

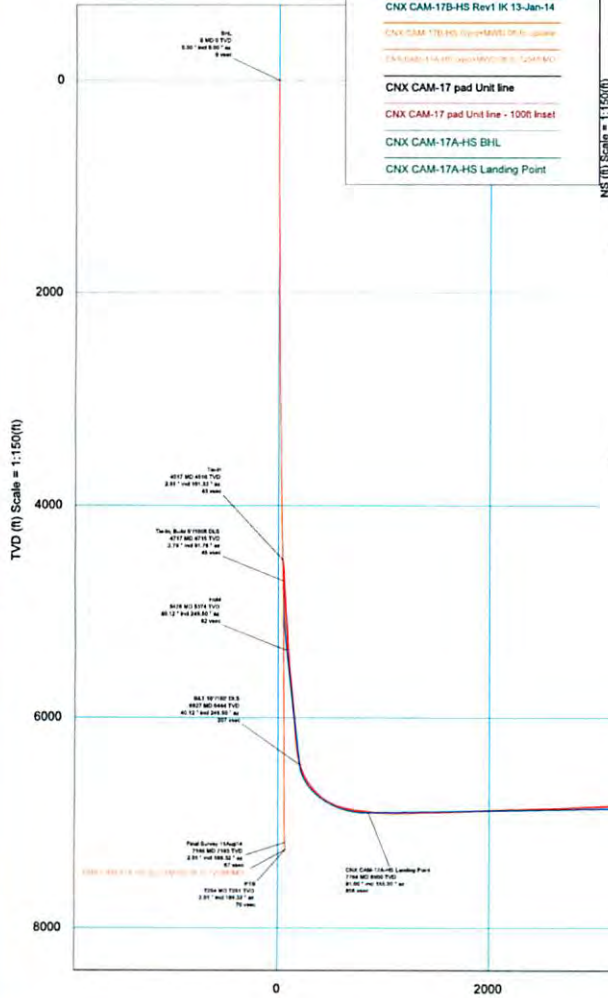
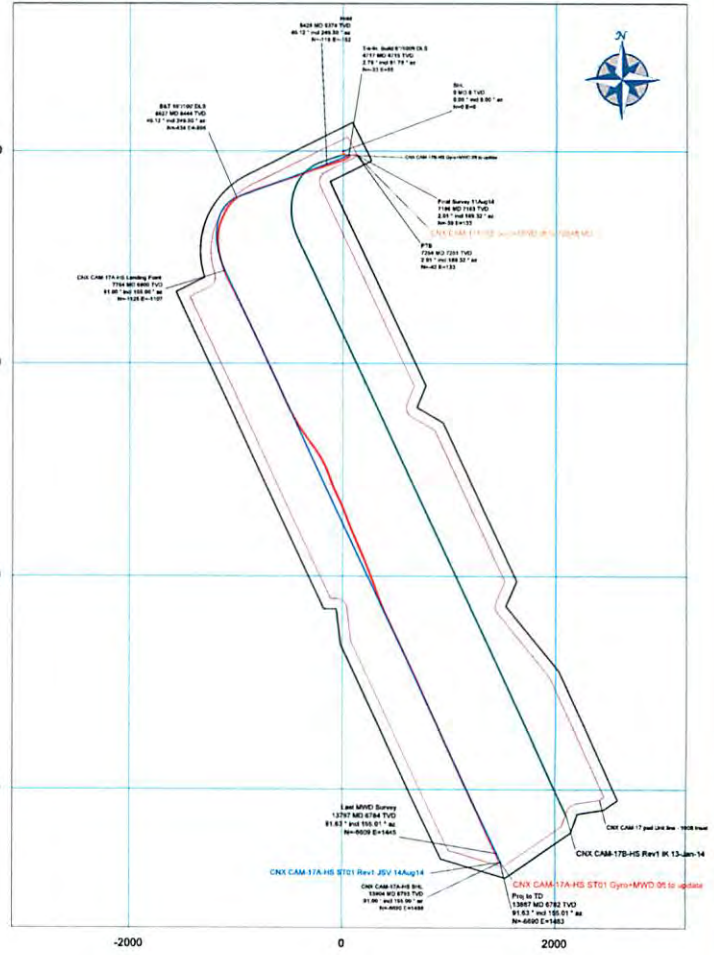
| | | | |
|-----------------------|-------------------------|--|---------------------------------|
| Borehole: ST01 | Well: CAM-17A-HS | Field: WV Lewis County (NAD 27) | Structure: Patterson 278 |
|-----------------------|-------------------------|--|---------------------------------|

| | | | | | | | |
|--|-----------------|--|--------------------|--|------------------------|---|--------------------------------|
| Gravity & Magnetic Parameters | | Surface Location | | NAD27 West Virginia State Plane, Southern Zone, US Feet | | Miscellaneous | |
| Model: HDGM 2013 | Dip: 66.888° | Date: 14-Aug-2014 | Lat: N 39 4 45.42 | Northing: 757431.88US | Grid Conv: 0.2552' | Shot: CAM-17A-HS | TVD Ref: KR(1272.00 above MSL) |
| MagDec: -8.3° | FB: 82395.821nT | Gravity FS: 999.288mgals (9.80665 Based) | Lon: W 80 26 13.20 | Easting: 2117284.28US | Scale Fact: 1.80054764 | Plan: CNX CAM-17A-HS ST01 Gyro-MWD DR to update | |

| Borehole | | Easting | | Latitude | | Longitude | | V-true Azimuth | | 167.461 | |
|------------------------------|-------|---------|----|----------|----|-----------|----|----------------|----|-------------|----|
| Target Name | | Depth | | Diameter | | Length | | Flow | | Local Depth | |
| CNX CAM-17 pad Unit line | Pad | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| CNX CAM-17A-HS BHL | Plan | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| CNX CAM-17A-HS Landing Point | Point | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Critical Point | | MD | | ASB | | VDR | | NVC/PS | | DLS | |
|-----------------|----------|-------|--------|---------|---------|----------|---------|--------|--|------|--|
| Top | 4918.00 | 2.01 | 19.33 | 4918.00 | 47.83 | -33.31 | 49.89 | | | | |
| Land MWD Survey | 13987.00 | 81.83 | 188.91 | 8184.10 | 8308.80 | -4699.92 | 1460.32 | | | 6.48 | |
| Pls to TD | 13987.00 | 81.83 | 188.91 | 8184.10 | 8308.80 | -4699.92 | 1460.32 | | | 6.48 | |

