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west virginia department of environmental protection

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

Harold D. Ward, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Monday, March 15, 2021  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC  
380 SOUTHPOINTE BOULEVARD, PLAZA II  
SUITE 200  
CANONSBURG, PA 15317

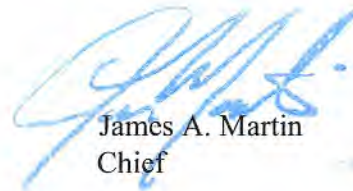
Re: Permit Modification Approval for KNOB CREEK S-6HM  
47-051-02281-00-00

**Lateral Extension**

TUG HILL OPERATING, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before 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 S-6HM  
Farm Name: DAVID LEE FRANKLIN  
U.S. WELL NUMBER: 47-051-02281-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 3/15/2021

Promoting a healthy environment.

03/19/2021



February 15, 2021

WADE STANSBERRY  
WV DEP OFFICE OF OIL & GAS  
601 57<sup>TH</sup> STREET SE  
CHARLESTON, WV 25304-2345

VIA USPS

RE: **Knob Creek S-6HM API # 47-051-02281 (H6A Permit Modification)**  
**Meade District, Marshall County, WV**

Dear Wade:

Tug Hill Operating, LLC is submitting a permit modification for its permitted well, Knob Creek S-6HM to add 3,755.08' to the lateral length. Therefore, enclosed please find the following:

- Modified WW-6B with changes highlighted in yellow
- Updated well plat
- Updated WW-6A1 information
- Updated Site Safety Plan (The only information that has changed is the contact information for the Inspector at the contact list at the end of the Plan).

If you have any questions or need any additional information, please do not hesitate to call me on (304) 376-0111. Thank you for attention to this matter, it is greatly appreciated.

Sincerely,

AMY MORRIS  
PERMIT SPECIALIST-APPALACHIA REGION  
TUG HILL OPERATING, LLC

Enclosures

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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      494510851      Marshall      Meade      Glen Easton 7.5'  
Operator ID      County      District      Quadrangle

2) Operator's Well Number: Knob Creek S-6HM      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: 737'      Elevation, proposed post-construction: 737'

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

(b) If Gas Shallow  Deep   
Horizontal

6) Existing Pad: Yes or No Yes

*M 10/29/2020*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus is the target formation at a depth of 6192' - 8243', thickness of 51' and an anticipated approximate pressure of 3800 psi.

8) Proposed Total Vertical Depth: 6,343'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 15,777'

11) Proposed Horizontal Leg Length: 8,725.40'

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

13) Method to Determine Fresh Water Depths: Use shallow offset wells to determine deepest freshwater, or determine using pro-drill tests, testing while drilling or petrophysical evaluation of resistivity.

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 292' and 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: \_\_\_\_\_

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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	13 3/8"	NEW	J55	54.5#	480'	480'	683ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	480'	480'	683ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,303'	2,303'	745ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	15,777'	15,777'	4,028ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#	6,207'		
Liners							

*MW*  
12/29/2020

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	13 3/8"	17.5"	.33	2,740	2,192	SEE #24	1.2
Coal	13 3/8"	17.5"	.33	2,740	2,192	SEE #24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE #24	1.19
Production	5 1/2"	8 7/8" _ 8 3/4"	.361	12,640	10,112	SEE #24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

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PACKERS

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Kind:	N/A			WV Department of Environmental Protection
Sizes:	N/A			
Depths Set:	N/A			

WW-6B  
(10/14)

API NO. 47- 051 - 02281  
OPERATOR WELL NO. Knob Creek S-6HM  
Well Pad Name: Knob Creek

*mw*  
*10/19/2021*

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

Drill through the Marcellus tagging less than 100' from the top of the Onondaga to get depths and log data. Plug back to proposed kick off point. Drill the horizontal section to planned and proposed TD. Run casing and cement to surface. Run Bond Log from app. 60 deg to surface. Make clean out run and stimulate.

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

Well to completed with approximately 22,000,000 lb. proppant and 390,000 barrels of water. Max rate = 80bpm; max psi = 9,000#.

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 other joint. Production casing will have one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

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

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Sfc - Premium NE-1 + 2% CaCl; Int1 - Premium NE-1 + 1.5% CaCL + Flake; Int2 - Lead: Premium NE-1 + 5% BA-90 + .85% R-3 + 3% KCl + .75 gals/100sk FP-13L + 1% MPA-170 Tail: Premium NE-1 +.1% R-3 + 5% KCl + 1% CD-32 + .4% FL-52 +.2% ASA-301 + .6% Sodium Metasilicate; Kick Plug - Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L; Prod - Lead: 50:50 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .75 gal/100sk FP-13L Tail: 25:75 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .375 gal/100sk FP-13L

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.

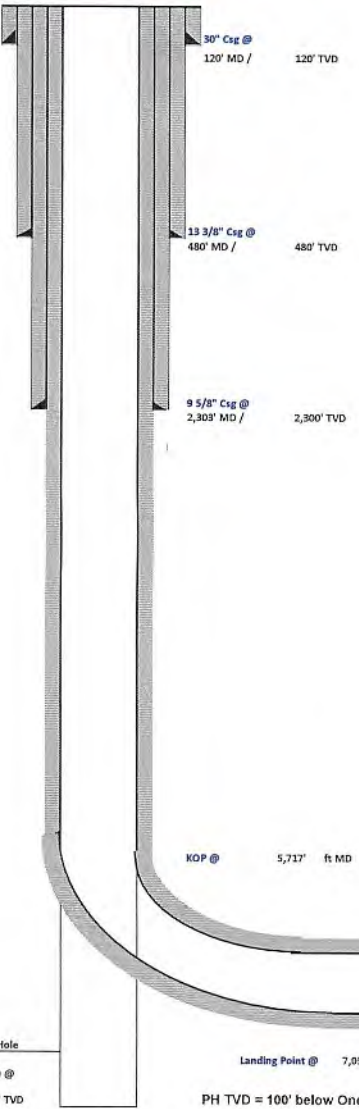


WELL NAME: Knob Creek 5-6HM  
 STATE: WV COUNTY: Marshall  
 DISTRICT: Meade  
 DF Elev: 737' GL Elev: 737'  
 TD: 15,777'  
 TH Latitude: 39.77005704  
 TH Longitude: -80.70550393  
 BH Latitude: 39.748672  
 BH Longitude: -80.695005

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	380
Sewickley Coal	292
Pittsburgh Coal	374
Big Lime	1687
Weir	1988
Berea	2172
Gordon	2435
Rhinestreet	5549
Genesee/Burkett	6061
Tully	6091
Hamilton	6124
Marcellus	6192
Landing Depth	6227
Onondaga	6243
Pilot Hole Depth	6343

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	8W	8W	Surface
Surface	17.5	13 3/8	480'	480'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,303'	2,300'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	15,777'	6,380'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	661	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	784	A	15	Air	1 Centralizer every other jt
Production	3,701	A	14.5	Air / SOBMs	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



*M*  
10/29/2020

Pilot Hole  
 PH TD @ 6,343' TVD  
 Landing Point @ 7,953' MD / 6,227' TVD  
 PH TVD = 100' below Onondaga Top

Lateral TD @ 15,777' ft MD  
 6,380' ft TVD

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**Tug Hill Operating, LLC Casing and Cement Program**

**Knob Creek S-6HM**

**Casing**

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	480'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,303'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	15,777'	CTS

**Cement**

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

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

Intermediate: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.19

Kick Off Plug: Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug

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 = 1.19

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**TUG HILL**  
OPERATING

**Well:** Knob Creek S-06HM (slot D)  
**Site:** Knob Creek  
**Project:** Marshall County, West Virginia.  
**Design:** rev4

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
2	1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2'/100' build
3	1550.00	5.00	284.40	1549.68	2.71	-10.56	2.00	284.400	-6.31	Begin 5.00° lateral section
4	3206.62	5.00	284.40	3200.00	38.62	-150.41	0.00	0.000	-89.83	Begin 3'/100' build/turn
5	4276.64	37.09	287.77	4185.86	151.67	-512.35	3.00	3.828	-324.79	Begin 37.09° tangent
6	5716.90	37.09	287.77	5334.63	416.80	-1339.49	0.00	0.000	-868.07	Begin 8'/100' build/turn
7	6605.48	50.00	173.68	6071.57	121.41	-1590.19	8.00	-132.334	-681.81	Begin 10'/100' build/turn
8	7053.15	89.00	149.50	6227.38	-261.54	-1450.54	10.00	-35.561	-274.25	Begin 89.00° lateral section
9	15776.96	89.00	149.50	8380.00	-7776.98	2976.59	0.00	0.000	8327.16	PBHL/TD 15776.95 MD 6380.00 TVD



