



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

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Monday, September 26, 2022
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 VAN WINKLE S-11HM
47-051-02360-00-00

Lateral Extension - 369'

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.

A handwritten signature in blue ink, appearing to read 'James A. Martin', is positioned above the printed name and title.

James A. Martin
Chief

Operator's Well Number: VAN WINKLE S-11HM
Farm Name: XCL MIDSTREAM OPERATING, LLC
U.S. WELL NUMBER: 47-051-02360-00-00
Horizontal 6A New Drill
Date Modification Issued: 09/26/2022

Promoting a healthy environment.

09/30/2022

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: Van Winkle S-11HM Well Pad Name: Hunter Pethtel

3) Farm Name/Surface Owner: XcL Midstream Operating, LLC Public Road Access: County Route 74

4) Elevation, current ground: 753' Elevation, proposed post-construction: 753'

5) Well Type (a) Gas X Oil _____ Underground Storage _____
Other _____
(b) If Gas Shallow X Deep _____
Horizontal X

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6131' - 6181', thickness of 50' and anticipated pressure of approx. 3800 psi.

8) Proposed Total Vertical Depth: 6,281'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 21,794'

11) Proposed Horizontal Leg Length: 15,103.93'

12) Approximate Fresh Water Strata Depths: 70; 414'

13) Method to Determine Fresh Water Depths: Based on the depth of Pittsburgh Coal seam, per WVGES mapping contours

14) Approximate Saltwater Depths: 869'

15) Approximate Coal Seam Depths: Sewickley Coal - 313' and Pittsburgh Coal - 408'

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

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

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

[Handwritten Signature]
STRADLER LOWER
8/25/22

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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/Coal	13 3/8"	NEW	J55	54.5#	515'	515' ✓	708ft ³ (CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,233'	2,233' ✓	725ft ³ (CTS)
Production	5 1/2"	NEW	P110	20#	21,794'	21,794' ✓	5547ft ³ (CTS)
Tubing	2 3/8"	NEW	P110	4.7#		6,352' ✓	
Liners							

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/Coal	13 3/8"	17 1/2"	.38	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							

PACKERS

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

Steve Grooms
 STRADLER LOWER
 8/25/22

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

Drill through the Marcellus and TD Pilot Hole 100' into the Onondaga. 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 37,800,000 lb proppant and 680,000 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.63 acres

22) Area to be disturbed for well pad only, less access road (acres): 4.87 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.

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

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.

