



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Thursday, January 9, 2020
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit approval for KNOB CREEK N-12HU
47-051-02268-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

Operator's Well Number: KNOB CREEK N-12HU
Farm Name: DAVID LEE FRANKLIN
U.S. WELL NUMBER: 47-051-02268-00-00
Horizontal 6A New Drill
Date Issued: 1/9/2020

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
9. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
10. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.



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Oil and Gas Conservation Commission
601 57th Street SE, Charleston, WV 25304
304-926-0499 Ext 1274

Randall M. Albert, Chairman
dep.wv.gov

November 18, 2019

Department of Environmental Protection
Office of Oil and Gas
Charleston, WV 25304

RE: Application for Deep Well Permit – API #47-051-02268

COMPANY: Tug Hill Operating, LLC

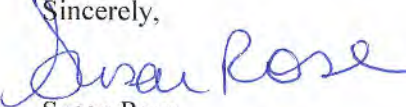
FARM: David Lee Franklin Knob Creek N-12HU

COUNTY: Marshall DISTRICT: Meade QUAD: Glen Easton

The deep well review of the application for the above company is Approved to drill to Trenton for Point Pleasant completion.

The applicant has complied with the provision of Chapter 22C-9, of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

1. Comments to Notice of Deviation filed? No
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners? Yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells: **yes; Docket 290-287 Exception Location Hearing
4. Provided a plat showing that the proposed location is a distance of 400+ feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Susan Rose
Administrator

Area of Review

Sources of information to Support 35CSR8 - 5.11: 9.3 et seq.

Description of process to identify potential pathways for well communication during hydraulic fracturing activities.

Data Sources Reviewed:

1. IHS Well Data service: Public nationwide data service that pulls directly from State agency Oil and Gas databases
2. Farm Maps
3. Topo Maps: Recent and older (contact WVGES)
4. Check with DPS

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (08/14/2019) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

1. Wellbore with IHS All Wells Layer
2. Map with Farm lines overlain and any well spots identified on Farm Maps
3. More recent (1970s vintage) topos and older topos

Discussion with Phil Dinterman WVGES GIS Department (7/15/2016)

- WVGES has plotted every well spot they have access to and are aware of with that contains a coordinate. 30000, 70000, and 90000 series wells are available via the WVGES online map. Some locations aren't great due to vintage and manipulation of maps through time
- 30000 series – any well drilled prior to 1929 – APIs were not assigned to original wells
- 70000 series – Well spots pulled from old Farm line maps that the WVGES has access to
- 90000 series – Any sources that the WVGES has access that shows a well spot but has no additional supporting information. DEP does not have 90000 series on their maps.
- There can be duplication between wells in the 3 series
- Phil indicated that other Operators are providing a screenshot of the WVGES map with their planned well and using that for permits

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Permit well - Knob Creek N-12HU

Wells within 500' Buffer

Note: Well spots depicted on Area of Review map (page 3) are derived from State held coordinates. The spots may differ from those depicted on the Well Plat because the Plat locations represent actual field surveyed locations. Please refer to the Plat for surveyed well spots

| API Number | Operator Name | Total Depth | Perforated Fms | Producing zones not perforated | Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation | Comments |
|------------|--------------------------|-------------|------------------|--------------------------------|---|-----------------------------|
| 4705130115 | Hope Natural Gas Company | 2329' TVD | Gordon Sandstone | Unknown | No, Well is too shallow to be within reasonable distance for fracture propagation from a Point Pleasant horizontal well. | Well was plugged 12/18/1939 |
| 4705130405 | Whilhelm & Jackson | unknown | Unknown | Unknown | Unknown but unlikely. Appears to be an old shallow well, coal test bore hole or CBM well. Well has been plugged. | Well plugged 12/4/1959 |

WV Geological & Economic Survey, Well: County = 51 Permit = 30115

Location Information: [View Map](#)

API: COUNTY PERMIT TAX DISTRICT QUAD_75 QUAD_15 LAT_CD LONG_DD UTM_E UTM_N
 4705130115 Morgan 32115 Meigs Gas Easton Cameron 32783254 -89.709374 624973.6 4421859.4

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TROT_FM | TFM_EST_PR |
|------------|-----------|--------------|-----------|---------------|----------|--------|-----------|-----------|-------------|--------------------------|---------|--------------|------------|
| 4705130115 | 5-13-1952 | Original Loc | Completed | Henry Name | 1 | 49 | Perk Name | 2009 | Unknown | Hope Natural Gas Company | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | O_BEF | O_AFT | WATER_QNTY |
|------------|-----------|-----------|------------|--------------|----------------|-------------|---------------|------------------|--------------|-----|------------|------|-----|---------|-----|-------|-------|------------|
| 4705130115 | 5-13-1952 | 5-20-1952 | 609 | Ground Level | Cameron-Gascon | Gordon | Gordon | Development Well | Unclassified | Gas | Cable Tool | 2329 | | 2002 | | | 0 | |

Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM TOP | DEPTH_BOT | FM BOT | O_BEF | O_AFT | WATER_QNTY |
|------------|-----------|----------|---------|----------|-----------|--------|-----------|--------|-------|-------|------------|
| 4705130115 | 5-13-1952 | Pay | Gas | Vertical | 211.6 | Gordon | 332.8 | Gordon | 0 | 0 | |

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV DATUM |
|------------|--------------|---------------------|-------------|-----------|---------------|-----------|-------------------|------------------|
| 4705130115 | Original Loc | Beckley coal | Well Record | 00 | Reasonable | 6 | Reasonable | 609 Ground Level |
| 4705130115 | Original Loc | Pittsburgh coal | Well Record | 313 | Reasonable | 10 | Reasonable | 609 Ground Level |
| 4705130115 | Original Loc | Salt Sands (undiff) | Well Record | 1015 | Reasonable | 165 | Reasonable | 609 Ground Level |
| 4705130115 | Original Loc | Big Lime | Well Record | 1310 | Reasonable | 40 | Reasonable | 609 Ground Level |
| 4705130115 | Original Loc | Big Injun (undiff) | Well Record | 1350 | Reasonable | 300 | Reasonable | 609 Ground Level |
| 4705130115 | Original Loc | Gordon Gray | Well Record | 2270 | Reasonable | 5 | Reasonable | 609 Ground Level |
| 4705130115 | Original Loc | Gordon | Well Record | 3318 | Reasonable | 13 | Reasonable | 609 Ground Level |

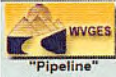
There is no Wireline (E-Log) data for this well

Plugging Information:

| API | PLG_DT | DEPTH_FBT |
|------------|------------|-----------|
| 4705130115 | 12-18-1939 | 0 |

There is no Sample data for this well

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Select County: (051) Marshall
 Enter Permit #: 30406
 Get Data Reset

Select datatypes: (Check All)
 Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/ShowWater Logs Btm Hole Loc.

- [Table Definitions](#)
- [County Code Translations](#)
- [Permit Numbering Schemas](#)
- [License Tables](#)
- [Contact Information](#)
- [Disclaimer](#)
- [WVGES Home](#)
- [Feedback/Print/Help](#)

WV Geological & Economic Survey

Well: County = 61 Permit = 30406

Location Information: [View Map](#)

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD | T5 | QUAD_16 | LAT_DD | LONG_DD | UTME | UTMN |
|------------|----------|--------|--------------|--------------|----------|-----------|------------|----------|-----------|------|
| 4705130406 | Marshall | 30406 | Meigs | Olson Easton | Camerton | 39.770924 | -80.701868 | 528302.1 | 4400341.2 | |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VO | PROP_TRGT |
|------------|--------|--------|--------------|-----------------------------|----------|--------|-------|-----------|---------------------------------------|------------------------|---------|-----------|
| 4705130406 | --1963 | | Original Les | Completed Hannah E Richmond | 453-HOPE | | | 2025 | OP&A V. Shider also William E Jackson | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FBT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TYD | TMO | NEW_FTO | G_BEP |
|------------|--------|---------|------|-----------|-------|------------|-------------|---------------|--------------|---------------|---------|----------|-----|-----|---------|-------|
| 4705130406 | --1963 | -- | 793 | Spot/Leve | | | | unclassified | unclassified | not available | unknown | unknown | | | | |

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

There is no Stratigraphy data for this well

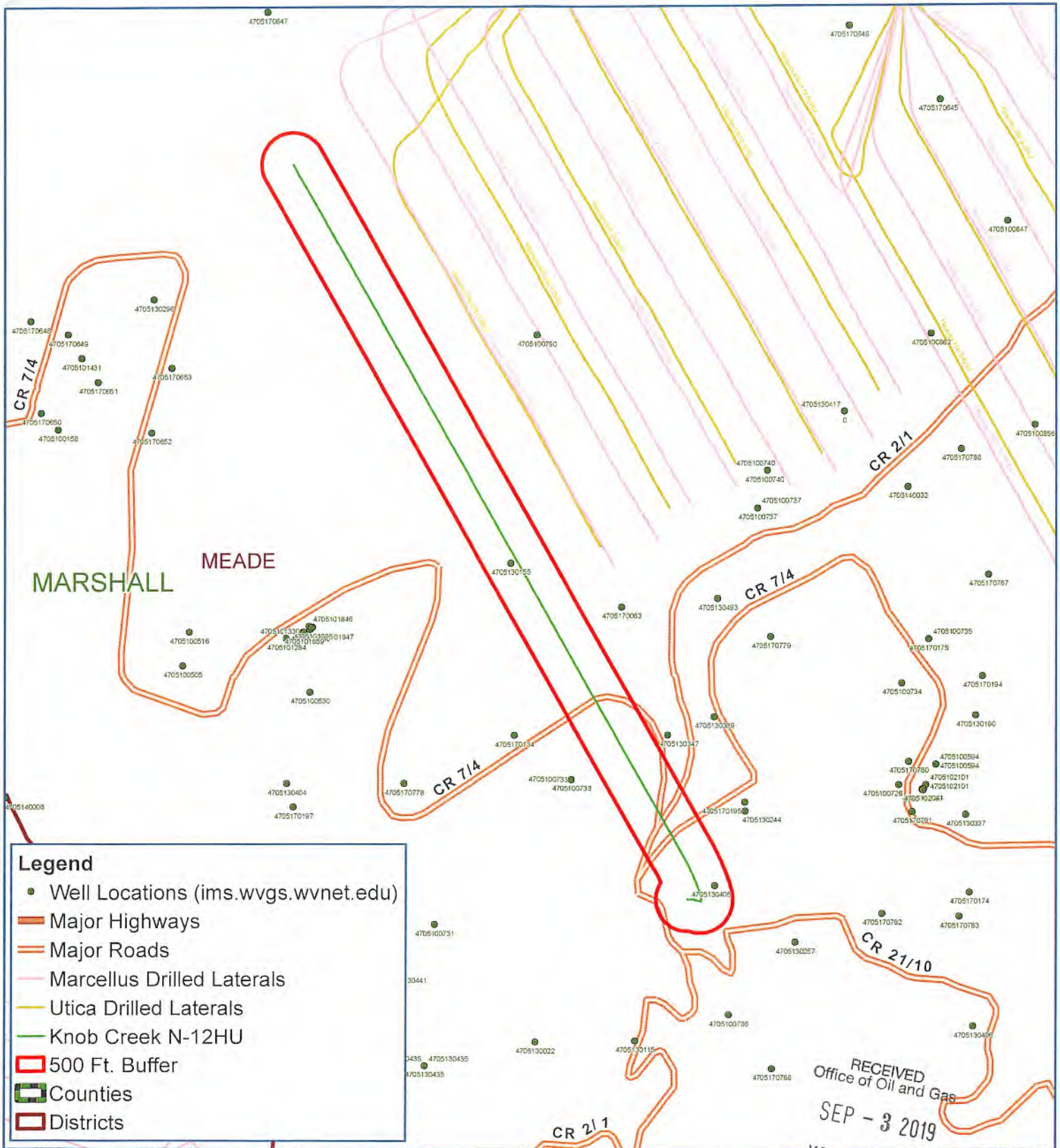
There is no Wireline (E-Log) data for this well

Plugging Information:

| API | PLG_DT | DEPTH_FBT |
|------------|-----------|-----------|
| 4705130406 | 12/4/1962 | 3 |

There is no Sample data for this well

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Knob Creek N - 12HU Meade District Marshall County, WV



Notes:
All locations are approximate and are for visualization purposes only.



Map Created: August 21, 2019
Map Current As Of: August 21, 2019





Planning Report - Geographic

| | | | |
|------------------|---------------------------------|-------------------------------------|---------------------------------|
| Database: | DB_Jul2216dt_v14 lt | Local Co-ordinate Reference: | Well Knob Creek N-12HU (slot M) |
| Company: | Tug Hill Operating LLC | TVD Reference: | GL=737 @ 737.00usft |
| Project: | Marshall County, West Virginia. | MD Reference: | GL=737 @ 737.00usft |
| Site: | Knob Creek | North Reference: | Grid |
| Well: | Knob Creek N-12HU (slot M) | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Original Hole | | |
| Design: | rev2 | | |

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

| | | | | | |
|------------------------------|------------|---------------------|--------------------|--------------------------|--------------|
| Site | Knob Creek | | | | |
| Site Position: | | Northing: | 14,443,053.74 usft | Latitude: | 39.76982148 |
| From: | Lat/Long | Easting: | 1,723,120.29 usft | Longitude: | -80.70566975 |
| Position Uncertainty: | 0.00 usft | Slot Radius: | 13-3/16 " | Grid Convergence: | 0.188 ° |

| | | | | | | |
|-----------------------------|----------------------------|-----------|----------------------------|--------------------|----------------------|--------------|
| Well | Knob Creek N-12HU (slot M) | | | | | |
| Well Position | +N/-S | 0.00 usft | Northing: | 14,443,135.94 usft | Latitude: | 39.77004661 |
| | +E/-W | 0.00 usft | Easting: | 1,723,190.50 usft | Longitude: | -80.70541895 |
| Position Uncertainty | | 0.00 usft | Wellhead Elevation: | | Ground Level: | 737.00 usft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | Original Hole | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2015 | 9/19/2017 | -8.693 | 66.922 | 52,139.59563076 |

| | | | | | |
|--------------------------|--------------------------------|---------------------|----------------------|----------------------|--|
| Design | rev2 | | | | |
| Audit Notes: | | | | | |
| Version: | Phase: | PLAN | Tie On Depth: | 0.00 | |
| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) | |
| | 0.00 | 0.00 | 0.00 | 331.55 | |

| | | | | | |
|---------------------------------|------------------------|--------------------------------|------------------|----------------|--|
| Plan Survey Tool Program | Date | 8/11/2019 | | | |
| Depth From (usft) | Depth To (usft) | Survey (Wellbore) | Tool Name | Remarks | |
| 1 | 0.00 | 23,889.84 rev2 (Original Hole) | MWD | | |
| | | | MWD - Standard | | |

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Planning Report - Geographic

| | | | |
|------------------|---------------------------------|-------------------------------------|---------------------------------|
| Database: | DB_Jul2216dt_v14 It | Local Co-ordinate Reference: | Well Knob Creek N-12HU (slot M) |
| Company: | Tug Hill Operating LLC | TVD Reference: | GL=737 @ 737.00usft |
| Project: | Marshall County, West Virginia. | MD Reference: | GL=737 @ 737.00usft |
| Site: | Knob Creek | North Reference: | Grid |
| Well: | Knob Creek N-12HU (slot M) | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Original Hole | | |
| Design: | rev2 | | |

| Plan Sections | | | | | | | | | | |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|----------|---------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 3,100.00 | 0.00 | 0.00 | 3,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 3,250.00 | 3.00 | 90.00 | 3,249.93 | 0.00 | 3.93 | 2.00 | 2.00 | 0.00 | 90.000 | |
| 4,750.00 | 3.00 | 90.00 | 4,747.88 | 0.00 | 82.43 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 4,900.00 | 0.00 | 90.00 | 4,897.81 | 0.00 | 86.36 | 2.00 | -2.00 | 0.00 | 180.000 | |
| 9,002.19 | 0.00 | 90.00 | 9,000.00 | 0.00 | 86.36 | 0.00 | 0.00 | 0.00 | 90.000 | |
| 9,360.19 | 7.16 | 103.59 | 9,357.06 | -5.25 | 108.07 | 2.00 | 2.00 | 3.80 | 103.588 | |
| 10,092.93 | 7.16 | 103.59 | 10,084.09 | -26.70 | 196.84 | 0.00 | 0.00 | 0.00 | 0.000 | |
| 11,000.18 | 50.00 | 337.57 | 10,887.09 | 306.68 | 112.79 | 6.00 | 4.72 | -13.89 | -130.386 | |
| 11,519.23 | 91.00 | 330.34 | 11,056.90 | 734.85 | -100.90 | 8.00 | 7.90 | -1.39 | -10.937 | |
| 23,889.84 | 91.00 | 330.34 | 10,842.00 | 11,483.35 | -6,221.00 | 0.00 | 0.00 | 0.00 | 0.000 | Knob Creek N-12HU I |

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Planning Report - Geographic

| | | | |
|------------------|---------------------------------|-------------------------------------|---------------------------------|
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| Company: | Tug Hill Operating LLC | TVD Reference: | GL=737 @ 737.00usft |
| Project: | Marshall County, West Virginia. | MD Reference: | GL=737 @ 737.00usft |
| Site: | Knob Creek | North Reference: | Grid |
| Well: | Knob Creek N-12HU (slot M) | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Original Hole | | |
| Design: | rev2 | | |

| Planned Survey | | | | | | | | | | |
|------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|-------------|--------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude | |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 100.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 500.00 | 0.00 | 0.00 | 500.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 900.00 | 0.00 | 0.00 | 900.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 1,300.00 | 0.00 | 0.00 | 1,300.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 1,400.00 | 0.00 | 0.00 | 1,400.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 1,500.00 | 0.00 | 0.00 | 1,500.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 1,600.00 | 0.00 | 0.00 | 1,600.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 1,700.00 | 0.00 | 0.00 | 1,700.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 1,800.00 | 0.00 | 0.00 | 1,800.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 1,900.00 | 0.00 | 0.00 | 1,900.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 2,000.00 | 0.00 | 0.00 | 2,000.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 2,100.00 | 0.00 | 0.00 | 2,100.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 2,200.00 | 0.00 | 0.00 | 2,200.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 2,300.00 | 0.00 | 0.00 | 2,300.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 2,400.00 | 0.00 | 0.00 | 2,400.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 2,500.00 | 0.00 | 0.00 | 2,500.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 2,600.00 | 0.00 | 0.00 | 2,600.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 2,700.00 | 0.00 | 0.00 | 2,700.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 2,800.00 | 0.00 | 0.00 | 2,800.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 2,900.00 | 0.00 | 0.00 | 2,900.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 3,000.00 | 0.00 | 0.00 | 3,000.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| 3,100.00 | 0.00 | 0.00 | 3,100.00 | 0.00 | 0.00 | 14,443,135.94 | 1,723,190.50 | 39.77004661 | -80.70541895 | |
| KOP Begin 2°/100' build | | | | | | | | | | |
| 3,200.00 | 2.00 | 90.00 | 3,199.98 | 0.00 | 1.75 | 14,443,135.94 | 1,723,192.24 | 39.77004660 | -80.70541274 | |
| 3,250.00 | 3.00 | 90.00 | 3,249.93 | 0.00 | 3.93 | 14,443,135.94 | 1,723,194.42 | 39.77004658 | -80.70540498 | |
| Begin 3.00° tangent section | | | | | | | | | | |
| 3,300.00 | 3.00 | 90.00 | 3,299.86 | 0.00 | 6.54 | 14,443,135.94 | 1,723,197.04 | 39.77004655 | -80.70539567 | |
| 3,400.00 | 3.00 | 90.00 | 3,399.73 | 0.00 | 11.78 | 14,443,135.94 | 1,723,202.27 | 39.77004651 | -80.70537704 | |
| 3,500.00 | 3.00 | 90.00 | 3,499.59 | 0.00 | 17.01 | 14,443,135.94 | 1,723,207.51 | 39.77004646 | -80.70535841 | |
| 3,600.00 | 3.00 | 90.00 | 3,599.45 | 0.00 | 22.24 | 14,443,135.94 | 1,723,212.74 | 39.77004641 | -80.70533979 | |
| 3,700.00 | 3.00 | 90.00 | 3,699.31 | 0.00 | 27.48 | 14,443,135.94 | 1,723,217.97 | 39.77004636 | -80.70532116 | |
| 3,800.00 | 3.00 | 90.00 | 3,799.18 | 0.00 | 32.71 | 14,443,135.94 | 1,723,223.21 | 39.77004632 | -80.70530254 | |
| 3,900.00 | 3.00 | 90.00 | 3,899.04 | 0.00 | 37.94 | 14,443,135.94 | 1,723,228.44 | 39.77004627 | -80.70528391 | |
| 4,000.00 | 3.00 | 90.00 | 3,998.90 | 0.00 | 43.18 | 14,443,135.94 | 1,723,233.68 | 39.77004622 | -80.70526529 | |
| 4,100.00 | 3.00 | 90.00 | 4,098.77 | 0.00 | 48.41 | 14,443,135.94 | 1,723,238.91 | 39.77004617 | -80.70524666 | |
| 4,200.00 | 3.00 | 90.00 | 4,198.63 | 0.00 | 53.65 | 14,443,135.94 | 1,723,244.14 | 39.77004613 | -80.70522804 | |
| 4,300.00 | 3.00 | 90.00 | 4,298.49 | 0.00 | 58.88 | 14,443,135.94 | 1,723,249.38 | 39.77004608 | -80.70520941 | |
| 4,400.00 | 3.00 | 90.00 | 4,398.36 | 0.00 | 64.11 | 14,443,135.94 | 1,723,254.61 | 39.77004603 | -80.70519079 | |
| 4,500.00 | 3.00 | 90.00 | 4,498.22 | 0.00 | 69.35 | 14,443,135.94 | 1,723,259.84 | 39.77004599 | -80.70517216 | |
| 4,600.00 | 3.00 | 90.00 | 4,598.08 | 0.00 | 74.58 | 14,443,135.94 | 1,723,265.08 | 39.77004594 | -80.70515353 | |
| 4,700.00 | 3.00 | 90.00 | 4,697.94 | 0.00 | 79.81 | 14,443,135.94 | 1,723,270.31 | 39.77004589 | -80.70513491 | |
| 4,750.00 | 3.00 | 90.00 | 4,747.88 | 0.00 | 82.43 | 14,443,135.94 | 1,723,272.93 | 39.77004587 | -80.70512560 | |
| Begin 2°/100' drop | | | | | | | | | | |
| 4,800.00 | 2.00 | 90.00 | 4,797.83 | 0.00 | 84.61 | 14,443,135.94 | 1,723,275.11 | 39.77004585 | -80.70511784 | |