Azimuths to Grid North  
True North: -0.19°  
Magnetic North: -8.88°

Magnetic Field  
Strength: 52139.6snT  
Dip Angle: 66.92°  
Date: 9/19/2017  
Model: IGRF2015

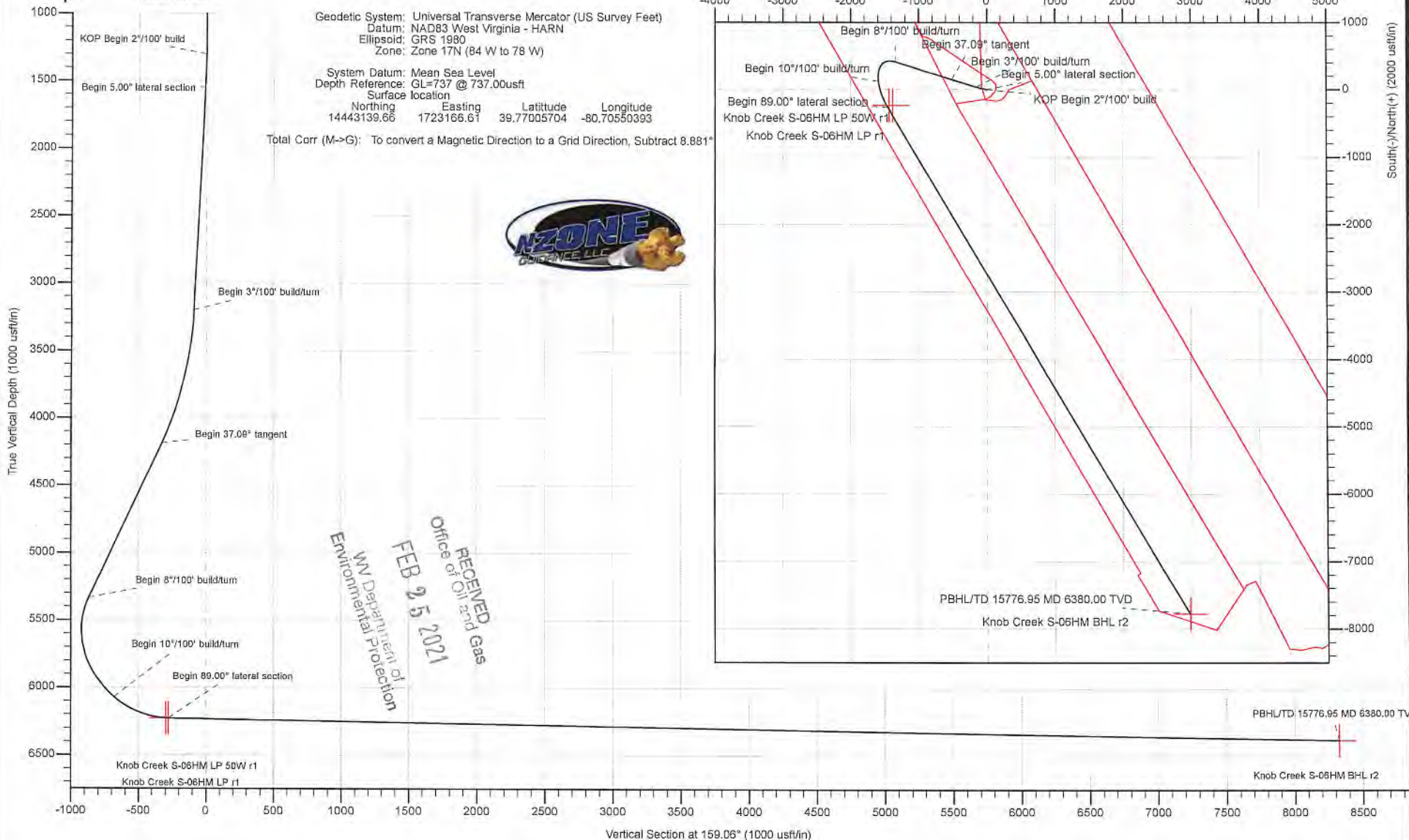
Geodetic System: Universal Transverse Mercator (US Survey Feet)  
Datum: NAD83 West Virginia - HARN  
Ellipsoid: GRS 1980  
Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level  
Depth Reference: GL=737 @ 737.00usft  
Surface location  
Northing Easting Latitude Longitude  
14443139.66 1723166.61 39.77005704 -80.70550393

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



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Planning Report - Geographic

Database:	DB_Jul2216dt_v14 lt	Local Co-ordinate Reference:	Well Knob Creek S-06HM (slot D)
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 S-06HM (slot D)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev4		

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 S-06HM (slot D)					
Well Position	+N/-S	0.00 usft	Northing:	14,443,139.66 usft	Latitude:	39.77005704
	+E/-W	0.00 usft	Easting:	1,723,166.61 usft	Longitude:	-80.70550393
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	52,139.61042599

Design	rev4				
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	159.06	

Plan Survey Tool Program	Date	8/11/2019			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	15,776.96 rev4 (Original Hole)	MWD		
			MWD - Standard		

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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		
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.000		
1,550.00	5.00	284.40	1,549.68	2.71	-10.56	2.00	2.00	0.00	284.400		
3,206.62	5.00	284.40	3,200.00	38.62	-150.41	0.00	0.00	0.00	0.000		
4,276.64	37.09	287.77	4,185.66	151.67	-512.35	3.00	3.00	0.32	3.828		
5,716.90	37.09	287.77	5,334.53	416.80	-1,339.49	0.00	0.00	0.00	0.000		
6,605.48	50.00	173.68	6,071.57	121.41	-1,590.19	8.00	1.45	-12.84	-132.334		
7,053.15	89.00	149.50	6,227.38	-261.54	-1,450.54	10.00	8.71	-5.40	-35.561		
15,776.96	89.00	149.50	6,380.00	-7,776.98	2,976.59	0.00	0.00	0.00	0.000	Knob Creek S-06HM	



Planning Report - Geographic

Database: DB\_Jul2216dt\_v14 lt  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia.  
 Site: Knob Creek  
 Well: Knob Creek S-06HM (slot D)  
 Wellbore: Original Hole  
 Design: rev4

Local Co-ordinate Reference: Well Knob Creek S-06HM (slot D)  
 TVD Reference: GL=737 @ 737.00usft  
 MD Reference: GL=737 @ 737.00usft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

