

State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

API 47-051-02052 County Marshall District Franklin  
Quad Powhatan Point 7.5' Pad Name Blake Field/Pool Name                     
Farm name Wilbert H. Bungard, et ux Well Number Blake N-5HM  
Operator (as registered with the OOG) Tug Hill Operating, LLC  
Address 380 Southpointe Boulevard, Plaza II, Suite 200 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,401,613.92 Easting 516,708.44  
Landing Point of Curve Northing 4,402,117.37 Easting 516,814.14  
Bottom Hole Northing 4,404,376.61 Easting 514,881.15

Elevation (ft) 1315.6' GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other  
Drilled with  Cable  Rotary

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Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine

Mud Type(s) and Additive(s)  
SOBM; Base oil, osmotic inhibitor, weighting agent, viscosifier, emulsifier, hardness buffer, fluid loss additive, LCM, Shale inhibitor, de-foamer, soaping agent, coagulant, flocculant; specific additives per WSSP and Permit.

Date permit issued 8/2/2018 Date drilling commenced 1/12/2019 Date drilling ceased 2/1/2019  
Date completion activities began 2/18/2019 Date completion activities ceased 6/9/2019  
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 70' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1595' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 969-975', 1054-1059' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by:  
*Jim [Signature]*  
7/28/2020

API 47-051 - 02052 Farm name Wilbert H. Bungard, et ux Well number Blake N-5HM

| CASING STRINGS            | Hole Size | Casing Size | Depth   | New or Used | Grade wt/ft | Basket Depth(s) | Did cement circulate (Y/N)<br>* Provide details below* |
|---------------------------|-----------|-------------|---------|-------------|-------------|-----------------|--|
| Conductor                 | 36"       | 30"         | 120'    | NEW         | 94.5#       | N/A             | Y  |
| Surface                   | 17 1/2"   | 13 3/8"     | 1169'   | NEW         | 54.5#       | N/A             | Y  |
| Coal                      | 17 1/2"   | 13 3/8"     | 1169'   | NEW         | 54.5#       | N/A             | Y  |
| Intermediate 1            | 12 1/4"   | 9 5/8"      | 2859'   | NEW         | 36#         | N/A             | Y  |
| Intermediate 2            |           |             |         |             |             |                 |  |
| Intermediate 3            |           |             |         |             |             |                 |  |
| Production                | 8 3/4"    | 5 1/2"      | 16,954' | NEW         | 20#         | N/A             | Y  |
| Tubing                    |           | 2 3/8"      | 8477'   | NEW         | 4.7#        | N/A             |  |
| Packer type and depth set |           |             |         |             |             |                 |  |

Comment Details \_\_\_\_\_

| CEMENT DATA    | Class/Type of Cement | Number of Sacks | Slurry wt (ppg) | Yield (ft <sup>3</sup> /sks) | Volume (ft <sup>3</sup> ) | Cement Top (MD) | WOC (hrs) |
|----------------|----------------------|-----------------|-----------------|------------------------------|---------------------------|-----------------|-----------|
| Conductor      | A                    |                 | 15.6            | 1.19                         |                           | 0               | 8         |
| Surface        | A                    | 1200            | 15.6            | 1.19                         | 1436                      | 0               | 8         |
| Coal           | A                    | 1200            | 15.6            | 1.19                         | 1436                      | 0               | 8         |
| Intermediate 1 | A                    | 908             | 15.6            | 1.19                         | 1077                      | 0               | 8         |
| Intermediate 2 |                      |                 |                 |                              |                           |                 |           |
| Intermediate 3 |                      |                 |                 |                              |                           |                 |           |
| Production     | A                    | 3957            | 14.5            | 1.17                         | 4649                      | 0               | 8         |
| Tubing         |                      |                 |                 |                              |                           |                 |           |

Drillers TD (ft) 16,978' Loggers TD (ft) n/a  
 Deepest formation penetrated Marcellus Plug back to (ft) n/a  
 Plug back procedure n/a

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Kick off depth (ft) 6,163'

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Check all wireline logs run  caliper  density  deviated/directional  induction  
 neutron  resistivity  gamma ray  temperature  sonic

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING 3 centralizers on surface casing at equal distance.  
Intermediate - 1 centralizer every other joint.  
 Production - one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_

API 47- 051 - 02052 Farm name Wilbert H. Bungard, et ux Well number Blake N-5HM

PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|-----------|------------------|------------------------|----------------------|------------------------|--------------|
|           | *see attached    |                        |                      |                        |              |
|           |                  |                        |                      |                        |              |
|           |                  |                        |                      |                        |              |
|           |                  |                        |                      |                        |              |
|           |                  |                        |                      |                        |              |
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|           |                  |                        |                      |                        |              |
|           |                  |                        |                      |                        |              |
|           |                  |                        |                      |                        |              |
|           |                  |                        |                      |                        |              |

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

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Complete a separate record for each stimulation stage.

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Amount of Nitrogen/other (units)

| Stage No. | Stimulations Date | Ave Pump Rate (BPM) | Ave Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen/other (units) |
|-----------|-------------------|---------------------|------------------------------|------------------------------|------------|--------------------------|------------------------|----------------------------------|
|           | attached          |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |
|           |                   |                     |                              |                              |            |                          |                        |                                  |

Please insert additional pages as applicable.

API 47- 051 - 02052 Farm name Wilbert H. Bungard, et ux Well number Blake N-5HM

| <u>PRODUCING FORMATION(S)</u> | <u>DEPTHS</u>        |            |                                 |
|-------------------------------|----------------------|------------|---------------------------------|
| <u>Marcellus</u>              | <u>6535' - 6417'</u> | <u>TVD</u> | <u>7127' - 16978'</u> <u>MD</u> |
| <u> </u>                      | <u> </u>             | <u> </u>   | <u> </u>                        |
| <u> </u>                      | <u> </u>             | <u> </u>   | <u> </u>                        |
| <u> </u>                      | <u> </u>             | <u> </u>   | <u> </u>                        |

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 1132 psi Bottom Hole   psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 0 mcfpd Oil 0 bpd NGL 0 bpd Water 600 bpd  
GAS MEASURED BY  Estimated  Orifice  Pilot

| LITHOLOGY/<br>FORMATION | TOP                     | BOTTOM             | TOP               | BOTTOM            | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND<br>TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC) |
|-------------------------|-------------------------|--------------------|-------------------|-------------------|--|
|                         | DEPTH IN FT<br>NAME TVD | DEPTH IN FT<br>TVD | DEPTH IN FT<br>MD | DEPTH IN FT<br>MD |  |
|                         | 0                       |                    | 0                 |                   |  |
| <u>attached</u>         |                         |                    |                   |                   |  |
|                         |                         |                    |                   |                   |  |
|                         |                         |                    |                   |                   |  |
|                         |                         |                    |                   |                   |  |
|                         |                         |                    |                   |                   |  |
|                         |                         |                    |                   |                   |  |
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|                         |                         |                    |                   |                   | JUL 10 2020  |
|                         |                         |                    |                   |                   | WV Department of<br>Environmental Protection   |
|                         |                         |                    |                   |                   |  |

Please insert additional pages as applicable.