| PAFF | Seq | Survey Tool | Vendor/Tool | Start Date | End Date | MD From | MD To | Survey Frequency | SDI Size (Inch) | SDI Size (mm) | Contingency |
|------|-----|-----------------|-------------|------------|----------|---------|--------|------------------|-----------------|---------------|-------------|
| 1 | 1 | SLS_MWD-MWD-Dyn | DL | 30 | 30 | 0 | 29.9 | Act Site | 1.25 | 31.75 | |
| 1 | 2 | SLS_MWD-ROT | DL | 30 | 30 | 29.9 | 4918.0 | Act Site | 11.34 | 5.88 | |
| 1 | 3 | SLS_MWD-STD | DL | 30 | 30 | 4918.0 | 13791 | Act Site | 176.81 | 32.86 | |
| 1 | 4 | SLS_MWD-TRND | DL | 30 | 30 | 13791 | 13847 | Act Site | 188.9 | 37.35 | |



Vertical Section (ft) Azim = 167.461° Scale = 1:150(ft) Origin = 0N=0, 0E=0

RECEIVED
Office of Oil and Gas

JUL 31 2015

WV Department of Environmental Protection 08/21/2015

CONTROLLED

Drawn by: []
Checked by: []
Date: []
Scale: []
Title: []

Grid
True
Mag
Grid North
Tot Corr (M-G -8.555°)
Mag Dec (-8.300°)
Grid Conv (0.255')

CNX CAM-17A-HS ST01 Gyro+MWD Off to 13887ft MD
(Non-Def Survey)

September 02, 2014 - 09:05 AM

CNX

WV Lewis County (NAD 27)

CNX CAM-17 Pad / CAM-17A-HS

CAM-17A-HS

ST01

Unknown / Unknown

CNX CAM-17A-HS ST01 Gyro+MWD Off to up

14-Aug-14

267.119° / 8116.052 ft / 6.640 / 1.176

NAD27 West Virginia State Plane, Southern Zone

N 39° 4' 45.41992", W 80° 35' 13.20390"

N 757491.500 ftUS, E 2117254.200 ftUS

0.2553°

1.000048

2.7.1043.0

Survey / DLS Computa Minimum Curvature / Lubinski

Vertical Section Azimu 167.461° (Grid North)

Vertical Section Origin 0.000 ft, 0.000 ft

TVD Reference Datum KB

TVD Reference Elevati 1272.500 ft above MSL

Seabed / Ground Elevi 1244.000 ft above MSL

Magnetic Declination: -8.300°

Total Gravity Field Stre 999.2878mgn (9.80665 Based)