Planning Report - Geographic

| | | | |
|------------------|---------------------------------|-------------------------------------|---------------------------------|
| Database: | DB_Jul2216dt_v14 It | Local Co-ordinate Reference: | Well Knob Creek N-12HU (slot M) |
| Company: | Tug Hill Operating LLC | TVD Reference: | GL=737 @ 737.00usft |
| Project: | Marshall County, West Virginia. | MD Reference: | GL=737 @ 737.00usft |
| Site: | Knob Creek | North Reference: | Grid |
| Well: | Knob Creek N-12HU (slot M) | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Original Hole | | |
| Design: | rev2 | | |

| Planned Survey | | | | | | | | | | |
|------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|-------------|--------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude | |
| 4,900.00 | 0.00 | 90.00 | 4,897.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| Begin vertical hold section | | | | | | | | | | |
| 5,000.00 | 0.00 | 90.00 | 4,997.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 5,100.00 | 0.00 | 90.00 | 5,097.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 5,200.00 | 0.00 | 90.00 | 5,197.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 5,300.00 | 0.00 | 90.00 | 5,297.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 5,400.00 | 0.00 | 90.00 | 5,397.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 5,500.00 | 0.00 | 90.00 | 5,497.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 5,600.00 | 0.00 | 90.00 | 5,597.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 5,700.00 | 0.00 | 90.00 | 5,697.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 5,800.00 | 0.00 | 90.00 | 5,797.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 5,900.00 | 0.00 | 90.00 | 5,897.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 6,000.00 | 0.00 | 90.00 | 5,997.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 6,100.00 | 0.00 | 90.00 | 6,097.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 6,200.00 | 0.00 | 90.00 | 6,197.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 6,300.00 | 0.00 | 90.00 | 6,297.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 6,400.00 | 0.00 | 90.00 | 6,397.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 6,500.00 | 0.00 | 90.00 | 6,497.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 6,600.00 | 0.00 | 90.00 | 6,597.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 6,700.00 | 0.00 | 90.00 | 6,697.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 6,800.00 | 0.00 | 90.00 | 6,797.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 6,900.00 | 0.00 | 90.00 | 6,897.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 7,000.00 | 0.00 | 90.00 | 6,997.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 7,100.00 | 0.00 | 90.00 | 7,097.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 7,200.00 | 0.00 | 0.00 | 7,197.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 7,300.00 | 0.00 | 90.00 | 7,297.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 7,400.00 | 0.00 | 90.00 | 7,397.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 7,500.00 | 0.00 | 90.00 | 7,497.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 7,600.00 | 0.00 | 90.00 | 7,597.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 7,700.00 | 0.00 | 0.00 | 7,697.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 7,800.00 | 0.00 | 90.00 | 7,797.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 7,900.00 | 0.00 | 90.00 | 7,897.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 8,000.00 | 0.00 | 90.00 | 7,997.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 8,100.00 | 0.00 | 90.00 | 8,097.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 8,200.00 | 0.00 | 0.00 | 8,197.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 8,300.00 | 0.00 | 90.00 | 8,297.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 8,400.00 | 0.00 | 90.00 | 8,397.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 8,500.00 | 0.00 | 90.00 | 8,497.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 8,600.00 | 0.00 | 90.00 | 8,597.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 8,700.00 | 0.00 | 0.00 | 8,697.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 8,800.00 | 0.00 | 90.00 | 8,797.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 8,900.00 | 0.00 | 90.00 | 8,897.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 9,000.00 | 0.00 | 90.00 | 8,997.81 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| 9,002.19 | 0.00 | 90.00 | 9,000.00 | 0.00 | 86.36 | 14,443,135.94 | 1,723,276.85 | 39.77004583 | -80.70511162 | |
| Begin 2°/100' build | | | | | | | | | | |
| 9,100.00 | 1.96 | 103.59 | 9,097.79 | -0.39 | 87.98 | 14,443,135.55 | 1,723,278.48 | 39.77004474 | -80.70510585 | |
| 9,200.00 | 3.96 | 103.59 | 9,197.65 | -1.60 | 92.99 | 14,443,134.34 | 1,723,283.49 | 39.77004137 | -80.70508803 | |
| 9,300.00 | 5.96 | 103.59 | 9,297.27 | -3.63 | 101.39 | 14,443,132.31 | 1,723,291.89 | 39.77003572 | -80.70505817 | |
| 9,360.19 | 7.16 | 103.59 | 9,357.06 | -5.25 | 108.07 | 14,443,130.70 | 1,723,298.57 | 39.77003122 | -80.70503441 | |
| Begin 7.16° tangent section | | | | | | | | | | |
| 9,400.00 | 7.16 | 103.59 | 9,396.57 | -6.41 | 112.89 | 14,443,129.53 | 1,723,303.39 | 39.77002798 | -80.70501726 | |
| 9,500.00 | 7.16 | 103.59 | 9,495.79 | -9.34 | 125.01 | 14,443,126.60 | 1,723,315.51 | 39.77001982 | -80.70497418 | |
| 9,600.00 | 7.16 | 103.59 | 9,595.01 | -12.27 | 137.12 | 14,443,123.67 | 1,723,327.62 | 39.77001167 | -80.70493110 | |
| 9,700.00 | 7.16 | 103.59 | 9,694.23 | -15.20 | 149.24 | 14,443,120.74 | 1,723,339.74 | 39.77000352 | -80.70488802 | |



Planning Report - Geographic

| | | | |
|------------------|---------------------------------|-------------------------------------|---------------------------------|
| Database: | DB_Jul2216dt_v14 lt | Local Co-ordinate Reference: | Well Knob Creek N-12HU (slot M) |
| Company: | Tug Hill Operating LLC | TVD Reference: | GL=737 @ 737.00usft |
| Project: | Marshall County, West Virginia. | MD Reference: | GL=737 @ 737.00usft |
| Site: | Knob Creek | North Reference: | Grid |
| Well: | Knob Creek N-12HU (slot M) | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Original Hole | | |
| Design: | rev2 | | |

| Planned Survey | | | | | | | | | | |
|-------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|-------------|--------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude | |
| 9,800.00 | 7.16 | 103.59 | 9,793.45 | -18.13 | 161.35 | 14,443,117.82 | 1,723,351.85 | 39.76999537 | -80.70484494 | |
| 9,900.00 | 7.16 | 103.59 | 9,892.67 | -21.06 | 173.47 | 14,443,114.89 | 1,723,363.97 | 39.76998722 | -80.70480186 | |
| 10,000.00 | 7.16 | 103.59 | 9,991.89 | -23.98 | 185.58 | 14,443,111.96 | 1,723,376.08 | 39.76997907 | -80.70475877 | |
| 10,092.93 | 7.16 | 103.59 | 10,084.09 | -26.70 | 196.84 | 14,443,109.24 | 1,723,387.34 | 39.76997149 | -80.70471874 | |
| Begin 6°/100' build/turn | | | | | | | | | | |
| 10,100.00 | 6.89 | 100.89 | 10,091.11 | -26.89 | 197.69 | 14,443,109.06 | 1,723,388.18 | 39.76997098 | -80.70471574 | |
| 10,200.00 | 5.73 | 44.94 | 10,190.59 | -24.49 | 207.11 | 14,443,111.46 | 1,723,397.61 | 39.76997749 | -80.70468216 | |
| 10,300.00 | 9.48 | 7.81 | 10,289.75 | -12.79 | 211.76 | 14,443,123.16 | 1,723,402.26 | 39.77000958 | -80.70466549 | |
| 10,400.00 | 14.79 | 354.15 | 10,387.50 | 8.09 | 211.58 | 14,443,144.03 | 1,723,402.08 | 39.77006691 | -80.70466589 | |
| 10,500.00 | 20.48 | 347.77 | 10,482.77 | 37.91 | 206.57 | 14,443,173.85 | 1,723,397.07 | 39.77014886 | -80.70468336 | |
| 10,600.00 | 26.30 | 344.10 | 10,574.52 | 76.35 | 196.79 | 14,443,212.29 | 1,723,387.29 | 39.77025451 | -80.70471772 | |
| 10,700.00 | 32.19 | 341.70 | 10,661.73 | 122.99 | 182.34 | 14,443,258.93 | 1,723,372.84 | 39.77038272 | -80.70476859 | |
| 10,800.00 | 38.10 | 339.97 | 10,743.47 | 177.31 | 163.39 | 14,443,313.25 | 1,723,353.89 | 39.77053207 | -80.70483540 | |
| 10,900.00 | 44.04 | 338.64 | 10,818.83 | 238.72 | 140.14 | 14,443,374.67 | 1,723,330.64 | 39.77070094 | -80.70491743 | |
| 11,000.00 | 49.99 | 337.57 | 10,886.98 | 306.56 | 112.84 | 14,443,442.50 | 1,723,303.34 | 39.77088748 | -80.70501378 | |
| 11,000.18 | 50.00 | 337.57 | 10,887.09 | 306.68 | 112.79 | 14,443,442.62 | 1,723,303.29 | 39.77088782 | -80.70501396 | |
| Begin 8°/100' build/turn | | | | | | | | | | |
| 11,100.00 | 57.86 | 335.79 | 10,945.82 | 380.69 | 80.82 | 14,443,516.63 | 1,723,271.31 | 39.77109134 | -80.70512688 | |
| 11,200.00 | 65.75 | 334.28 | 10,993.04 | 460.50 | 43.61 | 14,443,596.44 | 1,723,234.11 | 39.77131087 | -80.70525835 | |
| 11,300.00 | 73.65 | 332.96 | 11,027.72 | 544.44 | 1.95 | 14,443,680.38 | 1,723,192.45 | 39.77154177 | -80.70540563 | |
| 11,400.00 | 81.56 | 331.74 | 11,049.17 | 630.87 | -43.35 | 14,443,766.82 | 1,723,147.15 | 39.77177955 | -80.70556585 | |
| 11,500.00 | 89.47 | 330.57 | 11,056.98 | 718.12 | -91.42 | 14,443,854.07 | 1,723,099.08 | 39.77201960 | -80.70573589 | |
| 11,519.23 | 91.00 | 330.34 | 11,056.90 | 734.85 | -100.90 | 14,443,870.80 | 1,723,089.60 | 39.77206562 | -80.70576944 | |
| Begin 91.00° lateral section | | | | | | | | | | |
| 11,600.00 | 91.00 | 330.34 | 11,055.50 | 805.03 | -140.86 | 14,443,940.98 | 1,723,049.64 | 39.77225871 | -80.70591083 | |
| 11,700.00 | 91.00 | 330.34 | 11,053.76 | 891.92 | -190.33 | 14,444,027.86 | 1,723,000.17 | 39.77249777 | -80.70608589 | |
| 11,800.00 | 91.00 | 330.34 | 11,052.02 | 978.81 | -239.80 | 14,444,114.75 | 1,722,950.69 | 39.77273684 | -80.70626094 | |
| 11,900.00 | 91.00 | 330.34 | 11,050.29 | 1,065.69 | -289.28 | 14,444,201.64 | 1,722,901.22 | 39.77297590 | -80.70643600 | |
| 12,000.00 | 91.00 | 330.34 | 11,048.55 | 1,152.58 | -338.75 | 14,444,288.52 | 1,722,851.75 | 39.77321496 | -80.70661106 | |
| 12,100.00 | 91.00 | 330.34 | 11,046.81 | 1,239.47 | -388.22 | 14,444,375.41 | 1,722,802.28 | 39.77345402 | -80.70678612 | |
| 12,200.00 | 91.00 | 330.34 | 11,045.07 | 1,326.36 | -437.70 | 14,444,462.30 | 1,722,752.80 | 39.77369308 | -80.70696119 | |
| 12,300.00 | 91.00 | 330.34 | 11,043.34 | 1,413.24 | -487.17 | 14,444,549.19 | 1,722,703.33 | 39.77393214 | -80.70713625 | |
| 12,400.00 | 91.00 | 330.34 | 11,041.60 | 1,500.13 | -536.64 | 14,444,636.07 | 1,722,653.86 | 39.77417120 | -80.70731131 | |
| 12,500.00 | 91.00 | 330.34 | 11,039.86 | 1,587.02 | -586.11 | 14,444,722.96 | 1,722,604.38 | 39.77441026 | -80.70748638 | |
| 12,600.00 | 91.00 | 330.34 | 11,038.12 | 1,673.91 | -635.59 | 14,444,809.85 | 1,722,554.91 | 39.77464932 | -80.70766145 | |
| 12,700.00 | 91.00 | 330.34 | 11,036.39 | 1,760.79 | -685.06 | 14,444,896.74 | 1,722,505.44 | 39.77488838 | -80.70783651 | |
| 12,800.00 | 91.00 | 330.34 | 11,034.65 | 1,847.68 | -734.53 | 14,444,983.62 | 1,722,455.96 | 39.77512744 | -80.70801158 | |
| 12,900.00 | 91.00 | 330.34 | 11,032.91 | 1,934.57 | -784.01 | 14,445,070.51 | 1,722,406.49 | 39.77536649 | -80.70818665 | |
| 13,000.00 | 91.00 | 330.34 | 11,031.18 | 2,021.45 | -833.48 | 14,445,157.40 | 1,722,357.02 | 39.77560555 | -80.70836173 | |
| 13,100.00 | 91.00 | 330.34 | 11,029.44 | 2,108.34 | -882.95 | 14,445,244.29 | 1,722,307.55 | 39.77584461 | -80.70853680 | |
| 13,200.00 | 91.00 | 330.34 | 11,027.70 | 2,195.23 | -932.42 | 14,445,331.17 | 1,722,258.07 | 39.77608367 | -80.70871187 | |
| 13,300.00 | 91.00 | 330.34 | 11,025.96 | 2,282.12 | -981.90 | 14,445,418.06 | 1,722,208.60 | 39.77632273 | -80.70888695 | |
| 13,400.00 | 91.00 | 330.34 | 11,024.23 | 2,369.00 | -1,031.37 | 14,445,504.95 | 1,722,159.13 | 39.77656178 | -80.70906203 | |
| 13,500.00 | 91.00 | 330.34 | 11,022.49 | 2,455.89 | -1,080.84 | 14,445,591.84 | 1,722,109.65 | 39.77680084 | -80.70923710 | |
| 13,600.00 | 91.00 | 330.34 | 11,020.75 | 2,542.78 | -1,130.32 | 14,445,678.72 | 1,722,060.18 | 39.77703990 | -80.70941218 | |
| 13,700.00 | 91.00 | 330.34 | 11,019.02 | 2,629.67 | -1,179.79 | 14,445,765.61 | 1,722,010.71 | 39.77727895 | -80.70958726 | |
| 13,800.00 | 91.00 | 330.34 | 11,017.28 | 2,716.55 | -1,229.26 | 14,445,852.50 | 1,721,961.24 | 39.77751801 | -80.70976234 | |
| 13,900.00 | 91.00 | 330.34 | 11,015.54 | 2,803.44 | -1,278.73 | 14,445,939.38 | 1,721,911.76 | 39.77775707 | -80.70993743 | |
| 14,000.00 | 91.00 | 330.34 | 11,013.80 | 2,890.33 | -1,328.21 | 14,446,026.27 | 1,721,862.29 | 39.77799612 | -80.71011251 | |
| 14,100.00 | 91.00 | 330.34 | 11,012.07 | 2,977.22 | -1,377.68 | 14,446,113.16 | 1,721,812.82 | 39.77823518 | -80.71028760 | |
| 14,200.00 | 91.00 | 330.34 | 11,010.33 | 3,064.10 | -1,427.15 | 14,446,200.05 | 1,721,763.34 | 39.77847423 | -80.71046268 | |
| 14,300.00 | 91.00 | 330.34 | 11,008.59 | 3,150.99 | -1,476.63 | 14,446,286.93 | 1,721,713.87 | 39.77871329 | -80.71063777 | |
| 14,400.00 | 91.00 | 330.34 | 11,006.86 | 3,237.88 | -1,526.10 | 14,446,373.82 | 1,721,664.40 | 39.77895234 | -80.71081286 | |
| 14,500.00 | 91.00 | 330.34 | 11,005.12 | 3,324.76 | -1,575.57 | 14,446,460.71 | 1,721,614.93 | 39.77919139 | -80.71098795 | |



Planning Report - Geographic

| | | | |
|------------------|---------------------------------|-------------------------------------|---------------------------------|
| Database: | DB_Jul2216dt_v14 lt | Local Co-ordinate Reference: | Well Knob Creek N-12HU (slot M) |
| Company: | Tug Hill Operating LLC | TVD Reference: | GL=737 @ 737.00usft |
| Project: | Marshall County, West Virginia. | MD Reference: | GL=737 @ 737.00usft |
| Site: | Knob Creek | North Reference: | Grid |
| Well: | Knob Creek N-12HU (slot M) | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Original Hole | | |
| Design: | rev2 | | |