Drilling Contractor Precision  
Address 10358 Richmond Avenue, Suite 700 City Houston State TX Zip 77042

Logging Company n/a  
Address   City   State   Zip  

Cementing Company BJ Services  
Address 4000 Town Center Boulevard City Canonsburg State PA Zip 15317

Stimulating Company Halliburton Energy Services, Inc.  
Address 121 Champion Way, Suite 200 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Amy L. Miller Telephone 304-376-0111  
Signature   Title Permitting Specialist Date

**Blake N-5HM**  
**PERFORATION RECORD**

| Stage No. | Perforation Date | Perforated from MD ft. | Perforated to MD. Ft. | Number of Perforations | Formation(s) |
|-----------|------------------|------------------------|-----------------------|------------------------|--------------|
| 1         | 3/3/2019         | 16,809                 | 16,857                | 16                     | Marcellus    |
| 2         | 3/4/2019         | 16,581                 | 16,727                | 48                     | Marcellus    |
| 3         | 3/4/2019         | 16,406                 | 16,552                | 48                     | Marcellus    |
| 4         | 3/5/2019         | 16,231                 | 16,377                | 48                     | Marcellus    |
| 5         | 3/5/2019         | 16,056                 | 16,202                | 48                     | Marcellus    |
| 6         | 3/6/2019         | 15,881                 | 16,026                | 48                     | Marcellus    |
| 7         | 3/6/2019         | 15,705                 | 15,851                | 48                     | Marcellus    |
| 8         | 3/6/2019         | 15,530                 | 15,676                | 48                     | Marcellus    |
| 9         | 3/7/2019         | 15,355                 | 15,501                | 48                     | Marcellus    |
| 10        | 3/7/2019         | 15,180                 | 15,326                | 48                     | Marcellus    |
| 11        | 3/7/2019         | 15,005                 | 15,151                | 48                     | Marcellus    |
| 12        | 3/8/2019         | 14,830                 | 14,976                | 48                     | Marcellus    |
| 13        | 3/8/2019         | 14,655                 | 14,801                | 48                     | Marcellus    |
| 14        | 3/9/2019         | 14,480                 | 14,626                | 48                     | Marcellus    |
| 15        | 3/9/2019         | 14,305                 | 14,451                | 48                     | Marcellus    |
| 16        | 3/9/2019         | 14,130                 | 14,275                | 48                     | Marcellus    |
| 17        | 3/10/2019        | 13,954                 | 14,100                | 48                     | Marcellus    |
| 18        | 3/10/2019        | 13,779                 | 13,925                | 48                     | Marcellus    |
| 19        | 3/14/2019        | 13,604                 | 13,750                | 48                     | Marcellus    |
| 20        | 3/14/2019        | 13,429                 | 13,575                | 48                     | Marcellus    |
| 21        | 3/14/2019        | 13,254                 | 13,400                | 48                     | Marcellus    |
| 22        | 3/15/2019        | 13,079                 | 13,225                | 48                     | Marcellus    |
| 23        | 3/15/2019        | 12,904                 | 13,050                | 48                     | Marcellus    |
| 24        | 3/15/2019        | 12,729                 | 12,875                | 48                     | Marcellus    |
| 25        | 3/15/2019        | 12,554                 | 12,700                | 48                     | Marcellus    |
| 26        | 3/16/2019        | 12,379                 | 12,524                | 48                     | Marcellus    |
| 27        | 3/16/2019        | 12,203                 | 12,349                | 48                     | Marcellus    |
| 28        | 3/16/2019        | 12,028                 | 12,174                | 48                     | Marcellus    |
| 29        | 3/16/2019        | 11,853                 | 11,999                | 48                     | Marcellus    |
| 30        | 3/17/2019        | 11,678                 | 11,824                | 48                     | Marcellus    |
| 31        | 3/17/2019        | 11,503                 | 11,649                | 48                     | Marcellus    |
| 32        | 3/17/2019        | 11,328                 | 11,474                | 48                     | Marcellus    |
| 33        | 3/17/2019        | 11,153                 | 11,299                | 48                     | Marcellus    |
| 34        | 3/18/2019        | 10,978                 | 11,124                | 48                     | Marcellus    |
| 35        | 3/18/2019        | 10,803                 | 10,949                | 48                     | Marcellus    |
| 36        | 3/18/2019        | 10,628                 | 10,773                | 48                     | Marcellus    |
| 37        | 3/18/2019        | 10,452                 | 10,598                | 48                     | Marcellus    |
| 38        | 3/19/2019        | 10,277                 | 10,423                | 48                     | Marcellus    |
| 39        | 3/19/2019        | 10,102                 | 10,248                | 48                     | Marcellus    |
| 40        | 3/19/2019        | 9,927                  | 10,073                | 48                     | Marcellus    |
| 41        | 3/19/2019        | 9,752                  | 9,898                 | 48                     | Marcellus    |

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| Stage No. | Perforation Date | Perforated from MD ft. | Perforated to MD. Ft. | Number of Perforations | Formation(s) |
|-----------|------------------|------------------------|-----------------------|------------------------|--------------|
| 42        | 3/20/2019        | 9,577                  | 9,723                 | 48                     | Marcellus    |
| 43        | 3/20/2019        | 9,402                  | 9,548                 | 48                     | Marcellus    |
| 44        | 3/20/2019        | 9,227                  | 9,373                 | 48                     | Marcellus    |
| 45        | 3/21/2019        | 9,052                  | 9,198                 | 48                     | Marcellus    |
| 46        | 3/21/2019        | 8,877                  | 9,022                 | 48                     | Marcellus    |
| 47        | 3/21/2019        | 8,701                  | 8,847                 | 48                     | Marcellus    |
| 48        | 3/21/2019        | 8,526                  | 8,672                 | 48                     | Marcellus    |
| 49        | 3/22/2019        | 8,351                  | 8,497                 | 48                     | Marcellus    |
| 50        | 3/22/2019        | 8,176                  | 8,322                 | 48                     | Marcellus    |
| 51        | 3/22/2019        | 8,001                  | 8,147                 | 48                     | Marcellus    |
| 52        | 3/22/2019        | 7,826                  | 7,972                 | 48                     | Marcellus    |
| 53        | 3/22/2019        | 7,651                  | 7,797                 | 48                     | Marcellus    |
| 54        | 3/23/2019        | 7,476                  | 7,622                 | 48                     | Marcellus    |
| 55        | 3/23/2019        | 7,301                  | 7,447                 | 48                     | Marcellus    |
| 56        | 3/23/2019        | 7,126                  | 7,271                 | 48                     | Marcellus    |