Gravity Model: GARM

Total Magnetic Field S 52395.521 nT

Magnetic Dip Angle: 66.585°

Declination Date: 14-Aug-14

Magnetic Declination I HDGM 2013

North Reference: Grid North

Grid Convergence Use 0.2553°

Total Corr Mag North- -8.5554°

Local Coord Reference Well Head

| MD | Incl | Azim | Grid | TVD | TVDSS | VSEC | NS | EW | DLS | BR | TR | Northing | Easting | Latitude | Longitude | Directional Difficulty Index |
|--------|------|--------|---------|---------|---------|-------|--------|-------|-------|-------|--------|----------|----------------------------|----------|-----------|------------------------------|
| 0 | 0 | 0 | 0 | 0 | -1272.5 | 0 | 0 | 0 | N/A | N/A | N/A | 757431.5 | 2117254 N 39 44' W 80 35 1 | | | 0 |
| 116.5 | 0.4 | 299.79 | 116.5 | 116.5 | -1156 | -0.27 | 0.2 | -0.35 | 0.34 | 0.34 | 0 | 757431.7 | 2117254 N 39 44' W 80 35 1 | | | 0 |
| 216.5 | 0.12 | 315.22 | 216.5 | 216.5 | -1056 | -0.6 | 0.45 | -0.73 | 0.29 | -0.28 | 15.43 | 757432.1 | 2117253 N 39 44' W 80 35 1 | | | 0 |
| 316.5 | 0.19 | 306.68 | 316.5 | 316.5 | -956 | -0.81 | 0.62 | -0.94 | 0.07 | 0.07 | -8.54 | 757432.1 | 2117253 N 39 44' W 80 35 1 | | | 0 |
| 416.5 | 0.14 | 246.01 | 416.5 | 416.5 | -856 | -0.91 | 0.67 | -1.18 | 0.17 | -0.05 | -60.67 | 757432.2 | 2117253 N 39 44' W 80 35 1 | | | 0.11 |
| 516.5 | 0.06 | 204.8 | 516.5 | 516.5 | -756 | -0.85 | 0.58 | -1.31 | 0.1 | -0.08 | -41.21 | 757432.1 | 2117253 N 39 44' W 80 35 1 | | | 0.21 |
| 616.5 | 0.15 | 115.14 | 616.5 | 616.5 | -656 | -0.73 | 0.47 | -1.22 | 0.16 | 0.09 | -89.66 | 757432.1 | 2117253 N 39 44' W 80 35 1 | | | 0.31 |
| 716.5 | 0.22 | 133.15 | 716.5 | 716.5 | -556 | -0.49 | 0.29 | -0.96 | 0.09 | 0.07 | 18.01 | 757431.8 | 2117253 N 39 44' W 80 35 1 | | | 0.42 |
| 816.5 | 0.19 | 154.07 | 816.5 | 816.5 | -456 | -0.17 | 0 | -0.75 | 0.08 | -0.03 | 20.92 | 757431.5 | 2117253 N 39 44' W 80 35 1 | | | 0.51 |
| 916.5 | 0.35 | 147.2 | 916.49 | 916.49 | -356.01 | 0.28 | -0.4 | -0.51 | 0.16 | 0.16 | -6.87 | 757431.1 | 2117254 N 39 44' W 80 35 1 | | | 0.64 |
| 1016.5 | 0.52 | 150.48 | 1016.49 | 1016.49 | -256.01 | 1 | -1.05 | -0.12 | 0.17 | 0.17 | 3.28 | 757430.5 | 2117254 N 39 44' W 80 35 1 | | | 0.79 |
| 1116.5 | 0.57 | 145.34 | 1116.49 | 1116.49 | -156.01 | 1.9 | -1.86 | 0.39 | 0.07 | 0.05 | -5.14 | 757429.6 | 2117255 N 39 44' W 80 35 1 | | | 0.91 |
| 1216.5 | 0.56 | 186.62 | 1216.48 | 1216.48 | -56.02 | 2.82 | -2.75 | 0.61 | 0.4 | -0.01 | 41.28 | 757428.8 | 2117255 N 39 44' W 80 35 1 | | | 1.08 |
| 1316.5 | 0.51 | 186.47 | 1316.48 | 1316.48 | 43.98 | 3.7 | -3.68 | 0.51 | 0.05 | -0.05 | -0.15 | 757427.8 | 2117255 N 39 44' W 80 35 1 | | | 1.16 |
| 1416.5 | 0.75 | 177.76 | 1416.47 | 1416.47 | 143.97 | 4.77 | -4.78 | 0.48 | 0.26 | 0.24 | -8.71 | 757426.7 | 2117255 N 39 44' W 80 35 1 | | | 1.27 |
| 1516.5 | 0.56 | 167.19 | 1516.47 | 1516.47 | 243.97 | 5.9 | -5.91 | 0.62 | 0.22 | -0.19 | -10.57 | 757425.6 | 2117255 N 39 44' W 80 35 1 | | | 1.37 |
| 1616.5 | 0.46 | 164.56 | 1616.46 | 1616.46 | 343.96 | 6.79 | -6.77 | 0.83 | 0.1 | -0.1 | -2.63 | 757424.7 | 2117255 N 39 44' W 80 35 1 | | | 1.43 |
| 1716.5 | 0.33 | 151.11 | 1716.46 | 1716.46 | 443.96 | 7.47 | -7.41 | 1.08 | 0.16 | -0.13 | -13.45 | 757424.1 | 2117255 N 39 44' W 80 35 1 | | | 1.48 |
| 1816.5 | 0.46 | 144.8 | 1816.46 | 1816.46 | 543.96 | 8.11 | -7.99 | 1.45 | 0.14 | 0.13 | -6.31 | 757423.5 | 2117256 N 39 44' W 80 35 1 | | | 1.53 |
| 1916.5 | 0.65 | 143.93 | 1916.45 | 1916.45 | 643.95 | 9 | -8.77 | 2.01 | 0.19 | 0.19 | -0.87 | 757422.7 | 2117256 N 39 44' W 80 35 1 | | | 1.59 |
| 2016.5 | 0.49 | 139.17 | 2016.45 | 2016.45 | 743.95 | 9.9 | -9.56 | 2.63 | 0.17 | -0.16 | -4.76 | 757421.9 | 2117257 N 39 44' W 80 35 1 | | | 1.65 |
| 2116.5 | 0.5 | 129.8 | 2116.44 | 2116.44 | 843.94 | 10.62 | -10.16 | 3.24 | 0.08 | 0.01 | -9.37 | 757421.3 | 2117257 N 39 44' W 80 35 1 | | | 1.69 |
| 2216.5 | 0.48 | 146.72 | 2216.44 | 2216.44 | 943.94 | 11.36 | -10.79 | 3.81 | 0.15 | -0.02 | 16.92 | 757420.7 | 2117258 N 39 44' W 80 35 1 | | | 1.73 |
