 80° 29' 55.635 W |
| 2,625.0 | 7.30 | 343.70 | 2,589.4 | 256.5 | -217.3 | 14,262,185.03 | 1,782,259.62 | 39° 16' 20.548 N | 80° 29' 55.646 W |
| 2,655.0 | 8.70 | 341.30 | 2,619.1 | 260.5 | -218.6 | 14,262,189.00 | 1,782,258.35 | 39° 16' 20.588 N | 80° 29' 55.662 W |
| 2,685.0 | 7.90 | 341.20 | 2,648.8 | 264.6 | -220.0 | 14,262,193.11 | 1,782,256.96 | 39° 16' 20.628 N | 80° 29' 55.680 W |
| 2,715.0 | 6.90 | 340.60 | 2,678.5 | 268.3 | -221.2 | 14,262,196.76 | 1,782,255.70 | 39° 16' 20.665 N | 80° 29' 55.695 W |
| 2,745.0 | 5.60 | 339.50 | 2,708.4 | 271.3 | -222.4 | 14,262,199.83 | 1,782,254.59 | 39° 16' 20.695 N | 80° 29' 55.709 W |
| 2,775.0 | 5.00 | 342.30 | 2,738.2 | 274.0 | -223.3 | 14,262,202.44 | 1,782,253.68 | 39° 16' 20.721 N | 80° 29' 55.721 W |
| 2,805.0 | 4.50 | 344.20 | 2,768.1 | 276.3 | -224.0 | 14,262,204.82 | 1,782,252.96 | 39° 16' 20.744 N | 80° 29' 55.730 W |
| 2,835.0 | 4.20 | 344.70 | 2,798.0 | 278.5 | -224.6 | 14,262,207.01 | 1,782,252.35 | 39° 16' 20.766 N | 80° 29' 55.737 W |
| 2,865.0 | 3.60 | 347.20 | 2,828.0 | 280.5 | -225.1 | 14,262,208.99 | 1,782,251.85 | 39° 16' 20.786 N | 80° 29' 55.743 W |
| 2,876.0 | 3.50 | 347.10 | 2,839.0 | 281.2 | -225.2 | 14,262,209.66 | 1,782,251.70 | 39° 16' 20.792 N | 80° 29' 55.745 W |
| 2,940.0 | 3.50 | 347.10 | 2,902.8 | 285.0 | -226.1 | 14,262,213.46 | 1,782,250.83 | 39° 16' 20.830 N | 80° 29' 55.756 W |

TD @ 2940' MD / 2903' 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 |
| 2,940.0 | 2,902.8 | 285.0 | -226.1 | TD @ 2940' MD / 2903' TVD |

Checked By: _____ Approved By: _____ Date: _____



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

System Datum: Mean Sea Level

Site: W.F. Williams #232

Site Position: Northing: 14,261,928.49 usft
 From: Lat/Long Easting: 1,782,476.95 usft
 Position Uncertainty: 0.0 usft Slot Radius: 13-3/16 " Grid Convergence: 0.32 °

Well: W.F. Williams #232

Well Position: +N/-S 0.0 usft Northing: 14,261,928.49 usft Latitude: 39° 16' 18.000 N
 +E/-W 0.0 usft Easting: 1,782,476.95 usft Longitude: 80° 29' 52.900 W
 Position Uncertainty: 0.0 usft Wellhead Elevation: 0.0 usft Ground Level: 1,168.0 usft

Wellbore: Wellbore #1

Magnetics Model Name Sample Date Declination (°) Dip Angle (°) Field Strength (nT)
 IGRF2010 3/31/2015 -8.70 66.68 52,155

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 0.0 319.70

Survey Program Date 4/9/2015

From (usft) To (usft) Survey (Wellbore) Tool Name Description
 500.0 2,940.0 MWWD Survey (Wellbore #1) MWWD default MWWD - Standard