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**Blake N-5HM**  
**STIMULATION INFORMATION PER STAGE**

| Stage No. | Ave. Pump Rate (BPM) | Ave Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen/other (units) |
|-----------|----------------------|------------------------------|------------------------------|------------|--------------------------|------------------------|----------------------------------|
| 1         | 80.9                 | 7702                         | 4655                         | 3438       | 349750                   | 7070                   | 0                                |
| 2         | 84.3                 | 7954                         | 5027                         | 4579       | 489940                   | 8835                   | 0                                |
| 3         | 83                   | 7923                         | 4822                         | 4374       | 380870                   | 7656                   | 0                                |
| 4         | 80.4                 | 7510                         | 4840                         | 3437       | 535360                   | 10120                  | 0                                |
| 5         | 83.7                 | 7492                         | 4854                         | 3490       | 526010                   | 10018                  | 0                                |
| 6         | 80.3                 | 7298                         | 4657                         | 3850       | 419915                   | 8405                   | 0                                |
| 7         | 84.6                 | 7452                         | 4814                         | 4142       | 522920                   | 9671                   | 0                                |
| 8         | 83.9                 | 7434                         | 4818                         | 3703       | 529193                   | 9879                   | 0                                |
| 9         | 79.2                 | 7101                         | 4685                         | 3211       | 524180                   | 10108                  | 0                                |
| 10        | 83.2                 | 7344                         | 4862                         | 3293       | 530775                   | 9943                   | 0                                |
| 11        | 82.8                 | 7692                         | 4694                         | 3252       | 518350                   | 9565                   | 0                                |
| 12        | 84.3                 | 7758                         | 5417                         | 3218       | 527523                   | 9728                   | 0                                |
| 13        | 80.4                 | 7843                         | 4993                         | 3412       | 536523                   | 9771                   | 0                                |
| 14        | 80.3                 | 7732                         | 4896                         | 3554       | 528070                   | 9686                   | 0                                |
| 15        | 82.1                 | 7456                         | 4513                         | 3933       | 531860                   | 11189                  | 0                                |
| 16        | 84.6                 | 7590                         | 4648                         | 2982       | 526870                   | 9751                   | 0                                |
| 17        | 84.5                 | 7506                         | 4897                         | 3302       | 528735                   | 9657                   | 0                                |
| 18        | 84.6                 | 7235                         | 5107                         | 3404       | 521915                   | 9606                   | 0                                |
| 19        | 81.6                 | 8204                         | 5124                         | 3974       | 335375                   | 7527                   | 0                                |
| 20        | 81.5                 | 8056                         | 5037                         | 3119       | 440800                   | 8865                   | 0                                |
| 21        | 81.6                 | 7863                         | 4769                         | 3434       | 444575                   | 8789                   | 0                                |
| 22        | 83.3                 | 7525                         | 5073                         | 2987       | 445720                   | 8351                   | 0                                |
| 23        | 81.9                 | 7438                         | 4981                         | 3197       | 442290                   | 8240                   | 0                                |
| 24        | 83.3                 | 7259                         | 4797                         | 3121       | 441440                   | 8196                   | 0                                |
| 25        | 84.2                 | 7225                         | 5087                         | 3097       | 434760                   | 8270                   | 0                                |
| 26        | 82.4                 | 7578                         | 5143                         | 2984       | 437390                   | 8450                   | 0                                |
| 27        | 84.1                 | 7186                         | 5315                         | 3271       | 439390                   | 8164                   | 0                                |
| 28        | 79.6                 | 7739                         | 5868                         | 8001       | 398770                   | 8373                   | 0                                |
| 29        | 83.1                 | 7302                         | 5154                         | 3292       | 439300                   | 8552                   | 0                                |