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Planned Survey

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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	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
100.00	0.00	0.00	100.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
200.00	0.00	0.00	200.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
300.00	0.00	0.00	300.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
400.00	0.00	0.00	400.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
500.00	0.00	0.00	500.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
600.00	0.00	0.00	600.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
700.00	0.00	0.00	700.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
800.00	0.00	0.00	800.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
900.00	0.00	0.00	900.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,443,139.66	1,723,166.61	39.77005704	-80.70550393
<b>KOP Begin 2°/100' build</b>									
1,400.00	2.00	284.40	1,399.98	0.43	-1.69	14,443,140.10	1,723,164.92	39.77005825	-80.70550994
1,500.00	4.00	284.40	1,499.84	1.74	-6.76	14,443,141.40	1,723,159.85	39.77006187	-80.70552797
1,550.00	5.00	284.40	1,549.68	2.71	-10.56	14,443,142.37	1,723,156.05	39.77006458	-80.70554148
<b>Begin 5.00° lateral section</b>									
1,600.00	5.00	284.40	1,599.49	3.79	-14.78	14,443,143.46	1,723,151.83	39.77006760	-80.70555648
1,700.00	5.00	284.40	1,699.11	5.96	-23.22	14,443,145.63	1,723,143.39	39.77007363	-80.70558650
1,800.00	5.00	284.40	1,798.73	8.13	-31.66	14,443,147.79	1,723,134.94	39.77007965	-80.70561652
1,900.00	5.00	284.40	1,898.35	10.30	-40.11	14,443,149.96	1,723,126.50	39.77008568	-80.70564654
2,000.00	5.00	284.40	1,997.97	12.46	-48.55	14,443,152.13	1,723,118.06	39.77009171	-80.70567655
2,100.00	5.00	284.40	2,097.59	14.63	-56.99	14,443,154.30	1,723,109.62	39.77009774	-80.70570657
2,200.00	5.00	284.40	2,197.21	16.80	-65.43	14,443,156.46	1,723,101.18	39.77010377	-80.70573659
2,300.00	5.00	284.40	2,296.83	18.97	-73.87	14,443,158.63	1,723,092.73	39.77010980	-80.70576661
2,400.00	5.00	284.40	2,396.45	21.13	-82.31	14,443,160.80	1,723,084.29	39.77011583	-80.70579662
2,500.00	5.00	284.40	2,496.07	23.30	-90.76	14,443,162.97	1,723,075.85	39.77012185	-80.70582664
2,600.00	5.00	284.40	2,595.69	25.47	-99.20	14,443,165.13	1,723,067.41	39.77012788	-80.70585666
2,700.00	5.00	284.40	2,695.31	27.64	-107.64	14,443,167.30	1,723,058.97	39.77013391	-80.70588668
2,800.00	5.00	284.40	2,794.93	29.80	-116.08	14,443,169.47	1,723,050.53	39.77013994	-80.70591669
2,900.00	5.00	284.40	2,894.55	31.97	-124.52	14,443,171.64	1,723,042.08	39.77014597	-80.70594671
3,000.00	5.00	284.40	2,994.17	34.14	-132.96	14,443,173.80	1,723,033.64	39.77015200	-80.70597673
3,100.00	5.00	284.40	3,093.78	36.31	-141.41	14,443,175.97	1,723,025.20	39.77015803	-80.70600675
3,200.00	5.00	284.40	3,193.40	38.47	-149.85	14,443,178.14	1,723,016.76	39.77016405	-80.70603676
3,206.62	5.00	284.40	3,200.00	38.62	-150.41	14,443,178.28	1,723,016.20	39.77016445	-80.70603875
<b>Begin 3°/100' build/tum</b>									
3,300.00	7.80	285.78	3,292.79	41.35	-160.45	14,443,181.02	1,723,006.16	39.77017205	-80.70607445
3,400.00	10.80	286.46	3,391.46	45.85	-175.96	14,443,185.52	1,722,990.65	39.77018455	-80.70612960
3,500.00	13.79	286.86	3,489.16	51.97	-196.35	14,443,191.63	1,722,970.25	39.77020152	-80.70620211
3,600.00	16.79	287.11	3,585.61	59.67	-221.58	14,443,199.34	1,722,945.03	39.77022292	-80.70629178
3,700.00	19.79	287.29	3,680.54	68.96	-251.56	14,443,208.62	1,722,915.05	39.77024888	-80.70639837
3,800.00	22.79	287.42	3,773.70	79.79	-286.21	14,443,219.45	1,722,880.39	39.77027874	-80.70652158
3,900.00	25.79	287.52	3,864.84	92.14	-325.45	14,443,231.80	1,722,841.16	39.77031302	-80.70666107
4,000.00	28.79	287.61	3,953.70	105.98	-369.16	14,443,245.64	1,722,797.45	39.77035141	-80.70681646
4,100.00	31.79	287.68	4,040.03	121.26	-417.22	14,443,260.93	1,722,749.39	39.77039383	-80.70698733
4,200.00	34.79	287.73	4,123.61	137.96	-469.50	14,443,277.62	1,722,697.10	39.77044014	-80.70717321
4,276.64	37.09	287.77	4,185.66	151.67	-512.34	14,443,291.34	1,722,654.26	39.77047819	-80.70732551
<b>Begin 37.09° tangent</b>									
4,300.00	37.09	287.77	4,204.29	155.97	-525.76	14,443,295.64	1,722,640.85	39.77049012	-80.70737320
4,400.00	37.09	287.77	4,284.06	174.38	-583.19	14,443,314.04	1,722,583.42	39.77054119	-80.70757737
4,500.00	37.09	287.77	4,363.83	192.79	-640.62	14,443,332.45	1,722,525.99	39.77059225	-80.70778154
4,600.00	37.09	287.77	4,443.60	211.20	-698.05	14,443,350.86	1,722,468.56	39.77064332	-80.70798571



Planning Report - Geographic

<b>Database:</b>	DB_Jul2216dt_v14 It	<b>Local Co-ordinate Reference:</b>	Well Knob Creek S-06HM (slot D)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=737 @ 737.00usft
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	GL=737 @ 737.00usft
<b>Site:</b>	Knob Creek	<b>North Reference:</b>	Grid
<b>Well:</b>	Knob Creek S-06HM (slot D)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev4		

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FEB 25 2021

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,700.00	37.09	287.77	4,523.36	229.61	-755.48	14,443,369.27	1,722,411.13	39.77069439	-80.70818988	
4,800.00	37.09	287.77	4,603.13	248.01	-812.91	14,443,387.68	1,722,353.70	39.77074546	-80.70839406	
4,900.00	37.09	287.77	4,682.90	266.42	-870.34	14,443,406.09	1,722,296.27	39.77079653	-80.70859823	
5,000.00	37.09	287.77	4,762.67	284.83	-927.77	14,443,424.49	1,722,238.84	39.77084759	-80.70880240	
5,100.00	37.09	287.77	4,842.44	303.24	-985.20	14,443,442.90	1,722,181.41	39.77089866	-80.70900657	
5,200.00	37.09	287.77	4,922.20	321.65	-1,042.63	14,443,461.31	1,722,123.98	39.77094972	-80.70921075	
5,300.00	37.09	287.77	5,001.97	340.05	-1,100.06	14,443,479.72	1,722,066.55	39.77100079	-80.70941492	
5,400.00	37.09	287.77	5,081.74	358.46	-1,157.49	14,443,498.13	1,722,009.12	39.77105186	-80.70961909	
5,500.00	37.09	287.77	5,161.51	376.87	-1,214.92	14,443,516.53	1,721,951.69	39.77110292	-80.70982327	
5,600.00	37.09	287.77	5,241.28	395.28	-1,272.35	14,443,534.94	1,721,894.26	39.77115399	-80.71002744	
5,700.00	37.09	287.77	5,321.04	413.69	-1,329.78	14,443,553.35	1,721,836.83	39.77120505	-80.71023162	
5,716.90	37.09	287.77	5,334.53	416.80	-1,339.48	14,443,556.46	1,721,827.12	39.77121368	-80.71026612	
<b>Begin 8°/100' build/turn</b>										
5,800.00	32.93	278.72	5,402.62	427.88	-1,385.72	14,443,567.55	1,721,780.88	39.77124453	-80.71043056	
5,900.00	29.02	265.11	5,488.45	429.94	-1,436.84	14,443,569.60	1,721,729.77	39.77125062	-80.71061245	
6,000.00	26.80	248.63	5,576.94	419.63	-1,482.08	14,443,559.30	1,721,684.53	39.77122273	-80.71077356	
6,100.00	26.71	230.80	5,666.38	397.18	-1,520.55	14,443,536.84	1,721,646.05	39.77116140	-80.71091075	
6,200.00	28.76	214.13	5,755.02	363.01	-1,551.52	14,443,502.67	1,721,615.09	39.77106783	-80.71102134	
6,300.00	32.55	200.26	5,841.14	317.78	-1,574.37	14,443,457.45	1,721,592.24	39.77094364	-80.71110318	
6,400.00	37.55	189.36	5,923.06	262.39	-1,588.66	14,443,402.05	1,721,577.94	39.77079183	-80.71115469	
6,500.00	43.34	180.83	5,999.19	197.90	-1,594.12	14,443,337.56	1,721,572.48	39.77061478	-80.71117486	
6,600.00	49.64	174.01	6,068.04	125.57	-1,590.64	14,443,265.23	1,721,575.97	39.77041612	-80.71116329	
6,605.48	50.00	173.68	6,071.57	121.41	-1,590.19	14,443,261.07	1,721,576.42	39.77040468	-80.71116174	
<b>Begin 10°/100' build/turn</b>										
6,700.00	57.88	167.20	6,127.21	46.22	-1,577.31	14,443,185.88	1,721,589.30	39.77019809	-80.71111677	
6,800.00	66.51	161.49	6,173.84	-38.77	-1,553.31	14,443,100.89	1,721,613.29	39.76996445	-80.71103234	
6,900.00	75.33	156.49	6,206.51	-126.83	-1,519.37	14,443,012.83	1,721,647.24	39.76972231	-80.71091256	
7,000.00	84.24	151.88	6,224.24	-215.29	-1,476.51	14,442,924.38	1,721,690.09	39.76947902	-80.71076106	
7,053.15	89.00	149.50	6,227.38	-261.53	-1,450.55	14,442,878.13	1,721,716.06	39.76935179	-80.71066917	
<b>Begin 89.00° lateral section</b>										
7,100.00	89.00	149.50	6,228.20	-301.89	-1,426.77	14,442,837.77	1,721,739.84	39.76924073	-80.71058503	
7,200.00	89.00	149.50	6,229.94	-388.04	-1,376.02	14,442,751.62	1,721,790.58	39.76900370	-80.71040542	
7,300.00	89.00	149.50	6,231.69	-474.19	-1,325.27	14,442,665.47	1,721,841.33	39.76876666	-80.71022581	
7,400.00	89.00	149.50	6,233.44	-560.34	-1,274.53	14,442,579.32	1,721,892.08	39.76852962	-80.71004620	
7,500.00	89.00	149.50	6,235.19	-646.49	-1,223.78	14,442,493.17	1,721,942.83	39.76829258	-80.70986660	
7,600.00	89.00	149.50	6,236.94	-732.64	-1,173.03	14,442,407.03	1,721,993.58	39.76805554	-80.70968699	
7,700.00	89.00	149.50	6,238.69	-818.79	-1,122.28	14,442,320.88	1,722,044.32	39.76781850	-80.70950739	
7,800.00	89.00	149.50	6,240.44	-904.93	-1,071.54	14,442,234.73	1,722,095.07	39.76758146	-80.70932779	
7,900.00	89.00	149.50	6,242.19	-991.08	-1,020.79	14,442,148.58	1,722,145.82	39.76734442	-80.70914819	
8,000.00	89.00	149.50	6,243.94	-1,077.23	-970.04	14,442,062.43	1,722,196.57	39.76710738	-80.70896859	
8,100.00	89.00	149.50	6,245.69	-1,163.38	-919.29	14,441,976.28	1,722,247.31	39.76687034	-80.70878899	
8,200.00	89.00	149.50	6,247.44	-1,249.53	-868.54	14,441,890.13	1,722,298.06	39.76663330	-80.70860939	
8,300.00	89.00	149.50	6,249.19	-1,335.68	-817.80	14,441,803.98	1,722,348.81	39.76639626	-80.70842980	
8,400.00	89.00	149.50	6,250.94	-1,421.83	-767.05	14,441,717.84	1,722,399.56	39.76615922	-80.70825020	
8,500.00	89.00	149.50	6,252.69	-1,507.98	-716.30	14,441,631.69	1,722,450.31	39.76592218	-80.70807061	
8,600.00	89.00	149.50	6,254.44	-1,594.12	-665.55	14,441,545.54	1,722,501.05	39.76568513	-80.70789102	
8,700.00	89.00	149.50	6,256.19	-1,680.27	-614.81	14,441,459.39	1,722,551.80	39.76544809	-80.70771143	
8,800.00	89.00	149.50	6,257.94	-1,766.42	-564.06	14,441,373.24	1,722,602.55	39.76521105	-80.70753184	
8,900.00	89.00	149.50	6,259.69	-1,852.57	-513.31	14,441,287.09	1,722,653.30	39.76497401	-80.70735225	
9,000.00	89.00	149.50	6,261.44	-1,938.72	-462.56	14,441,200.94	1,722,704.04	39.76473696	-80.70717266	
9,100.00	89.00	149.50	6,263.19	-2,024.87	-411.81	14,441,114.80	1,722,754.79	39.76449992	-80.70699308	
9,200.00	89.00	149.50	6,264.94	-2,111.02	-361.07	14,441,028.65	1,722,805.54	39.76426288	-80.70681349	
9,300.00	89.00	149.50	6,266.68	-2,197.17	-310.32	14,440,942.50	1,722,856.29	39.76402583	-80.70663391	
9,400.00	89.00	149.50	6,268.43	-2,283.31	-259.57	14,440,856.35	1,722,907.04	39.76378879	-80.70645433	