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MORGANTOWN, WV

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Database: Compass

Well W.F. Williams #232
Well @ 1176.0usft
Well @ 1176.0usft
Grid
Minimum Curvature
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 |
| | 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 | | | | | | | | | | |
| | 555.0 | 1.40 | 113.20 | 555.0 | -0.3 | 0.6 | -0.6 | 2.55 | 0.7 | 113.20 |
| | 585.0 | 1.50 | 105.50 | 585.0 | -0.5 | 1.3 | -1.3 | 0.73 | 1.4 | 111.09 |
| | 615.0 | 1.20 | 80.50 | 615.0 | -0.6 | 2.0 | -1.7 | 2.18 | 2.1 | 105.67 |
| | 645.0 | 1.50 | 36.30 | 645.0 | -0.2 | 2.6 | -1.8 | 3.51 | 2.6 | 94.43 |
| | 675.0 | 2.20 | 12.30 | 675.0 | 0.7 | 2.9 | -1.4 | 3.43 | 3.0 | 76.88 |
| | 705.0 | 4.00 | 354.30 | 704.9 | 2.3 | 2.9 | -0.2 | 6.75 | 3.7 | 52.13 |
| | 735.0 | 5.60 | 348.00 | 734.8 | 4.8 | 2.5 | 2.0 | 5.61 | 5.4 | 27.99 |
| | 765.0 | 7.20 | 343.70 | 764.6 | 8.0 | 1.7 | 5.0 | 5.56 | 8.2 | 11.98 |
| | 795.0 | 8.60 | 342.70 | 794.3 | 11.9 | 0.5 | 8.8 | 4.69 | 12.0 | 2.41 |
| | 825.0 | 9.50 | 342.20 | 824.0 | 16.4 | -0.9 | 13.1 | 3.01 | 16.5 | 356.79 |
| | 855.0 | 9.50 | 340.80 | 853.5 | 21.1 | -2.5 | 17.7 | 0.77 | 21.3 | 353.27 |
| | 885.0 | 10.80 | 339.40 | 883.1 | 26.1 | -4.3 | 22.7 | 4.41 | 26.5 | 350.65 |
| | 915.0 | 12.10 | 338.20 | 912.5 | 31.7 | -6.5 | 28.3 | 4.41 | 32.3 | 348.48 |
| | 945.0 | 13.80 | 336.10 | 941.7 | 37.8 | -9.1 | 34.7 | 5.88 | 38.9 | 346.52 |
| | 975.0 | 14.60 | 335.30 | 970.8 | 44.6 | -12.1 | 41.8 | 2.75 | 46.2 | 344.81 |
| | 1,005.0 | 14.90 | 332.50 | 999.8 | 51.4 | -15.5 | 49.2 | 2.58 | 53.7 | 343.26 |
| | 1,035.0 | 15.40 | 325.60 | 1,028.8 | 58.1 | -19.5 | 56.9 | 6.23 | 61.3 | 341.46 |
| | 1,065.0 | 15.70 | 321.00 | 1,057.7 | 64.6 | -24.3 | 65.0 | 4.23 | 69.0 | 339.38 |
| | 1,095.0 | 15.20 | 318.80 | 1,086.6 | 70.7 | -29.4 | 72.9 | 2.57 | 76.6 | 337.38 |
| | 1,125.0 | 13.50 | 315.20 | 1,115.7 | 76.1 | -34.5 | 80.4 | 6.40 | 83.6 | 335.62 |
| | 1,155.0 | 12.10 | 312.90 | 1,144.9 | 80.7 | -39.3 | 87.0 | 4.97 | 89.8 | 334.06 |
| | 1,185.0 | 11.90 | 312.80 | 1,174.2 | 85.0 | -43.8 | 93.2 | 0.67 | 95.6 | 332.71 |
| | 1,215.0 | 12.10 | 313.10 | 1,203.6 | 89.2 | -48.4 | 99.4 | 0.70 | 101.5 | 331.52 |
| | 1,245.0 | 12.20 | 313.40 | 1,232.9 | 93.6 | -53.0 | 105.6 | 0.39 | 107.5 | 330.46 |

HP
HG Energy EOW Report



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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Company: HG Energy, LLC
Project: Harrison County, West Virginia
Site: W.F. Williams #232
Well: W.F. Williams #232
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference:
TVD Reference: Well W.F. Williams #232
MD Reference: Well @ 1176.0usft
North Reference: Well @ 1176.0usft
Survey Calculation Method: Grid
Database: Minimum Curvature
Compass