| Planned Survey | | | | | | | | | | |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|-------------|--------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude | |
| 14,600.00 | 91.00 | 330.34 | 11,003.38 | 3,411.65 | -1,625.04 | 14,446,547.60 | 1,721,565.45 | 39.77943045 | -80.71116304 | |
| 14,700.00 | 91.00 | 330.34 | 11,001.64 | 3,498.54 | -1,674.52 | 14,446,634.48 | 1,721,515.98 | 39.77966950 | -80.71133813 | |
| 14,800.00 | 91.00 | 330.34 | 10,999.91 | 3,585.43 | -1,723.99 | 14,446,721.37 | 1,721,466.51 | 39.77990856 | -80.71151323 | |
| 14,900.00 | 91.00 | 330.34 | 10,998.17 | 3,672.31 | -1,773.46 | 14,446,808.26 | 1,721,417.03 | 39.78014761 | -80.71168832 | |
| 15,000.00 | 91.00 | 330.34 | 10,996.43 | 3,759.20 | -1,822.94 | 14,446,895.15 | 1,721,367.56 | 39.78038666 | -80.71186342 | |
| 15,100.00 | 91.00 | 330.34 | 10,994.70 | 3,846.09 | -1,872.41 | 14,446,982.03 | 1,721,318.09 | 39.78062571 | -80.71203851 | |
| 15,200.00 | 91.00 | 330.34 | 10,992.96 | 3,932.98 | -1,921.88 | 14,447,068.92 | 1,721,268.62 | 39.78086477 | -80.71221361 | |
| 15,300.00 | 91.00 | 330.34 | 10,991.22 | 4,019.86 | -1,971.36 | 14,447,155.81 | 1,721,219.14 | 39.78110382 | -80.71238871 | |
| 15,400.00 | 91.00 | 330.34 | 10,989.48 | 4,106.75 | -2,020.83 | 14,447,242.70 | 1,721,169.67 | 39.78134287 | -80.71256381 | |
| 15,500.00 | 91.00 | 330.34 | 10,987.75 | 4,193.64 | -2,070.30 | 14,447,329.58 | 1,721,120.20 | 39.78158192 | -80.71273891 | |
| 15,600.00 | 91.00 | 330.34 | 10,986.01 | 4,280.53 | -2,119.77 | 14,447,416.47 | 1,721,070.72 | 39.78182097 | -80.71291402 | |
| 15,700.00 | 91.00 | 330.34 | 10,984.27 | 4,367.41 | -2,169.25 | 14,447,503.36 | 1,721,021.25 | 39.78206002 | -80.71308912 | |
| 15,800.00 | 91.00 | 330.34 | 10,982.54 | 4,454.30 | -2,218.72 | 14,447,590.24 | 1,720,971.78 | 39.78229908 | -80.71326423 | |
| 15,900.00 | 91.00 | 330.34 | 10,980.80 | 4,541.19 | -2,268.19 | 14,447,677.13 | 1,720,922.30 | 39.78253813 | -80.71343934 | |
| 16,000.00 | 91.00 | 330.34 | 10,979.06 | 4,628.08 | -2,317.67 | 14,447,764.02 | 1,720,872.83 | 39.78277718 | -80.71361444 | |
| 16,100.00 | 91.00 | 330.34 | 10,977.32 | 4,714.96 | -2,367.14 | 14,447,850.91 | 1,720,823.36 | 39.78301623 | -80.71378955 | |
| 16,200.00 | 91.00 | 330.34 | 10,975.59 | 4,801.85 | -2,416.61 | 14,447,937.79 | 1,720,773.89 | 39.78325528 | -80.71396466 | |
| 16,300.00 | 91.00 | 330.34 | 10,973.85 | 4,888.74 | -2,466.08 | 14,448,024.68 | 1,720,724.41 | 39.78349432 | -80.71413977 | |
| 16,400.00 | 91.00 | 330.34 | 10,972.11 | 4,975.62 | -2,515.56 | 14,448,111.57 | 1,720,674.94 | 39.78373337 | -80.71431489 | |
| 16,500.00 | 91.00 | 330.34 | 10,970.37 | 5,062.51 | -2,565.03 | 14,448,198.46 | 1,720,625.47 | 39.78397242 | -80.71449000 | |
| 16,600.00 | 91.00 | 330.34 | 10,968.64 | 5,149.40 | -2,614.50 | 14,448,285.34 | 1,720,575.99 | 39.78421147 | -80.71466512 | |
| 16,700.00 | 91.00 | 330.34 | 10,966.90 | 5,236.29 | -2,663.98 | 14,448,372.23 | 1,720,526.52 | 39.78445052 | -80.71484023 | |
| 16,800.00 | 91.00 | 330.34 | 10,965.16 | 5,323.17 | -2,713.45 | 14,448,459.12 | 1,720,477.05 | 39.78468957 | -80.71501535 | |
| 16,900.00 | 91.00 | 330.34 | 10,963.43 | 5,410.06 | -2,762.92 | 14,448,546.01 | 1,720,427.58 | 39.78492862 | -80.71519047 | |
| 17,000.00 | 91.00 | 330.34 | 10,961.69 | 5,496.95 | -2,812.39 | 14,448,632.89 | 1,720,378.10 | 39.78516766 | -80.71536559 | |
| 17,100.00 | 91.00 | 330.34 | 10,959.95 | 5,583.84 | -2,861.87 | 14,448,719.78 | 1,720,328.63 | 39.78540671 | -80.71554071 | |
| 17,200.00 | 91.00 | 330.34 | 10,958.21 | 5,670.72 | -2,911.34 | 14,448,806.67 | 1,720,279.16 | 39.78564576 | -80.71571583 | |
| 17,300.00 | 91.00 | 330.34 | 10,956.48 | 5,757.61 | -2,960.81 | 14,448,893.56 | 1,720,229.68 | 39.78588480 | -80.71589096 | |
| 17,400.00 | 91.00 | 330.34 | 10,954.74 | 5,844.50 | -3,010.29 | 14,448,980.44 | 1,720,180.21 | 39.78612385 | -80.71606608 | |
| 17,500.00 | 91.00 | 330.34 | 10,953.00 | 5,931.39 | -3,059.76 | 14,449,067.33 | 1,720,130.74 | 39.78636290 | -80.71624121 | |
| 17,600.00 | 91.00 | 330.34 | 10,951.27 | 6,018.27 | -3,109.23 | 14,449,154.22 | 1,720,081.27 | 39.78660194 | -80.71641634 | |
| 17,700.00 | 91.00 | 330.34 | 10,949.53 | 6,105.16 | -3,158.70 | 14,449,241.10 | 1,720,031.79 | 39.78684099 | -80.71659147 | |
| 17,800.00 | 91.00 | 330.34 | 10,947.79 | 6,192.05 | -3,208.18 | 14,449,327.99 | 1,719,982.32 | 39.78708003 | -80.71676660 | |
| 17,900.00 | 91.00 | 330.34 | 10,946.05 | 6,278.94 | -3,257.65 | 14,449,414.88 | 1,719,932.85 | 39.78731908 | -80.71694173 | |
| 18,000.00 | 91.00 | 330.34 | 10,944.32 | 6,365.82 | -3,307.12 | 14,449,501.77 | 1,719,883.37 | 39.78755812 | -80.71711686 | |
| 18,100.00 | 91.00 | 330.34 | 10,942.58 | 6,452.71 | -3,356.60 | 14,449,588.65 | 1,719,833.90 | 39.78779717 | -80.71729199 | |
| 18,200.00 | 91.00 | 330.34 | 10,940.84 | 6,539.60 | -3,406.07 | 14,449,675.54 | 1,719,784.43 | 39.78803621 | -80.71746713 | |
| 18,300.00 | 91.00 | 330.34 | 10,939.11 | 6,626.48 | -3,455.54 | 14,449,762.43 | 1,719,734.96 | 39.78827526 | -80.71764226 | |
| 18,400.00 | 91.00 | 330.34 | 10,937.37 | 6,713.37 | -3,505.02 | 14,449,849.32 | 1,719,685.48 | 39.78851430 | -80.71781740 | |
| 18,500.00 | 91.00 | 330.34 | 10,935.63 | 6,800.26 | -3,554.49 | 14,449,936.20 | 1,719,636.01 | 39.78875334 | -80.71799254 | |
| 18,600.00 | 91.00 | 330.34 | 10,933.89 | 6,887.15 | -3,603.96 | 14,450,023.09 | 1,719,586.54 | 39.78899239 | -80.71816768 | |
| 18,700.00 | 91.00 | 330.34 | 10,932.16 | 6,974.03 | -3,653.43 | 14,450,109.98 | 1,719,537.06 | 39.78923143 | -80.71834282 | |
| 18,800.00 | 91.00 | 330.34 | 10,930.42 | 7,060.92 | -3,702.91 | 14,450,196.87 | 1,719,487.59 | 39.78947047 | -80.71851796 | |
| 18,900.00 | 91.00 | 330.34 | 10,928.68 | 7,147.81 | -3,752.38 | 14,450,283.75 | 1,719,438.12 | 39.78970951 | -80.71869310 | |
| 19,000.00 | 91.00 | 330.34 | 10,926.95 | 7,234.70 | -3,801.85 | 14,450,370.64 | 1,719,388.64 | 39.78994856 | -80.71886825 | |
| 19,100.00 | 91.00 | 330.34 | 10,925.21 | 7,321.58 | -3,851.33 | 14,450,457.53 | 1,719,339.17 | 39.79018760 | -80.71904339 | |
| 19,200.00 | 91.00 | 330.34 | 10,923.47 | 7,408.47 | -3,900.80 | 14,450,544.42 | 1,719,289.70 | 39.79042664 | -80.71921854 | |
| 19,300.00 | 91.00 | 330.34 | 10,921.73 | 7,495.36 | -3,950.27 | 14,450,631.30 | 1,719,240.23 | 39.79066568 | -80.71939369 | |
| 19,400.00 | 91.00 | 330.34 | 10,920.00 | 7,582.25 | -3,999.74 | 14,450,718.19 | 1,719,190.75 | 39.79090472 | -80.71956884 | |
| 19,500.00 | 91.00 | 330.34 | 10,918.26 | 7,669.13 | -4,049.22 | 14,450,805.08 | 1,719,141.28 | 39.79114376 | -80.71974399 | |
| 19,600.00 | 91.00 | 330.34 | 10,916.52 | 7,756.02 | -4,098.69 | 14,450,891.96 | 1,719,091.81 | 39.79138280 | -80.71991914 | |
| 19,700.00 | 91.00 | 330.34 | 10,914.79 | 7,842.91 | -4,148.16 | 14,450,978.85 | 1,719,042.33 | 39.79162184 | -80.72009429 | |
| 19,800.00 | 91.00 | 330.34 | 10,913.05 | 7,929.80 | -4,197.64 | 14,451,065.74 | 1,718,992.86 | 39.79186088 | -80.72026945 | |
| 19,900.00 | 91.00 | 330.34 | 10,911.31 | 8,016.68 | -4,247.11 | 14,451,152.63 | 1,718,943.39 | 39.79209992 | -80.72044460 | |
| 20,000.00 | 91.00 | 330.34 | 10,909.57 | 8,103.57 | -4,296.58 | 14,451,239.51 | 1,718,893.92 | 39.79233896 | -80.72061976 | |

SEP - 3 2019



Planning Report - Geographic

Database: DB_Jul2216dt_v14 It
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Knob Creek
 Well: Knob Creek N-12HU (slot M)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Knob Creek N-12HU (slot M)
 TVD Reference: GL=737 @ 737.00usft
 MD Reference: GL=737 @ 737.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|-------------|--------------|
| 20,100.00 | 91.00 | 330.34 | 10,907.84 | 8,190.46 | -4,346.05 | 14,451,326.40 | 1,718,844.44 | 39.79257800 | -80.72079491 |
| 20,200.00 | 91.00 | 330.34 | 10,906.10 | 8,277.34 | -4,395.53 | 14,451,413.29 | 1,718,794.97 | 39.79281704 | -80.72097007 |
| 20,300.00 | 91.00 | 330.34 | 10,904.36 | 8,364.23 | -4,445.00 | 14,451,500.18 | 1,718,745.50 | 39.79305608 | -80.72114523 |
| 20,400.00 | 91.00 | 330.34 | 10,902.62 | 8,451.12 | -4,494.47 | 14,451,587.08 | 1,718,696.02 | 39.79329512 | -80.72132039 |
| 20,500.00 | 91.00 | 330.34 | 10,900.89 | 8,538.01 | -4,543.95 | 14,451,673.95 | 1,718,646.55 | 39.79353415 | -80.72149556 |
| 20,600.00 | 91.00 | 330.34 | 10,899.15 | 8,624.89 | -4,593.42 | 14,451,760.84 | 1,718,597.08 | 39.79377319 | -80.72167072 |
| 20,700.00 | 91.00 | 330.34 | 10,897.41 | 8,711.78 | -4,642.89 | 14,451,847.73 | 1,718,547.61 | 39.79401223 | -80.72184589 |
| 20,800.00 | 91.00 | 330.34 | 10,895.68 | 8,798.67 | -4,692.36 | 14,451,934.61 | 1,718,498.13 | 39.79425127 | -80.72202105 |
| 20,900.00 | 91.00 | 330.34 | 10,893.94 | 8,885.56 | -4,741.84 | 14,452,021.50 | 1,718,448.66 | 39.79449030 | -80.72219622 |
| 21,000.00 | 91.00 | 330.34 | 10,892.20 | 8,972.44 | -4,791.31 | 14,452,108.39 | 1,718,399.19 | 39.79472934 | -80.72237139 |
| 21,100.00 | 91.00 | 330.34 | 10,890.46 | 9,059.33 | -4,840.78 | 14,452,195.28 | 1,718,349.71 | 39.79496838 | -80.72254656 |
| 21,200.00 | 91.00 | 330.34 | 10,888.73 | 9,146.22 | -4,890.26 | 14,452,282.16 | 1,718,300.24 | 39.79520741 | -80.72272173 |
| 21,300.00 | 91.00 | 330.34 | 10,886.99 | 9,233.11 | -4,939.73 | 14,452,369.05 | 1,718,250.77 | 39.79544645 | -80.72289690 |
| 21,400.00 | 91.00 | 330.34 | 10,885.25 | 9,319.99 | -4,989.20 | 14,452,455.94 | 1,718,201.30 | 39.79568548 | -80.72307207 |
| 21,500.00 | 91.00 | 330.34 | 10,883.52 | 9,406.88 | -5,038.68 | 14,452,542.82 | 1,718,151.82 | 39.79592452 | -80.72324725 |
| 21,600.00 | 91.00 | 330.34 | 10,881.78 | 9,493.77 | -5,088.15 | 14,452,629.71 | 1,718,102.35 | 39.79616355 | -80.72342242 |
| 21,700.00 | 91.00 | 330.34 | 10,880.04 | 9,580.66 | -5,137.62 | 14,452,716.60 | 1,718,052.88 | 39.79640259 | -80.72359760 |
| 21,800.00 | 91.00 | 330.34 | 10,878.30 | 9,667.54 | -5,187.09 | 14,452,803.49 | 1,718,003.40 | 39.79664162 | -80.72377278 |
| 21,900.00 | 91.00 | 330.34 | 10,876.57 | 9,754.43 | -5,236.57 | 14,452,890.37 | 1,717,953.93 | 39.79688066 | -80.72394796 |
| 22,000.00 | 91.00 | 330.34 | 10,874.83 | 9,841.32 | -5,286.04 | 14,452,977.26 | 1,717,904.46 | 39.79711969 | -80.72412314 |
| 22,100.00 | 91.00 | 330.34 | 10,873.09 | 9,928.20 | -5,335.51 | 14,453,064.15 | 1,717,854.99 | 39.79735873 | -80.72429832 |
| 22,200.00 | 91.00 | 330.34 | 10,871.36 | 10,015.09 | -5,384.99 | 14,453,151.04 | 1,717,805.51 | 39.79759776 | -80.72447350 |
| 22,300.00 | 91.00 | 330.34 | 10,869.62 | 10,101.98 | -5,434.46 | 14,453,237.92 | 1,717,756.04 | 39.79783679 | -80.72464869 |
| 22,400.00 | 91.00 | 330.34 | 10,867.88 | 10,188.87 | -5,483.93 | 14,453,324.81 | 1,717,706.57 | 39.79807583 | -80.72482387 |
| 22,500.00 | 91.00 | 330.34 | 10,866.14 | 10,275.75 | -5,533.40 | 14,453,411.70 | 1,717,657.09 | 39.79831486 | -80.72499906 |
| 22,600.00 | 91.00 | 330.34 | 10,864.41 | 10,362.64 | -5,582.88 | 14,453,498.59 | 1,717,607.62 | 39.79855389 | -80.72517425 |
| 22,700.00 | 91.00 | 330.34 | 10,862.67 | 10,449.53 | -5,632.35 | 14,453,585.47 | 1,717,558.15 | 39.79879292 | -80.72534944 |
| 22,800.00 | 91.00 | 330.34 | 10,860.93 | 10,536.42 | -5,681.82 | 14,453,672.36 | 1,717,508.67 | 39.79903195 | -80.72552463 |
| 22,900.00 | 91.00 | 330.34 | 10,859.20 | 10,623.30 | -5,731.30 | 14,453,759.25 | 1,717,459.20 | 39.79927099 | -80.72569982 |
| 23,000.00 | 91.00 | 330.34 | 10,857.46 | 10,710.19 | -5,780.77 | 14,453,846.13 | 1,717,409.73 | 39.79951002 | -80.72587501 |
| 23,100.00 | 91.00 | 330.34 | 10,855.72 | 10,797.08 | -5,830.24 | 14,453,933.02 | 1,717,360.26 | 39.79974905 | -80.72605021 |
| 23,200.00 | 91.00 | 330.34 | 10,853.98 | 10,883.97 | -5,879.71 | 14,454,019.91 | 1,717,310.78 | 39.79998808 | -80.72622540 |
| 23,300.00 | 91.00 | 330.34 | 10,852.25 | 10,970.85 | -5,929.19 | 14,454,106.80 | 1,717,261.31 | 39.80022711 | -80.72640060 |
| 23,400.00 | 91.00 | 330.34 | 10,850.51 | 11,057.74 | -5,978.66 | 14,454,193.68 | 1,717,211.84 | 39.80046614 | -80.72657580 |
| 23,500.00 | 91.00 | 330.34 | 10,848.77 | 11,144.63 | -6,028.13 | 14,454,280.57 | 1,717,162.36 | 39.80070517 | -80.72675099 |
| 23,600.00 | 91.00 | 330.34 | 10,847.04 | 11,231.52 | -6,077.61 | 14,454,367.46 | 1,717,112.89 | 39.80094420 | -80.72692619 |
| 23,700.00 | 91.00 | 330.34 | 10,845.30 | 11,318.40 | -6,127.08 | 14,454,454.35 | 1,717,063.42 | 39.80118323 | -80.72710139 |
| 23,800.00 | 91.00 | 330.34 | 10,843.56 | 11,405.29 | -6,176.55 | 14,454,541.23 | 1,717,013.95 | 39.80142226 | -80.72727660 |
| 23,889.84 | 91.00 | 330.34 | 10,842.00 | 11,483.35 | -6,221.00 | 14,454,619.29 | 1,716,969.50 | 39.80163700 | -80.72743400 |

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Planning Report - Geographic

| | | | |
|------------------|---------------------------------|-------------------------------------|---------------------------------|
| Database: | DB_Jul2216dt_v14 It | Local Co-ordinate Reference: | Well Knob Creek N-12HU (slot M) |
| Company: | Tug Hill Operating LLC | TVD Reference: | GL=737 @ 737.00usft |
| Project: | Marshall County, West Virginia. | MD Reference: | GL=737 @ 737.00usft |
| Site: | Knob Creek | North Reference: | Grid |
| Well: | Knob Creek N-12HU (slot M) | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Original Hole | | |
| Design: | rev2 | | |

| Design Targets | | | | | | | | | |
|--|-----------|----------|-----------|-----------|-----------|---------------|--------------|-------------|--------------|
| Target Name | Dip Angle | Dip Dir. | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
| - hit/miss target | (°) | (°) | (usft) | (usft) | (usft) | (usft) | (usft) | | |
| - Shape | | | | | | | | | |
| Knob Creek N-12HU BH - plan hits target center - Point | 0.00 | 0.00 | 10,842.00 | 11,483.35 | -6,221.00 | 14,454,619.29 | 1,716,969.50 | 39.80163700 | -80.72743400 |
| Knob Creek N-12HU LP - plan misses target center by 76.15usft at 11508.34usft MD (11057.01 TVD, 725.38 N, -95.52 E) - Point | 0.00 | 0.00 | 11,057.00 | 762.93 | -29.27 | 14,443,898.88 | 1,723,161.23 | 39.77214209 | -80.70551418 |
| Knob Creek N-12HU LP - plan misses target center by 32.69usft at 11532.93usft MD (11056.66 TVD, 746.75 N, -107.67 E) - Point | 0.00 | 0.00 | 11,057.00 | 762.93 | -79.27 | 14,443,898.88 | 1,723,111.23 | 39.77214254 | -80.70569213 |

| Plan Annotations | | | | |
|-----------------------|-----------------------|-------------------|--------------|----------------------------------|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment |
| | | +N/-S (usft) | +E/-W (usft) | |
| 3,100.00 | 3,100.00 | 0.00 | 0.00 | KOP Begin 2°/100' build |
| 3,250.00 | 3,249.93 | 0.00 | 3.93 | Begin 3.00° tangent section |
| 4,750.00 | 4,747.88 | 0.00 | 82.43 | Begin 2°/100' drop |
| 4,900.00 | 4,897.81 | 0.00 | 86.36 | Begin vertical hold section |
| 9,002.19 | 9,000.00 | 0.00 | 86.36 | Begin 2°/100' build |
| 9,360.19 | 9,357.06 | -5.25 | 108.07 | Begin 7.16° tangent section |
| 10,092.93 | 10,084.09 | -26.70 | 196.84 | Begin 6°/100' build/turn |
| 11,000.18 | 10,887.09 | 306.68 | 112.79 | Begin 8°/100' build/turn |
| 11,519.23 | 11,056.90 | 734.85 | -100.90 | Begin 91.00° lateral section |
| 23,889.84 | 10,842.00 | 11,483.35 | -6,221.00 | PBHL/TD 23889.84 MD 10842.00 TVD |

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STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Tug Hill Operating, LLC

| | | | |
|------------------|-----------------|--------------|-------------------------|
| <u>494510851</u> | <u>Marshall</u> | <u>Meade</u> | <u>Glen Easton 7.5'</u> |
|------------------|-----------------|--------------|-------------------------|

Operator ID County District Quadrangle

2) Operator's Well Number: Knob Creek N-12HU Well Pad Name: Knob Creek

3) Farm Name/Surface Owner: David Lee Franklin Public Road Access: St. Joseph Road - CR 21

4) Elevation, current ground: 734.67' Elevation, proposed post-construction: 734.67'

5) Well Type (a) Gas Oil _____ Underground Storage _____
Other _____

(b) If Gas Shallow _____ Deep
Horizontal

6) Existing Pad: Yes or No Yes

Ju
10/3/19

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Point Pleasant is the target formation at a depth of 11,129' - 11,007' - thickness of 122' and anticipated pressure of approx. 9500 psi.

8) Proposed Total Vertical Depth: 11,279'

9) Formation at Total Vertical Depth: Trenton

10) Proposed Total Measured Depth: 23,890'

11) Proposed Horizontal Leg Length: 12,372.92'

12) Approximate Fresh Water Strata Depths: 70' ; 380'

13) Method to Determine Fresh Water Depths: Offset well reports or noticeable flow at the flowline or when need to start soaping

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 292' ; Pittsburgh Coal - 374'

16) Approximate Depth to Possible Void (coal mine, karst, other): none

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes _____ No

(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

18) **CASING AND TUBING PROGRAM**

| TYPE | Size (in) | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling (ft) | INTERVALS: Left in Well (ft) | CEMENT: Fill-up (Cu. Ft.)/CTS |
|--------------|------------------|--------------------|--------------|-------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|
| Conductor | 30" | NEW | BW | BW | 120' | 120' | 259FT^3(CTS) |
| Fresh Water | 20" | NEW | J55 | 106.5# | 480' | 480' | 831 FT^3(CTS) |
| Coal | 13 3/8" | NEW | J55 | 54.5# | 2200' | 2200' | 1,558FT^3(CTS) |
| Intermediate | 9 5/8" | NEW | HPP110 | 47# | 9,887' | 9,887' | 3,206FT^3(CTS) |
| Production | 5 1/2" | NEW | P110 | 23# | 23,890' | 23,890' | 5,641FT^3(CTS) |
| Tubing | 2 7/8" | NEW | P110 | 6.5# | | 10,593' | |
| Liners | | | | | | | |

JW 10/3/19

| TYPE | Size (in) | Wellbore Diameter (in) | Wall Thickness (in) | Burst Pressure (psi) | Anticipated Max. Internal Pressure (psi) | Cement Type | Cement Yield (cu. ft./k) |
|--------------|------------------|-------------------------------|----------------------------|-----------------------------|---|--------------------|---------------------------------|
| Conductor | 30" | 36" | 1.0 | 2,333 | 1,866 | CLASS A | 1.2 |
| Fresh Water | 20" | 26" | .5 | 2,410 | 1,928 | SEE # 24 | 1.2 |
| Coal | 13 3/8" | 17 1/2" | .38 | 2,740 | 2,192 | SEE #24 | 1.2 |
| Intermediate | 9 5/8" | 12 1/4" | .472 | 10,730 | 6,968 | SEE #24 | 1.99 |
| Production | 5 1/2" | 8 1/2" | .415 | 16,510 | 10,864 | SEE #24 | 1.18 |
| Tubing | 2 7/8" | | | 11,385 | 11,624 | | |
| Liners | | | | | | | |

PACKERS

| | | | | |
|-------------|-----|--|--|--|
| Kind: | N/A | | | |
| Sizes: | N/A | | | |
| Depths Set: | N/A | | | |

10/3/19

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill through the Point Pleasant and TD Pilot Hole 150' into the Trenton. Log vertical section and run a solid cement plug back to proposed KOP. Drill curve and lateral per proposed well plan, run and cement production casing. Perform CBL from 60 deg to surface, make cleanout run, and stimulate.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Well to be completed with approximately 30,927,500 lb proppant and 478,162 bbl of water. Max rate = 80 bpm; max psi = 12,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 12.93 acres

22) Area to be disturbed for well pad only, less access road (acres): 5.55 acres

23) Describe centralizer placement for each casing string:

Will run 3 centralizers on surface casing at equal distance. Intermediate will have 1 centralizer every third joint. Production casing will have one centralizer every third joint in lateral, one centralizer every joint through curve, one centralizer every third joint to surface.

24) Describe all cement additives associated with each cement type:

*See Attachment

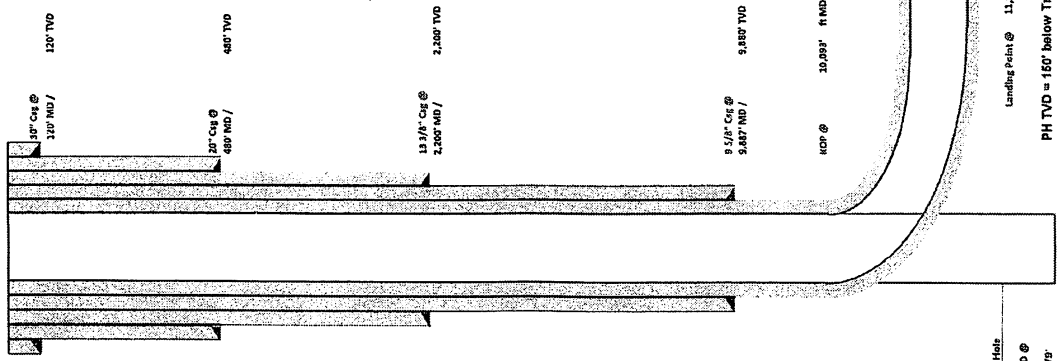
25) Proposed borehole conditioning procedures:

Will circulate a minimum of 3 hours at TD, short trip to curve, circulate bottoms up, check for flow, POOH

*Note: Attach additional sheets as needed.