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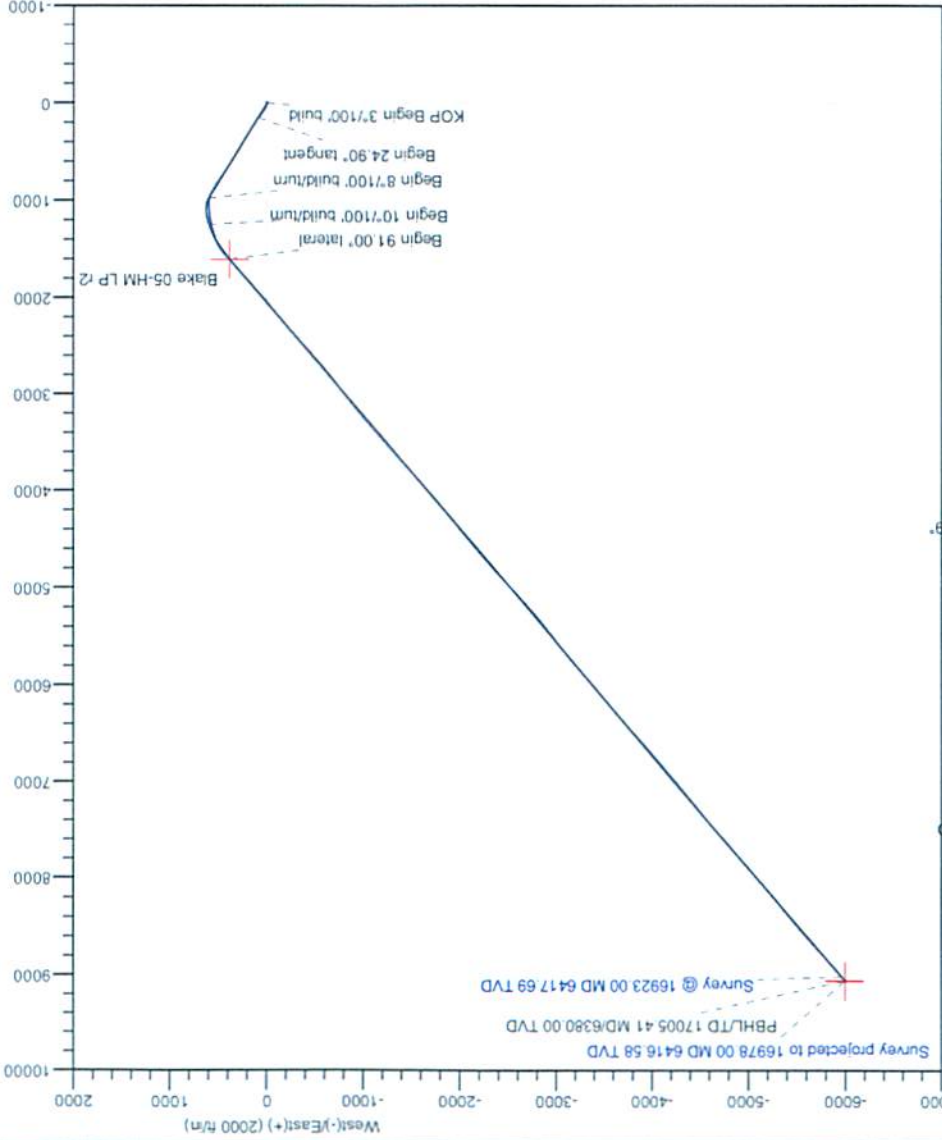
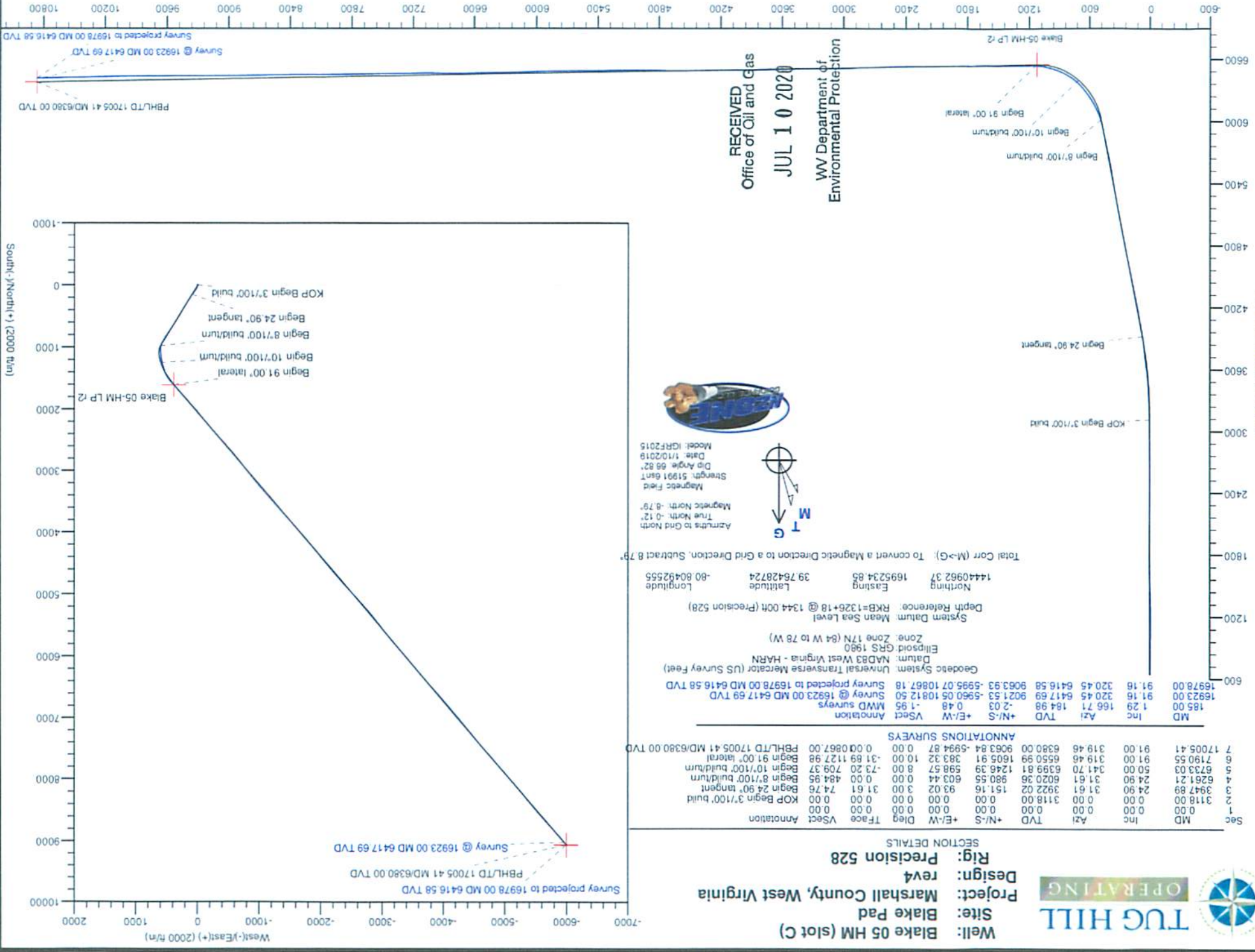
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| Stage No. | Ave. Pump Rate (BPM) | Ave Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen/other (units) |
|-----------|----------------------|------------------------------|------------------------------|------------|--------------------------|------------------------|----------------------------------|
| 30        | 83.3                 | 7859                         | 5034                         | 3401       | 441920                   | 8582                   | 0                                |
| 31        | 83.3                 | 7372                         | 4921                         | 3599       | 442020                   | 8555                   | 0                                |
| 32        | 84.1                 | 7332                         | 5103                         | 3804       | 436830                   | 8719                   | 0                                |
| 33        | 84.5                 | 7321                         | 5020                         | 3264       | 437180                   | 8476                   | 0                                |
| 34        | 83.6                 | 7402                         | 5027                         | 3430       | 441000                   | 8830                   | 0                                |
| 35        | 80.9                 | 7422                         | 5263                         | 3004       | 439280                   | 8909                   | 0                                |
| 36        | 89.8                 | 7537                         | 5651                         | 3685       | 441480                   | 8571                   | 0                                |
| 37        | 86.7                 | 7520                         | 5440                         | 3694       | 438070                   | 8893                   | 0                                |
| 38        | 88.1                 | 7596                         | 5224                         | 3325       | 434250                   | 8521                   | 0                                |
| 39        | 83.1                 | 7674                         | 5671                         | 3928       | 356660                   | 7087                   | 0                                |
| 40        | 87.8                 | 7782                         | 5578                         | 4521       | 358000                   | 7177                   | 0                                |
| 41        | 88.7                 | 7474                         | 5117                         | 3965       | 360620                   | 7594                   | 0                                |
| 42        | 88.8                 | 7579                         | 5049                         | 4239       | 318785                   | 7142                   | 0                                |
| 43        | 88.1                 | 7302                         | 4918                         | 4954       | 359320                   | 6901                   | 0                                |
| 44        | 86.2                 | 7283                         | 4841                         | 4535       | 356720                   | 6951                   | 0                                |
| 45        | 87                   | 7130                         | 5186                         | 4177       | 360580                   | 7606                   | 0                                |
| 46        | 88.2                 | 7288                         | 4944                         | 4724       | 362760                   | 7142                   | 0                                |
| 47        | 89.2                 | 6941                         | 4748                         | 4403       | 363840                   | 7319                   | 0                                |
| 48        | 88.4                 | 7210                         | 4857                         | 4405       | 340360                   | 6905                   | 0                                |
| 49        | 89.7                 | 7256                         | 4838                         | 4357       | 358540                   | 7327                   | 0                                |
| 50        | 89.8                 | 6811                         | 4789                         | 3846       | 365570                   | 7129                   | 0                                |
| 51        | 89.3                 | 6656                         | 4730                         | 3767       | 362860                   | 6920                   | 0                                |
| 52        | 89.3                 | 6835                         | 4660                         | 4084       | 358740                   | 7104                   | 0                                |
| 53        | 87.7                 | 6976                         | 5191                         | 4811       | 355140                   | 6848                   | 0                                |
| 54        | 87.3                 | 7038                         | 5048                         | 4119       | 358240                   | 6915                   | 0                                |
| 55        | 82.9                 | 7273                         | 5208                         | 4466       | 348780                   | 6974                   | 0                                |
| 56        | 89.7                 | 6565                         | 5049                         | 3990       | 354340                   | 6841                   | 0                                |