| Survey | MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | EW (usft) | V. Sec (usft) | Dleg (°/100usft) | Closure Distance (usft) | Closure Azimuth (°) |
|--------|-----------|---------|-------------------|------------|------------|-----------|---------------|------------------|-------------------------|---------------------|
| | 1,275.0 | 12.10 | 314.40 | 1,262.2 | 97.9 | -57.6 | 111.9 | 0.78 | 113.6 | 329.56 |
| | 1,305.0 | 12.70 | 315.30 | 1,291.5 | 102.5 | -62.1 | 118.3 | 2.10 | 119.8 | 328.78 |
| | 1,365.0 | 12.10 | 311.30 | 1,350.2 | 111.3 | -71.5 | 131.1 | 1.75 | 132.3 | 327.29 |
| | 1,395.0 | 11.70 | 305.80 | 1,379.5 | 115.2 | -76.3 | 137.2 | 4.01 | 138.2 | 326.47 |
| | 1,425.0 | 11.40 | 304.00 | 1,408.9 | 118.6 | -81.2 | 143.0 | 1.56 | 143.8 | 325.59 |
| | 1,455.0 | 11.00 | 303.80 | 1,438.3 | 121.9 | -86.1 | 148.6 | 1.34 | 149.2 | 324.76 |
| | 1,485.0 | 10.60 | 302.70 | 1,467.8 | 124.9 | -90.8 | 154.0 | 1.50 | 154.4 | 324.00 |
| | 1,515.0 | 10.60 | 304.90 | 1,497.3 | 128.0 | -95.4 | 159.3 | 1.35 | 159.6 | 323.32 |
| | 1,545.0 | 10.50 | 311.60 | 1,526.8 | 131.4 | -99.7 | 164.7 | 4.10 | 164.9 | 322.82 |
| | 1,575.0 | 9.80 | 315.60 | 1,556.3 | 135.0 | -103.5 | 169.9 | 3.31 | 170.1 | 322.53 |
| | 1,605.0 | 9.80 | 317.20 | 1,585.9 | 138.7 | -107.0 | 175.0 | 0.91 | 175.2 | 322.35 |
| | 1,635.0 | 10.80 | 322.30 | 1,615.4 | 142.8 | -110.5 | 180.4 | 4.51 | 180.6 | 322.28 |
| | 1,665.0 | 11.80 | 325.70 | 1,644.8 | 147.6 | -113.9 | 186.3 | 4.00 | 186.5 | 322.34 |
| | 1,695.0 | 11.80 | 325.40 | 1,674.2 | 152.7 | -117.4 | 192.4 | 0.20 | 192.6 | 322.44 |
| | 1,725.0 | 12.00 | 322.60 | 1,703.5 | 157.7 | -121.0 | 198.5 | 2.04 | 198.8 | 322.49 |
| | 1,755.0 | 13.30 | 314.40 | 1,732.8 | 162.6 | -125.4 | 205.1 | 7.38 | 205.3 | 322.35 |
| | 1,785.0 | 14.30 | 313.20 | 1,761.9 | 167.5 | -130.6 | 212.2 | 3.47 | 212.4 | 322.07 |
| | 1,815.0 | 14.30 | 317.60 | 1,791.0 | 172.8 | -135.8 | 219.6 | 3.62 | 219.7 | 321.84 |
| | 1,845.0 | 13.20 | 323.00 | 1,820.1 | 178.2 | -140.3 | 226.7 | 5.63 | 226.9 | 321.79 |
| | 1,875.0 | 13.20 | 324.00 | 1,849.4 | 183.8 | -144.4 | 233.5 | 0.76 | 233.7 | 321.84 |
| | 1,905.0 | 13.40 | 323.70 | 1,878.6 | 189.3 | -148.5 | 240.4 | 0.71 | 240.6 | 321.90 |
| | 1,935.0 | 13.30 | 323.70 | 1,907.7 | 194.9 | -152.6 | 247.3 | 0.33 | 247.5 | 321.95 |
| | 1,965.0 | 13.10 | 322.90 | 1,936.9 | 200.4 | -156.7 | 254.2 | 0.90 | 254.4 | 321.98 |
| | 1,995.0 | 12.50 | 322.00 | 1,966.2 | 205.7 | -160.7 | 260.8 | 2.11 | 261.0 | 322.00 |
| | 2,025.0 | 12.30 | 319.80 | 1,995.5 | 210.7 | -164.8 | 267.2 | 1.71 | 267.5 | 321.97 |
| | 2,055.0 | 12.50 | 316.50 | 2,024.8 | 215.5 | -169.1 | 273.7 | 2.45 | 273.9 | 321.88 |
| | 2,085.0 | 12.40 | 314.40 | 2,054.1 | 220.1 | -173.6 | 280.1 | 1.55 | 280.3 | 321.73 |