WELL NAME: Knob Creek H-12HU
STATE: WV **COUNTY:** Marshall
DISTRICT: Meade
DF Desc: 737' **GL Desc:** 737'
TD: 23,890'
TR1 Latitude: 39.17004661
TR1 Longitude: -80.70541895
BR1 Latitude: 39.801637
BR1 Longitude: -80.727834



| Formation | Depth (MD) | Depth (TVD) |
|---------------------|------------|-------------|
| Deposit Fresh Water | 30' | 30' |
| Swickley Coal | 292' | 292' |
| Pittsburgh Coal | 574' | 574' |
| Big Lino | 1,603' | 1,603' |
| Berea | 2,103' | 2,103' |
| Tully | 6,100' | 6,100' |
| Marcellus | 6,204' | 6,204' |
| Onondaga | 6,235' | 6,235' |
| Salis | 6,271' | 6,271' |
| Lockport | 8,028' | 8,028' |
| Utica | 10,765' | 10,765' |
| Point Pleasant | 11,007' | 11,007' |
| Landing Depth | 11,057' | 11,057' |
| Trenton | 11,119' | 11,119' |
| Plot Hole TD | 11,279' | 11,279' |

| Type | Hole Size (in) | Csg Size (in) | Depth (MD) | Depth (TVD) | Weight (lb/ft) | Grade | Top of Cement |
|----------------|----------------|---------------|------------|-------------|----------------|-------|---------------|
| Conductor | 36 | 30 | 120' | 120' | 8W | BW | Surface |
| Surface | 26 | 20 | 480' | 480' | 106.5 | 155 | Surface |
| Intermediate 1 | 17 1/2 | 13 3/8 | 3,200' | 2,200' | 54.5 | 155 | Surface |
| Intermediate 2 | 12 1/4 | 9 5/8 | 9,887' | 9,887' | 47 | HP710 | Surface |
| Production | 8 1/2 | 5 1/2 | 23,890' | 10,842' | 23 | HC710 | Surface |

| Cement Summary | Sacks | Class | Density | Fluid Type | Centralizer Notes |
|----------------|-------|-------|---------|-------------|--|
| | | | | | |
| Conductor | 338 | A | 15.6 | Alt | None |
| Surface | 891 | A | 15.6 | Alt | 3 Centralizers at equal distance |
| Intermediate 1 | 1,688 | A | 15 | Alt | 1 Centralizer every other ft |
| Intermediate 2 | 2,770 | A | 14.5 | Alt | 1 Centralizer every other ft |
| Production | 5,014 | A | 15 | Alt / SOBMA | 1 every other joint in laterals; 1 per joint in curve; 1 every other ft to s/c |

Jan 10/3/19

Landed TD @ 23,890'
 10,842' FT TVD



Tug Hill Operating, LLC Casing and Cement Program

Knob Creek N-12HU

Casing

| | String | Grade | Bit Size | Depth (Measured) | Cement Fill Up |
|----------------|---------|--------|----------|------------------|----------------|
| Conductor | 30" | BW | 36" | 120' | CTS |
| Surface | 20" | J55 | 26" | 480' | CTS |
| Intermediate 1 | 13 3/8" | J55 | 17 1/2" | 2,200' | CTS |
| Intermediate 2 | 9 5/8" | HPP110 | 12 1/4" | 9,887' | CTS |
| Production | 5 1/2" | HCP110 | 8 1/2" | 23,890' | CTS |

Cement

Surface: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2

Intermediate 1: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.2

Intermediate 2: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.99

Production: 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.18

WW-9
(4/16)

API Number 47 - 051 -
Operator's Well No. Knob Creek N-12HU

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

Watershed (HUC 10) Fish Creek Quadrangle Glen Easton 7.5'

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes No

Will a pit be used? Yes No

If so, please describe anticipated pit waste: AST Tanks with proper containment will be used for staging fresh water for frac and flow back water

Will a synthetic liner be used in the pit? Yes No If so, what ml.? AST Tanks will be used with proper contain

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number UIC 2459, UIC 965, UIC 359, UIC 2D0732540, UIC 2D0732523)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain _____)

Will closed loop system be used? If so, describe: Yes - For Vertical and Horizontal Drilling

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air for vertical / Oil for Horizontal

-If oil based, what type? Synthetic, petroleum, etc. Synthetic Oil Base

Additives to be used in drilling medium? Barite for weight

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. All drill cuttings to be disposed of in a Landfill

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386426)

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature James A. Pancake
Company Official (Typed Name) Jim Pancake
Company Official Title VP Geosciences

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Subscribed and sworn before me this 22 day of AVGUST, 20 19

Maureen A Stead Notary Public

My commission expires 1/28/23

Commonwealth of Pennsylvania - Notary Seal
MAUREEN A STEAD - Notary Public
Washington County
My Commission Expires Jan 28, 2023
Commission Number 1259926

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 12.93 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

| Temporary | | Permanent | |
|-----------------|----------|---------------|----------|
| Seed Type | lbs/acre | Seed Type | lbs/acre |
| Annual Ryegrass | 40 | Orchard Grass | 12 |
| Spring Oats | 96 | Ladino | 3 |
| | | White Clover | 2 |

Attach:

Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions (L x W x D) of the pit, and dimensions (L x W), and area in acreage, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *Jan Nicholas*

Comments: _____

Title: WVDEP Oil and Gas Inspector

Date: 8/22/19

Field Reviewed? () Yes () No

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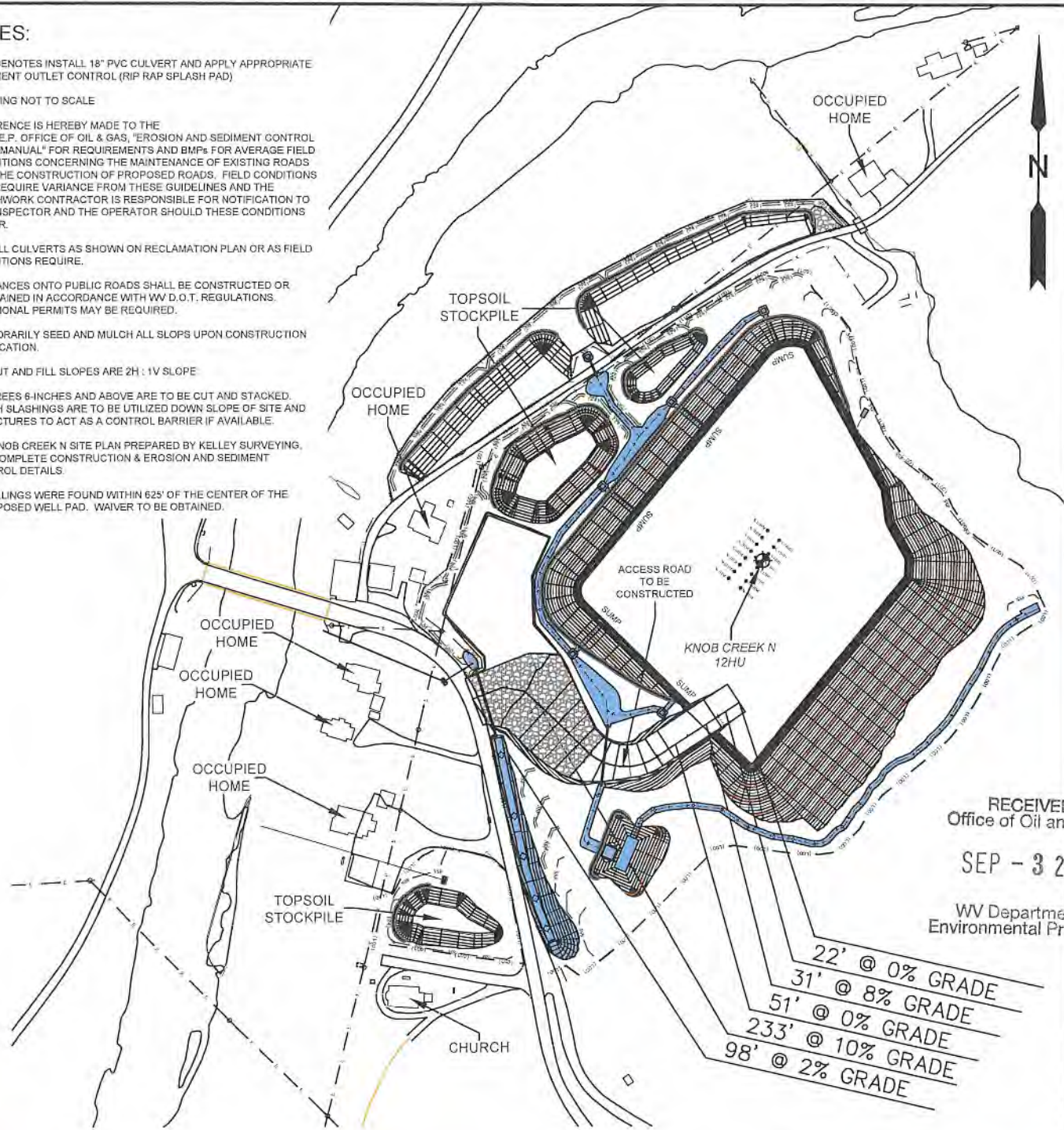
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PROPOSED KNOB CREEK N - 12HU

NOTES:

1. - DENOTES INSTALL 18" PVC CULVERT AND APPLY APPROPRIATE SEDIMENT OUTLET CONTROL (RIP RAP SPLASH PAD)
2. DRAWING NOT TO SCALE
3. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
4. INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.
5. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
6. TEMPORARILY SEED AND MULCH ALL SLOPS UPON CONSTRUCTION OF LOCATION.
7. ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE
8. ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO BE UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.
9. SEE KNOB CREEK N SITE PLAN PREPARED BY KELLEY SURVEYING. FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.
10. DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF THE PROPOSED WELL PAD. WAIVER TO BE OBTAINED.



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22' @ 0% GRADE
31' @ 8% GRADE
51' @ 0% GRADE
233' @ 10% GRADE
98' @ 2% GRADE

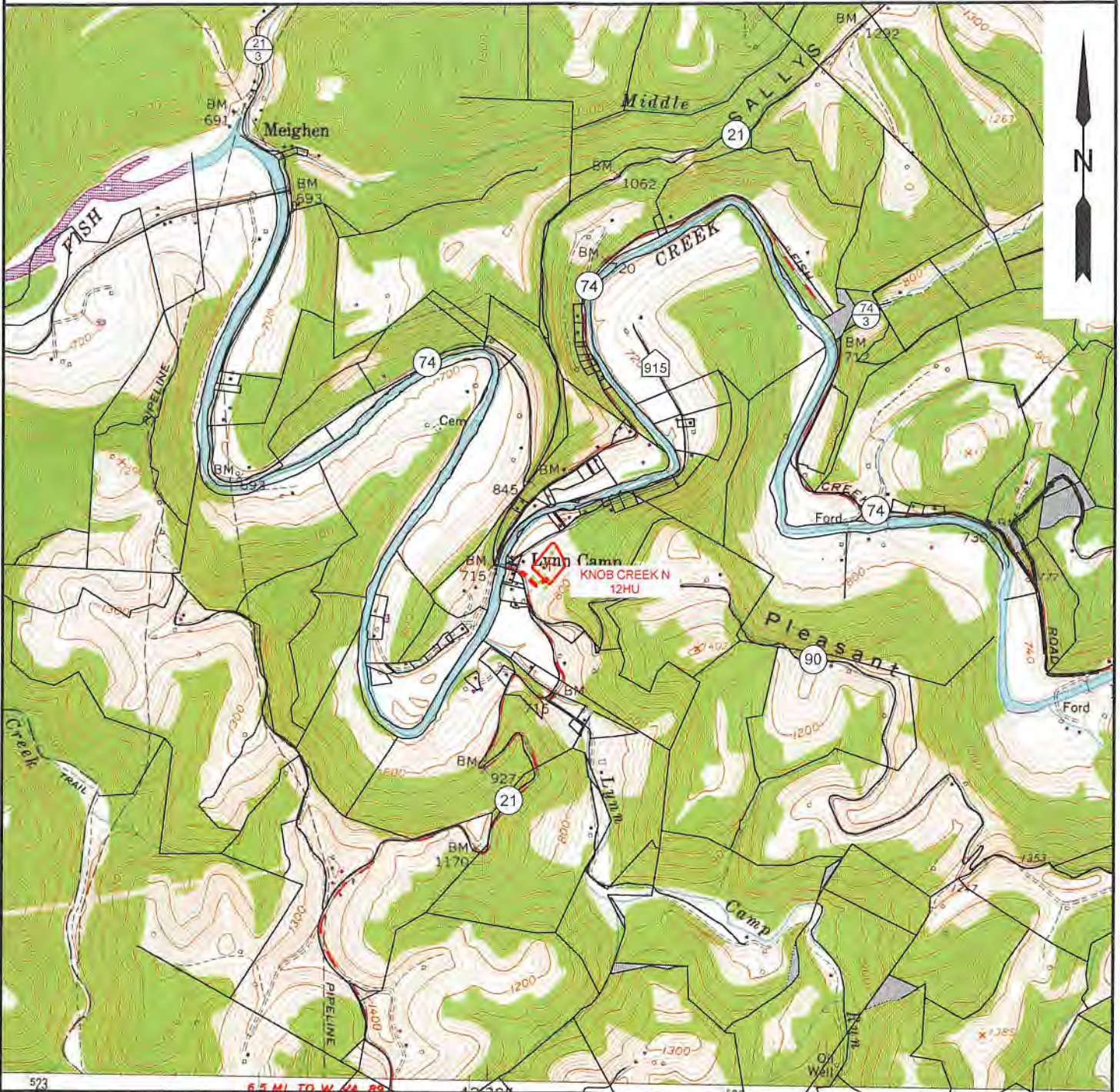
SILT FENCE AND/OR SEDIMENT AND EROSION CONTROL MEASURE

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Solutions from the ground up.
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www.sls.wv.com

| | | | |
|------------------|----------|-------------------------|-------|
| TOPO SECTION: | | OPERATOR: | |
| GLEN EASTON 7.5' | | PREPARED FOR: | |
| COUNTY | DISTRICT | TUG HILL OPERATING, LLC | |
| MARSHALL | MEADE | 380 SOUTHPOINTE BLVD | |
| | | SUITE 200 | |
| | | CANONSBURG, PA 15317 | |
| DRAWN BY | JOB NO. | DATE | SCALE |
| K.G.M. | 8789 | 08/20/2019 | NONE |

TUG HILL
OPERATING

PROPOSED KNOB CREEK N - 12HU



NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN PUBLIC SERVICE DISTRICT
PROCTOR, WV

LAT: 39.7137712
LON: -80.8258327
LOCATED: S 59°36'12" W AT 39,574.55' FROM THE CENTER OF KNOB CREEK N

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| | | | |
|------------------|----------|--|------------|
| TOPO SECTION: | | OPERATOR: | |
| GLEN EASTON 7.5' | | PREPARED FOR: | |
| COUNTY | DISTRICT | TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317 | |
| MARSHALL | MEADE | DATE | SCALE |
| DRAWN BY | JOB NO. | 08/20/2019 | 1" - 2000' |
| K.G.M. | 8789 | | |

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TUG HILL
WV Department of
Environmental Protection
OPERATING

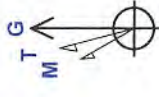


Well: Knob Creek N-12HU (slot M)
Site: Knob Creek
Project: Marshall County, West Virginia.
Design: rev2

Geodetic 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: GL=737 @ 737.00usft
 Northing: 14443135.94
 Easting: 1723150.50
 Latitude: 39.77004661
 Longitude: -80.70541895

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.881°



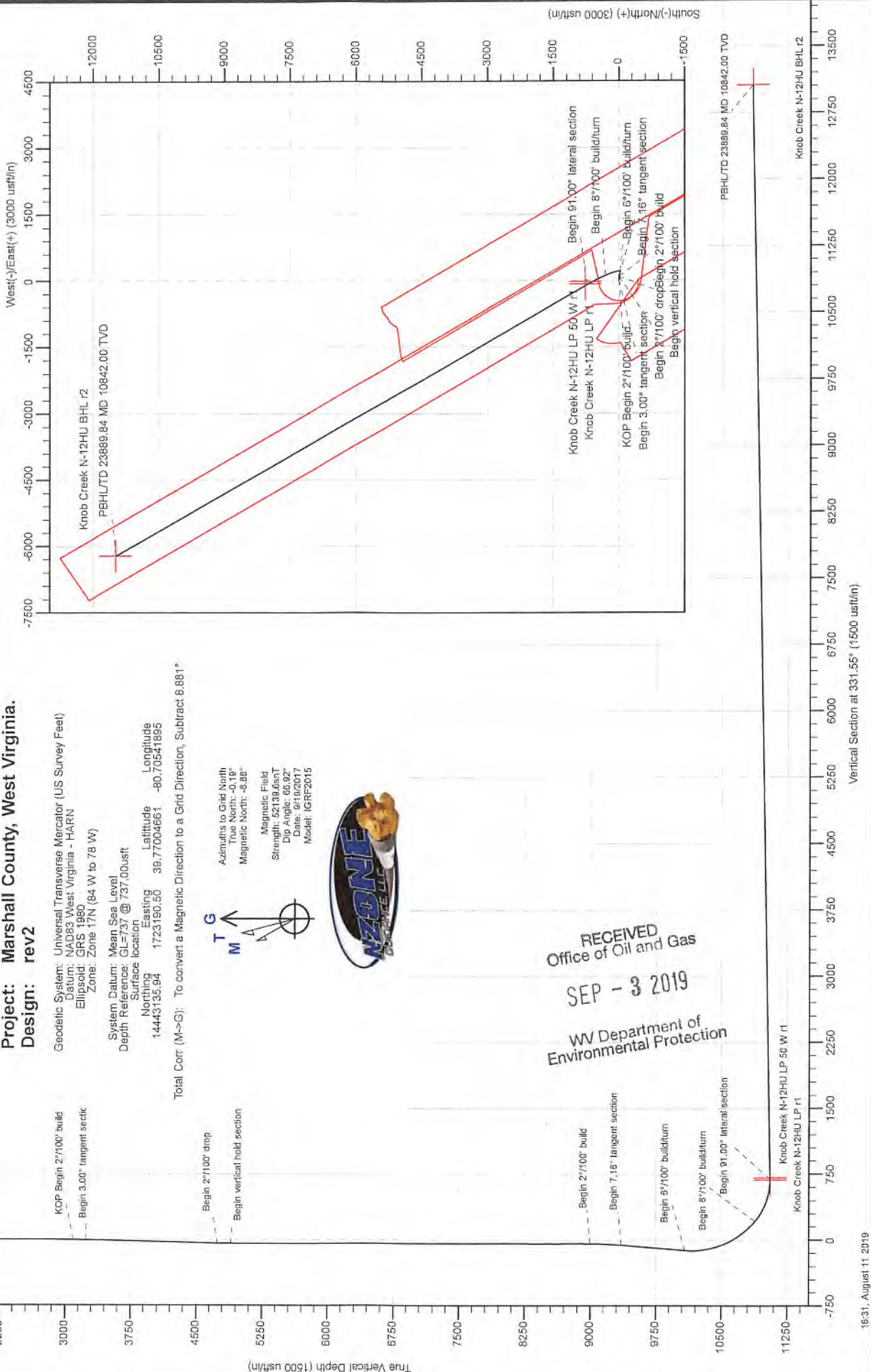
Azimuths to Grid North
 True North: -0.19°
 Magnetic North: -8.88°
 Magnetic Field
 Strength: 52.19 Gauss
 Dip Angle: 66.27°
 Date: 01/19/2017
 Model: IGRF2015



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SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/S | +E/W | Dleg | TFace | VSecl | Annotation |
|-----|----------|-------|--------|----------|----------|----------|------|---------|---------|---------------------------------|
| 1 | 3100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2 | 3250.00 | 0.00 | 0.00 | 3100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | KOP Begin 2°/100' build |
| 3 | 4750.00 | 3.00 | 90.00 | 3249.93 | 0.00 | 3.83 | 0.00 | 0.00 | -1.87 | Begin 3.00° tangent section |
| 4 | 4900.00 | 0.00 | 90.00 | 4747.88 | 0.00 | 82.43 | 0.00 | 90.000 | -39.26 | Begin vertical hold section |
| 5 | 9002.19 | 0.00 | 90.00 | 4857.81 | 0.00 | 86.36 | 0.00 | 90.000 | -41.13 | Begin 2°/100' build |
| 6 | 9360.19 | 0.00 | 90.00 | 9000.00 | 0.00 | 86.36 | 0.00 | 90.000 | -41.13 | Begin 2°/100' build |
| 7 | 10092.93 | 7.16 | 103.59 | 9357.06 | 0.00 | 108.07 | 0.00 | 0.000 | -56.09 | Begin 7.16° tangent section |
| 8 | 11000.18 | 50.00 | 337.57 | 10064.09 | -26.70 | 196.84 | 0.00 | 0.000 | -117.24 | Begin 8°/100' build/turn |
| 9 | 11519.23 | 91.00 | 330.34 | 10887.09 | 306.68 | 112.79 | 6.00 | 6.000 | 215.93 | Begin 8°/100' build/turn |
| 10 | 11519.23 | 91.00 | 330.34 | 11056.90 | 734.85 | -100.90 | 8.00 | -10.937 | 694.19 | Begin 91.00° lateral section |
| 11 | 23889.84 | 91.00 | 330.34 | 10842.00 | 11483.35 | -6221.00 | 0.00 | 0.000 | 3050.17 | PBHLTD 23889.84 MD 10842.00 TVD |