| 2316.5 | 0.52 | 141.95 | 2316.44 | 2316.44 | 1043.94 | 12.16 | -11.5 | 4.32 | 0.06 | 0.04 | -4.77 | 757420.1 | 2117259 N 39 44' W 80 35 1 | | | 1.76 |
| 2416.5 | 0.69 | 154.88 | 2416.43 | 2416.43 | 1143.93 | 13.16 | -12.4 | 4.85 | 0.22 | 0.17 | 12.93 | 757419.1 | 2117259 N 39 44' W 80 35 1 | | | 1.82 |
| 2516.5 | 0.54 | 142.37 | 2516.42 | 2516.42 | 1243.92 | 14.17 | -13.32 | 5.39 | 0.2 | -0.15 | -12.51 | 757418.2 | 2117260 N 39 44' W 80 35 1 | | | 1.86 |
| 2616.5 | 0.71 | 139.27 | 2616.42 | 2616.42 | 1343.92 | 15.14 | -14.16 | 6.09 | 0.17 | 0.17 | -3.1 | 757417.3 | 2117260 N 39 44' W 80 35 1 | | | 1.91 |
| 2716.5 | 0.58 | 169.61 | 2716.41 | 2716.41 | 1443.91 | 16.2 | -15.13 | 6.58 | 0.36 | -0.13 | 30.34 | 757416.4 | 2117261 N 39 44' W 80 35 1 | | | 1.97 |
| 2816.5 | 0.67 | 136.51 | 2816.41 | 2816.41 | 1543.91 | 17.2 | -16.05 | 7.08 | 0.37 | 0.09 | -33.1 | 757415.5 | 2117261 N 39 44' W 80 35 1 | | | 2.02 |
| 2916.5 | 0.93 | 127.93 | 2916.4 | 2916.4 | 1643.9 | 18.33 | -16.97 | 8.12 | 0.29 | 0.26 | -8.58 | 757414.5 | 2117262 N 39 44' W 80 35 1 | | | 2.08 |
| 3016.5 | 0.84 | 124.21 | 3016.39 | 3016.39 | 1743.89 | 19.49 | -17.88 | 9.36 | 0.11 | -0.09 | -3.72 | 757413.6 | 2117264 N 39 44' W 80 35 1 | | | 2.11 |
| 3116.5 | 0.98 | 126.82 | 3116.37 | 3116.37 | 1843.87 | 20.67 | -18.81 | 10.66 | 0.15 | 0.14 | 2.61 | 757412.7 | 2117265 N 39 44' W 80 35 1 | | | 2.15 |
| 3216.5 | 0.62 | 134.7 | 3216.36 | 3216.36 | 1943.86 | 21.78 | -19.7 | 11.72 | 0.38 | -0.36 | 7.88 | 757411.8 | 2117266 N 39 44' W 80 35 1 | | | 2.2 |
| 3316.5 | 0.64 | 143.42 | 3316.36 | 3316.36 | 2043.86 | 22.74 | -20.53 | 12.44 | 0.1 | 0.02 | 8.72 | 757411.1 | 2117267 N 39 44' W 80 35 1 | | | 2.23 |
| 3416.5 | 0.78 | 124.56 | 3416.35 | 3416.35 | 2143.85 | 23.75 | -21.36 | 13.34 | 0.27 | 0.14 | -18.86 | 757410.1 | 2117268 N 39 44' W 80 35 1 | | | 2.27 |
| 3516.5 | 0.77 | 120.16 | 3516.34 | 3516.34 | 2243.84 | 24.7 | -22.09 | 14.48 | 0.06 | -0.01 | -4.4 | 757409.4 | 2117269 N 39 44' W 80 35 1 | | | 2.29 |
| 3616.5 | 1.01 | 122.42 | 3616.33 | 3616.33 | 2343.83 | 25.78 | -22.9 | 15.8 | 0.24 | 0.24 | 2.26 | 757408.6 | 2117270 N 39 44' W 80 35 1 | | | 2.33 |
| 3716.5 | 1.24 | 141.97 | 3716.31 | 3716.31 | 2443.81 | 27.38 | -24.22 | 17.21 | 0.44 | 0.23 | 19.55 | 757407.3 | 2117271 N 39 44' W 80 35 1 | | | 2.38 |
| 3816.5 | 1.61 | 132.46 | 3816.28 | 3816.28 | 2543.78 | 29.51 | -26.02 | 18.92 | 0.44 | 0.37 | -9.51 | 757405.5 | 2117273 N 39 44' W 80 35 1 | | | 2.44 |
| 3916.5 | 1.78 | 127.32 | 3916.28 | 3916.28 | 2643.73 | 31.85 | -27.91 | 21.19 | 0.23 | 0.17 | -5.14 | 757403.6 | 2117275 N 39 44' W 80 35 1 | | | 2.49 |
| 4016.5 | 2.18 | 107.87 | 4016.18 | 4016.18 | 2743.68 | 34 | -29.44 | 24.23 | 0.78 | 0.4 | -19.45 | 757402.1 | 2117278 N 39 44' W 80 35 1 | | | 2.56 |
| 4116.5 | 2.22 | 104.16 | 4116.1 | 4116.1 | 2843.6 | 35.83 | -30.5 | 27.92 | 0.15 | 0.04 | -3.71 | 757401 | 2117282 N 39 44' W 80 35 1 | | | 2.61 |
| 4216.5 | 2.47 | 105.12 | 4216.02 | 4216.02 | 2943.52 | 37.7 | -31.53 | 31.88 | 0.25 | 0.25 | 0.96 | 757400 | 2117286 N 39 44' W 80 35 1 | | | 2.66 |
| 4316.5 | 2.68 | 108.91 | 4315.92 | 4315.92 | 3043.42 | 39.92 | -32.85 | 36.17 | 0.27 | 0.21 | 3.79 | 757398.7 | 2117290 N 39 44' W 80 35 1 | | | 2.71 |
| 4416.5 | 2.83 | 83.18 | 4415.81 | 4415.81 | 3143.31 | 41.39 | -33.32 | 40.83 | 1.24 | 0.15 | -25.73 | 757398.2 | 2117295 N 39 44' W 80 35 1 | | | 2.8 |
| 4516.5 | 2.81 | 101.33 | 4515.69 | 4515.69 | 3243.19 | 42.63 | -33.51 | 45.69 | 0.89 | -0.02 | 18.15 | 757398 | 2117300 N 39 44' W 80 35 1 | | | 2.87 |
| 4524 | 7.56 | 111.37 | 4523.15 | 4523.15 | 3250.65 | 42.98 | -33.72 | 46.33 | 64.24 | 63.33 | 133.87 | 757397.8 | 2117301 N 39 44' W 80 35 1 | | | 3.02 |
| 4555 | 9.5 | 117.04 | 4553.81 | 4553.81 | 3281.31 | 45.74 | -35.63 | 50.51 | 6.81 | 6.26 | 18.29 | 757395.9 | 2117305 N 39 44' W 80 35 1 | | | 3.11 |