WV Department of Environmental Protection



Planning Report - Geographic

Database: DB\_Jul2216dt\_v14 It  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia.  
 Site: Knob Creek  
 Well: Knob Creek S-06HM (slot D)  
 Wellbore: Original Hole  
 Design: rev4

Local Co-ordinate Reference: Well Knob Creek S-06HM (slot D)  
 TVD Reference: GL=737 @ 737.00usft  
 MD Reference: GL=737 @ 737.00usft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

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Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,500.00	89.00	149.50	6,270.18	-2,369.46	-208.82	14,440,770.20	1,722,957.78	39.76355174	-80.70627475
9,600.00	89.00	149.50	6,271.93	-2,455.61	-158.08	14,440,684.05	1,723,008.53	39.76331470	-80.70609517
9,700.00	89.00	149.50	6,273.68	-2,541.76	-107.33	14,440,597.90	1,723,059.28	39.76307766	-80.70591559
9,800.00	89.00	149.50	6,275.43	-2,627.91	-56.58	14,440,511.75	1,723,110.03	39.76284061	-80.70573601
9,900.00	89.00	149.50	6,277.18	-2,714.06	-5.83	14,440,425.61	1,723,160.77	39.76260356	-80.70555644
10,000.00	89.00	149.50	6,278.93	-2,800.21	44.92	14,440,339.46	1,723,211.52	39.76236652	-80.70537686
10,100.00	89.00	149.50	6,280.68	-2,886.36	95.66	14,440,253.31	1,723,262.27	39.76212947	-80.70519729
10,200.00	89.00	149.50	6,282.43	-2,972.50	146.41	14,440,167.16	1,723,313.02	39.76189243	-80.70501772
10,300.00	89.00	149.50	6,284.18	-3,058.65	197.16	14,440,081.01	1,723,363.77	39.76165538	-80.70483815
10,400.00	89.00	149.50	6,285.93	-3,144.80	247.91	14,439,994.86	1,723,414.51	39.76141833	-80.70465858
10,500.00	89.00	149.50	6,287.68	-3,230.95	298.65	14,439,908.71	1,723,465.26	39.76118128	-80.70447901
10,600.00	89.00	149.50	6,289.43	-3,317.10	349.40	14,439,822.56	1,723,516.01	39.76094424	-80.70429944
10,700.00	89.00	149.50	6,291.18	-3,403.25	400.15	14,439,736.42	1,723,566.76	39.76070719	-80.70411988
10,800.00	89.00	149.50	6,292.93	-3,489.40	450.90	14,439,650.27	1,723,617.50	39.76047014	-80.70394031
10,900.00	89.00	149.50	6,294.68	-3,575.55	501.65	14,439,564.12	1,723,668.25	39.76023309	-80.70376075
11,000.00	89.00	149.50	6,296.43	-3,661.69	552.39	14,439,477.97	1,723,719.00	39.75999604	-80.70358118
11,100.00	89.00	149.50	6,298.18	-3,747.84	603.14	14,439,391.82	1,723,769.75	39.75975899	-80.70340162
11,200.00	89.00	149.50	6,299.93	-3,833.99	653.89	14,439,305.67	1,723,820.50	39.75952195	-80.70322206
11,300.00	89.00	149.50	6,301.67	-3,920.14	704.64	14,439,219.52	1,723,871.24	39.75928490	-80.70304250
11,400.00	89.00	149.50	6,303.42	-4,006.29	755.38	14,439,133.37	1,723,921.99	39.75904785	-80.70286295
11,500.00	89.00	149.50	6,305.17	-4,092.44	806.13	14,439,047.23	1,723,972.74	39.75881080	-80.70268339
11,600.00	89.00	149.50	6,306.92	-4,178.59	856.88	14,438,961.08	1,724,023.49	39.75857375	-80.70250384
11,700.00	89.00	149.50	6,308.67	-4,264.73	907.63	14,438,874.93	1,724,074.23	39.75833670	-80.70232428
11,800.00	89.00	149.50	6,310.42	-4,350.88	958.38	14,438,788.78	1,724,124.98	39.75809964	-80.70214473
11,900.00	89.00	149.50	6,312.17	-4,437.03	1,009.12	14,438,702.63	1,724,175.73	39.75786259	-80.70196518
12,000.00	89.00	149.50	6,313.92	-4,523.18	1,059.87	14,438,616.48	1,724,226.48	39.75762554	-80.70178563
12,100.00	89.00	149.50	6,315.67	-4,609.33	1,110.62	14,438,530.33	1,724,277.23	39.75738849	-80.70160608
12,200.00	89.00	149.50	6,317.42	-4,695.48	1,161.37	14,438,444.18	1,724,327.97	39.75715144	-80.70142653
12,300.00	89.00	149.50	6,319.17	-4,781.63	1,212.11	14,438,358.04	1,724,378.72	39.75691438	-80.70124699
12,400.00	89.00	149.50	6,320.92	-4,867.78	1,262.86	14,438,271.89	1,724,429.47	39.75667733	-80.70106744
12,500.00	89.00	149.50	6,322.67	-4,953.92	1,313.61	14,438,185.74	1,724,480.22	39.75644028	-80.70088790
12,600.00	89.00	149.50	6,324.42	-5,040.07	1,364.36	14,438,099.59	1,724,530.96	39.75620323	-80.70070835
12,700.00	89.00	149.50	6,326.17	-5,126.22	1,415.11	14,438,013.44	1,724,581.71	39.75596617	-80.70052881
12,800.00	89.00	149.50	6,327.92	-5,212.37	1,465.85	14,437,927.29	1,724,632.46	39.75572912	-80.70034927
12,900.00	89.00	149.50	6,329.67	-5,298.52	1,516.60	14,437,841.14	1,724,683.21	39.75549206	-80.70016973
13,000.00	89.00	149.50	6,331.42	-5,384.67	1,567.35	14,437,754.99	1,724,733.96	39.75525501	-80.69999020
13,100.00	89.00	149.50	6,333.17	-5,470.82	1,618.10	14,437,668.85	1,724,784.70	39.75501796	-80.69981066
13,200.00	89.00	149.50	6,334.92	-5,556.97	1,668.84	14,437,582.70	1,724,835.45	39.75478090	-80.69963112
13,300.00	89.00	149.50	6,336.67	-5,643.11	1,719.59	14,437,496.55	1,724,886.20	39.75454385	-80.69945159
13,400.00	89.00	149.50	6,338.41	-5,729.26	1,770.34	14,437,410.40	1,724,936.95	39.75430679	-80.69927206
13,500.00	89.00	149.50	6,340.16	-5,815.41	1,821.09	14,437,324.25	1,724,987.69	39.75406973	-80.69909253
13,600.00	89.00	149.50	6,341.91	-5,901.56	1,871.84	14,437,238.10	1,725,038.44	39.75383268	-80.69891299
13,700.00	89.00	149.50	6,343.66	-5,987.71	1,922.58	14,437,151.95	1,725,089.19	39.75359562	-80.69873347
13,800.00	89.00	149.50	6,345.41	-6,073.86	1,973.33	14,437,065.80	1,725,139.94	39.75335857	-80.69855394
13,900.00	89.00	149.50	6,347.16	-6,160.01	2,024.08	14,436,979.66	1,725,190.69	39.75312151	-80.69837441
14,000.00	89.00	149.50	6,348.91	-6,246.16	2,074.83	14,436,893.51	1,725,241.43	39.75288445	-80.69819489
14,100.00	89.00	149.50	6,350.66	-6,332.30	2,125.57	14,436,807.36	1,725,292.18	39.75264739	-80.69801536
14,200.00	89.00	149.50	6,352.41	-6,418.45	2,176.32	14,436,721.21	1,725,342.93	39.75241034	-80.69783584
14,300.00	89.00	149.50	6,354.16	-6,504.60	2,227.07	14,436,635.06	1,725,393.68	39.75217328	-80.69765632
14,400.00	89.00	149.50	6,355.91	-6,590.75	2,277.82	14,436,548.91	1,725,444.42	39.75193622	-80.69747680
14,500.00	89.00	149.50	6,357.66	-6,676.90	2,328.57	14,436,462.76	1,725,495.17	39.75169916	-80.69729728
14,600.00	89.00	149.50	6,359.41	-6,763.05	2,379.31	14,436,376.62	1,725,545.92	39.75146210	-80.69711776
14,700.00	89.00	149.50	6,361.16	-6,849.20	2,430.06	14,436,290.47	1,725,596.67	39.75122504	-80.69693824
14,800.00	89.00	149.50	6,362.91	-6,935.35	2,480.81	14,436,204.32	1,725,647.42	39.75098798	-80.69675872
14,900.00	89.00	149.50	6,364.66	-7,021.49	2,531.56	14,436,118.17	1,725,698.16	39.75075092	-80.69657921