Well Site Safety Plan

Tug Hill Operating, LLC

ju
8/22/19

Well Name: Knob Creek N-12HU

Pad Location: Knob Creek
Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

NORTHING - 4,402,276.64

EASTING - 525,229.52

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**NOB CREEK N LEASE
UTICA UNIT - 599.24 AC±
WELL 12HU
TUG HILL OPERATING**

T.H. LATITUDE 39°47'30"
B.H. LATITUDE 39°50'00"

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
NAD'83 S.P.C.(FT) N. 464,863.27 E. 1,629,685.28
NAD'83 GEO. LAT-(N) 39.770467 LONG-(W) 80.705419
NAD'83 UTM (M) N. 4,402,276.64 E. 525,229.52
LANDING POINT
NAD'83 S.P.C.(FT) N. 465,600.0 E. 1,629,596.6
NAD'83 GEO. LAT-(N) 39.772066 LONG-(W) 80.705789
NAD'83 UTM (M) N. 4,402,500.6 E. 525,198.8
BOTTOM HOLE
NAD'83 S.P.C.(FT) N. 476,452.9 E. 1,623,655.0
NAD'83 GEO. LAT-(N) 39.801637 LONG-(W) 80.727434
NAD'83 UTM (M) N. 4,405,776.8 E. 523,333.4

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°42'30"

| MAP/PARCEL | ADJOINING SURFACE OWNER LIST | ACRES |
|------------|-------------------------------|----------------|
| 9-11-1 | GERALD F. PADLOW | 1.033 |
| 9-13-10 | ARTHUR L. MOORE | 3.96 |
| 9-13-13.1 | THOMAS JOHN FOX | 0.827 |
| 9-14-2 | MICHAEL L. ALVAREZ | 0.75 |
| 9-14-33 | PAUL G. FOX | 0.338 |
| 9-14-37 | MARGARET FOX - LIFE | LOT |
| 9-14-40 | MARGARET FOX - LIFE | 19,560 SQ. FT. |
| 9-14-41 | MARGARET FOX - LIFE | 9165 SQ. FT. |
| 9-16-14 | LYNN CAMP METHODIST CHURCH | 0.762 |
| 9-16-15 | RONALD R. YOUNG, ET UX - LIFE | 52.02 |
| 9-16-15.1 | ERIC J. YOUNG | 1.98 |



NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- SEE REFERENCES FOR DWELLINGS LOCATED WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'.
- BASED ON WV DOT COUNTY ROUTE 74 IS A 40' STRIP OF LAND ACQUIRED IN NUMEROUS DEEDS.
- PROPOSED LATERAL OR TOP HOLE OF NOB CREEK N-12HU IS WITHIN 3000' OF THE TOP HOLES OR LATERALS OR EXISTING WELLS PROPOSED NOB CREEK N-11HU, PROPOSED NOB CREEK N-13HU, PROPOSED NOB CREEK S-14HU, PROPOSED NOB CREEK S-15HU, PROPOSED NOB CREEK S-16HU, PROPOSED KEITH STERN N-13HU, HEAVEN HILL 2W-12HU (47-051-01952), HEAVEN HILL 2W-13HU (47-051-01957).

| TAG | SURFACE OWNER | PARCEL | ACRES |
|-----|---|-----------|------------------|
| A | DAVID LEE FRANKLIN | 9-14-33 | 65.824 |
| B | JOHN F. GUNNINGHAM, ET UX | 9-14-22 | 75.22 |
| C | WILLIAM C. GROFT, ET UX | 9-14-30 | 0.35 |
| D | MARGARET K. FOX (LIFE) | 9-14-38 | 0.031 |
| E | MARGARET K. FOX (LIFE) | 9-14-36 | 1600 SQ. FT. |
| F | MARGARET K. FOX (LIFE) | 9-14-39 | 8675 SQ. FT. |
| G | DAVID LEE FRANKLIN | 9-14-44 | 2.913 |
| H | STATE OF WEST VIRGINIA (FISH CREEK) | N/A | N/A |
| I | JOHN C. LAGOS, ET UX | 9-14-42 | 1.87 |
| J | PATRICK J. SCHELLHASE TRUST | 9-14-11.3 | 33.424 |
| K | CHARLES R. SCHELLHASE, ET UX | 9-14-28 | 3.029 |
| L | ANDREW FASCULETOS, ET UX | 9-14-29 | 0.209 |
| M | PATRICK J. SCHELLHASE | 9-14-27 | 3.004 |
| N | ANDREW FASCULETOS, ET UX | 9-14-29.1 | 1.171 |
| O | TWILA C. COPFIELD | 9-14-32 | 0.583 |
| P | JAMES G. FOX | 9-14-43 | 0.66 |
| Q | TWILA C. COPFIELD | 9-14-32.1 | 0.184 |
| R | MARGARET K. FOX (LIFE) | 9-13-15 | 15.513 |
| S | JAMES E. PEELMAN | 9-14-53 | 0.555 |
| T | JAMES E. PEELMAN | 9-14-52 | 0.439 |
| U | RICHARD L. HARVETH, ET UX | 9-14-54 | 1.649 |
| V | GEORGE R. TAYLOR, ET UX | 9-14-44.1 | 4.423 |
| W | WILFORD F. NELSON, JR., ET UX | 9-14-31 | 0.954 |
| X | MARGARET K. FOX (LIFE) | 9-14-46 | 18.888 |
| Y | RONALD MARSH | 9-14-50 | 0.707 |
| Z | MICHAEL L. & CHERYL J. ACREE | 9-14-47 | 0.355 |
| AA | GEORGE R. TAYLOR, ET UX | 9-14-45 | 10.98 |
| BB | MARTHA JANE FAZZARO | 9-14-46.1 | 1.512 |
| CC | GEORGE R. TAYLOR, ET UX | 9-14-51 | 1.621 |
| DD | NILA JEAN FROHNAPFEL | 9-13-12 | 91.1007 |
| EE | MARGARET K. FOX (LIFE) | 9-13-14 | 3.00 |
| FF | DANIEL JAY FITZWATER | 9-13-20 | 105.5 |
| GG | ROBERT I. DUFFEY - LIFE | 9-14-10 | 25/100 AC. |
| HH | MICHAEL L. & CHERYL J. ACREE | 9-14-48 | 0.472 |
| II | LOVE A. BLAKE, JR. | 9-14-11.2 | 4.00 |
| JJ | MICHAEL L. & CHERYL J. ACREE | 9-14-49 | 0.118 |
| KK | JOHN T. ERAZMUS, III | 9-14-7 | 0.25 |
| LL | JOHN E. DUFFEY, ET UX | 9-14-9 | 2/5 AC. |
| MM | JOHNNY C. HOLCOMB & JOHNNY C. HOLCOMB, II | 9-14-8 | 2/5 AC. |
| NN | HOY GLENN CROW | 9-14-11 | 141.559 |
| OO | MICHAEL L. ALVAREZ | 9-14-6 | 120 X 200' |
| PP | MICHAEL L. ALVAREZ | 9-14-5 | 200' X 60' |
| QQ | MICHAEL L. ALVAREZ | 9-14-4 | 3 PCLS & 1/8 AC. |
| RR | SAMUEL & HEATHER SUHODOLKI | 9-14-1 | 86.48 |
| SS | ROBERT T. & BARBARA A. ANKROM | 9-13-12.1 | 2.632 |
| TT | ELEANOR M. FOX EST. | 9-13-18 | 30.00 |
| UU | KENNETH N. & TERESA A. SMERTNECK | 9-13-11 | 112.67 |
| VV | MICHAEL L. ALVAREZ | 9-14-1.1 | 1.6 |
| WW | MICHAEL L. ALVAREZ | 9-14-3 | N PT PCLS 3-4.5 |
| XX | KENNETH N. & TERESA A. SMERTNECK | 9-14-1.2 | 1.02 |
| YY | SAMUEL & HEATHER SUHODOLKI | 9-13-11.1 | 0.49 |
| ZZ | MARGARET K. FOX (LIFE) | 9-11-2 | 84.978 |
| A0 | KENNETH F. GATEWOOD, ET UX | 9-11-2.1 | 0.308 |
| A1 | GERALD PADLOW, ET UX | 9-11-2.2 | 0.291 |
| A2 | RAY A. WHETZAL, JR., ET AL | 9-10-13 | 71.119 |
| A3 | WILLIAM MCCONNELL | 9-10-14 | 15.00 |
| A4 | J. F. CROW ESTATE, ET AL | 9-10-9 | 17 AC. 14 P. |
| A5 | J. F. CROW ESTATE, ET AL | 9-10-11 | 60.00 |
| A6 | JOSEPH MICHAEL BONENE | 9-10-15 | 44.00 |
| A7 | DAVID & PAMELA SCHIMMEL | 9-10-7 | 1.00 |
| A8 | BRENT ALLEN CONNER | 9-10-8 | 2.00 |
| A9 | KENNETH W. MASON EST. | 9-10-6 | 43.00 |
| B0 | RONALD KEITH & RUBY MASON | 9-6-12 | 59.00 |
| B1 | KENNETH W. MASON EST. | 9-10-5 | 51.62 |
| B2 | KENNETH W. MASON EST. | 9-6-14 | 19.37 |
| B3 | J. F. CROW ESTATE, ET AL | 9-6-15 | 55.23 |
| B4 | JANE RICHARDSON HEIRS, ET AL | 9-6-16 | 23.05 |
| B5 | ROBERT LEE CARNEY, ET UX | 9-6-4 | 118.17 |

P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 462-5934
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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 REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 849 *C. Victor Moyers*

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE AUGUST 21, 20 19
REVISED SEPTEMBER 18, 2019
OPERATORS WELL NO. NOB CREEK N-12HU
API WELL NO. 47-051-0220846A
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8789P12HUR-REV2.dwg
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW

LOCATION: GROUND = 732.20' ELEVATION PROPOSED = 734.67' WATERSHED FISH CREEK (HUC 10)
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER DAVID LEE FRANKLIN ACREAGE 65.824±
ROYALTY OWNER DAVID LEE FRANKLIN, ET AL - SEE WW-6A1 ACREAGE 65.824±
LEASE NO. SEE WW-6A1

PROPOSED WORK:
DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER
PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION POINT PLEASANT
ESTIMATED DEPTH TVD: 11,279' TMD: 23,890'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD
FORT WORTH, TX 76107 CHARLESTON, WV 25313

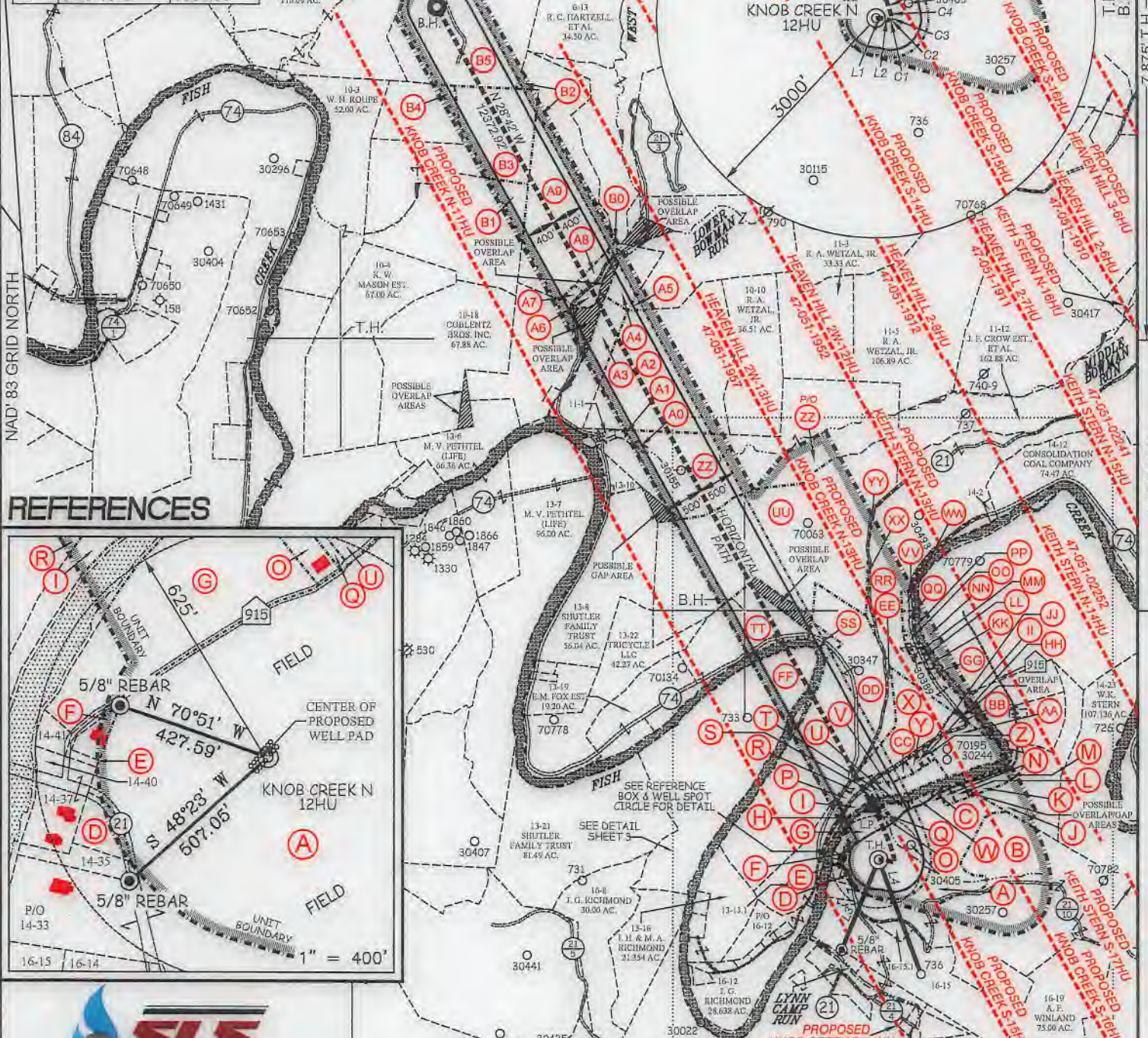
COUNTY NAME PERMIT

**KNOB CREEK N LEASE
UTICA UNIT - 599.24 AC±
WELL 12HU
TUG HILL OPERATING**

| LINE | BEARING | DISTANCE |
|------|------------|----------|
| L1 | S 89°03' E | 86.39' |
| L2 | S 75°28' E | 114.57' |
| L3 | S 22°30' W | 1320.99' |
| L4 | S 20°18' E | 1654.98' |

4-17
M. MCGARDLE,
ET AL
65,791 AC

6-3
W. N. ROUPE
118.09 AC

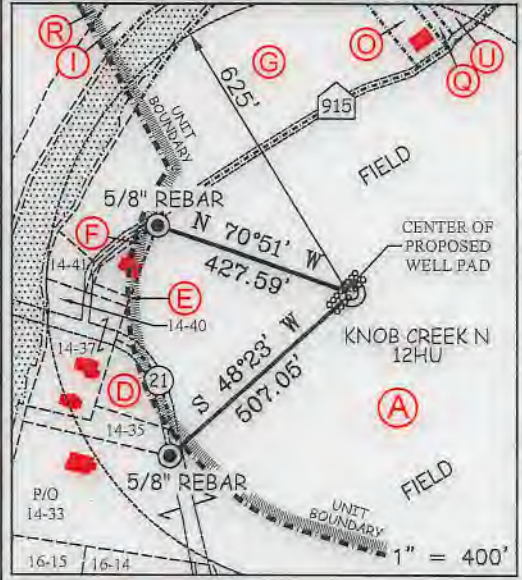


T.H. LATITUDE 39°47'30"
B.H. LATITUDE 39°50'00"

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°42'30"

NAD'83 GRID NORTH

REFERENCES



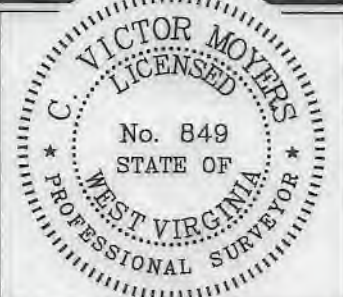
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Solutions from the ground up.
P.O. Box 150 | 12 Vanhorn Drive | Glenville, WV 26031 | (304) 452-5934
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P.S. 849 *C. Victor Moyers*

| CURVE | ARC LENGTH | RADIUS | CHORD BEARING | CHORD LENGTH |
|-------|------------|----------|---------------|--------------|
| C1 | 10.16' | 10.03' | N 76°40' E | 9.73' |
| C2 | 12.75' | 23.71' | N 22°37' E | 12.59' |
| C3 | 34.85' | 141.39' | N 02°29' W | 34.76' |
| C4 | 79.29' | 663.76' | N 13°19' W | 79.24' |
| C5 | 148.79' | 2213.68' | N 18°41' W | 148.76' |
| C6 | 552.25' | 3807.31' | N 24°57' W | 551.77' |

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

| | | |
|----------------------|-------------------|--------------------|
| NAD'83 S.P.C.(FT) | N. 464,863.27 | E. 1,629,685.28 |
| NAD'83 GEO. | LAT-(N) 39.770467 | LONG-(W) 80.705419 |
| NAD'83 UTM (M) | N. 4,402,276.64 | E. 525,229.52 |
| LANDING POINT | | |
| NAD'83 S.P.C.(FT) | N. 465,600.0 | E. 1,629,596.6 |
| NAD'83 GEO. | LAT-(N) 39.772086 | LONG-(W) 80.705769 |
| NAD'83 UTM (M) | N. 4,402,500.6 | E. 525,198.8 |
| BOTTOM HOLE | | |
| NAD'83 S.P.C.(FT) | N. 476,452.9 | E. 1,623,655.0 |
| NAD'83 GEO. | LAT-(N) 39.801637 | LONG-(W) 80.727434 |
| NAD'83 UTM (M) | N. 4,405,776.8 | E. 523,333.4 |



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

LEGEND

| | |
|---------------------------------|--|
| UNIT BOUNDARY | |
| LEASED TRACTS INSIDE | |
| UNIT BOUNDARY | |
| SURFACE LINE | |
| PROPOSED UTICA | |
| WELL LATERAL | |
| 400' OFFSET LINE | |
| 500' OFFSET LINE | |
| TIE LINE | |
| CREEK | |
| ROAD | |
| COUNTY ROUTE | |
| PROPOSED WELL | |
| EXISTING WELL | |
| PERMITTED WELL | |
| SURFACE OWNER (SEE TABLE) | |
| LEASE # (SEE ADDITIONAL SHEETS) | |

SCALE 1" = 2000' FILE NO. 8789P12HUR-REV2.dwg
KNOB CREEK N-12HU REV2

DATE AUGUST 21, 2019
REVISED SEPTEMBER 18, 2019

OPERATORS WELL NO. KNOB CREEK N-12HU

API WELL NO. 47-051-022086A

NO. STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
DIVISION OF
ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

WELL OPERATOR TUG HILL OPERATING, LLC ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107

DESIGNATED AGENT DIANNA STAMPER CT CORPORATION SYSTEM ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

COUNTY NAME PERMIT

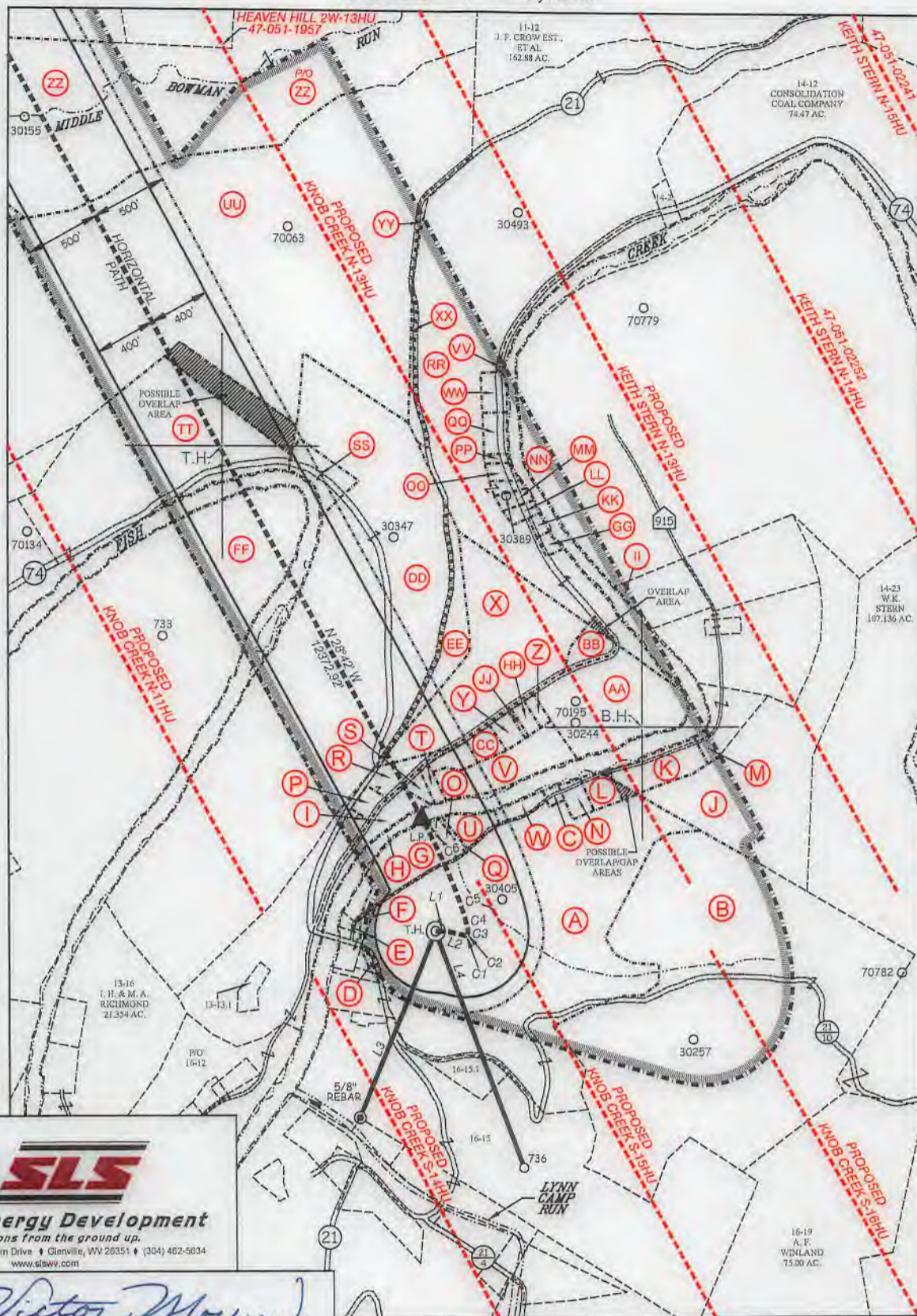
**KNOB CREEK N LEASE
UTICA UNIT - 599.24 AC±
WELL 12HU
TUG HILL OPERATING**

T.H. LATITUDE 39°47'30"
B.H. LATITUDE 39°50'00"

**SHEET 3 DETAIL
SCALE - 1" = 1,000'**

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°42'30"

NAD '83 GRID NORTH



7,875' T.H.