| 4587 | 8.62 | 119.2 | 4585.41 | 4585.41 | 3312.91 | 49.02 | -38 | 54.95 | 2.95 | -2.75 | 6.75 | 757395.5 | 2117309 N 39 44' W 80 35 1 | | | 3.16 |
| 4618 | 5.72 | 127.88 | 4616.17 | 4616.17 | 3343.67 | 51.76 | -40.08 | 58.2 | 9.96 | -9.35 | 28 | 757391.4 | 2117312 N 39 44' W 80 35 1 | | | 3.25 |
| 4649 | 4.04 | 132.58 | 4647.05 | 4647.05 | 3374.55 | 53.85 | -41.77 | 60.22 | 5.57 | -5.42 | 15.16 | 757389.7 | 2117314 N 39 44' W 80 35 1 | | | 3.29 |
| 4681 | 3.69 | 127.17 | 4678.98 | 4678.98 | 3406.48 | 55.56 | -43.15 | 61.87 | 1.58 | -1.09 | -16.91 | 757388.4 | 2117316 N 39 44' W 80 35 1 | | | 3.31 |
| 4 | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | |
|-------|-------|--------|---------|---------|---------|----------|----------|-------|-------|--------|----------|-----------|----------|---------|------|
| 5341 | 31.66 | 252.08 | 5304.69 | 4032.19 | 91.94 | -116.01 | -98.13 | 4.92 | 4.68 | -3 | 757315.5 | 2117156 N | 39 4 4 W | 80 35 1 | 4.2 |
| 5388 | 34.91 | 252.7 | 5343.98 | 4071.48 | 94.21 | -123.81 | -122.71 | 6.95 | 6.91 | 1.32 | 757307.7 | 2117131 N | 39 4 4 W | 80 35 1 | 4.26 |
| 5435 | 37.11 | 252.35 | 5381.99 | 4109.49 | 96.59 | -132.1 | -149.06 | 4.7 | 4.68 | -0.74 | 757299.4 | 2117105 N | 39 4 4 W | 80 35 1 | 4.32 |
| 5482 | 36.76 | 251.94 | 5419.56 | 4147.06 | 99.21 | -140.76 | -175.95 | 0.91 | -0.74 | -0.87 | 757290.7 | 2117078 N | 39 4 4 W | 80 35 1 | 4.36 |
| 5529 | 39.57 | 252.34 | 5456.51 | 4184.01 | 101.9 | -149.67 | -203.59 | 6 | 5.98 | 0.85 | 757281.8 | 2117051 N | 39 4 4 W | 80 35 1 | 4.41 |
| 5576 | 40.8 | 252.8 | 5492.42 | 4219.92 | 104.48 | -158.75 | -232.52 | 2.69 | 2.62 | 0.98 | 757272.7 | 2117022 N | 39 4 4 W | 80 35 1 | 4.46 |
| 5623 | 40.1 | 251.89 | 5528.18 | 4255.68 | 107.2 | -168 | -261.58 | 1.95 | -1.49 | -1.94 | 757263.5 | 2116993 N | 39 4 4 W | 80 35 1 | 4.49 |
| 5670 | 41.24 | 250.47 | 5563.83 | 4291.33 | 110.55 | -177.88 | -290.57 | 3.12 | 2.43 | -3.02 | 757253.6 | 2116964 N | 39 4 4 W | 80 35 1 | 4.53 |
| 5717 | 40.36 | 249.93 | 5599.41 | 4326.91 | 114.43 | -188.28 | -319.46 | 2.02 | -1.87 | -1.15 | 757243.2 | 2116935 N | 39 4 4 W | 80 35 1 | 4.57 |
| 5764 | 40.1 | 249.81 | 5635.29 | 4362.79 | 118.44 | -198.73 | -347.96 | 0.58 | -0.55 | -0.26 | 757232.8 | 2116906 N | 39 4 4 W | 80 35 1 | 4.6 |
| 5811 | 39.31 | 249.54 | 5671.45 | 4398.95 | 122.51 | -209.16 | -376.12 | 1.72 | -1.68 | -0.57 | 757222.3 | 2116878 N | 39 4 4 W | 80 35 1 | 4.63 |
| 5858 | 40.45 | 250.24 | 5707.52 | 4435.02 | 126.48 | -219.52 | -404.42 | 2.61 | 2.43 | 1.49 | 757212 | 2116850 N | 39 4 4 W | 80 35 1 | 4.66 |
| 5905 | 39.83 | 250.59 | 5743.45 | 4470.95 | 130.2 | -229.67 | -432.96 | 1.4 | -1.32 | 0.74 | 757201.8 | 2116821 N | 39 4 4 W | 80 35 1 | 4.68 |
| 5999 | 41.15 | 251.04 | 5814.93 | 4542.43 | 137.26 | -249.73 | -490.61 | 1.44 | 1.4 | 0.48 | 757181.8 | 2116764 N | 39 4 4 W | 80 35 1 | 4.73 |
| 6093 | 42.21 | 251.97 | 5885.14 | 4612.64 | 143.74 | -269.55 | -549.89 | 1.31 | 1.13 | 0.99 | 757161.9 | 2116704 N | 39 4 4 W | 80 35 2 | 4.78 |
| 6187 | 40.1 | 250.24 | 5955.91 | 4683.41 | 150.57 | -289.56 | -608.41 | 2.55 | -2.24 | -1.84 | 757141.9 | 2116646 N | 39 4 4 W | 80 35 2 | 4.83 |
| 6281 | 40.63 | 250.56 | 6027.53 | 4755.03 | 158.05 | -309.98 | -665.76 | 0.61 | 0.56 | 0.34 | 757121.5 | 2116588 N | 39 4 4 W | 80 35 2 | 4.86 |
| 6376 | 42.12 | 252.69 | 6098.82 | 4826.32 | 164.41 | -329.76 | -725.35 | 2.16 | 1.57 | 2.24 | 757101.7 | 2116529 N | 39 4 4 W | 80 35 2 | 4.91 |
| 6470 | 39.92 | 251.54 | 6169.74 | 4897.24 | 170.15 | -348.69 | -784.06 | 2.47 | -2.34 | -1.22 | 757082.8 | 2116470 N | 39 4 4 W | 80 35 2 | 4.95 |
| 6564 | 40.19 | 249.5 | 6241.7 | 4969.2 | 177.46 | -368.86 | -841.09 | 1.43 | 0.29 | -2.17 | 757062.6 | 2116413 N | 39 4 4 W | 80 35 2 | 4.98 |
| 6658 | 40.71 | 247.76 | 6313.23 | 5040.73 | 186.83 | -391.09 | -897.87 | 1.32 | 0.55 | -1.85 | 757040.4 | 2116356 N | 39 4 4 W | 80 35 2 | 5.01 |