WV Department of Environmental Protection



Planning Report - Geographic

<b>Database:</b>	DB_Jul2216dt_v14 It	<b>Local Co-ordinate Reference:</b>	Well Knob Creek S-06HM (slot D)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=737 @ 737.00usft
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	GL=737 @ 737.00usft
<b>Site:</b>	Knob Creek	<b>North Reference:</b>	Grid
<b>Well:</b>	Knob Creek S-06HM (slot D)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev4		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,000.00	89.00	149.50	6,366.41	-7,107.64	2,582.30	14,436,032.02	1,725,748.91	39.75051386	-80.69639970
15,100.00	89.00	149.50	6,368.16	-7,193.79	2,633.05	14,435,945.87	1,725,799.66	39.75027680	-80.69622019
15,200.00	89.00	149.50	6,369.91	-7,279.94	2,683.80	14,435,859.72	1,725,850.41	39.75003974	-80.69604067
15,300.00	89.00	149.50	6,371.66	-7,366.09	2,734.55	14,435,773.57	1,725,901.15	39.74980268	-80.69586117
15,400.00	89.00	149.50	6,373.41	-7,452.24	2,785.30	14,435,687.43	1,725,951.90	39.74956562	-80.69568166
15,500.00	89.00	149.50	6,375.15	-7,538.39	2,836.04	14,435,601.28	1,726,002.65	39.74932856	-80.69550215
15,600.00	89.00	149.50	6,376.90	-7,624.54	2,886.79	14,435,515.13	1,726,053.40	39.74909150	-80.69532264
15,700.00	89.00	149.50	6,378.65	-7,710.68	2,937.54	14,435,428.98	1,726,104.15	39.74885444	-80.69514314
15,776.95	89.00	149.50	6,380.00	-7,776.98	2,976.59	14,435,362.69	1,726,143.20	39.74867202	-80.69500501
<b>PBHL/TD 15776.95 MD 6380.00 TVD</b>									
15,776.96	89.00	149.50	6,380.00	-7,776.98	2,976.59	14,435,362.68	1,726,143.20	39.74867200	-80.69500500

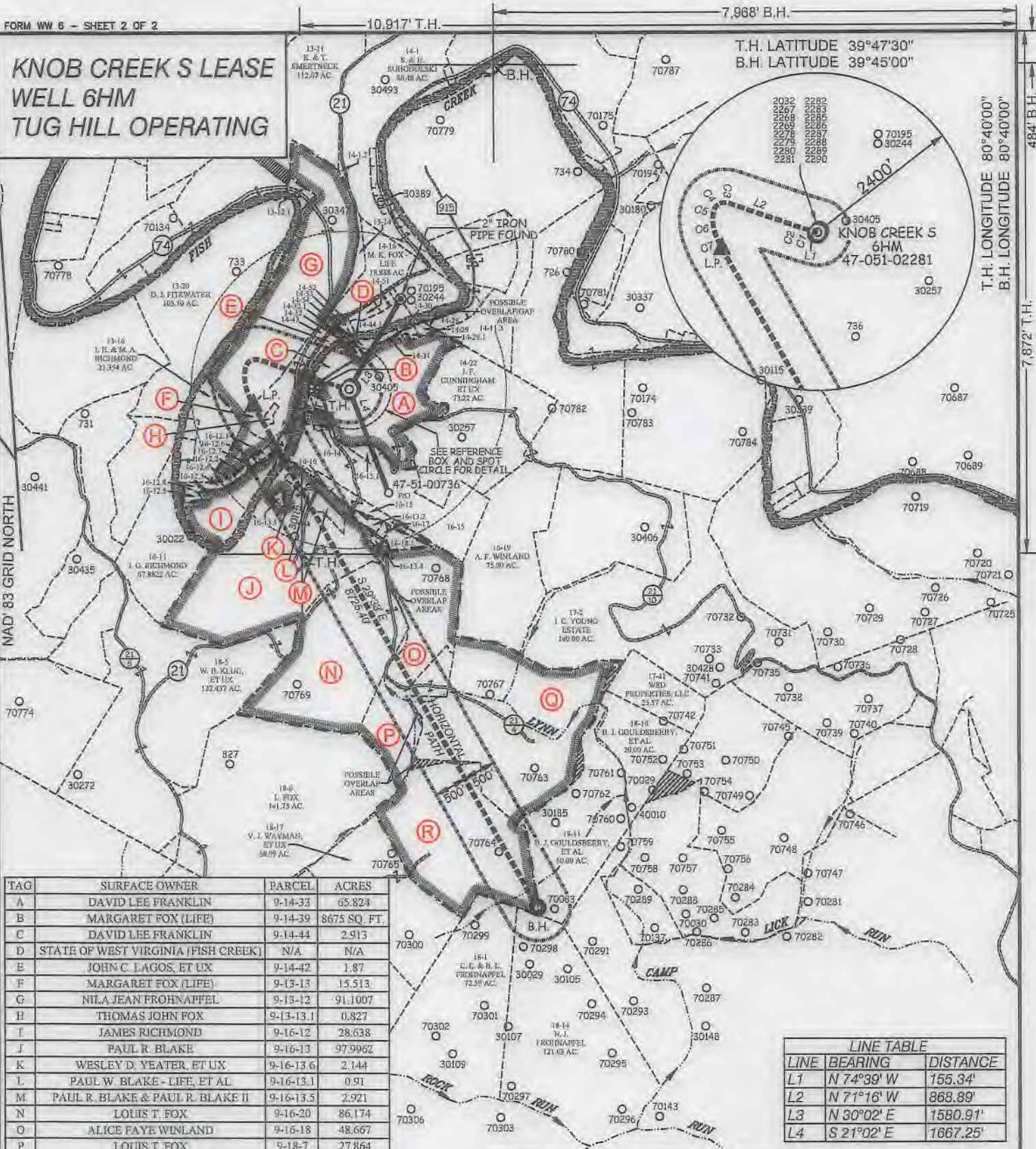
Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Knob Creek S-06HM LP - hit/miss target - Shape	0.00	0.00	6,227.00	-232.77	-1,429.08	14,442,906.89	1,721,737.52	39.76943058	-80.71059247
- plan misses target center by 33.01usft at 7038.58usft MD (6226.95 TVD, -248.94 N, -1457.87 E)									
- Point									
Knob Creek S-06HM LP - plan misses target center by 76.17usft at 7064.63usft MD (6227.58 TVD, -271.43 N, -1444.72 E)	0.00	0.00	6,227.00	-232.77	-1,379.08	14,442,906.89	1,721,787.52	39.76943013	-80.71041452
- Point									
Knob Creek S-06HM BH - plan hits target center - Point	0.00	0.00	6,380.00	-7,776.98	2,976.59	14,435,362.68	1,726,143.20	39.74867200	-80.69500500