Handwritten signature and date: 9/30/22

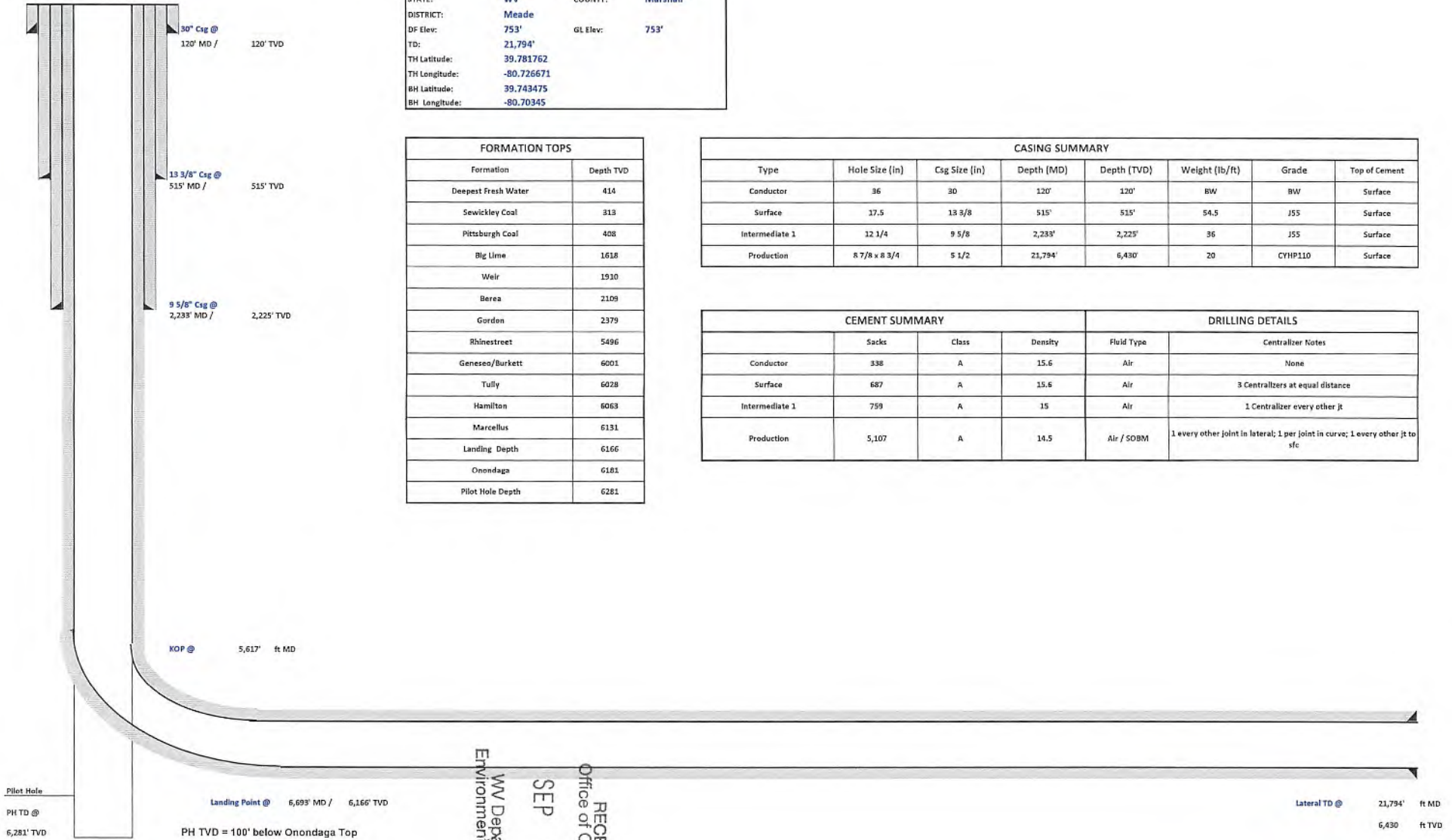


WELL NAME: Van Winkle 5-11HM
STATE: WV **COUNTY:** Marshall
DISTRICT: Meade
DF Elev: 753' **GL Elev:** 753'
TD: 21,794'
TH Latitude: 39.781762
TH Longitude: -80.726671
BH Latitude: 39.743475
BH Longitude: -80.70345

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	414
Sewickley Coal	313
Pittsburgh Coal	408
Big Lime	1618
Weir	1910
Berea	2109
Gordon	2379
Rhinestreet	5496
Genesee/Burkett	6001
Tully	6028
Hamilton	6063
Marcellus	6131
Landing Depth	6166
Onondaga	6181
Pilot Hole Depth	6281

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'	BW	BW	Surface
Surface	17.5	13 3/8	515'	515'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,233'	2,225'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	21,794'	6,430'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	687	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	759	A	15	Air	1 Centralizer every other jt
Production	5,107	A	14.5	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



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Tug Hill Operating, LLC Casing and Cement Program

Van Winkle S-11HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	515'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,233'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4	21,794'	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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09/30/2022



Well: Van Winkle S-11 HM (slot L)
 Site: Van Winkle
 Project: Marshall County, West Virginia NAD83 UTM 17N
 Design: rev3
 Rig:

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V/Sect	Annotation
1	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	
2	1500.00	0.00	0.000	1500.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	2300.00	16.00	270.000	2289.64	0.00	-110.98	2.00	270.00	-47.37	Begin 8°/100' build/turn
4	2495.11	17.63	257.718	2476.46	-6.29	-166.77	2.00	-71.26	-65.49	Begin 17.63° tangent
5	5617.07	17.63	257.718	5451.71	-207.48	-1090.92	0.00	0.00	-277.98	Begin 8°/100' build/turn
6	6282.12	50.00	164.356	6024.08	-495.18	-1123.00	8.00	-107.26	-31.50	Begin 10°/100' build/turn
7	6693.27	89.00	150.036	6165.96	-839.82	-971.31	10.00	-22.09	344.92	Begin 89.00° lateral
8	21794.46	89.00	150.036	6430.47	-13920.57	6569.90	0.00	0.0015393.05		PBHL/TD 21794.46 MD 6430.47 TVD

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Van Winkle S-11HM LP r1	6166.00	-839.75	-981.90	14447382.899	1717205.893	39.779464000	-80.730175000
- plan misses target center by 9.15ft at 6688.03ft MD (6165.85 TVD, -835.28 N, -973.92 E)							
Van Winkle S-11HM PBHL r3	6430.47	-13920.57	6569.90	14447382.899	1717205.893	39.743475000	-80.703450000
- plan hits target center							

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 @ 753.00ft

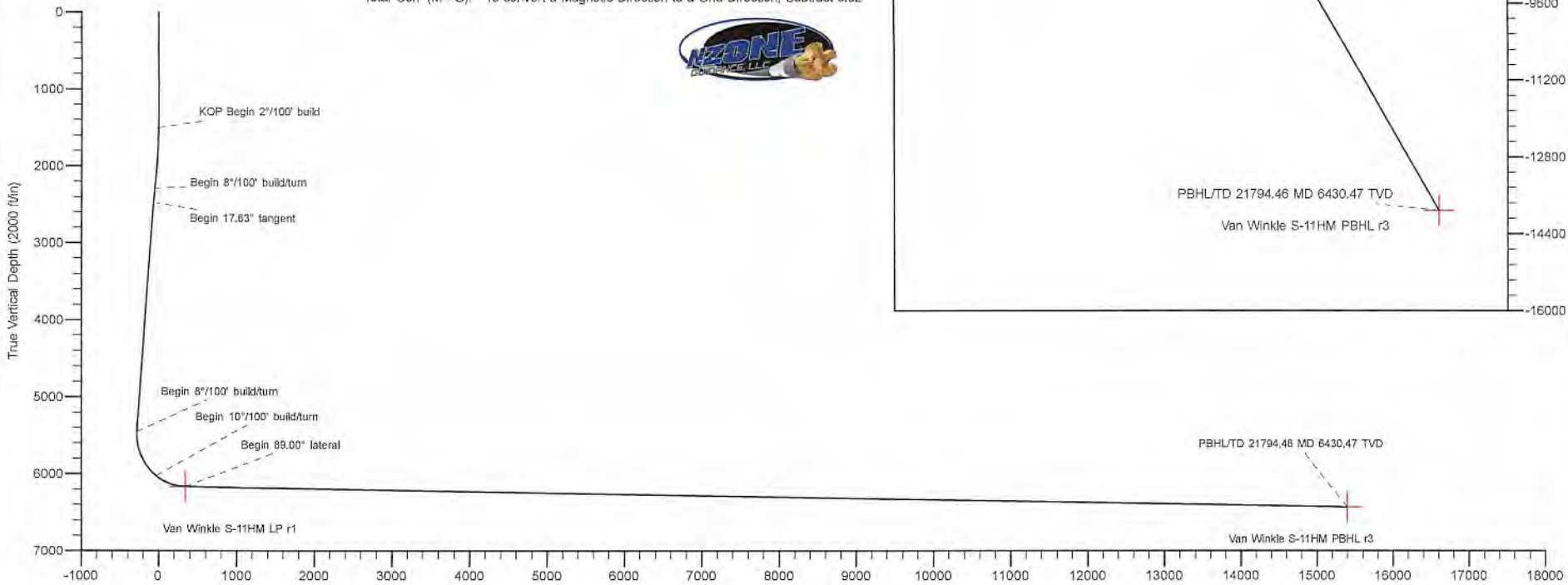
Northing	Easting	Latitude	Longitude
14447382.899	1717205.893	39.781762000	-80.726671000