| 6752 | 39.22 | 245.42 | 6385.28 | 5112.78 | 198.19 | -415.05 | -953.28 | 2.25 | -1.59 | -2.49 | 757016.4 | 2116301 N | 39 4 4 W | 80 35 2 | 5.05 |
| 6799 | 38.16 | 240.39 | 6421.97 | 5149.47 | 205.56 | -428.41 | -979.42 | 7.06 | -2.26 | -10.7 | 757003.1 | 2116275 N | 39 4 4 W | 80 35 2 | 5.08 |
| 6846 | 37.99 | 234.65 | 6458.98 | 5186.48 | 215.43 | -443.96 | -1003.85 | 7.54 | -0.36 | -12.21 | 756987.5 | 2116250 N | 39 4 4 W | 80 35 2 | 5.1 |
| 6893 | 37.99 | 226.86 | 6496.04 | 5223.54 | 228.41 | -462.23 | -1026.22 | 10.2 | 0 | -16.57 | 756969.3 | 2116228 N | 39 4 4 W | 80 35 2 | 5.13 |
| 6940 | 39.04 | 222.1 | 6532.83 | 5260.33 | 244.34 | -483.11 | -1046.7 | 6.69 | 2.23 | -10.13 | 756948.4 | 2116207 N | 39 4 4 W | 80 35 2 | 5.16 |
| 6987 | 40.01 | 216.72 | 6569.09 | 5296.59 | 262.78 | -506.21 | -1065.66 | 7.57 | 2.06 | -11.45 | 756925.3 | 2116188 N | 39 4 4 W | 80 35 2 | 5.18 |
| 7034 | 42.12 | 211.42 | 6604.54 | 5332.04 | 283.99 | -531.78 | -1082.92 | 8.66 | 4.49 | -11.28 | 756899.7 | 2116171 N | 39 4 4 W | 80 35 2 | 5.21 |
| 7081 | 44.67 | 208.25 | 6638.69 | 5366.19 | 307.85 | -559.79 | -1098.96 | 7.13 | 5.43 | -6.74 | 756871.7 | 2116155 N | 39 4 3 W | 80 35 2 | 5.23 |
| 7128 | 46.6 | 205.47 | 6671.55 | 5399.05 | 333.82 | -589.77 | -1114.13 | 5.89 | 4.11 | -5.91 | 756841.7 | 2116140 N | 39 4 3 W | 80 35 2 | 5.25 |
| 7175 | 49.59 | 202.82 | 6702.94 | 5430.44 | 361.87 | -621.69 | -1128.41 | 7.62 | 6.36 | -5.64 | 756809.8 | 2116126 N | 39 4 3 W | 80 35 2 | 5.28 |
| 7222 | 52.5 | 200.94 | 6732.49 | 5459.99 | 392.03 | -655.6 | -1142.02 | 6.93 | 6.19 | -4 | 756775.9 | 2116112 N | 39 4 3 W | 80 35 2 | 5.3 |
| 7268 | 56.45 | 195.74 | 6759.23 | 5486.73 | 424.15 | -691.12 | -1153.75 | 12.58 | 8.59 | -11.3 | 756740.4 | 2116100 N | 39 4 3 W | 80 35 2 | 5.33 |
| 7316 | 60.59 | 191.02 | 6784.3 | 5511.8 | 460.96 | -730.93 | -1163.18 | 12.03 | 8.63 | -9.83 | 756700.5 | 2116091 N | 39 4 3 W | 80 35 2 | 5.36 |
| 7363 | 64.19 | 186.57 | 6806.09 | 5533.59 | 499.75 | -772.07 | -1169.52 | 11.36 | 7.66 | -9.47 | 756659.4 | 2116085 N | 39 4 3 W | 80 35 2 | 5.39 |
| 7410 | 68.15 | 182.07 | 6825.08 | 5552.58 | 540.88 | -814.92 | -1172.73 | 12.15 | 8.43 | -9.57 | 756616.5 | 2116081 N | 39 4 3 W | 80 35 2 | 5.42 |
| 7457 | 72.98 | 176.9 | 6840.72 | 5568.22 | 584.2 | -859.21 | -1172.3 | 14.6 | 10.28 | -11 | 756572.3 | 2116082 N | 39 4 3 W | 80 35 2 | 5.46 |
| 7504 | 76.24 | 172.7 | 6853.2 | 5580.7 | 629.13 | -904.32 | -1168.18 | 11.06 | 6.94 | -8.94 | 756527.1 | 2116086 N | 39 4 3 W | 80 35 2 | 5.48 |
| 7552 | 78.7 | 169.66 | 6863.61 | 5591.11 | 675.88 | -950.61 | -1160.99 | 8.03 | 5.13 | -6.33 | 756480.9 | 2116093 N | 39 4 3 W | 80 35 2 | 5.51 |
| 7599 | 80.11 | 166.6 | 6872.26 | 5599.76 | 722.07 | -995.81 | -1151.49 | 7.07 | 3 | -6.51 | 756435.6 | 2116103 N | 39 4 3 W | 80 35 2 | 5.53 |
| 7646 | 82.13 | 163.47 | 6879.51 | 5607.01 | 768.45 | -1040.66 | -1139.5 | 7.86 | 4.3 | -6.66 | 756390.8 | 2116115 N | 39 4 3 W | 80 35 2 | 5.55 |
| 7693 | 83.54 | 161.21 | 6885.38 | 5612.88 | 814.9 | -1085.1 | -1125.35 | 5.64 | 3 | -4.81 | 756346.4 | 2116129 N | 39 4 3 W | 80 35 2 | 5.57 |
| 7740 | 84.24 | 158.77 | 6890.38 | 5617.88 | 861.23 | -1129 | -1109.36 | 5.37 | 1.49 | -5.19 | 756302.4 | 2116145 N | 39 4 3 W | 80 35 2 | 5.59 |
| 7787 | 85.3 | 155.92 | 6894.67 | 5622.17 | 907.3 | -1172.19 | -1091.33 | 6.45 | 2.26 | -6.06 | 756259.3 | 2116163 N | 39 4 3 W | 80 35 2 | 5.61 |
| 7834 | 87.05 | 153.49 | 6897.8 | 5625.3 | 953.03 | -1214.58 | -1071.13 | 6.36 | 3.72 | -5.17 | 756216.9 | 2116183 N | 39 4 3 W | 80 35 2 | 5.63 |
| 7875 | 88.72 | 153.09 | 6899.31 | 5626.81 | 992.76 | -1251.18 | -1052.88 | 4.19 | 4.07 | -0.98 | 756180.3 | 2116201 N | 39 4 3 W | 80 35 2 | 5.65 |
| 7970 | 89.08 | 153.22 | 6901.14 | 5628.64 | 1084.79 | -1335.93 | -1009.99 | 0.4 | 0.38 | 0.14 | 756095.5 | 2116244 N | 39 4 3 W | 80 35 2 | 5.67 |
| 8064 | 91.45 | 154.65 | 6900.7 | 5628.2 | 1176.18 | -1420.36 | -968.69 | 2.94 | 2.52 | 1.52 | 756011.1 | 2116285 N | 39 4 3 W | 80 35 2 | 5.7 |