11,546' B.H.



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www.slsww.com

P.S. 849 *C. Victor Moyers*

| | | |
|--|-------------------|--------------------|
| (S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH) | | |
| NAD'83 S.P.C.(FT) | N. 464,863.27 | E. 1,629,685.28 |
| NAD'83 GEO. | LAT-(N) 39.770467 | LONG-(W) 80.705419 |
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| LANDING POINT | | |
| NAD'83 S.P.C.(FT) | N. 465,600.0 | E. 1,629,596.6 |
| NAD'83 GEO. | LAT-(N) 39.772066 | LONG-(W) 80.705769 |
| NAD'83 UTM (M) | N. 4,402,500.6 | E. 525,198.8 |
| BOTTOM HOLE | | |
| NAD'83 S.P.C.(FT) | N. 476,452.9 | E. 1,623,655.0 |
| NAD'83 GEO. | LAT-(N) 39.801637 | LONG-(W) 80.727434 |
| NAD'83 UTM (M) | N. 4,405,776.8 | E. 523,333.4 |



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

LEGEND

- UNIT BOUNDARY
- LEASED TRACTS INSIDE
- UNIT BOUNDARY
- SURFACE LINE
- PROPOSED UTICA
- WELL LATERAL
- 400' OFFSET LINE
- 500' OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE ADDITIONAL SHEETS)

COUNTY NAME

PERMIT

SCALE 1" = 1000' FILE NO. 8789P12HUR-REV2.dwg
KNOB CREEK N-12HU REV2
DATE AUGUST 21, 2019
REVISED SEPTEMBER 18, 2019
OPERATORS WELL NO. KNOB CREEK N-12HU
API WELL NO. 47-051-02268H6A
STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
DIVISION OF
ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS



WELL OPERATOR TUG HILL OPERATING, LLC
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500
FORT WORTH, TX 76107

DESIGNATED AGENT DIANNA STAMPER
ADDRESS 5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

**KNOB CREEK N LEASE
UTICA UNIT - 599.24 AC ±
WELL 12HU
TUG HILL OPERATING**



| NO. | Lease ID | Tag | Parcel | Grantor, Lessor, Etc. | Deed Book/Page | |
|-----|----------------|-----|-----------------|---|----------------|-----|
| 1 | 10*47051.219.1 | A | 9-14-33 | DAVID LEE FRANKLIN | 937 | 385 |
| 2 | 10*16479 | B | 9-14-22 | JOHN F CUNNINGHAM AND BERNEICE K CUNNINGHAM | 826 | 88 |
| 3 | 10*47051.219.1 | C | 9-14-30 | DAVID LEE FRANKLIN | 937 | 385 |
| 4 | 10*47051.243.1 | D | 9-14-38 | MARY A FOX, ET AL | 879 | 332 |
| 5 | 10*47051.219.1 | E | 9-14-36 | DAVID LEE FRANKLIN | 937 | 385 |
| 6 | 10*47051.219.1 | F | 9-14-39 | DAVID LEE FRANKLIN | 937 | 385 |
| 7 | 10*47051.219.1 | G | 9-14-44 | DAVID LEE FRANKLIN | 937 | 385 |
| 8 | 10*23458 | H | FISH CREEK - WV | WEST VIRGINIA DIVISION OF NATURAL RESOURCES | 1019 | 373 |
| 9 | 10*19538 | I | 9-14-42 | JOHN C LAGOS AND CYNTHIA M LAGOS, ET AL | 936 | 531 |
| 10 | 10*23053 | J | 9-14-11.3 | CE YOUNG | 63 | 146 |
| 11 | 10*23053 | K | 9-14-28 | CE YOUNG | 63 | 146 |
| 12 | 10*22394 | L | 9-14-29 | THE ANDREW & KAREN FASOULETOS 2017 IRREVOCABLE TRUST DATED SEPT 14 2017 | 964 | 513 |
| 13 | 10*23053 | M | 9-14-27 | CE YOUNG | 63 | 146 |
| 14 | 10*22394 | N | 9-14-29.1 | THE ANDREW & KAREN FASOULETOS 2017 IRREVOCABLE TRUST DATED SEPT 14 2017 | 964 | 513 |
| 15 | 10*47051.219.1 | O | 9-14-32 | DAVID LEE FRANKLIN | 937 | 385 |
| 16 | 10*18732 | P | 9-14-43 | SHERRILL M LEAVERS AND JAMES H LEAVERS, ET AL | 938 | 245 |
| 17 | 10*47051.219.1 | Q | 9-14-32.1 | DAVID LEE FRANKLIN | 937 | 385 |
| 18 | 10*18732 | R | 9-13-13 | SHERRILL M LEAVERS AND JAMES H LEAVERS, ET AL | 938 | 245 |
| 19 | 10*19565 | S | 9-14-53 | WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, ET AL | 947 | 566 |
| 20 | 10*19565 | T | 9-14-52 | WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, ET AL | 947 | 566 |
| 21 | 10*15523 | U | 9-14-54 | RICHARD L HARVETH AND SANDRA J HARVETH | 729 | 638 |
| 22 | 10*19565 | V | 9-14-44.1 | WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, ET AL | 947 | 566 |
| 23 | 10*47051.219.1 | W | 9-14-31 | DAVID LEE FRANKLIN | 937 | 385 |
| 24 | 10*18298 | X | 9-14-46 | MAUREEN GREGG, ET AL | 929 | 273 |
| 25 | 10*19565 | Y | 9-14-50 | WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, ET AL | 947 | 566 |
| 26 | 10*19565 | Z | 9-14-47 | WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, ET AL | 947 | 566 |
| 27 | 10*19565 | AA | 9-14-45 | WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, ET AL | 947 | 566 |
| 28 | 10*18298 | BB | 9-14-46.1 | MAUREEN GREGG, ET AL | 929 | 273 |
| 29 | 10*19565 | CC | 9-14-51 | WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, ET AL | 947 | 566 |
| 30 | 10*24858 | DD | 9-13-12 | NILA JEAN FROHNAPFEL | 1028 | 119 |
| 31 | 10*47051.243.1 | EE | 9-13-14 | MARY A FOX, ET AL | 879 | 332 |
| 32 | 10*17193 | FF | 9-13-20 | JOHN P. ICARD, ET AL | 716 | 12 |
| 33 | 10*19621 | GG | 9-14-10 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 34 | 10*19565 | HH | 9-14-48 | WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, ET AL | 947 | 566 |
| 35 | 10*23053 | II | 9-14-11.2 | CE YOUNG | 63 | 146 |
| 36 | 10*19565 | JJ | 9-14-49 | WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, ET AL | 947 | 566 |
| 37 | 10*19621 | KK | 9-14-7 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 38 | 10*19621 | LL | 9-14-9 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 39 | 10*19621 | MM | 9-14-8 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 40 | 10*23053 | NN | 9-14-11 | CE YOUNG | 63 | 146 |
| 41 | 10*19621 | OO | 9-14-6 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 42 | 10*19621 | PP | 9-14-5 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 43 | 10*19621 | QQ | 9-14-4 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 44 | 10*19621 | RR | 9-14-1 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 45 | 10*19942 | SS | 9-13-12.1 | ROBERT T ANKROM & BARBARA A ANKROM | 949 | 207 |
| 46 | 10*18351 | TT | 9-13-18 | MARK ALLEN LENENBERG, ET AL | 931 | 399 |
| 47 | 10*18265 | UU | 9-13-11 | KENNETH NELSON SMERTNECK AND TERESA ANN SMERTNECK | 933 | 103 |
| 48 | 10*19621 | VV | 9-14-1.1 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 49 | 10*19621 | WW | 9-14-3 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 50 | 10*19621 | XX | 9-14-1.2 | MARY RUTH FROHNAPFEL, ET AL | 938 | 595 |
| 51 | 10*18265 | YY | 9-13-11.1 | KENNETH NELSON SMERTNECK AND TERESA ANN SMERTNECK | 933 | 103 |
| 52 | 10*47051.243.1 | ZZ | 9-11-2 | MARY A FOX, ET AL | 879 | 332 |
| 53 | 10*47051.272.0 | A0 | 9-11-2.1 | KENNETH P GATEWOOD AND MARY M GATEWOOD | 888 | 600 |
| 54 | 10*16526 | A1 | 9-11-2.2 | JUDITH PADLOW AKA JUDI L PADLOW | 957 | 134 |
| 55 | 10*15567 | A2 | 9-10-13 | VICKIE MASON, ET AL | 680 | 409 |
| 56 | 10*15600 | A3 | 9-10-14 | WILLIAM D MCCONNELL | 715 | 447 |
| 57 | 10*15510 | A4 | 9-10-9 | ELAINE PHELPS ET VIR, ET AL | 718 | 326 |
| 58 | 10*15510 | A5 | 9-10-11 | ELAINE PHELPS ET VIR, ET AL | 718 | 326 |
| 59 | 10*47051.117.1 | A6 | 9-10-15 | JOSEPH MICHAEL BONENE | 940 | 359 |
| 60 | 10*47051.117.1 | A7 | 9-10-7 | JOSEPH MICHAEL BONENE | 940 | 359 |
| 61 | 10*47051.117.1 | A8 | 9-10-8 | JOSEPH MICHAEL BONENE | 940 | 359 |
| 62 | 10*15504 | A9 | 9-10-6 | JAMES MASON ET AL | 692 | 461 |
| 63 | 10*15525 | B0 | 9-6-12 | RONALD KEITH MASON ET UX, ET AL | 772 | 445 |
| 64 | 10*15504 | B1 | 9-10-5 | JAMES MASON ET AL | 692 | 461 |
| 65 | 10*15504 | B2 | 9-6-14 | JAMES MASON ET AL | 692 | 461 |
| 66 | 10*15510 | B3 | 9-6-15 | ELAINE PHELPS ET VIR, ET AL | 718 | 326 |
| 67 | 10*15464 | B4 | 9-6-16 | MARY ALICE THOMAS MELLOTT, ET AL | 906 | 527 |
| 68 | 10*19116 | B5 | 9-6-4 | ROBERT LEE CARNEY AND BONNIE ANNE CARNEY | 682 | 255 |

FILE NO. 8789P12HUR-REV2.dwg
KNOB CREEK N-12HU REV2

DATE AUGUST 21, 20 19

REVISED SEPTEMBER 18, 2019

OPERATORS WELL NO. KNOB CREEK N-12HU

API WELL NO. 47 STATE _____ COUNTY _____ PERMIT _____



STATE OF WEST VIRGINIA
DIVISION OF
ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS



P.S. 849 C. Victor Moyers

WELL OPERATOR TUG HILL OPERATING, LLC
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500
FORT WORTH, TX 76107

DESIGNATED AGENT DIANNA STAMPER
ADDRESS CT CORPORATION SYSTEM
5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

COUNTY NAME

PERMIT

WW-6A1
(5/13)

Operator's Well No. Knob Creek N-12HU

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

| Lease Name or Number | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Book/Page |
|-------------------------|-----------------------|-----------------------|---------|-----------|
|-------------------------|-----------------------|-----------------------|---------|-----------|

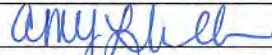
*See attached pages

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Tug Hill Operating, LLC
 By: Amy L. Miller 
 Its: Permitting Specialist - Appalachia Region

| Lease ID | Parcel | Tag | Grantor, Lessor, Etc. | Grantee, Lessee, Etc. | Royalty | Deed Book/Page | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment |
|-----------------|---------|-----|--|---------------------------|---------|----------------|------------|------------|------------|------------|------------|---|---|---|---|
| 10*47051.108.52 | 9-10-13 | A2 | CONNIE N ASTON | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.53 | 9-10-13 | A2 | MARY JANE RYLE | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.56 | 9-10-13 | A2 | PAULA HUNDL | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.57 | 9-10-13 | A2 | ROBERT B KERNS | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.58 | 9-10-13 | A2 | RONALD W KERNS | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.59 | 9-10-13 | A2 | PAUL URSSES KERNS ESTATE SALVATORE P PUGLISI, EXECUTOR | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.6 | 9-10-13 | A2 | TERRI MCCARDLE | TH EXPLORATION LLC | 1/8+ | 895 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.61 | 9-10-13 | A2 | AMANDA FEIGH | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.7 | 9-10-13 | A2 | GARY FRANCIS WHEITZAL | TH EXPLORATION LLC | 1/8+ | 895 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.73 | 9-10-13 | A2 | JOHN ASTON JR | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.77 | 9-10-13 | A2 | SHONDA WOOD | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.78 | 9-10-13 | A2 | DONNA WOODS MOODY | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*47051.108.79 | 9-10-13 | A2 | MARK A ASTON | TH EXPLORATION LLC | 1/8+ | 901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*155600 | 9-10-14 | A3 | WILLIAM D MCCONNELL | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | N/A | N/A | N/A | N/A | N/A | Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 29/325 | Statoil USA Onshore Properties Inc to Chevron USA Inc: 30/427 | Chesapeake Appalachia LLC to Statoil USA Inc: 30/461 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15510 | 9-10-9 | A4 | ELAINE PHELPS ET VIR | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15511 | 9-10-9 | A4 | DAVID E CROW | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/463 | NPAR LLC to Chevron USA Inc: 28/269 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15512 | 9-10-9 | A4 | FRANCES COFFEY | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15513 | 9-10-9 | A4 | KAY KEYES | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15514 | 9-10-9 | A4 | L PAUL CROW | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15515 | 9-10-9 | A4 | DESIRE L CROW | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15516 | 9-10-9 | A4 | ROSE MARIE KIELGCZEWSKI | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15517 | 9-10-9 | A4 | DIANNE GELLNER & GARY GELLNER | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15519 | 9-10-9 | A4 | JOHN CROW | TRIENERGY HOLDINGS, LLC | 1/8+ | 726 | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/449 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | Chevron USA Inc to TH Exploration LLC: 36/148 |

| Lease ID | Parcel | Tag | Grantor, Lessor, Etc. | Grantee, Lessee, Etc. | Royalty | Deed Book/Page | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment |
|----------------|---------|-----|--|-------------------------|---------|----------------|------------|------------|------------|------------|------------|------------|--|--------------------------------------|---|------------|---|
| 10*15520 | 9-10-9 | A4 | TIMOTHY CROW | TRIENERGY HOLDINGS, LLC | 1/8+ | 726 582 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/449 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*47051.123.1 | 9-10-9 | A4 | LOYD G BAKER | TH EXPLORATION LLC | 1/8+ | 865 389 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/449 | N/A | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*47051.123.2 | 9-10-9 | A4 | JAMES P HOLIDAY AND JACQUELINE HOLIDAY | TH EXPLORATION LLC | 1/8+ | 873 143 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/463 | N/A | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15510 | 9-10-11 | A5 | ELAINE PHELPS ET VIR | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 326 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15511 | 9-10-11 | A5 | DAVID E CROW | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 376 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/463 | NPAR LLC to Chevron USA Inc: 26/269 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15512 | 9-10-11 | A5 | FRANCES COFFEY | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 378 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15513 | 9-10-11 | A5 | KAY KEYES | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 330 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15514 | 9-10-11 | A5 | L PAUL CROW | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 336 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15515 | 9-10-11 | A5 | DESIRE L CROW | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 334 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15516 | 9-10-11 | A5 | ROSE MARIE KIELGCZEWSKI | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 354 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15517 | 9-10-11 | A5 | DIANNE GELLNER & GARY GELLNER | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 345 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15519 | 9-10-11 | A5 | JOHN CROW | TRIENERGY HOLDINGS, LLC | 1/8+ | 726 580 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/449 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15520 | 9-10-11 | A5 | TIMOTHY CROW | TRIENERGY HOLDINGS, LLC | 1/8+ | 726 582 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/449 | NPAR LLC to Chevron USA Inc: 756/332 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*47051.123.1 | 9-10-11 | A5 | LOYD G BAKER | TH EXPLORATION LLC | 1/8+ | 865 389 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/449 | N/A | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*47051.123.2 | 9-10-11 | A5 | JAMES P HOLIDAY AND JACQUELINE HOLIDAY | TH EXPLORATION LLC | 1/8+ | 873 143 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/449 | N/A | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*47051.117.1 | 9-10-15 | A6 | JOSEPH MICHAEL BONENE | TH EXPLORATION LLC | 1/8+ | 940 359 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/449 | N/A | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*47051.117.1 | 9-10-7 | A7 | JOSEPH MICHAEL BONENE | TH EXPLORATION LLC | 1/8+ | 940 359 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/449 | N/A | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*47051.117.1 | 9-10-8 | A8 | JOSEPH MICHAEL BONENE | TH EXPLORATION LLC | 1/8+ | 940 359 | N/A | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 25/449 | N/A | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |

| Lease ID | Parcel | Tag | Grantor, Lessor, Etc. | Grantee, Lessee, Etc. | Royalty | Deed Book/Page | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | |
|----------|--------|-----|------------------------------------|-------------------------|---------|----------------|------------|------------|------------|------------|------------|---|---|--|---|
| 10*15504 | 9-10-6 | A9 | JAMES MASON ET AL | AB RESOURCES | 1/8+ | 692 461 | N/A | N/A | N/A | N/A | N/A | AB Resources LLC & NPAR LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/490 | Chief Exploration & Development LLC, Chief O&G LLC, Radler 2000 LP & Enerplus Resources Corp to Chevron USA Inc: 25/1 | AB Resources LLC to Chevron USA Inc: 756/397 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15525 | 9-6-12 | B0 | RONALD KEITH MASON ET UX | CHEVRON U.S.A. INC. | 1/8+ | 772 445 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15541 | 9-6-12 | B0 | MARY RUTH FROHNAPFEL | CHEVRON U.S.A. INC. | 1/8+ | 781 312 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15542 | 9-6-12 | B0 | KENNETH D SIBURT | CHEVRON U.S.A. INC. | 1/8+ | 781 218 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15543 | 9-6-12 | B0 | SANDRA FROWEN | CHEVRON U.S.A. INC. | 1/8+ | 781 307 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15544 | 9-6-12 | B0 | VICKI J CHERRY AND RICKEY E CHERRY | CHEVRON U.S.A. INC. | 1/8+ | 793 318 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15545 | 9-6-12 | B0 | JAMES B SIBURT AND DELILA D SIBURT | CHEVRON U.S.A. INC. | 1/8+ | 793 332 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15546 | 9-6-12 | B0 | ALAN K SIBURT ET UX | CHEVRON U.S.A. INC. | 1/8+ | 793 325 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15547 | 9-6-12 | B0 | RODNEY L SIBURT | CHEVRON U.S.A. INC. | 1/8+ | 793 346 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15504 | 9-10-5 | B1 | JAMES MASON ET AL | AB RESOURCES | 1/8+ | 692 461 | N/A | N/A | N/A | N/A | N/A | AB Resources LLC & NPAR LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/490 | Chief Exploration & Development LLC, Chief O&G LLC, Radler 2000 LP & Enerplus Resources Corp to Chevron USA Inc: 25/1 | AB Resources LLC to Chevron USA Inc: 756/397 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15504 | 9-6-14 | B2 | JAMES MASON ET AL | AB RESOURCES | 1/8+ | 692 461 | N/A | N/A | N/A | N/A | N/A | AB Resources LLC & NPAR LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/490 | Chief Exploration & Development LLC, Chief O&G LLC, Radler 2000 LP & Enerplus Resources Corp to Chevron USA Inc: 25/1 | AB Resources LLC to Chevron USA Inc: 756/397 | Chevron USA Inc to TH Exploration LLC: 36/148 |
| 10*15510 | 9-6-15 | B3 | ELAINE PHELPS ET VIR | TRIENERGY HOLDINGS, LLC | 1/8+ | 718 326 | N/A | N/A | N/A | N/A | N/A | TriEnergy Holdings LLC to NPAR LLC: 24/430 | TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356 | TriEnergy Holdings LLC & TriEnergy Inc to TH Exploration LLC: 36/148 | |


| Lease ID | Parcel | Tag | Grantor, Lessor, Etc. | Grantee, Lessee, Etc. | Royalty | Deed Book/Page | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | |
|----------|--------|-----|--|---------------------------|---------|----------------|------------|------------|------------|------------|------------|--|---|--|--|
| PENDING | 9-6-16 | B4 | LORI K. JARVIS | TH EXPLORATION LLC | 1/8+ | PENDING | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| 10*19116 | 9-6-4 | B5 | ROBERT LEE CARNEY AND BONNIE ANNE CARNEY | CHESAPEAKE APPALACHIA LLC | 1/8+ | 682 255 | N/A | N/A | N/A | N/A | N/A | 22/671 | 30/392 | 30/404 | |
| | | | | | | | | | | | | Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: | Chesapeake Appalachia LLC to Chevron USA Inc: | Statoil USA Onshore Properties Inc to Chevron USA Inc: | Chevron USA Inc to TH Exploration LLC: |

CERTIFICATE OF CONSENT AND EASEMENT

We, the undersigned, for valuable consideration, the receipt and sufficiency of which is hereby acknowledged, being all the owners of the surface of that certain lot, tract or parcel of land located in Meade District, Marshall County, State of West Virginia, shown on the attached plat or survey, hereby consents and grants an easement, pursuant to West Virginia Code, Section 22C-9-7(b)(4) and Operating Rule 4.4 of the Rules and Regulations of the West Virginia Oil and Gas Conservation Commission, to TH Exploration, LLC, its successors or assigns, for the drilling and operation of a deep well for the production of oil or gas at the location shown on the attached plat or survey.

Executed this 29th day of March, 2018.