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

HP
HG Energy EOW Report



Company: HG Energy, LLC
Project: Harrison County, West Virginia
Site: W.F. Williams #232
Well: W.F. Williams #232
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well W.F. Williams #232
TVD Reference: Well @ 1176.0ustf
MD Reference: Well @ 1176.0ustf
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass

| Survey | MD (ustf) | Inc (°) | Azi (azimuth) (°) | TVD (ustf) | N/S (ustf) | E/W (ustf) | V. Sec (ustf) | DLeg (°/100ustf) | Closure Distance (ustf) | Closure Azimuth (°) |
|--------|-----------|---------|-------------------|------------|------------|------------|---------------|------------------|-------------------------|---------------------|
| | 2,115.0 | 11.70 | 309.40 | 2,083.4 | 224.3 | -178.3 | 286.3 | 4.19 | 286.5 | 321.52 |
| | 2,145.0 | 10.90 | 301.00 | 2,112.9 | 227.7 | -183.0 | 292.0 | 6.09 | 292.1 | 321.20 |
| | 2,175.0 | 10.20 | 294.80 | 2,142.4 | 230.2 | -187.9 | 297.1 | 4.44 | 297.2 | 320.78 |
| | 2,205.0 | 10.10 | 293.70 | 2,171.9 | 232.4 | -192.7 | 301.9 | 0.73 | 301.9 | 320.34 |
| | 2,235.0 | 9.50 | 290.20 | 2,201.4 | 234.3 | -197.4 | 306.4 | 2.82 | 306.4 | 319.88 |
| | 2,265.0 | 8.40 | 279.90 | 2,231.1 | 235.5 | -201.9 | 310.2 | 6.46 | 310.2 | 319.40 |
| | 2,295.0 | 7.20 | 270.40 | 2,260.8 | 235.9 | -206.0 | 313.1 | 5.86 | 313.2 | 318.88 |
| | 2,325.0 | 5.40 | 266.30 | 2,290.6 | 235.9 | -209.2 | 315.2 | 6.18 | 315.3 | 318.42 |
| | 2,355.0 | 3.60 | 262.50 | 2,320.5 | 235.6 | -211.6 | 316.6 | 6.08 | 316.7 | 318.08 |
| | 2,385.0 | 2.40 | 288.10 | 2,350.5 | 235.7 | -213.1 | 317.6 | 5.90 | 317.8 | 317.88 |
| | 2,415.0 | 2.00 | 311.60 | 2,380.5 | 236.3 | -214.1 | 318.7 | 3.26 | 318.8 | 317.82 |
| | 2,445.0 | 4.30 | 1.40 | 2,410.4 | 237.7 | -214.5 | 320.0 | 11.25 | 320.2 | 317.94 |
| | 2,475.0 | 6.00 | 356.60 | 2,440.3 | 240.4 | -214.5 | 322.1 | 5.84 | 322.2 | 318.26 |
| | 2,505.0 | 6.72 | 352.00 | 2,470.1 | 243.7 | -214.9 | 324.9 | 2.94 | 324.9 | 318.60 |
| | 2,535.0 | 6.20 | 351.70 | 2,499.9 | 247.1 | -215.3 | 327.7 | 1.74 | 327.7 | 318.92 |
| | 2,565.0 | 5.80 | 350.40 | 2,529.8 | 250.2 | -215.8 | 330.4 | 1.41 | 330.4 | 319.21 |
| | 2,595.0 | 6.00 | 347.00 | 2,559.6 | 253.2 | -216.4 | 333.1 | 1.34 | 333.1 | 319.47 |
| | 2,625.0 | 7.30 | 343.70 | 2,589.4 | 256.5 | -217.3 | 336.2 | 4.51 | 336.2 | 319.73 |
| | 2,655.0 | 8.70 | 341.30 | 2,619.1 | 260.5 | -218.6 | 340.1 | 4.80 | 340.1 | 320.00 |
| | 2,685.0 | 7.90 | 341.20 | 2,648.8 | 264.6 | -220.0 | 344.1 | 2.67 | 344.1 | 320.26 |
| | 2,715.0 | 6.90 | 340.60 | 2,678.5 | 268.3 | -221.2 | 347.7 | 3.34 | 347.7 | 320.49 |
| | 2,745.0 | 5.60 | 339.50 | 2,708.4 | 271.3 | -222.4 | 350.8 | 4.35 | 350.8 | 320.67 |
| | 2,775.0 | 5.00 | 342.30 | 2,738.2 | 274.0 | -223.3 | 353.3 | 2.18 | 353.4 | 320.82 |
| | 2,805.0 | 4.50 | 344.20 | 2,768.1 | 276.3 | -224.0 | 355.6 | 1.75 | 355.7 | 320.97 |
| | 2,835.0 | 4.20 | 344.70 | 2,798.0 | 278.5 | -224.6 | 357.7 | 1.01 | 357.8 | 321.12 |
| | 2,865.0 | 3.60 | 347.20 | 2,828.0 | 280.5 | -225.1 | 359.5 | 2.08 | 359.7 | 321.25 |
| | 2,875.0 | 3.50 | 347.10 | 2,839.0 | 281.2 | -225.2 | 360.1 | 0.91 | 360.3 | 321.30 |