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 WV Department of Environmental Protection





Well: Blake 05 HM (slot C)  
 Site: Blake Pad  
 Project: Marshall County, West Virginia  
 Design: rev4  
 Rig: Precision 528



SECTION DETAILS

| Sec | MD       | Inc   | Azi    | TVD     | +N/S  | +E/-W | Vsect | Annotation  |
|-----|----------|-------|--------|---------|-------|-------|-------|-------------|
| 1   | 0.00     | 0.00  | 0.00   | 0.00    | 0.00  | 0.00  | 0.00  | TFace       |
| 2   | 3118.00  | 0.00  | 0.00   | 3118.00 | -2.03 | 0.48  | -1.95 | MWD surveys |
| 3   | 3947.89  | 24.90 | 31.61  | 3922.02 | -2.03 | 0.48  | -1.95 | MWD surveys |
| 4   | 6261.21  | 24.90 | 31.61  | 6020.36 | -2.03 | 0.48  | -1.95 | MWD surveys |
| 5   | 6733.03  | 50.00 | 341.70 | 6399.81 | -2.03 | 0.48  | -1.95 | MWD surveys |
| 6   | 7190.55  | 91.00 | 319.46 | 6550.99 | -2.03 | 0.48  | -1.95 | MWD surveys |
| 7   | 17005.41 | 91.00 | 319.46 | 6380.00 | -2.03 | 0.48  | -1.95 | MWD surveys |

Geodesic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: NAD83 West Virginia - HARN  
 Ellipsoid: GRS 1980  
 Zone: Zone 17N (84 W to 78 W)  
 System Datum: Mean Sea Level  
 Depth Reference: RKB=1326+18 @ 1344 00ft (Precision 528)  
 Northing 14440962.37 Easting 1695234.85  
 Longitude -80.80492555  
 Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.79°



Azimuth to Grid North: -0.12°  
 True North: -8.79°  
 Magnetic North: -8.79°  
 Magnetic Field Strength: 51991 gauss  
 Dip Angle: 66.82°  
 Date: 1/10/2019  
 Model: IGRF2015

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South(-)/North(+) (2000 ft/m)

True Vertical Depth (1200 ft/m)

10800

-600

10000

6600

10800  
10200  
9600  
9000  
8400  
7800  
7200  
6600  
6000  
5400  
4800  
4200  
3600  
3000  
2400  
1800  
1200  
600  
0

6600  
6000  
5400  
4800  
4200  
3600  
3000  
2400  
1800  
1200  
600  
0

West(-)/East(+) (2000 ft/m)  
 2000  
1000  
0  
-1000  
-2000  
-3000  
-4000  
-5000  
-6000  
-7000

Survey projected to 16978 00 MD 6416 58 TVD  
 PBH/LTD 17005 41 MD/6380 00 TVD  
 Survey @ 16923 00 MD 6417 69 TVD  
 Survey projected to 16978 00 MD 6416 58 TVD  
 Survey projected to 16978 00 MD 6417 69 TVD  
 PBH/LTD 17005 41 MD/6380 00 TVD

BLAKE N-5HM

| LITHOLOGY/FORMATION | TOP DEPTH IN FT/<br>Name TVD | BOTTOM DEPTH<br>IN FT TVD | TOP DEPTH<br>IN FT MD | BOTTOM DEPTH<br>IN FT MD | DESCRIBE ROCK TYPE AND RECORD<br>QUANTITY AND TYPE OF FLUID |
|---------------------|------------------------------|---------------------------|-----------------------|--------------------------|---|
| Maxton              | 1972                         | 2060                      | 1972                  | 2060                     | Sandstone   |
| Big Lime            | 2060                         | 2102                      | 2060                  | 2102                     | Limestone   |
| Big Injun           | 2102                         | 2448                      | 2102                  | 2448                     | Sandstone   |
| Weir                | 2448                         | 2603                      | 2448                  | 2603                     | Sandstone   |
| Berea               | 2603                         | 2883                      | 2603                  | 2883                     | Sandstone   |
| Gordon              | 2883                         | 2930                      | 2883                  | 2930                     | Sandstone   |
| Fifty Foot          | 2930                         | 3546                      | 2930                  | 3550                     | Sandstone   |
| Speechley           | 3546                         | 4958                      | 3550                  | 5092                     | Sandstone   |
| Benson              | 4958                         | 5345                      | 5092                  | 5518                     | Sandstone   |
| Alexander           | 5345                         | 5924                      | 5518                  | 6158                     | Siltstone   |
| Rhinestreet         | 5924                         | 6337                      | 6158                  | 6650                     | Black shale   |
| Middlesex           | 6337                         | 6418                      | 6650                  | 6778                     | Black shale   |
| Geneseo/Burkett     | 6418                         | 6445                      | 6778                  | 6831                     | Black shale   |
| Tully               | 6445                         | 6471                      | 6831                  | 6890                     | Limestone   |
| Hamilton            | 6471                         | 6503                      | 6890                  | 6980                     | Grey shale  |
| Marcellus           | 6503                         | -                         | 6980                  | -                        | Black shale   |

## Hydraulic Fracturing Fluid Product Component Information Disclosure

|                                |                         |
|--------------------------------|-------------------------|
| Job Start Date:                | 3/2/2019                |
| Job End Date:                  | 3/23/2019               |
| State:                         | West Virginia           |
| County:                        | Marshall                |
| API Number:                    | 47-051-02052-00-00      |
| Operator Name:                 | Tug Hill Operating, LLC |
| Well Name and Number:          | Blake 5H                |
| Latitude:                      | 39.76429000             |
| Longitude:                     | -80.80492555            |
| Datum:                         | NAD83                   |
| Federal Well:                  | NO                      |
| Indian Well:                   | NO                      |
| True Vertical Depth:           | 6,541                   |
| Total Base Water Volume (gal): | 20,280,616              |
| Total Base Non Water Volume:   | 0                       |