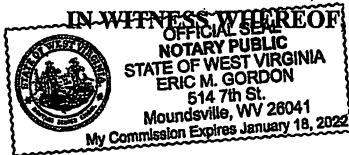

David Lee Franklin


Linda Lee Franklin

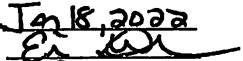
STATE OF WEST VIRGINIA
COUNTY OF MARSHALL

SS:

On this, the 29th day of March, 2018, before me, a notary public, the undersigned officer, personally appeared David Lee Franklin, known to me (or satisfactorily proven) to be the person who's name is subscribed to the within instrument, and acknowledged that he/she executed the same for purposed therein contained.



I hereunto set my hand and official seal.

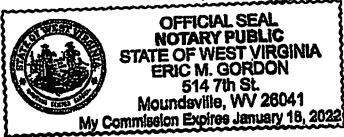
My Commission Expires: Jan 18, 2022
Signature/Notary Public: 
Name/Notary Public (print): Eric Gordon

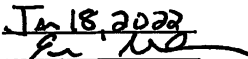
STATE OF WEST VIRGINIA
COUNTY OF MARSHALL

SS:

On this, the 29th day of ~~February~~ ^{March}, 2018, before me, a notary public, the undersigned officer, personally appeared Linda Lee Franklin, known to me (or satisfactorily proven) to be the person who's name is subscribed to the within instrument, and acknowledged that he/she executed the same for purposed therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

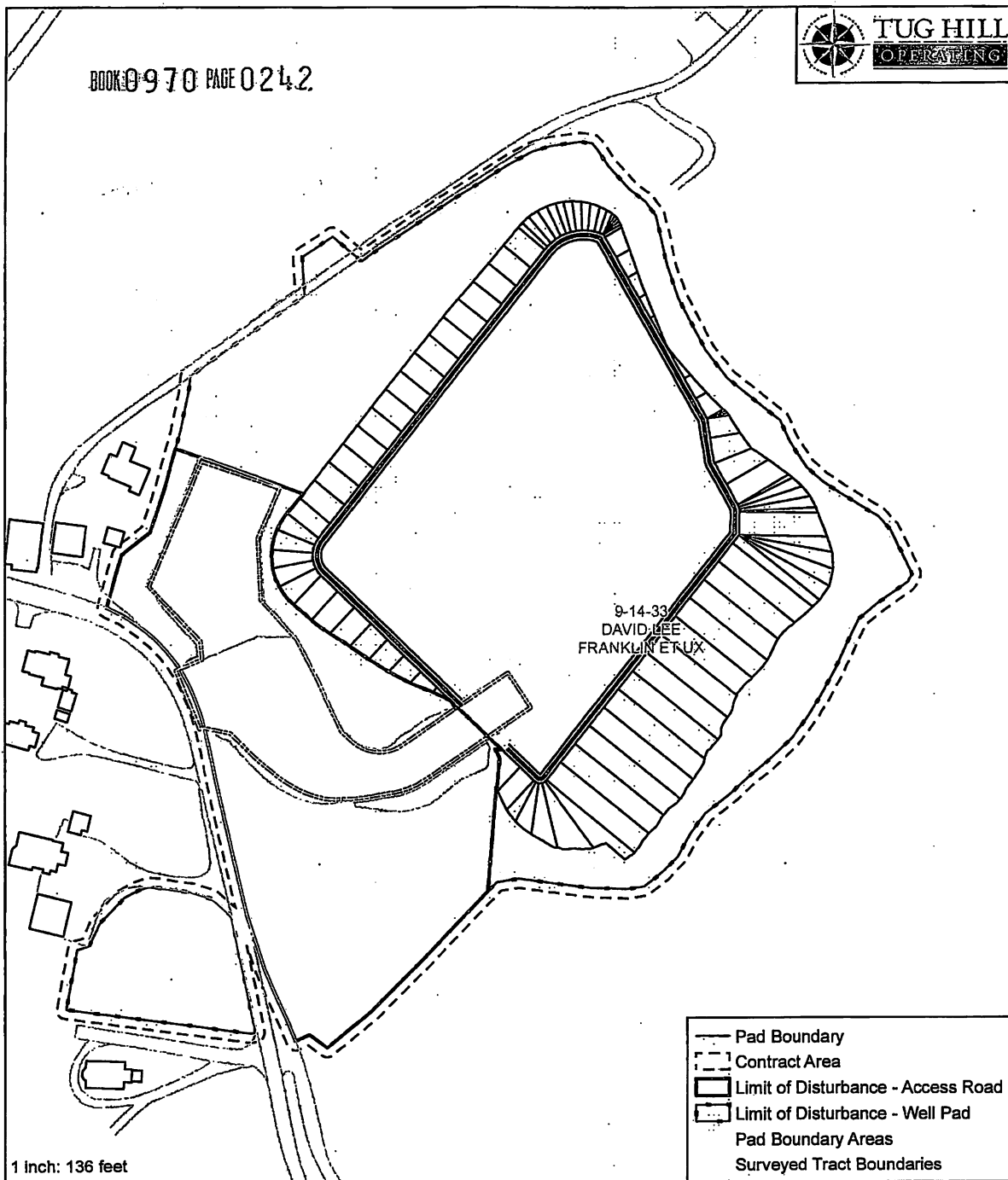


My Commission Expires: Jan 18, 2022
Signature/Notary Public: 
Name/Notary Public (print): Eric Gordon

This instrument prepared by:
WV Oil and Gas Conservation Commission
601 57th Street
Charleston, WV 25304

Marshall County
Jan Pest, Clerk
Instrument 1439948
05/03/2018 @ 02:09:35 PM
RIGHT OF WAY W/O CONSIDERATIO
Book 970 @ Page 241
Pages Recorded 2
Recording Cost \$ 11.00

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9-14-33
DAVID LEE
FRANKLIN ET UX

- Pad Boundary
- - - Contract Area
- ▭ Limit of Disturbance - Access Road
- ▨ Limit of Disturbance - Well Pad
- ▭ Pad Boundary Areas
- ▭ Surveyed Tract Boundaries

1 inch: 136 feet

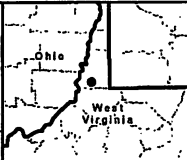
0 35 70 140
Feet



NOTE: THE APPROVED SITE LOCATION FOR THE SERVICE BY PLACED ROAD, RIGHT OF WAY, AND THE LOCATION OF THE PROPERTY TAX PARCELS ARE GENERALLY SHOWN ABOVE. HOWEVER, THESE ACTUAL LOCATIONS MAY VARY AS THE EXISTING RECORD DEPICTION, THE ACTUAL PROPERTY TAX PARCELS SHALL BEAR REVISION AND RECORDED IN THE PUBLIC RECORDS OF THE COUNTY RECORDS AND THE APPROVED SITE LOCATION FOR THE SERVICE BY PLACED ROAD AND RIGHT OF WAY SHALL BE THE LOCATION AS ACTUALLY CONSTRUCTED.

Exhibit "A"
DAVID LEE FRANKLIN ET UX
Marshall, WV

Date: 3/29/18
Name: David Lee Franklin
Name: Sandra Lee Franklin



Date: 3/28/2018
PCS: NAD 1983 UTM Zone 17N Foot US

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Environmental Protection

STATE OF WEST VIRGINIA, MARSHALL COUNTY, SCT.:

I, JAN PEST, Clerk of the County Commission of said County, do hereby certify that the annexed writing, bearing date on the 29th day of March, 2018, was presented for and by me, admitted to record in my office upon the above certificate as to the parties therein named this 3rd day of May, 2018 at 2:09 o'clock P.M.

TESTE: Jan Pest Clerk.

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

Jan Pest
MARSHALL County 02:05:39 PM
Instrument No 1415451
Date Recorded 10/04/2016
Document Type ASN
Pages Recorded 7
Book-Page 36-535
Recording Fee \$7.00
Additional \$6.00

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "*Assignment*") is from GULFPORT ENERGY CORPORATION, a Delaware corporation ("*Gulfport*"), and FOSSIL CREEK OHIO, LLC, a Delaware limited liability company ("*Fossil Creek*" and, together with Gulfport, "*Assignors*"), to TH Exploration, LLC, a Texas limited liability company ("*Assignee*"), and is executed on September 23, 2016 (the "*Effective Date*"). Assignors and Assignee may be referred to herein collectively as the "*Parties*," or individually as a "*Party*." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignors and the Assignee dated June 24, 2016 (the "*Acreage Trade Agreement*").

**ARTICLE 1
ASSIGNMENT OF ASSETS**

Section 1.1 Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, each Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee its right, title and interest in and to the oil and gas leases described in more detail on Exhibit A attached hereto (the "*Leases*") and any surface use agreements that relate to such Leases insofar as such surface use agreements relate to the portion of lands covered by such Leases (collectively with the Leases, the "*Conveyed Assets*").

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Section 1.4 Assignment Subject to Acreage Trade Agreement. This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignors, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

**ARTICLE 2
SPECIAL WARRANTY OF TITLE AND DISCLAIMERS**

Section 2.1 Special Warranty of Title. Each Assignor hereby agrees to warrant and defend Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignors or any of their respective Affiliates, but not otherwise.

Section 2.2 Disclaimers of Warranties and Representations.

(a) EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN SECTION VI AND VII OF THE ACREAGE TRADE AGREEMENT OR THIS ASSIGNMENT, ASSIGNORS MAKE NO, AND HEREBY EXPRESSLY DISCLAIM, ANY

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PARTIAL ASSIGNMENT OF OIL AND GAS LEASES

This **PARTIAL ASSIGNMENT OF OIL AND GAS LEASES** (hereinafter, "**Assignment**"), made the 31 day of May, 2018 (hereinafter, "**Effective Date**"), is by and between **CNX GAS COMPANY LLC**, a Virginia limited liability company, whose address is 1000 CONSOL Energy Drive, Suite 400, Canonsburg, Pennsylvania 15317 (hereinafter "**Assignor**") and **TH EXPLORATION, LLC**, a Texas limited liability company, whose address is 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "**Assignee**"). All references in this Assignment to "**Party**" or "**Parties**" shall be deemed at all times to mean Assignor or Assignee or both. Capitalized terms used but not defined herein shall have the meaning given such terms in the Acreage Trade Agreement, by and between Assignor and Assignee dated April 9, 2018 (the "**ATA**").

WHEREAS, Assignor desires to assign all of Assignor's right, title and interest in and to those Oil and Gas Lease(s) as same may have been previously or will in the future be modified, extended, or amended (hereinafter, "**Lease**" or "**Leases**"), covering certain tracts of land (hereinafter, "**Lands**") located in Marshall County, West Virginia; such Leases and Lands covered thereby being more particularly described on **Exhibit "A"** attached hereto and made a part hereof insofar and only insofar as such Leases cover the Target Formations (as defined below).

NOW, THEREFORE, for and in consideration of TEN AND NO/100 DOLLARS (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Assignor does hereby **GRANT, BARGAIN, ASSIGN, TRANSFER, AND CONVEY** unto Assignee the following "**Assigned Rights**":

- (a) All of Assignor's right, title, and interest in and to those Leases set forth on **Exhibit A** attached hereto **INSOFAR AND ONLY INSOFAR** as to the particular Target Formation(s) (defined below) described and delineated on **Exhibit A** for each Lease:
 - i. "**Target Formation(s)**" means, with respect to each Lease, two hundred feet (200') above the top and two hundred feet (200') below the base of the Marcellus Formation or the Utica Formation or both, as specified for each Lease on **Exhibit A**. For the purposes of this Assignment, the Marcellus Formation shall be defined as the formation commonly known as the Marcellus Shale Formation, with the top of the Marcellus Shale Formation defined as the correlative stratigraphic equivalent to that point found at 6517 feet (6517') measured depth on the Halliburton Simms U-5H Composite_DLL_DEN_NEU Log dated June 14, 2014 (the "**Log**")

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WV Department of
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STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

Jan Post
MARSHALL County 12:43:01 PM
Instrument No 1404876
Date Recorded 05/20/2016
Document Type ASN
Pages Recorded 20
Book-Page 36-148
Recording Fee \$20.00
Additional \$8.00

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 17th day of May, 2016 (the "Effective Date"), by and between **CHEVRON U.S.A. INC.** (hereinafter "Assignor") and **TH EXPLORATION, LLC** (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated May 2, 2016 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in **Exhibit "A"**, and as depicted in **Exhibits "A-1"** and **"A-2"**, attached hereto and made a part hereof (hereinafter the "Leases"); and

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases as described below.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and subject to the limited warranties, restrictions and conditions hereinafter mentioned, the parties hereto, intending to be legally bound, do covenant and agree as follows:

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon, except that Assignor accepts and reserves from this Assignment the Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia.

TO HAVE AND TO HOLD such right, title and interest in and to the Leases unto Assignee or its designee, and their respective successors and assigns, forever, in accordance with the provisions of this Assignment.

2. Special Warranty. Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the Conveyed Interests since the time that Assignor obtained its interests in the Leases. Assignor does covenant, promise and agree, to and with the Assignee, its respective successors and assigns, to forever specially warrant and defend the title to the Leases or portions thereof included under this Assignment, unto the Assignee and its respective successors and assigns, against the lawful claims of Assignor, and all persons claiming, or to claim, the same or any part thereof, by, through or under Assignor.

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WV Department of
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217
for new

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "*Assignment*") is from STATOIL USA ONSHORE PROPERTIES INC., a Delaware corporation ("*Assignor*"), to TH Exploration, LLC, a Texas limited liability company ("*Assignee*"), and is executed on December 18, 2017 (the "*Effective Date*"). Assignor and Assignee may be referred to herein collectively as the "*Parties*," or individually as a "*Party*." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated August 24, 2017 (the "*Acreage Trade Agreement*").

**ARTICLE 1
ASSIGNMENT OF ASSETS**

Section 1.1 Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on Exhibit A attached hereto (the "*Leases*") INsofar AND ONLY INsofar as they cover those lands described on Exhibit A (the "*Leasehold Rights*") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "*Conveyed Assets*").

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Section 1.2 Assignment Subject to Acreage Trade Agreement. This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignor, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

**ARTICLE 2
SPECIAL WARRANTY OF TITLE AND DISCLAIMERS**

Section 2.1 Special Warranty of Title. Assignor hereby agrees to warrant and defend Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignor or any of its Affiliates, but not otherwise.

Section 2.2 Disclaimers of Warranties and Representations.

(a) EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN SECTION VI OF THE ACREAGE TRADE AGREEMENT OR THIS ASSIGNMENT, ASSIGNOR MAKES NO, AND HEREBY EXPRESSLY DISCLAIMS, ANY REPRESENTATION OR

MICHAEL MORAN
BRIGHTON RESOURCES
5851 ELLSWORTH AVENUE, #1
PITTSBURGH PA 15232-1707

BOOK 0040 PAGE 0127

STATE OF WEST VIRGINIA §
§
COUNTY OF MARSHALL §

Marshall County
Jan Pest, Clerk
Instrument 1428356
08/16/2017 @ 12:08:49 PM
ASSIGNMENTS
Book 40 @ Page 127
Pages Recorded 25
Recording Cost \$ 33.00

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 1 day of AUGUST, 2017 (the "Effective Date"), by and between CHEVRON U.S.A. INC. (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated the 1st day of August, 2017 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit "A", attached hereto and made a part hereof (hereinafter the "Leases"), less and except certain overriding royalty interests and exclusions; and

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases as described below, subject to certain overriding royalty interests and less and except certain exclusions.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and subject to the limited warranties, restrictions and conditions hereinafter mentioned, the parties hereto, intending to be legally bound, do covenant and agree as follows:

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon, except that Assignor excepts and reserves from this Assignment the following:

A. The Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia, and

B. As to each of the Leases and all oil, gas, and associated hydrocarbons produced, saved and sold thereunder, an overriding royalty interest equal to the difference between 82% and the

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August 29, 2019

WV Department of Environmental Protection
Office of Oil & Gas
601 57th Street, SE
Charleston, WV 25304
Attention: Laura Adkins

RE: Knob Creek N-12HU

Subject: Marshall County Route 84/1, 21/3 and 74 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 84/1, 21/3 and 74 in the area reflected on the Knob Creek N-12HU well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 304-376-0111, or by email at amiller@tug-hilop.com.

Sincerely,

A handwritten signature in blue ink that reads "Amy L. Miller".

Amy L. Miller
Permitting Specialist - Appalachia

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WW-6AC
(1/12)

**STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE CERTIFICATION**

Date of Notice Certification: 08/29/2019

API No. 47-051 -

Operator's Well No. Knob Creek N-12HU

Well Pad Name: Knob Creek

Notice has been given:

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

| | | |
|---------------------------------------|---|-------------------------------|
| State: <u>West Virginia</u> | UTM NAD 83 | Easting: <u>525,229.52</u> |
| County: <u>Marshall</u> | | Northing: <u>4,402,276.64</u> |
| District: <u>Meads</u> | Public Road Access: <u>St. Joseph Road - CR 21</u> | |
| Quadrangle: <u>Glen Easton 7.5'</u> | Generally used farm name: <u>David Lee Franklin</u> | |
| Watershed: <u>Fish Creek (HUC 10)</u> | | |

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

| | |
|--|--|
| <p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 150px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p> | <p align="center">OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p align="center">RECEIVED Office of Oil and Gas SEP - 3 2019</p> <p align="center">WV Department of Environmental Protection</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> |
|--|--|

Required Attachments:

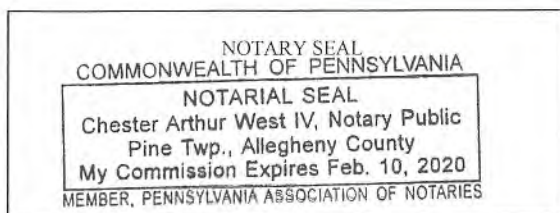
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

WW-6AC
(1/12)

Certification of Notice is hereby given:

THEREFORE, I Amy L. Miller, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

| | | | |
|----------------|---|------------|---|
| Well Operator: | <u>Tug Hill Operating, LLC</u> | Address: | <u>380 Southpointe Boulevard, Plaza II, Suite 200</u> |
| By: | <u>Amy L. Miller <i>Amy Miller</i></u> | | <u>Canonsburg, PA 15317</u> |
| Its: | <u>Permitting Specialist - Appalachia</u> | Facsimile: | <u>724-749-8388</u> |
| Telephone: | <u>724-749-8388</u> | Email: | <u>amiller@tug-hill.com</u> |



Subscribed and sworn before me this 29th day of August 2014.

[Signature] Notary Public

My Commission Expires 2-10-2020

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

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WV Department of
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WW-6A
(9-13)

4705102268

API NO. 47- -
OPERATOR WELL NO. Knob Creek N-12HU
Well Pad Name: Knob Creek

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF APPLICATION

Notice Time Requirement: notice shall be provided no later than the filing date of permit application.

Date of Notice: 8/26/2019 Date Permit Application Filed: 8/27/2019

Notice of:

- [X] PERMIT FOR ANY WELL WORK [] CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

Delivery method pursuant to West Virginia Code § 22-6A-10(b)

- [] PERSONAL SERVICE [] REGISTERED MAIL [X] METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

[X] Application Notice [X] WSSP Notice [X] E&S Plan Notice [X] Well Plat Notice is hereby provided to:

[X] SURFACE OWNER(s)
Name: David Lee Franklin
Address: 131 Saint Joseph Road
Glen Easton, WV 26039

Name: _____
Address: _____

[X] SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: David Lee Franklin
Address: 131 Saint Joseph Road
Glen Easton, WV 26039

Name: _____
Address: _____

[] SURFACE OWNER(s) (Impoundments or Pits)
Name: _____
Address: _____

[X] COAL OWNER OR LESSEE
Name: CNX Land Resources, Inc.
Address: 1000 Consol Energy Drive
Canonsburg, PA 15318

[] COAL OPERATOR
Name: _____
Address: _____

[X] SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: *See attached list
Address: _____

[] OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: _____
Address: _____

*Please attach additional forms if necessary

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WV Department of
Environmental Protection

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

This Notice Shall Include:

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

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Well Location Restrictions

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items

WW-6A
(8-13)

API NO. 47- _____ - _____
OPERATOR WELL NO. Knob Creek N-12HU
Well Pad Name: Knob Creek

examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

Water Well Testing:

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

Water Testing Laboratories:

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

Written Comment:

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0450

Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**

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Time Limits and Methods for Filing Comments.

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

Comment Requirements

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx> and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

Permit Denial or Condition

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

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WW-6A
(8-13)

API NO. 47- _____ - _____
OPERATOR WELL NO. Knob Creek N-12HU
Well Pad Name: Knob Creek

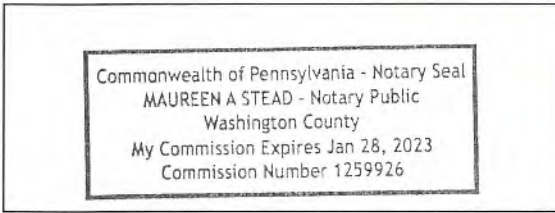
Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-8388
Email: amiller@tug-hillop.com *any kull*

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at deprivacyofficer@wv.gov.