HP
HG Energy EOW Report



Company: HG Energy, LLC
Project: Harrison County, West Virginia
Site: W.F. Williams #232
Well: W.F. Williams #232
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Design: Wellbore #1

Local Co-ordinate Reference: Well W.F. Williams #232
TVD Reference: Well @ 1176.0usft
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass

| Survey | MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | EW (usft) | V. Sec (usft) | DLeg (°/100usft) | Closure Distance (usft) | Closure Azimuth (°) |
|---------------------------|-----------|---------|-------------------|------------|------------|-----------|---------------|------------------|-------------------------|---------------------|
| TD @ 2940' MD / 2903' TVD | 2,940.0 | | 347.10 | 2,902.8 | 285.0 | -226.1 | 363.6 | 0.00 | 363.8 | 321.57 |

| Design Annotations | 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 |
| | 2,940.0 | 2,902.8 | 285.0 | -226.1 | TD @ 2940' MD / 2903' TVD |

Checked By: _____ Approved By: _____ Date: _____

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 DEC 15 2015
 WV GEOLOGICAL SURVEY
 MORGANTOWN, WV

Company Name: HG Energy, LLC
 W.F. Williams #232
 Harrison County, West Virginia
 Rig: Decker 9
 Created By: Jerry Arsenault
 Date: 4/13/2015

W.F. Williams #232
 Harrison County, West Virginia
 Q150318 & AM-150282
 Design #1

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 DEC 15 2015
 WV GEOLOGICAL SURVEY
 MORGANTOWN, WV



PROJECT DETAILS: Harrison County, West Virginia
 Geodetic System: Universal Transverse Mercator
 Ellipsoid: GRS 1980
 Zone: 17N (84 W to 78 W)
 System Datum: Mean Sea Level