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,300.00	1,300.00	0.00	0.00	KOP Begin 2°/100' build
1,550.00	1,549.88	2.71	-10.56	Begin 5.00° lateral section
3,206.62	3,200.00	38.62	-150.41	Begin 3°/100' build/turn
4,276.64	4,185.66	151.67	-512.34	Begin 37.09° tangent
5,716.90	5,334.53	416.80	-1,339.48	Begin 8°/100' build/turn
6,605.48	6,071.57	121.41	-1,590.19	Begin 10°/100' build/turn
7,053.15	6,227.38	-261.53	-1,450.55	Begin 89.00° lateral section
15,776.95	6,380.00	-7,776.98	2,976.59	PBHL/TD 15776.95 MD 6380.00 TVD

RECEIVED  
Office of Oil and Gas  
FEB 25 2021

WV Department of  
Environmental Protection

**KNOB CREEK S LEASE  
WELL 6HM  
TUG HILL OPERATING**



TAG	SURFACE OWNER	PARCEL	ACRES
A	DAVID LEE FRANKLIN	9-14-33	65.824
B	MARGARET FOX (LIFE)	9-14-39	8675 SQ. FT.
C	DAVID LEE FRANKLIN	9-14-44	2.913
D	STATE OF WEST VIRGINIA (FISH CREEK)	N/A	N/A
E	JOHN C. LAGOS, ET UX	9-14-42	1.87
F	MARGARET FOX (LIFE)	9-13-13	15.513
G	NILA JEAN FROHNAPFEL	9-13-12	91.1007
H	THOMAS JOHN FOX	9-13-13.1	0.827
I	JAMES RICHMOND	9-16-12	28.638
J	PAUL R. BLAKE	9-16-13	97.9962
K	WESLEY D. YEATER, ET UX	9-16-13.6	2.144
L	PAUL W. BLAKE - LIFE, ET AL	9-16-13.1	0.91
M	PAUL R. BLAKE & PAUL R. BLAKE II	9-16-13.5	2.921
N	LOUIS T. FOX	9-16-20	86.174
O	ALICE FAYE WINLAND	9-16-18	48.667
P	LOUIS T. FOX	9-18-7	27.864
Q	ROBERT J. COMBS, ET AL	9-18-9	110.75
R	DOUGLAS J. WAYMAN	9-18-8	92.72

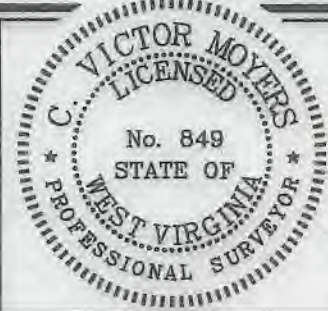
LINE	BEARING	DISTANCE
L1	N 74°39' W	155.34'
L2	N 71°16' W	868.89'
L3	N 30°02' E	1580.91'
L4	S 21°02' E	1667.25'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	105.64'	3582.04'	N 72°21' W	105.64'
C2	273.68'	36985.28'	N 71°27' W	273.68'
C3	145.36'	217.34'	N 87°54' W	142.67'
C4	115.54'	161.08'	S 47°24' W	113.08'
C5	148.13'	346.57'	S 12°47' W	147.00'
C6	241.35'	726.21'	S 08°50' E	240.24'
C7	245.81'	1235.52'	S 23°49' E	245.40'



42 Venhorn Drive | P.O. Box 150 | Glenville, WV 26031 | 304.462.9634  
 1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952  
 264 Sash Buckle Bypass | Beckley, WV 25801 | 304.255.5296  
 slsww.com

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD83 S.P.C.(FT)	N. 464,867.39	E. 1,629,661.44	
NAD83 GEO.	LAT-(N) 39.770057	LONG-(W) 80.705504	
NAD83 UTM (M)	N. 4,402,277.77	E. 525,222.23	
LANDING POINT			
NAD83 S.P.C.(FT)	N. 464,630.1	E. 1,628,206.2	
NAD83 GEO.	LAT-(N) 39.769352	LONG-(W) 80.710669	
NAD83 UTM (M)	N. 4,402,198.1	E. 524,780.1	
BOTTOM HOLE			
NAD83 S.P.C.(FT)	N. 457,039.1	E. 1,632,508.7	
NAD83 GEO.	LAT-(N) 39.748672	LONG-(W) 80.695005	
NAD83 UTM (M)	N. 4,399,907.3	E. 526,129.5	



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

P.S. 849 *C. Victor Moyers*

LEGEND	
LEASE LINE	
SURFACE LINE	
WELL LATERAL	
OFFSET LINE	
TIE LINE	
CREEK	
ROAD	
COUNTY ROUTE	
PROPOSED WELL	
EXISTING WELL	
PERMITTED WELL	
TAX MAP-PARCEL	
SURFACE OWNER (SEE TABLE)	
LEASE # (SEE WW-6A1)	

SCALE 1" = 2000' FILE NO. 8789P6HMR3.dwg  
 KNOB CREEK S-6HM-REV4  
 DATE JULY 27, 2018  
 REVISED 09-30-2019, 08-28-2020, 10-29-2020  
 OPERATORS WELL NO. KNOB CREEK S-6HM  
 API WELL NO. 47-051-02281  
 NO. STATE COUNTY PERMIT

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

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 26313

COUNTY NAME  
 PERMIT

**KNOB CREEK S LEASE  
WELL 6HM  
TUG HILL OPERATING**

-B.H.

T.H. LATITUDE 39°47'30"  
B.H. LATITUDE 39°45'00"

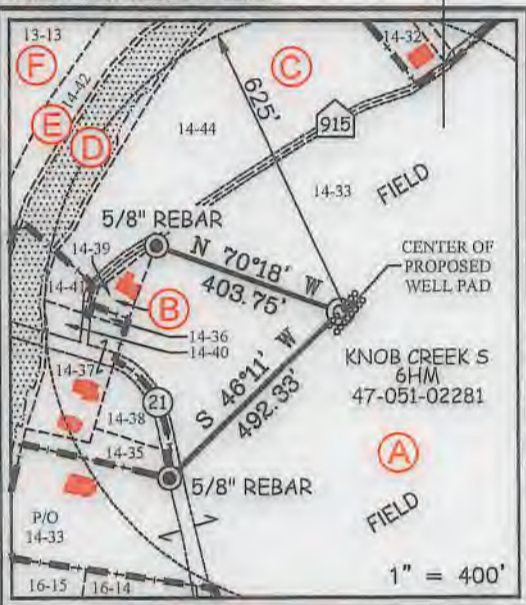
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)		
NAD'83 S.P.C.(FT)	N. 464,887.39	E. 1,629,661.44
NAD'83 GEO.	LAT-(N) 39.770057	LONG-(W) 80.705504
NAD'83 UTM (M)	N. 4,402,277.77	E. 525,222.23
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 464,630.1	E. 1,628,206.2
NAD'83 GEO.	LAT-(N) 39.769352	LONG-(W) 80.710669
NAD'83 UTM (M)	N. 4,402,198.1	E. 524,780.1
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 457,039.1	E. 1,632,508.7
NAD'83 GEO.	LAT-(N) 39.748672	LONG-(W) 80.695005
NAD'83 UTM (M)	N. 4,399,907.3	E. 526,129.5

T.H. LONGITUDE 80°40'00"  
B.H. LONGITUDE 80°40'00"  
484' B.H.