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### Hydraulic Fracturing Fluid Composition:

| Trade Name  | Supplier     | Purpose      | Ingredients | Chemical Abstract Service Number (CAS #) | Maximum Ingredient Concentration in Additive (% by mass)** | Maximum Ingredient Concentration in HF Fluid (% by mass)** | Comments        |
|-------------|--------------|--------------|-------------|--|--|--|-----------------|
| Fresh Water | Operator     | Base Fluid   |             |  |  |  |                 |
|             |              |              | Water       | 7732-18-5                                | 100.00000  | 87.28472   | Density = 8.340 |
| Ingredients | Listed Above | Listed Above |             |  |  |  |                 |
|             |              |              | Water       | 7732-18-5                                | 100.00000  | 0.13788  |                 |

|   |             |                      |  |              |  |  |  |
|---|-------------|----------------------|--|--------------|--|--|--|
| FDP-S1286-17  | Halliburton | Corrosion Inhibitor  |  |              |  |  |  |
|   |             |                      |  | Listed Below |  |  |  |
| MC MX 5-2402  | MultiChem   | Additive             |  |              |  |  |  |
|   |             |                      |  | Listed Below |  |  |  |
| HYDROCHLORIC ACID                                   | Halliburton | Solvent              |  |              |  |  |  |
|   |             |                      |  | Listed Below |  |  |  |
| MC MX 2-2822  | MultiChem   | Scale Inhibitor      |  |              |  |  |  |
|   |             |                      |  | Listed Below |  |  |  |
| OILPERM A   | Halliburton | Non-ionic Surfactant |  |              |  |  |  |
|   |             |                      |  | Listed Below |  |  |  |
| SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676) | Halliburton | Proppant             |  |              |  |  |  |
|   |             |                      |  | Listed Below |  |  |  |
| SAND-PREMIUM WHITE-40/70, BULK                      | Halliburton | Proppant             |  |              |  |  |  |
|   |             |                      |  | Listed Below |  |  |  |
| Legend LD-2115                                      | MultiChem   | Friction Reducer     |  |              |  |  |  |
|   |             |                      |  | Listed Below |  |  |  |

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|                                |             |          |  |              |  |  |  |
|--------------------------------|-------------|----------|--|--------------|--|--|--|
| MC MX 8-4543                   | MultiChem   | Biocide  |  |              |  |  |  |
|                                |             |          |  | Listed Below |  |  |  |
| SAND-PREMIUM WHITE-30/50, BULK | Halliburton | Proppant |  |              |  |  |  |
|                                |             |          |  | Listed Below |  |  |  |

Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.

|  |  |  |  |                  |           |          |  |
|--|--|--|--|------------------|-----------|----------|--|
|  |  |  | Crystalline silica, quartz   | 14808-60-7       | 100.00000 | 12.42674 |  |
|  |  |  | Inorganic salt   | Proprietary      | 30.00000  | 0.03260  |  |
|  |  |  | Hydrotreated light petroleum distillate  | 64742-47-8       | 30.00000  | 0.03260  |  |
|  |  |  | Hydrochloric acid  | 7647-01-0        | 15.00000  | 0.02068  |  |
|  |  |  | Sodium nitrate   | 7631-99-4        | 60.00000  | 0.01881  |  |
|  |  |  | Methanol   | 67-56-1          | 100.00000 | 0.00279  |  |
|  |  |  | Amines   | 70900-16-2       | 30.00000  | 0.00227  |  |
|  |  |  | Contains no hazardous substances in concentrations above cut-off values according to the competent authority | CAS Not Assigned | 100.00000 | 0.00201  |  |
|  |  |  | Sodium Chloride  | 7647-14-5        | 5.00000   | 0.00038  |  |
|  |  |  | Ethanol  | 64-17-5          | 60.00000  | 0.00033  |  |
|  |  |  | Oxyalkylated phenolic resin  | Proprietary      | 30.00000  | 0.00022  |  |
|  |  |  | Heavy aromatic petroleum naphtha   | 64742-94-5       | 30.00000  | 0.00017  |  |
|  |  |  | Modified thiourea polymer  | Proprietary      | 30.00000  | 0.00016  |  |
|  |  |  | Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched                                     | 127087-87-0      | 5.00000   | 0.00003  |  |
|  |  |  | Naphthalene  | 91-20-3          | 5.00000   | 0.00003  |  |

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|  |  |  |                        |             |         |         |  |
|--|--|--|------------------------|-------------|---------|---------|--|
|  |  |  | Ethoxylated alcohols   | Proprietary | 5.00000 | 0.00003 | Denise Tuck,<br>Halliburton, 3000 N.<br>Sam Houston Pkwy E.,<br>Houston, TX 77032,<br>281-871-6226 |
|  |  |  | Propargyl alcohol      | 107-19-7    | 5.00000 | 0.00003 |  |
|  |  |  | 1,2,4 Trimethylbenzene | 95-63-6     | 1.00000 | 0.00001 |  |

\* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

\*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

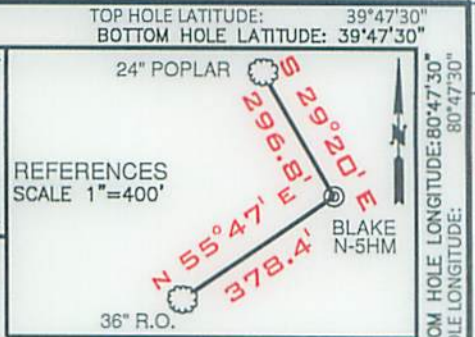
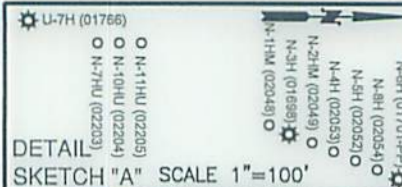
Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