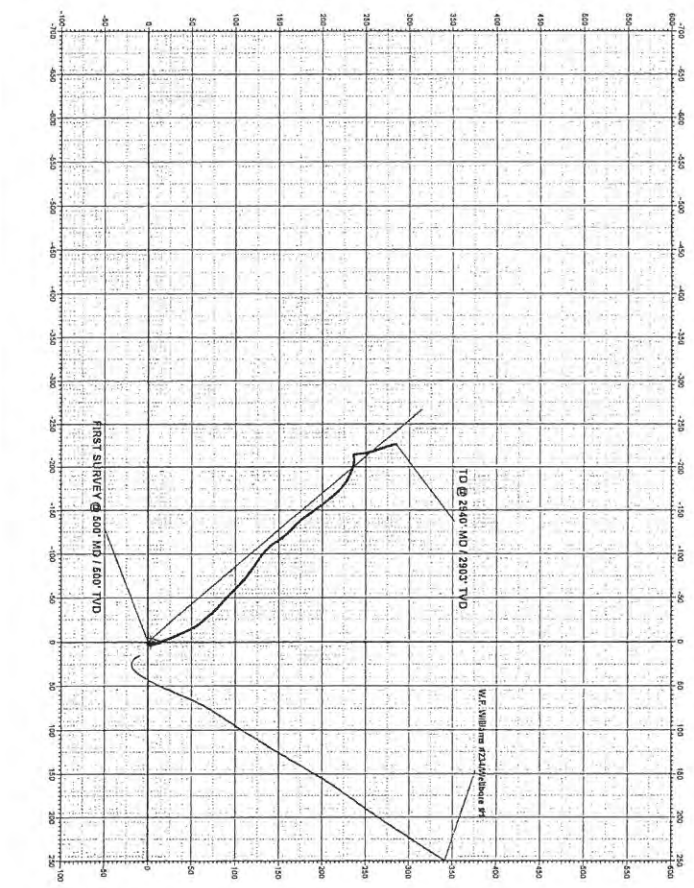
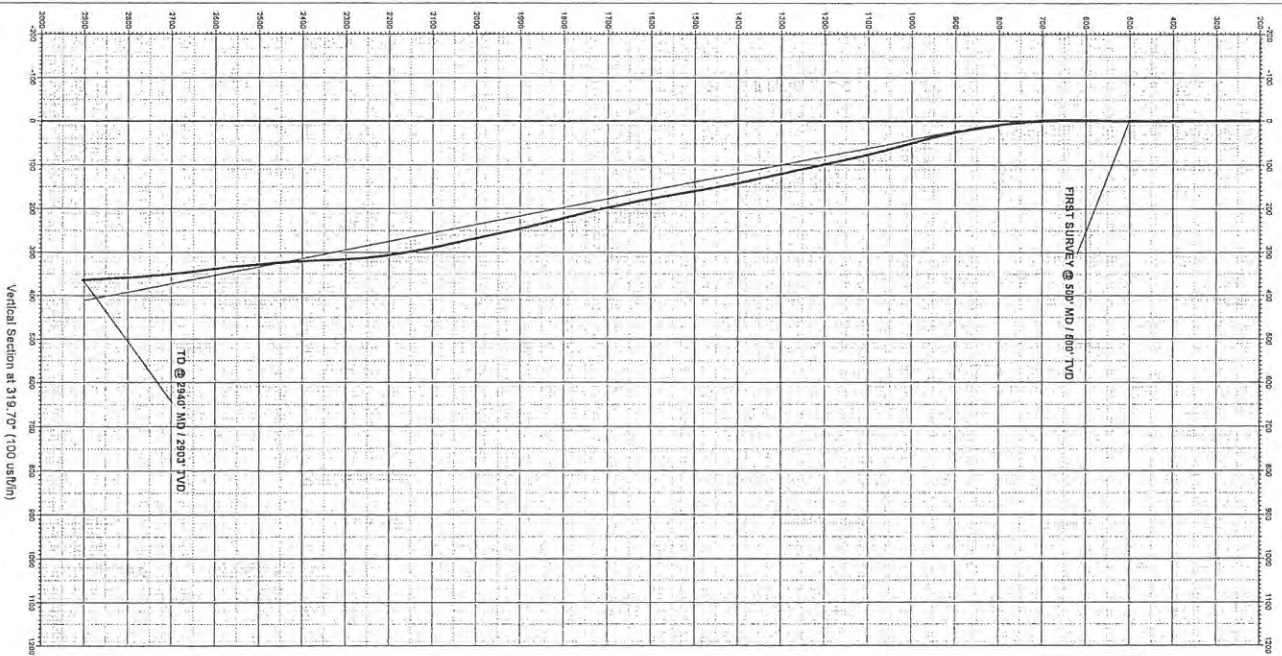
WELL DETAILS: W.F. Williams #232
 Ground Level: 1188.0
 +N/3 +E/W Northing: 1182478.55 Easting: 1971516.00 N 80° 29' 52.800 W
 0.0 0.0

DESIGN TARGET DETAILS
 Name: TD 2755.0 +N/3 +E/W Northing: 1782328.27 Easting: 1972000.0 N 80° 29' 55.000 W
 -Plan View target center

HG Energy

ANNOTATIONS
 MD 0.0 +N/3 +E/W Vsect-Departure Annotation: TD@500' MD / 500' TVD
 2840.0 3.50 247.10 2902.8 285.0 -255.1 385.5 386.5 TD@340' MD / 2803' TVD

Azimuths to Grid North
 Correction: -9.02°
 Magnetic Field
 Strength: 52155.4srT
 Dip Angle: 66.68°
 Date: 3/31/2015
 Model: IGRF2010



Vertical Section at 319.70' (100 usft/in)