Subscribed and sworn before me this 20 day of AUG, 2019.
Maureen Stead Notary Public
My Commission Expires 1/28/23

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Environmental Protection

Exhibit WW-6A

Supplement Pg. 1A

Tug Hill Operating, LLC
 380 Southpointe Blvd, Suite 200
 Cannonsburg, PA 15137

Residences within Two-Thousand Feet (2,000')

Well: KNOB CREEK N – 12HU
 District: Meade (Residence #'s 1-12, 14-26) (Church #13)
 State: WV

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There are twenty-five (25) residences, no businesses, one (1) church, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

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 Environmental Protection

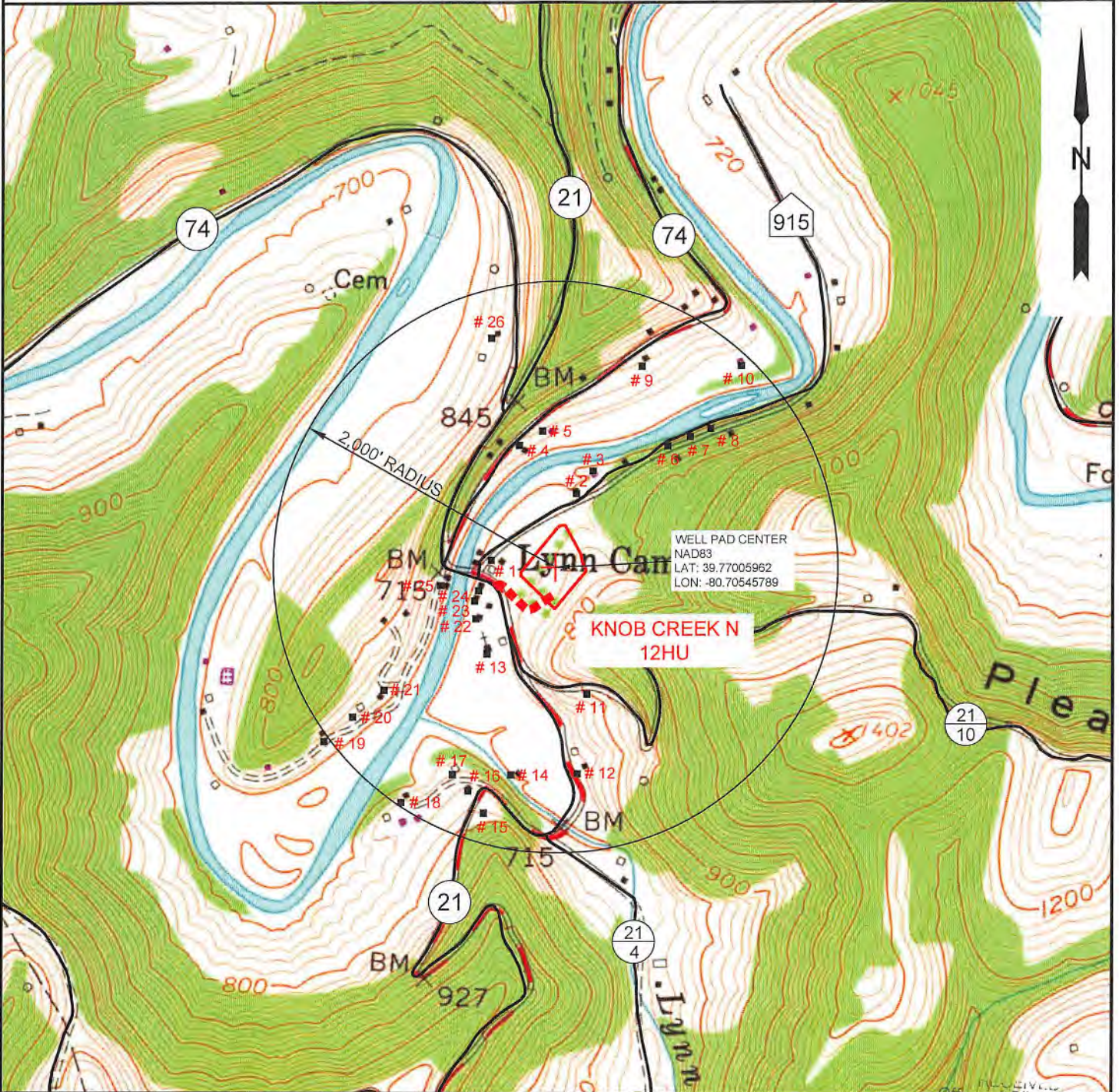
| | | |
|---|---|---|
| <p>Residence # 1 TM 14 Pcl. 39 Margaret K. Fox – Life c/o Paul Fox Phone: 304-455-3817 (Per Tax Address – Paul G. Fox) Physical Address: 31 Crow Dr. Glen Easton, WV 26039 Tax Address: 5761 Saint Joseph Rd. Proctor, WV 26055</p> | <p>Residence # 2 TM 14 Pcl. 32 Twila C. Coffield Phone: 304-845-5941 Physical Address: 184 Crow Dr. Glen Easton, WV 26039 Tax Address: 16 Sandy Ave. Moundsville, WV 26041-1020</p> | <p>Residence # 3 TM 14 Pcl. 54 Richard L. Harveth, Et Ux c/o Richard Lee Harveth Phone: 304-845-7397; 304-845-5128 Physical Address: 220 Crow Dr. Glen Easton, WV 26039 Tax Address: Same</p> |
| <p>Residence # 4 TM 14 Pcl. 42 John C. Lagos, Et Ux Phone: 304-845-2793 Physical Address: 12529 Fish Creek Rd. Glen Easton, WV 26039 Tax Address: 404 Jefferson Ave. Glen Dale, WV 26038</p> | <p>Residence # 5 TM 14 Pcl. 53 James E. Peelman Phone: None Found Physical Address: 12551 Fish Creek Rd. Glen Easton, WV 26039 Tax Address: 12551 Fish Creek Rd. Glen Easton, WV 26039</p> | <p>Residence # 6 TM 14 Pcl. 29.1 Andrew Fasouletos, Et Ux Phone: 304-845-9009 Physical Address: 329 Crow Dr. Glen Easton, WV 26039 Tax Address: 1. Rd. 2 Box 150 Proctor, WV 26055 2. 3391 Taylors Ridge Rd. Proctor, WV 26055-9723</p> |
| <p>Residence # 7 TM 14 Pcl. 29.1 Andrew Fasouletos, Et Ux Phone: 304-845-9009 Physical Address: 361 Crow Dr. Glen Easton, WV 26039 Tax Address: 1. Rd. 2 Box 150 Proctor, WV 26055 2. 3391 Taylors Ridge Rd. Proctor, WV 26055-9723</p> | <p>Residence # 8 TM 14 Pcl. 29 Andrew Fasouletos, Et Ux c/o Tena Marie Stricklin Phone: 304-845-9009 Physical Address: 389 Crow Dr. Glen Easton, WV 26039 Tax Address: 1. 3391 Taylors Ridge Rd. Proctor, WV 26055-9723 2. Rd. 2 Box 150 Proctor, WV 26055</p> | <p>Residence # 9 TM 14 Pcl. 48 Michael L. & Cheryl J. Acree Phone: 304-455-2148; 304-455-5859 Physical Address: 12725 Fish Creek Rd. Glen Easton, WV 26039 Tax Address: 189 Plum St. Proctor, WV 26055</p> |

| | | |
|--|--|--|
| <p>Residence # 10 TM 14 Pcl. 45 George R. Taylor, Et Ux Phone: 304-845-2987 Physical Address: 12781 Fish Creek Rd. Glen Easton, WV 26039 Tax Address: Same</p> | <p>Residence # 11 TM 16 Pcl. 15.1 Eric J. Young Phone: 304-686-3398; 304-905-1986 (Per Address – Chelsey Long); 304-845-0154 (Per Address – Bill J. Blatt) Physical Address: 153 Young Ln. Glen Easton, WV 26039 Tax Address: Same</p> | <p>Residence # 12 TM 16 Pcl. 15 Ronald R. Young, Et Ux - Life Phone: 304-845-6044 (Per Tax Address – Geraldine M. Young) Physical Address: 348 Saint Joseph Rd. Glen Easton, WV 26039 Tax Address: Same</p> |
| <p>Church # 13 TM 16 Pcl. 14 Lynn Camp Methodist Church Phone: Physical Address: 171 Saint Joseph Rd. Glen Easton, WV 26039 Tax Address: Unknown Address Moundsville, WV 26041</p> | <p>Residence # 14 TM 16 Pcl. 15 Ronald R. Young, Et Ux - Life Phone: 304-845-6044 (Per Tax Address – Geraldine M. Young) Physical Address: 323 Saint Joseph Rd. Glen Easton, WV 26039 Tax Address: 348 Saint Joseph Rd. Glen Easton, WV 26039</p> | <p>Residence # 15 TM 16 Pcl. 13.5 Paul R. Blake & Paul R. Blake II Phone: 304-845-9369 Physical Address: 616 Saint Joseph Rd. Glen Easton, WV 26039 Tax Address: 121 Vandivere Ln. Glen Easton, WV 26039-9707</p> |
| <p>Residence # 16 TM 16 Pcl. 13.1 Paul W. Blake - Life Phone: 304-845-2999 Physical Address: 581 Saint Joseph Rd. Glen Easton, WV 26039 Tax Address: 1500 8th St. Moundsville, WV 26041-2031</p> | <p>Residence # 17 TM 16 Pcl. 13.6 Wesley D. Yeater, Et Ux Phone: 304-843-5212 Physical Address: 37 Vandivere Ln. Glen Easton, WV 26039 Tax Address: Same</p> | <p>Residence # 18 TM 16 Pcl. 13.3 Paul R. Blake Phone: 304-845-9369 Physical Address: 121 Vandivere Ln. Glen Easton, WV 26039 Tax Address: Same</p> <p style="text-align: right;">RECEIVED Office of Oil and Gas SEP - 3 2019 WV Department of Environmental Protection</p> |
| <p>Residence # 19 TM 16 Pcl. 12.2 Spencer J. & Carrie A. Richmond Phone: 304-845-2274; 304-845-8186 Physical Address: 293 Richmond Ln. Glen Easton, WV 26039 Tax Address: 243 Richmond Ln. Glen Easton, WV 26039</p> | <p>Residence # 20 TM 16 Pcl. 12.7 Spencer J. & Carrie A. Richmond Phone: 304-845-2274; 304-845-8186 Physical Address: 243 Richmond Ln. Glen Easton, WV 26039 Tax Address: Same</p> | <p>Residence # 21 TM 16 Pcl. 12.1 James G. Richmond, Et Ux Phone: 304-845-8186 Physical Address: 157 Richmond Ln. Glen Easton, WV 26039 Tax Address: Same</p> |
| <p>Residence # 22 TM 14 Pcl. 33 David Lee Franklin Phone: 304-845-6025; 304-845-3203 Physical Address: 131 Saint Joseph Rd. Glen Easton, WV 26039 Tax Address: 131 Saint Joseph Rd. Glen Easton, WV 26039</p> | <p>Residence # 23 TM 14 Pcl. 37 Margaret K. Fox – Life c/o Paul Fox Phone: 304-455-3817 (Per Tax Address – Paul G. Fox) Physical Address: 107 Saint Joseph Rd. Glen Easton, WV 26039 Tax Address: 5761 Saint Joseph Rd. Proctor, WV 26055</p> | <p>Residence # 24 TM 14 Pcl. 37 Margaret K. Fox – Life c/o Paul Fox Phone: 304-455-3817 (Per Tax Address – Paul G. Fox) Physical Address: 51 Saint Joseph Rd. Glen Easton, WV 26039 Tax Address: 5761 Saint Joseph Rd. Proctor, WV 26055</p> |

| | | |
|---|--|--|
| <p>Residence # 25 TM 13 Pcl. 13 Margaret K. Fox – Life c/o Paul Fox Phone: 304-455-3817 (Per Tax Address – Paul G. Fox) Physical Address: 28 Richmond Ln. Glen Easton, WV 26039 Tax Address: 5761 Saint Joseph Rd. Proctor, WV 26055</p> | <p>Residence # 26 TM 13 Pcl. 12 Nila Jean Prohnapfel Phone: None Found Physical Address: 11975 Fish Creek Rd. Glen Easton, WV 26039 Tax Address: Rd. 1 Box 190 Proctor, WV 26055-9703</p> | |
|---|--|--|

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PROPOSED KNOB CREEK N - 12HU



NOTE: THERE APPEARS TO BE TWENTY-SIX (26) POSSIBLE WATER SOURCES WITHIN 2,000'.

SEP - 3 2019

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Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 482-5834
www.slsww.com

| | | | |
|------------------|----------|-------------------------|------------|
| TOPO SECTION: | | OPERATOR: | |
| GLEN EASTON 7.5' | | PREPARED FOR: | |
| COUNTY | DISTRICT | TUG HILL OPERATING, LLC | |
| MARSHALL | MEADE | 380 SOUTHPOINTE BLVD | |
| | | SUITE 200 | |
| | | CANONSBURG, PA 15317 | |
| DRAWN BY | JOB NO. | DATE | SCALE |
| K.G.M. | 8789 | 08/20/2019 | 1" = 1000' |

WV Department of Environmental Protection
TUG HILL
OPERATING

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

Date of Notice: 2/5/2018 **Date of Planned Entry:** 2/12/2018

Delivery method pursuant to West Virginia Code § 22-6A-10a

PERSONAL SERVICE REGISTERED MAIL METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

SURFACE OWNER(s)

Name: David Lee Franklin (Pad and Access Road)
Address: 131 Saint Joseph Road
Glen Easton, WV 26039

Name: _____
Address: _____

Name: _____
Address: _____

COAL OWNER OR LESSEE

Name: CNX Land Resources, Inc.
Address: 1000 Consol Energy Drive
Canonsburg, PA 15318

MINERAL OWNER(s)

Name: David Lee Franklin
Address: 131 Saint Joseph Road
Glen Easton, WV 26039

*please attach additional forms if necessary

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State: West Virginia
County: Marshall
District: Meade
Quadrangle: Glen Easton 7.5'

Approx. Latitude & Longitude: 39.7700596; -80.7054579
Public Road Access: St. Joseph Road - County Route 21
Watershed: Fish Creek (HUC 10)
Generally used farm name: David Lee Franklin

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-8388
Email: amilier@tug-hill.com

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030

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WV Department of
Environmental Protection

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF PLANNED OPERATION

Notice Time Requirement: notice shall be provided no later than the **filing date of permit application.**

Date of Notice: 08/23/2019 **Date Permit Application Filed:** 08/27/2019

Delivery method pursuant to West Virginia Code § 22-6A-16(c)

CERTIFIED MAIL **HAND**
RETURN RECEIPT REQUESTED **DELIVERY**

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

Notice is hereby provided to the SURFACE OWNER(s)
(at the address listed in the records of the sheriff at the time of notice):

Name: David Lee Franklin
Address: 131 Saint Joseph Road
Glen Easton, WV 26039

Name: _____
Address: _____

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

| | | | | |
|-------------|----------------------------|---------------------------|--------------------------------|---------------------|
| State: | <u>West Virginia</u> | UTM NAD 83 | Easting: | <u>525,229.52</u> |
| County: | <u>Marshall</u> | | Northing: | <u>4,402,276.64</u> |
| District: | <u>Meade</u> | Public Road Access: | <u>St. Joseph Road - CR 21</u> | |
| Quadrangle: | <u>Glen Easton 7.5'</u> | Generally used farm name: | <u>David Lee Franklin</u> | |
| Watershed: | <u>Fish Creek (HUC 10)</u> | | | |

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-8388
Email: amiller@tug-hillop.com

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030

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WV Department of
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Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.



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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

March 5, 2018

Jill M. Newman
Deputy Commissioner

James A. Martin, Chief
Office of Oil and Gas
Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Subject: DOH Permit for the Knob Creek Pad, Marshall County
Knob Creek N-12HU Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2018-0224 which has been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off of Marshall County Route 21 SLS.

The operator has signed a STATEWIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

Gary K. Clayton, P.E.
Regional Maintenance Engineer
Central Office O&G Coordinator

Cc: Jonathan White
Tug Hill Operating, LLC
CH, OM, D-6
File

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TUG HILL

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PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Knob Creek N-12HU

| PRODUCT NAME: | CHEMICAL DESCRIPTION: | PRODUCT USE: | HAZARDOUS COMPONENT: |
|---------------|----------------------------------|------------------|--|
| GBW-20C | Hemicellulase Breaker | Breaker - Water | None |
| ALPHA 1427 | | Biocide | Glutaraldehyde – CAS#000111-30-8 Quaternary ammonium chloride CAS# 007173-51-5 Alky dimethyl benzyl ammonium Chloride (C12-16) – CAS#068424-85-1 Ethanol – CAS# 000064-17-5 Water – CAS# 007732-18-5 |
| FRAC SAND | Silica Sand (various Mesh sizes) | Proppant | Crystalline silica (quartz) CAS# 14808-60-7 |
| S-8C, Sand | Silica Sand (100 mesh) | Sand | Silica – CAS# 14808-60-7 |
| GW-3LDF | | Gellant - Water | Petroleum Distillate Blend – Proprietary, (Not Associated with Diesel Fuel) Guar gum – CAS# 009000-30-0 |
| FRW-18 | | Friction Reducer | Hydrotreated light distillate CAS# 064742-47-8 |
| Scaletrol | | Scale Inhibitor | Ethylene glycol – CAS# 000107-21-1 Diethylene glycol – CAS# 000111-46-6 |

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WEST VIRGINIA COUNTY MAP



WVDEP OOG ACCEPTED AS-BUILT

10/8/2019

Knob Creek 1 Site Site Design, Construction Plan, & Erosion and Sediment Control Plans Tug Hill Operating Marshall County Meade District Latitude 39.77005962° Longitude -80.70545789° Middle Fish Creek Watershed

Pertinent Site Information Knob Creek 1 Site Emergency Number: 304-845-1920 Meade District, Marshall County, WV Watershed: Middle Fish Creek Watershed Tug Hill Contact Number: 1-817-632-3400

Table with 10 columns: Name, Date, Type, etc. Property Owner Information - Knob Creek 1 Site

Exhibit A: Final Design: Issue for Permitting



Table with 2 columns: Area, Value. Includes sections for Access Road, Disturbed Area, and Additional Information.

Table with 2 columns: Description, Value. Knob Creek 1 Site Quantities

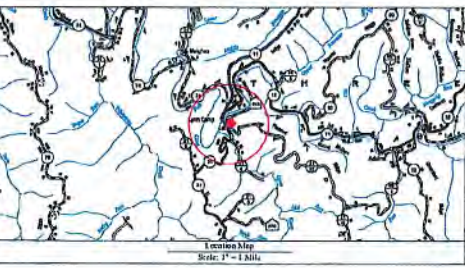
Large table with multiple columns listing site locations (e.g., WVA 204271, WVA 204272) and their corresponding coordinates.

Existing API Numbers 47-051-02032

Project Contacts: Joe Hill (Project Manager), Mike Kelly (Site Supervisor), etc.

Approach Route: From the intersection of WV Rt 2 and Co Rt 17 (12th Street) in Meigsdale, WV... Floodplain Conditions: Do not construct any structure in the floodplain...

Table with 2 columns: Site Locations (PAD 27) and Site Locations (PAD 83). Lists stationing and coordinates.

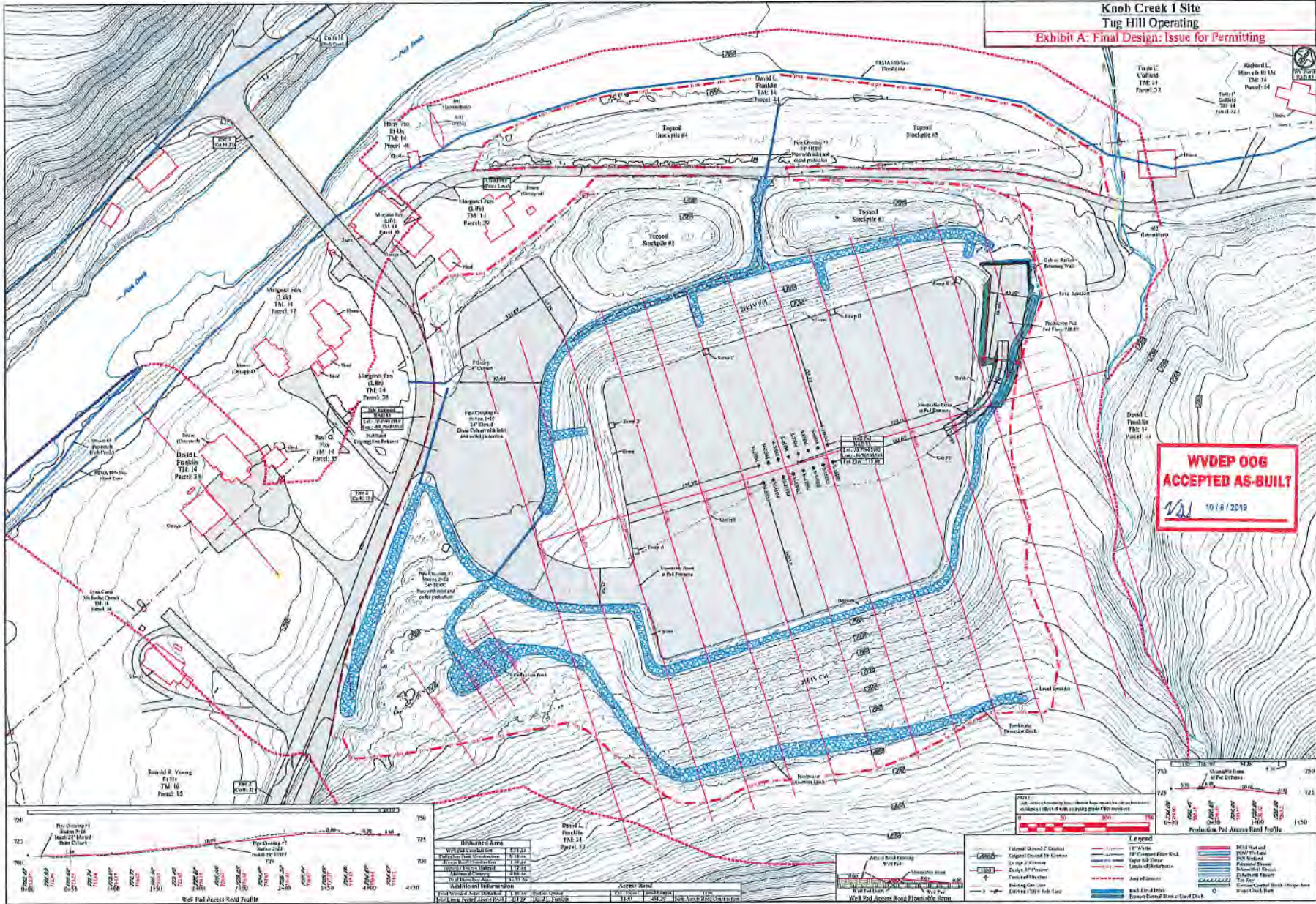


Site Location Right-of-Way: All PAD construction is to be within the right-of-way... List of items to be submitted for permit review.



Vertical sidebar containing 'TUG HILL OPERATING' logo, 'Cover Sheet' information, and 'Knob Creek 1 Site' details.

Knob Creek 1 Site
Tug Hill Operating
Exhibit A: Final Design: Issue for Permitting



WVDEP O&G
ACCEPTED AS-BUILT
 10/16/2019

TUG HILL OPERATING

Knob Creek 1 Site
 Mendon, Monroe County, WV

Site Plan
Knob Creek 1 Site
 Mendon, Monroe County, WV

Scale: 1" = 100'

Sheet No. 11

Date: 10/16/2019
Scale: As Shown
Drawn By: JLS
Rev: 00