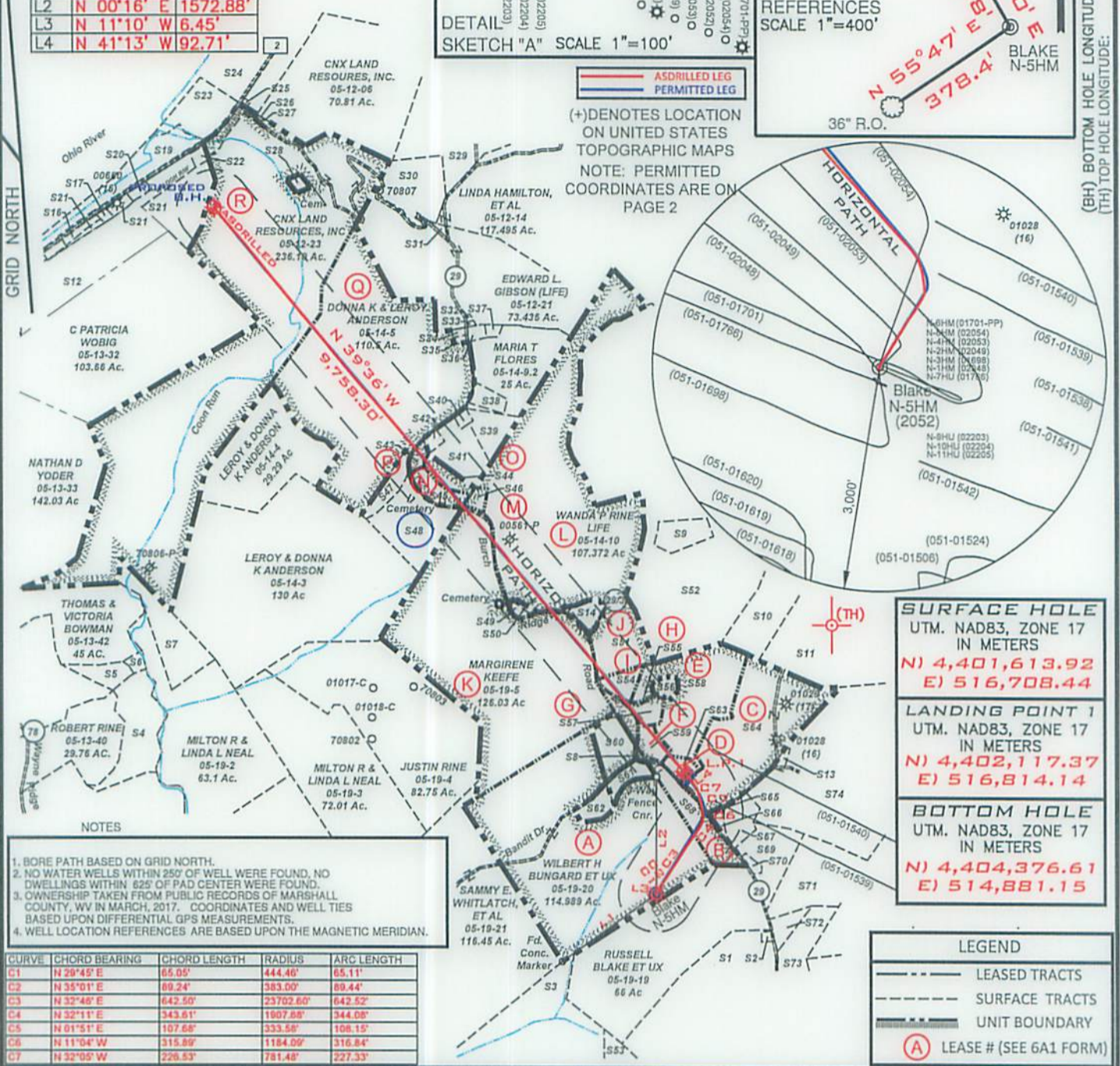
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**BLAKE LEASE  
WELL N-5HM  
814.8846± ACRES**

| LINE | BEARING    | DISTANCE |
|------|------------|----------|
| L1   | S 54°34' W | 1540.82' |
| L2   | N 00°16' E | 1572.88' |
| L3   | N 11°10' W | 6.45'    |
| L4   | N 41°13' W | 92.71'   |



(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS  
NOTE: PERMITTED COORDINATES ARE ON PAGE 2



| POINT           | UTM. NAD83, ZONE 17 IN METERS    |
|-----------------|----------------------------------|
| SURFACE HOLE    | N) 4,401,613.92<br>E) 516,708.44 |
| LANDING POINT 1 | N) 4,402,117.37<br>E) 516,814.14 |
| BOTTOM HOLE     | N) 4,404,376.61<br>E) 514,881.15 |

- NOTES
- BORE PATH BASED ON GRID NORTH.
  - NO WATER WELLS WITHIN 250' OF WELL WERE FOUND. NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
  - OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2017. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
  - WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

| CURVE | CHORD BEARING | CHORD LENGTH | RADIUS    | ARC LENGTH |
|-------|---------------|--------------|-----------|------------|
| C1    | N 29°45' E    | 65.05'       | 444.40'   | 65.11'     |
| C2    | N 35°01' E    | 89.24'       | 383.00'   | 89.44'     |
| C3    | N 32°48' E    | 642.50'      | 23702.60' | 642.52'    |
| C4    | N 32°11' E    | 343.61'      | 1907.68'  | 344.08'    |
| C5    | N 01°51' E    | 107.68'      | 333.56'   | 108.15'    |
| C6    | N 11°04' W    | 315.89'      | 1184.09'  | 316.84'    |
| C7    | N 32°05' W    | 226.53'      | 781.48'   | 227.33'    |

LEGEND

- LEASED TRACTS
- SURFACE TRACTS
- UNIT BOUNDARY
- LEASE # (SEE 6A1 FORM)

FILE NUMBER \_\_\_\_\_

DRAWING NUMBER BLAKE\_WP\_N-5HM

SCALE 1" = 2000'

MINIMUM DEGREE OF ACCURACY 1/200

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING GRADE GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

*David L Jackson*



JACKSON SURVEYING INC.  
P.O. Box 1460  
Clarksburg, WV 26302  
304-623-5851



WVDEP  
OFFICE OF OIL & GAS  
601 57TH STREET, SE  
CHARLESTON, WV 25304

DATE: June 17, 2020

OPERATORS WELL NO. BLAKE N-5HM

API WELL NO. 47-051-02052

STATE WV COUNTY MARSHALL PERMIT 02052

LOCATION ELEVATION 1315.6' WATERSHED (HUC 10) French Creek - Ohio River

DISTRICT Franklin COUNTY Marshall

QUADRANGLE Powhatan Point 7.5' LEASE NUMBER SEE WW-6A1 Form

SURFACE OWNER WILBERT H. BUNGARD, ET UX ACREAGE 114.989

OIL & GAS ROYALTY OWNER RUSSELL BLAKE, ET AL LEASE ACREAGE 114.989

PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE (SPECIFY) AS-DRILLED

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD: 6,542' TMD: 16,978'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER CT CORPORATION SYSTEM

ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

COUNTY NAME  
PERMIT

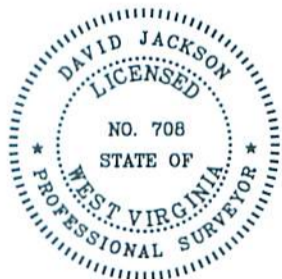
PG 2 OF 2 **BLAKE LEASE**  
**WELL N-5HM**  
**814.8846± ACRES**