7,872' T.H.

**REFERENCES**

T.H.



MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
9-13-12.1	ROBERT T. & BARBARA A. ANKROM	2.632
9-13-14	MARGARET K. FOX - LIFE	3.00
9-14-1.2	KENNETH N. & TERESA A. SMERTNECK	1.02
9-14-11.3	PATRICK J. SCHELLHASE - TRUST	23.424
9-14-28	CHARLES R. SCHELLHASE, ET UX	3.029
9-14-29	ANDREW FASOULETOS, ET UX	0.209
9-14-29.1	ANDREW FASOULETOS, ET UX	1.171
9-14-30	WILLIAM C. GROFT, ET UX	0.35
9-14-31	WILFORD F. NELSON, JR., ET UX	0.954
9-14-32	TWILA C. COFFIELD	0.583
9-14-32.1	TWILA C. COFFIELD	0.184
9-14-35	PAUL G. FOX	0.338
9-14-36	MARGARET FOX - LIFE	1600 SQ. FT.
9-14-37	MARGARET FOX - LIFE	LOT
9-14-38	MARGARET FOX - LIFE	0.631
9-14-40	MARGARET FOX - LIFE	19,560 SQ. FT.
9-14-41	MARGARET FOX - LIFE	9165 SQ. FT.
9-14-43	JAMES G. FOX	0.66
9-14-44.1	GEORGE R. TAYLOR, ET UX	4.423
9-14-51	GEORGE R. TAYLOR, ET UX	1.621
9-14-52	JAMES E. PEELMAN	0.439
9-14-53	JAMES E. PEELMAN	0.355
9-14-54	RICHARD L. HARVETH, ET UX	1.649
9-16-12.1	JAMES G. RICHMOND, ET UX	0.691
9-16-12.2	SPENCER J. & CARRIE A. RICHMOND	0.375
9-16-12.3	JAMES G. RICHMOND, ET UX	0.937
9-16-12.4	SHEILA TRUAX, ET VIR.	0.516
9-16-12.5	TIMOTHY S. & GRETCHEN M. KIDD	1.23
9-16-12.6	SPENCER J. & CARRIE A. RICHMOND	0.141
9-16-12.7	SPENCER J. & CARRIE A. RICHMOND	0.55
9-16-12.8	IVAN H. & MARGARET A. RICHMOND	0.83
9-16-13.2	ELEANOR M. FOX ESTATE	1.570
9-16-13.3	PAUL R. BLAKE	0.7538
9-16-13.4	JOHN FOX	0.533
9-16-14	LYNN CAMP METHODIST CHURCH	0.762
9-16-15	RONALD R. YOUNG, ET UX - LIFE	32.02
9-16-15.1	ERIC J. YOUNG	1.98
9-16-16	CLINTON B. WHITELATCH, SR., ET UX ESTS	1 AC. 5 6/10 POLES
9-16-17	ELEANOR M. FOX ESTATE	0.741
9-16-18.1	ROBIN D. & DAVID G. STEWART	3.333

**NOTES ON SURVEY**

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. WERE FOUND WITHIN 825' OF THE CENTER OF PROPOSED WELL PAD.
- SEE REFERENCES FOR DWELLINGS LOCATED WITHIN 825' 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.



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.482.5834  
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3932  
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296  
slswv.com

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 JULY 27, 20 18  
REVISED 09-30-2019, 08-28-2020, 10-29-2020  
OPERATORS WELL NO. KNOB CREEK S-6HM  
API WELL NO. 47 - 051 - 02281  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8789P6HMR3.dwg  
KNOB CREEK S-6HM-REV4  
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:  
ELEVATION 737.50' WATERSHED FISH CREEK (HUC 10)  
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE B.H. - WILEYVILLE 7.5'  
T.H. - 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±  
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 MARCELLUS  
ESTIMATED DEPTH TVD: 6,343' / TMD: 15,777'

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

COUNTY NAME PERMIT

**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

\*Co-tenancy utilization – At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act.

**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. Morris *Amy L. Morris*  
 Its: Permitting Specialist - Appalachia Region