| 8158 | 91.8 | 154.5 | 6898.04 | 5625.54 | 1267.77 | -1505.22 | -928.35 | 0.41 | 0.37 | -0.16 | 755926.2 | 2116326 N | 39 4 3 W | 80 35 2 | 5.72 |
| 8252 | 91.71 | 153.35 | 6895.16 | 5622.66 | 1359.12 | -1589.61 | -887.05 | 1.23 | -0.1 | -1.22 | 755841.8 | 2116367 N | 39 4 2 W | 80 35 2 | 5.75 |
| 8347 | 91.19 | 155.15 | 6892.75 | 5620.25 | 1451.57 | -1675.15 | -845.18 | 1.97 | -0.55 | 1.89 | 755756.3 | 2116408 N | 39 4 2 W | 80 35 2 | 5.77 |
| 8441 | 91.36 | 155.02 | 6890.66 | 5618.16 | 1543.36 | -1760.38 | -806.21 | 0.23 | 0.18 | -0.14 | 755671 | 2116448 N | 39 4 2 W | 80 35 2 | 5.79 |
| 8535 | 91.63 | 154.94 | 6888.21 | 5615.71 | 1635.11 | -1845.53 | -766.47 | 0.3 | 0.29 | -0.09 | 755585.9 | 2116488 N | 39 4 2 W | 80 35 2 | 5.82 |
| 8630 | 91.28 | 154.68 | 6885.8 | 5613.3 | 1727.77 | -1931.47 | -726.04 | 0.46 | -0.37 | -0.27 | 755499.9 | 2116528 N | 39 4 2 W | 80 35 2 | 5.84 |
| 8724 | 91.89 | 155.57 | 6883.2 | 5610.7 | 1819.56 | -2016.71 | -686.52 | 1.15 | 0.65 | 0.95 | 755414.7 | 2116568 N | 39 4 2 W | 80 35 2 | 5.86 |
| 8817 | 92.07 | 155.8 | 6879.98 | 5607.48 | 1910.55 | -2101.41 | -648.25 | 0.31 | 0.19 | 0.25 | 755330 | 2116606 N | 39 4 2 W | 80 35 2 | 5.88 |
| 8912 | 91.63 | 154.88 | 6876.92 | 5604.42 | 2003.39 | -2187.7 | -608.63 | 1.07 | -0.46 | -0.97 | 755243.7 | 2116646 N | 39 4 2 W | 80 35 2 | 5.9 |
| 9006 | 92.51 | 156.68 | 6873.52 | 5601.02 | 2095.37 | -2273.37 | -570.1 | 2.13 | 0.94 | -1.91 | 755158 | 2116684 N | 39 4 2 W | 80 35 2 | 5.92 |
| 9100 | 91.71 | 155.06 | 6870.06 | 5597.56 | 2187.39 | -2359.09 | -531.7 | 1.92 | -0.85 | -1.72 | 755072.3 | 2116722 N | 39 4 2 W | 80 35 2 | 5.94 |
| 9195 | 91.45 | 152.22 | 6867.44 | 5594.94 | 2279.6 | -2444.17 | -489.54 | 3 | -0.27 | -2.99 | 754987.2 | 2116765 N | 39 4 2 W | 80 35 1 | 5.96 |
| 9289 | 91.63 | 150.08 | 6864.91 | 5592.41 | 2369.77 | -2526.47 | -444.2 | 2.28 | 0.19 | -2.28 | 754904.9 | 2116810 N | 39 4 2 W | 80 35 1 | 5.98 |
| 9383 | 91.36 | 147.14 | 6862.46 | 5589.96 | 2458.69 | -2606.68 | -395.26 | 3.14 | -0.29 | -3.13 | 754824.7 | 2116859 N | 39 4 1 W | 80 35 1 | 6 |
| 9477 | 91.63 | 144.72 | 6860.01 | 5587.51 | 2546.1 | -2684.51 | -342.62 | 2.59 | 0.29 | -2.57 | 754746.9 | 2116912 N | 39 4 1 W | 80 35 1 | 6.03 |
| 9572 | 91.63 | 142.25 | 6857.31 | 5584.81 | 2632.86 | -2760.83 | -286.12 | 2.6 | 0 | -2.6 | 754670.6 | 2116968 N | 39 4 1 W | 80 35 1 | 6.05 |
| 9666 | 93.39 | 146.35 | 6853.19 | 5580.69 | 2719.18 | -2837.07 | -231.33 | 4.74 | 1.87 | 4.36 | 754594.3 | 2117023 N | 39 4 1 W | 80 35 1 | 6.07 |
| 9760 | 92.68 | 152.27 | 6848.21 | 5575.71 | 2808.33 | -2917.75 | -183.45 | 6.33 | -0.76 | 6.3 | 754513.6 | 2117071 N | 39 4 1 W | 80 35 1 | 6.1 |
| 9854 | 92.15 | 157.96 | 6844.24 | 5571.74 | 2900.04 | -3002.91 | -143.94 | 6.07 | -0.56 | 6.05 | 754428.5 | 2117110 N | 39 4 1 W | 80 35 1 | 6.12 |
| 9948 | 92.86 | 160.02 | 6840.13 | 5567.63 | 2992.92 | -3090.58 | -110.28 | 2.32 | 0.76 | 2.19 | 754340.8 | 2117144 N | 39 4 1 W | 80 35 1 | 6.14 |
| 10040 | 93.47 | 156.38 | 6835.05 | 5562.55 | 3083.57 | -3175.85 | -76.17 | 4.01 | 0.66 | -3.96 | 754255.5 | 2117178 N | 39 4 1 W | 80 35 1 | 6.16 |
| 10134 | 92.59 | 154.36 | 6830.08 | 5557.58 | 3175.35 | -3261.17 | -37.05 | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|-------|-------|--------|---------|---------|---------|----------|---------|------|-------|-------|----------|---------|---|----|---|----|---|----|----|------|
| 11827 | 90.66 | 155.19 | 6811.15 | 5538.65 | 4840.01 | -4820.33 | 620.19 | 0.22 | -0.19 | -0.12 | 752611 | 2117874 | N | 39 | 3 | 5' | W | 80 | 35 | 6.43 |
| 11922 | 90.66 | 155.09 | 6810.05 | 5537.55 | 4932.81 | -4906.52 | 660.12 | 0.11 | 0 | -0.11 | 752524.8 | 2117914 | N | 39 | 3 | 5' | W | 80 | 35 | 6.44 |
| 12015 | 90.66 | 155.27 | 6808.98 | 5536.48 | 5023.68 | -4990.93 | 699.16 | 0.19 | 0 | 0.19 | 752440.3 | 2117953 | N | 39 | 3 | 5' | W | 80 | 35 | 6.45 |