| Number | TAX MAP -PARCEL | ADJOINER OWNER   | ACRES   |
|--------|-----------------|--|---------|
| S1     | 05-19-28        | DAVID D. & MARK E. YOHO  | 56.899  |
| S2     | 05-19-32        | JASPER N. BURCH ET AL - TRUSTEES   | 0.397   |
| S3     | 05-22-04        | CNX GAS COMPANY, LLC   | 159.05  |
| S4     | 05-13-41A       | RODNEY & RHONDA JACKSON  | 17.05   |
| S5     | 05-13-41B       | LARRY & JUDY DARRAH  | 4.15    |
| S6     | 05-13-41C       | BENTON DARRAH, LILLIE MAY DUGAN,<br>ALMA BITMER, ALBERTA PALMER &<br>AUDREY HOWARD | 1.0     |
| S7     | 05-14-02        | JOHN B. WILLIAMS, ET AL  | 20.17   |
| S8     | 05-19-20        | WILBERT H. BUNGARD ET UX   | 114.989 |
| S9     | 05-14-12.1      | HENRY WILSON PLUNKERT, JR.   | 5.0     |
| S10    | 05-14-14        | ROBERT L. SHIELDS ET AL  | 29.05   |
| S11    | 05-14-15        | ROBERT L. SHIELDS ET AL  | 53.0    |
| S12    | 05-13-31        | CNX LAND RESOURCES, INC.   | 31.723  |
| S13    | 05-19-13.1      | DONALD SHIELDS   | 0.80    |
| S14    | 05-14-10.4      | ADAM & JESSE ROBINSON  | 3.343   |
| S16    | 05-12-28        | W.V. DEPT. OF HIGHWAYS   | 1.1     |
| S17    | 05-12-24.2      | W.V. DEPT. OF HIGHWAYS   | 0.539   |
| S19    | 05-12-25        | CSX  | 12.8    |
| S20    | 05-12-24        | W.V. DEPT. OF HIGHWAYS   | 0.964   |
| S21    | 05-12-24.3      | CNX LAND RESOURCES, INC.   | 18.523  |
| S22    | 05-12-24.1      | W.V. DEPT. OF HIGHWAYS   | 0.99    |
| S23    | 05-12-23.2      | CNX LAND RESOURCES, INC.   | 12.50   |
| S24    | 05-12-6.2       | CONSOLIDATION COAL COMPANY<br>MURRAY ENERGY  | 25.50   |
| S25    | 05-12-6.1       | W.V. DEPT. OF HIGHWAYS   | 0.31    |
| S26    | 05-12-23.3      | W.V. DEPT. OF HIGHWAYS   | 0.111   |
| S27    | 05-12-23.1      | JAMES N. DAUGHERTY   | 0.28    |
| S28    | 05-12-22        | CNX LAND RESOURCES, INC.   | 0.944   |
| S29    | 05-12-07        | ROBERT WM. RIGGENBACH, ET UX   | 104.231 |
| S30    | 05-12-21.1      | ROBERT W. JR. &<br>WENDY L. RIGGENBACH   | 14.222  |
| S31    | 05-12-15        | WOODLAND HILL CHURCH OF GOD, TRS   | 0.375   |
| S32    | 05-12-16        | GARY E. GIBSON, ET AL  | 0.104   |
| S33    | 05-12-16.1      | GARY E. GIBSON, ET AL  | 0.146   |
| S34    | 05-12-20        | JONI LYN LEON  | 0.457   |
| S35    | 05-12-19        | JONI LYN LEON  | 0.457   |
| S36    | 05-12-18        | HILDA DELORIS BAXTER   | 1.018   |
| S37    | 05-12-17        | HILDA DELORIS BAXTER   | 0.752   |
| S38    | 05-14-9.1       | MARIA T. FLOREZ  | 2.882   |
| S39    | 05-14-9.5       | MARIA T. FLOREZ  | 6.024   |
| S40    | 05-14-19        | BRIAN A. & CHARLOTTE MULL  | 0.92    |
| S41    | 05-14-09        | WALTER W. STREIGHT JR., ET UX  | 9.311   |
| S42    | 05-14-17        | JUSTIN & JODY RINE   | 1.1044  |
| S43    | 05-14-16        | GEORGE A. KNUTH  | 1.6386  |
| S44    | 05-14-9.4       | VERNIE A. RINE, ET UX  | 3.404   |
| S45    | 05-14-9.3       | VERNIE A. RINE, ET UX  | 4.118   |
| S46    | 05-14-10.3      | VERNIE A. & JODY K. RINE   | 1.54    |
| S47    | 05-14-07        | DONNA K. & LEROY ANDERSON  | 4.60    |
| S48    | 05-14-08        | LAWRENCE EUGENE ANDERSON   | 18.29   |
| S49    | 05-14-10.1      | IDA RUTAN (LIFE), RALPH R. HOYT  | 0.50    |
| S50    | 05-14-10.2      | IDA RUTAN (LIFE), RALPH R. HOYT  | 0.495   |
| S51    | 05-14-11        | DALE R. GALLAHER, ET AL  | 12.0    |
| S52    | 05-14-12        | DALE R. GALLAHER, ET AL  | 135.100 |
| S53    | 05-19-18.2      | PAUL V. & CAROL NEELY  | 32.672  |
| S54    | 05-19-06        | MARTHA M. RUTAN  | 5.1099  |
| S55    | 05-19-7.3       | OLAN V. RUTAN, ET UX   | 0.341   |
| S56    | 05-19-7.4       | OLAN V. RUTAN, ET UX   | 1.787   |
| S57    | 05-19-7.2       | OLAN RUTAN   | 2.783   |
| S58    | 05-19-7         | OLAN V. RUTAN, ET UX   | 32.4801 |
| S59    | 05-19-7.1       | ROBERT L. SHIELD, ET AL  | 3.399   |
| S60    | 05-19-20.2      | CASANDRA L. HARMON   | 7.448   |
| S61    | 05-19-20.1      | JOHN J. EBERT, EST.  | 3.848   |
| S62    | 05-19-20.3      | SIDNEY HARMON  | 3.715   |
| S63    | 05-19-7.5       | ADAM T. & JESSE L. ROBINSON  | 2.640   |
| S64    | 05-19-8         | CNX GAS COMPANY, LLC   | 40.0    |
| S65    | 05-19-11        | ERNIE L. ANDERSON, ET UX   | 0.08    |
| S66    | 05-19-10        | ERNIE L. ANDERSON, ET UX   | 0.8125  |
| S67    | 05-19-12        | ERNIE L. ANDERSON, ET UX   | 5.33    |
| S68    | 05-19-09        | PENNY ELAINE MENENDEZ  | 10.0    |
| S69    | 05-19-29        | ERNIE L. & TAMMY L. ANDERSON   | 10.961  |
| S70    | 05-19-15        | B.J. HERRAN REVOCABLE TRUST  | 0.177   |
| S71    | 05-19-30        | ERNIE & TAMMY ANDERSON   | 19.037  |
| S72    | 05-19-30.1      | ERIC R.W. & ASHLEY A. HUGGINS  | 2.911   |
| S73    | 05-19-31        | CHARLES F. & DIANA L. HAYNES   | 8.779   |
| S74    | 05-19-13        | RONA LEE RICE & CHARLES FRANKLIN<br>MCCARDLE                                       | 94.925  |

**SURFACE HOLE**  
 UTM. NAD83, ZONE 17  
 IN METERS  
 N) 4,401,614.14  
 E) 516,708.62

**LANDING POINT 1**  
 UTM. NAD83, ZONE 17  
 IN METERS  
 N) 4,402,103.56  
 E) 516,825.42

**BOTTOM HOLE**  
 UTM. NAD83, ZONE 17  
 IN METERS  
 N) 4,404,376.79  
 E) 514,881.38



*David L Jackson*

P.S.  
708

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JUL 10 2020

WV Department of  
Environmental Protection

OPERATOR'S  
 WELL #: Blake N-5HM  
 API #: 47-051-02052  
 DISTRICT: Franklin  
 COUNTY: Marshall  
 STATE: WV

WELL PLAT  
 PAGE 2 OF 2  
 DATE: 06/17/2020



**TUG HILL**  
**OPERATING**