Lease ID	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10*19674	9-13-13.1	H	DEBRA SHORT AND RODNEY SHORT	TH EXPLORATION LLC	1/8+	944 337	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19675	9-13-13.1	H	BARBARA LEISHMAN AND DANNY K LEISHMAN	TH EXPLORATION LLC	1/8+	944 432	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19714	9-13-13.1	H	DAVID A ROBINSON AND PATRICIA A ROBINSON	TH EXPLORATION LLC	1/8+	944 434	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19865	9-13-13.1	H	TERRI J STREAM AND JOHN T STREAM	TH EXPLORATION LLC	1/8+	945 580	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19869	9-13-13.1	H	SHIRLEY J DUFFY	TH EXPLORATION LLC	1/8+	945 578	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19870	9-13-13.1	H	DORIS L MASTERS AND ROY N MASTERS	TH EXPLORATION LLC	1/8+	945 576	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21027	9-13-13.1	H	MARY D LING	TH EXPLORATION LLC	1/8+	951 126	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21087	9-13-13.1	H	THOMAS E DODD AND ANITA M DODD	TH EXPLORATION LLC	1/8+	951 124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21088	9-13-13.1	H	DONALD E WEST AND MARTHA E WEST	TH EXPLORATION LLC	1/8+	951 122	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21104	9-13-13.1	H	LARRY W BAILEY AND MARSHA K BAILEY	TH EXPLORATION LLC	1/8+	951 131	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21105	9-13-13.1	H	THE CALVIN O WILLIAMS & PATSY S WILLIAMS REVOCABLE LIVING TRUST	TH EXPLORATION LLC	1/8+	951 137	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21107	9-13-13.1	H	RONALD L WEST	TH EXPLORATION LLC	1/8+	951 135	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21108	9-13-13.1	H	SANDRA A WHITE	TH EXPLORATION LLC	1/8+	951 140	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21491	9-13-13.1	H	DARLENA BRY AND LEE V BRY	TH EXPLORATION LLC	1/8+	957 290	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21507	9-13-13.1	H	DONALD FURLONG AND LISA K FURLONG	TH EXPLORATION LLC	1/8+	951 128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21838	9-13-13.1	H	FIRST PRESBYTERIAN CHURCH OF CLARKSBURG	TH EXPLORATION LLC	1/8+	959 625	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21955	9-13-13.1	H	THEODORE F MASLOWSKI AND ANITA MASLOWSKI	TH EXPLORATION LLC	1/8+	960 13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21963	9-13-13.1	H	LINDA R JANSSEN AND DENNIS D JANSSEN	TH EXPLORATION LLC	1/8+	960 28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21964	9-13-13.1	H	WILLIAM R DODD AND SHIRLEY A DODD	TH EXPLORATION LLC	1/8+	960 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21983	9-13-13.1	H	OPAL V BUCKMASTER	TH EXPLORATION LLC	1/8+	953 497	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22113	9-13-13.1	H	SYLVIA D WEST	TH EXPLORATION LLC	1/8+	962 224	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22117	9-13-13.1	H	DEBORAH L WRABEL AND GREGORY G WRABEL	TH EXPLORATION LLC	1/8+	961 354	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22119	9-13-13.1	H	JAMES S RICHMOND	TH EXPLORATION LLC	1/8+	953 499	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22121	9-13-13.1	H	WICKI ANN WILLIAMS & WILLIAM J WILLIAMS	TH EXPLORATION LLC	1/8+	961 352	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22377	9-13-13.1	H	MONTY W BAILEY AND MARTHA E BAILEY	TH EXPLORATION LLC	1/8+	962 226	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22378	9-13-13.1	H	KEVIN R RICHMOND AND VALERIE L RICHMOND	TH EXPLORATION LLC	1/8+	962 228	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22458	9-13-13.1	H	JAMES RICHMOND AND CINDY L RICHMOND	TH EXPLORATION LLC	1/8+	963 132	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22463	9-13-13.1	H	STEVEN R MCCLINTOCK	TH EXPLORATION LLC	1/8+	964 458	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22517	9-13-13.1	H	PHYLLIS M RADER	TH EXPLORATION LLC	1/8+	964 456	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*22545	9-13-13.1	H	JANICE L MASLOWSKI AND FLOYD F MECHLING	TH EXPLORATION LLC	1/8+	968 9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23140	9-13-13.1	H	MELISSA JENKINS	TH EXPLORATION LLC	1/8+	984 86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23144	9-13-13.1	H	MARGARET A WALTERS	TH EXPLORATION LLC	1/8+	984 84	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23145	9-13-13.1	H	WILLIAM BENNETT	TH EXPLORATION LLC	1/8+	984 82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23146	9-13-13.1	H	RETA J GRIFFIN AND MARTIN A GRIFFIN	TH EXPLORATION LLC	1/8+	984 80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23154	9-13-13.1	H	CAROLYN HAY BENNETT	TH EXPLORATION LLC	1/8+	984 78	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23188	9-13-13.1	H	LISA MCMANUS	TH EXPLORATION LLC	1/8+	984 530	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23299	9-13-13.1	H	PATRICIA L BECK	TH EXPLORATION LLC	1/8+	988 19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23312	9-13-13.1	H	GONNA M CARTER	TH EXPLORATION LLC	1/8+	988 17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23559	9-13-13.1	H	ROBERT TOOMBS WRIGHT MONTAGUE BY DAVID C WHITE, ESQ, GUARDIAN AD LITEM	TH EXPLORATION LLC	1/8+	1009 249	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23577	9-13-13.1	H	JOHN WILLIAM MACKENZIE MONTAGUE BY DAVID C WHITE, ESQ, GUARDIAN AD LITEM	TH EXPLORATION LLC	1/8+	1009 253	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23578	9-13-13.1	H	DUDLEY PORTER THAYER MONTAGUE JR BY DAVID C WHITE, ESQ, GUARDIAN AD LITEM	TH EXPLORATION LLC	1/8+	1009 251	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*24740	9-13-13.1	H	*RICARDO THOMAS MAYA	TH EXPLORATION LLC	1/8+	1025 614	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*25442	9-13-13.1	H	SARAH BETH PREWITT ET AL	TH EXPLORATION LLC	1/8+	1033 297	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*27947	9-13-13.1	H	STONE HILL MINERALS HOLDINGS LLC	TH EXPLORATION LLC	1/8+	1063 568	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*16481	9-16-12	I	JAMES G RICHMOND AND CINDY L RICHMOND	FOSSIL CREEK OHIO, LLC	1/8+	829 71	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Fossil Creek Ohio LLC to Gulfport Energy Corp: 32/307	Fossil Creek Ohio LLC to Gulfport Energy Corp: 34/410	Gulfport Energy Corp & Fossil Creek Ohio, LLC to TH Exploration LLC: 36/535
10*47051.135.0	9-16-13	J	PAUL R BLAKE	TH EXPLORATION LLC	1/8+	878 280	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.151.0	9-16-13.6	K	WESLEY D YEATER AND CAROL A YEATER	TH EXPLORATION LLC	1/8+	873 504	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19615	9-16-13.1	L	WESLEY D YEATER JR AND MONICA YEATER	TH EXPLORATION LLC	1/8+	937 323	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19616	9-16-13.1	L	WESLEY D YEATER JR AND CAROL A YEATER	TH EXPLORATION LLC	1/8+	937 315	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*17772	9-16-13.5	M	KANDI MIDCAP	TH EXPLORATION LLC	1/8+	942 449	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23726	9-16-20	N	LOUIS T FOX	TH EXPLORATION LLC	1/8+	1011 520	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*27395	9-16-20	N	LYNN CAMP UNITED METHODIST CHURCH	TH EXPLORATION LLC	1/8+	1058 376	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.187.1	9-18-18	O	ALICE F WINDLAND	TH EXPLORATION LLC	1/8+	881 133	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21293	9-18-7	P	LOUIS T FOX AND KAREN A FOX	TH EXPLORATION LLC	1/8+	952 364	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*27824	9-18-9	Q	CATHARINE V B YOUNG AND A J YOUNG	J S MASON	1/8+	164 534	J S Mason to Frank Marling: 164/571	Frank Marling to Lynn Camp Oil & Gas Company: 164/572	Lynn Camp Oil & Gas Company to Cameron Heat & Light Company: 220/423	Cameron Heat & Light Company to Zogg and Zogg Inc: 227/258	Zogg & Zogg Inc to Gerald Wells: 239/160	Gerald Wells & Hazel Wells to Paul J Klug and E J Klug: 380/359	E J Klug, Paul Klug & Lena Klug to Carl D. Perkins: 453/390	Carl D Perkins & Dorothy Louise Perkins to Perkins Oil & Gas Inc: 484/281 & 17/589	Perkins Oil & Gas Inc to Stone Energy Corporation: 26/322	Stone Energy Corp to EQT Production Co: 38/75	EQT Production Co to TH Exploration LLC: 48/21	N/A	
10*47051.152.1	9-18-8	R	TAMMY JO LONG	TH EXPLORATION LLC	1/8+	860 361	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.152.2	9-18-8	R	DOUGLAS J WAYMAN	TH EXPLORATION LLC	1/8+	865 350	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

\*Co-tenancy utilization - At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act.



ASSIGNMENT AND BILL OF SALE

This ASSIGNMENT AND BILL OF SALE (this "*Assignment*") dated as of December 1, 2020 (the "*Execution Date*"), is made by and between EQT PRODUCTION COMPANY, a Pennsylvania corporation, with an address at 625 Liberty Avenue, Suite 1700, Pittsburgh, Pennsylvania 15222 ("*EQT*"), and TH EXPLORATION, LLC, a Texas limited liability company, with an address at 1320 S. University Drive, Suite 500, Fort Worth, Texas 76107 ("*TH*") pursuant to the terms of that certain Acreage Trade Agreement by and among EQT, TH and TH Exploration II, LLC ("*TH II*"), dated July 8, 2020 (the "*Agreement*"). EQT and TH may be referred to herein together as the "*Parties*", and each individually as a "*Party*".

RECITALS

WHEREAS, EQT desires to transfer, convey and assign to TH certain of EQT's oil and gas leasehold interests located in Marshall County, West Virginia set forth on Exhibit A attached hereto and incorporated herein ("*EQT Leases*") in accordance with this Assignment and the Agreement; and

WHEREAS, TH desires to receive from EQT, all of EQT's right, title and interest in and to the EQT Leases in accordance with this Assignment and the Agreement.

NOW, THEREFORE, for and in consideration of the mutual promises contained herein and in the Agreement, the benefits to be derived by each Party hereunder and under the Agreement, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

ARTICLE I  
DEFINED TERMS

1.1 *Definitions.* Capitalized terms used herein and not otherwise defined throughout this Assignment shall have the meanings given such terms in the Agreement.

ARTICLE II  
ASSIGNMENT OF ASSETS

2.1 *Assignment.* Subject to the terms and conditions of this Assignment and the Agreement, EQT does hereby assign, convey and transfer to TH all of the right, title and interest of EQT in and to the following (collectively for purposes of this Assignment, the "*EQT Assets*"):

(a) Subject to the conveyance of the Wells Assets from EQT to TH II as described in the Agreement, the EQT Leases and appurtenances thereto (including rights of access and to install facilities), all Hydrocarbons within, produced from, derived from, or sold from the EQT Leases (and all proceeds related thereto), on and after the Valuation Date, and all Surface Contracts including but not limited to those set forth on Exhibit B attached hereto and incorporated herein (the "*EQT Surface Contracts*") related to the EQT Leases and such Hydrocarbons; and

(b) Copies of deeds, files and all other ownership information directly related to the acquisition, operations and maintenance of the EQT Leases, lease files for the EQT Leases

RECEIVED  
Office of Oil and Gas

FEB 25 2021

WV Department of  
Environmental Protection

03/19/2021



# Well Site Safety Plan

## Tug Hill Operating, LLC

*guc*  
*10/29/2020*

Well Name: Knob Creek S-6HM

Pad Location: Knob Creek Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,402,277.77

Easting: 525,222.23

RECEIVED  
Office of Oil and Gas

FEB 25 2021

October 2020  
WV Department of  
Environmental Protection

03/19/2021