| 12110 | 90.84 | 155.24 | 6807.74 | 5535.24 | 5116.52 | -5077.2 | 738.92 | 0.19 | 0.19 | -0.03 | 752354.1 | 2117993 | N | 39 | 3 | 5' | W | 80 | 35 | 6.46 |
| 12204 | 90.75 | 155.45 | 6806.43 | 5533.93 | 5208.42 | -5162.62 | 778.13 | 0.24 | -0.1 | 0.22 | 752268.7 | 2118032 | N | 39 | 3 | 5' | W | 80 | 35 | 6.47 |
| 12298 | 90.66 | 155.1 | 6805.28 | 5532.78 | 5300.29 | -5248 | 817.44 | 0.38 | -0.1 | -0.37 | 752183.3 | 2118072 | N | 39 | 3 | 5' | W | 80 | 35 | 6.48 |
| 12392 | 90.57 | 155.27 | 6804.27 | 5531.77 | 5392.14 | -5333.31 | 856.89 | 0.2 | -0.1 | 0.18 | 752098 | 2118111 | N | 39 | 3 | 5' | W | 80 | 35 | 6.49 |
| 12486 | 90.84 | 155.57 | 6803.11 | 5530.61 | 5484.06 | -5418.79 | 895.99 | 0.43 | 0.29 | 0.32 | 752012.5 | 2118150 | N | 39 | 3 | 5' | W | 80 | 35 | 6.5 |
| 12580 | 90.57 | 155.56 | 6801.95 | 5529.45 | 5576.04 | -5504.36 | 934.87 | 0.29 | -0.29 | -0.01 | 751926.9 | 2118189 | N | 39 | 3 | 5' | W | 80 | 35 | 6.51 |
| 12674 | 90.48 | 154.32 | 6801.09 | 5528.59 | 5667.8 | -5589.51 | 974.68 | 1.32 | -0.1 | -1.32 | 751841.7 | 2118229 | N | 39 | 3 | 5' | W | 80 | 35 | 6.52 |
| 12768 | 90.4 | 154.74 | 6800.37 | 5527.87 | 5759.41 | -5674.37 | 1015.11 | 0.45 | -0.09 | 0.45 | 751756.9 | 2118269 | N | 39 | 3 | 4' | W | 80 | 35 | 6.53 |
| 12862 | 91.01 | 155.43 | 6799.22 | 5526.72 | 5851.22 | -5759.61 | 1054.7 | 0.98 | 0.65 | 0.73 | 751671.6 | 2118309 | N | 39 | 3 | 4' | W | 80 | 35 | 6.54 |
| 12956 | 90.57 | 155.02 | 6797.92 | 5525.42 | 5943.07 | -5844.95 | 1094.09 | 0.64 | -0.47 | -0.44 | 751586.3 | 2118348 | N | 39 | 3 | 4' | W | 80 | 34 | 6.55 |
| 13050 | 90.57 | 154.67 | 6796.98 | 5524.48 | 6034.8 | -5930.03 | 1134.05 | 0.37 | 0 | -0.37 | 751501.2 | 2118388 | N | 39 | 3 | 4' | W | 80 | 34 | 6.56 |
| 13144 | 90.57 | 154.68 | 6796.05 | 5523.55 | 6126.46 | -6014.99 | 1174.25 | 0.01 | 0 | 0.01 | 751416.2 | 2118429 | N | 39 | 3 | 4' | W | 80 | 34 | 6.57 |
| 13238 | 90.66 | 155.25 | 6795.04 | 5522.54 | 6218.23 | -6100.16 | 1214.03 | 0.61 | 0.1 | 0.61 | 751331.1 | 2118468 | N | 39 | 3 | 4' | W | 80 | 34 | 6.58 |
| 13332 | 90.66 | 155.24 | 6793.96 | 5521.46 | 6310.1 | -6185.51 | 1253.39 | 0.01 | 0 | -0.01 | 751245.7 | 2118508 | N | 39 | 3 | 4' | W | 80 | 34 | 6.59 |
| 13426 | 91.28 | 156.33 | 6792.37 | 5519.87 | 6402.14 | -6271.23 | 1291.94 | 1.33 | 0.66 | 1.16 | 751160 | 2118546 | N | 39 | 3 | 4' | W | 80 | 34 | 6.6 |
| 13520 | 91.28 | 156.15 | 6790.27 | 5517.77 | 6494.32 | -6357.24 | 1329.8 | 0.19 | 0 | -0.19 | 751074 | 2118584 | N | 39 | 3 | 4' | W | 80 | 34 | 6.61 |
| 13614 | 91.1 | 155.35 | 6788.31 | 5515.81 | 6586.34 | -6442.93 | 1368.4 | 0.87 | -0.19 | -0.85 | 750988.3 | 2118623 | N | 39 | 3 | 4' | W | 80 | 34 | 6.62 |
| 13708 | 91.28 | 155.09 | 6786.36 | 5513.86 | 6678.18 | -6528.25 | 1407.79 | 0.34 | 0.19 | -0.28 | 750903 | 2118662 | N | 39 | 3 | 4' | W | 80 | 34 | 6.62 |
| 13797 | 91.63 | 155.01 | 6784.1 | 5511.6 | 6765.07 | -6608.92 | 1445.32 | 0.4 | 0.39 | -0.09 | 750822.3 | 2118700 | N | 39 | 3 | 4' | W | 80 | 34 | 6.63 |
| 13887 | 91.63 | 155.01 | 6781.54 | 5509.04 | 6852.92 | -6690.46 | 1483.32 | 0 | 0 | 0 | 750740.7 | 2118738 | N | 39 | 3 | 3' | W | 80 | 34 | 6.64 |

Non-Def Survey

ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

| Part | MD From | MD To | EDU Freq | Hole Size | Casing | Survey Tool Type | Borehole / Survey |
|------|---------|--------|----------|-----------|--------|-------------------|--|
| 1 | 0 | 28.5 | Act Stns | 30 | 30 | SLB_NSG+MSHOT-Def | Original Borehole / CNX CAM-17A-HS Gyro+MWD Off to 7254ft MD |
| 1 | 28.5 | 4516.5 | Act Stns | 30 | 30 | SLB_NSG+MSHOT | Original Borehole / CNX CAM-17A-HS Gyro+MWD Off to 7254ft MD |
| 1 | 4516.5 | 13797 | Act Stns | 30 | 30 | SLB_MWD-STD | STD1 / CNX CAM-17A-HS STD1 Gyro+MWD Off to update |
| 1 | 13797 | 13887 | Act Stns | 30 | 30 | SLB_BLIND+TREND | STD1 / CNX CAM-17A-HS STD1 Gyro+MWD Off to update |

RECEIVED
Office of Oil and Gas

JUL 31 2015

WV Department of
Energy and Mineral Resources
08/21/2015