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.82°



Azimuths to Grid North
 True North: -0.17°
 Magnetic North: -8.82°

Magnetic Field
 Strength: 51641.5nT
 Dip Angle: 66.43°
 Date: 7/5/2022
 Model: IGRF2020



Vertical Section at 154.735° (2000 ft/in)



Planning Report - Geographic

Database:	DB_Feb2822	Local Co-ordinate Reference:	Well Van Winkle S-11 HM (slot L)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 753.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 753.00ft
Site:	Van Winkle	North Reference:	Grid
Well:	Van Winkle S-11 HM (slot L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Project	Marshall County, West Virginia NAD83 UTM 17N		
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	Van Winkle				
Site Position:		Northing:	14,447,369.493 usft	Latitude:	39.781725330
From:	Lat/Long	Easting:	1,717,188.440 usft	Longitude:	-80.726733270
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "		

Well	Van Winkle S-11 HM (slot L)					
Well Position	+N-S	0.00 ft	Northing:	14,447,382.899 usft	Latitude:	39.781762000
	+E-W	0.00 ft	Easting:	1,717,205.893 usft	Longitude:	-80.726671000
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft	Ground Level:	753.00 ft	
Grid Convergence:						

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	7/5/2022	-8.65	66.43	51,641.48813238

Design	rev3				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (ft)	+N-S (ft)	+E-W (ft)	Direction (°)	
	0.00	0.00	0.00	154.735	

Plan Survey Tool Program	Date				
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	21,794.46	rev3 (Original Hole)		

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	0.00	0.000	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,300.00	16.00	270.000	2,289.64	0.00	-110.98	2.00	2.00	0.00	270.00	
2,495.11	17.63	257.718	2,476.46	-6.29	-166.77	2.00	0.84	-6.29	-71.26	
5,617.07	17.63	257.718	5,451.71	-207.48	-1,090.92	0.00	0.00	0.00	0.00	
6,282.12	50.00	164.356	6,024.08	-495.18	-1,123.00	8.00	4.87	-14.04	-107.26	
6,693.27	89.00	150.036	6,165.96	-839.82	-971.31	10.00	9.48	-3.48	-22.09	
21,794.46	89.00	150.036	6,430.47	-13,920.57	6,569.90	0.00	0.00	0.00	0.00	Van Winkle S-11HM F

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Planning Report - Geographic

Database:	DB_Feb2822	Local Co-ordinate Reference:	Well Van Winkle S-11 HM (slot L)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 753.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 753.00ft
Site:	Van Winkle	North Reference:	Grid
Well:	Van Winkle S-11 HM (slot L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.000	0.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
100.00	0.00	0.000	100.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
200.00	0.00	0.000	200.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
300.00	0.00	0.000	300.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
400.00	0.00	0.000	400.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
500.00	0.00	0.000	500.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
600.00	0.00	0.000	600.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
700.00	0.00	0.000	700.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
800.00	0.00	0.000	800.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
900.00	0.00	0.000	900.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
1,000.00	0.00	0.000	1,000.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
1,100.00	0.00	0.000	1,100.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
1,200.00	0.00	0.000	1,200.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
1,300.00	0.00	0.000	1,300.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
1,400.00	0.00	0.000	1,400.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
1,500.00	0.00	0.000	1,500.00	0.00	0.00	14,447,382.899	1,717,205.893	39.781762000	-80.726671000	
KOP Begin 2°/100' build										
1,600.00	2.00	270.000	1,599.98	0.00	-1.75	14,447,382.899	1,717,204.148	39.781762015	-80.726677212	
1,700.00	4.00	270.000	1,699.84	0.00	-6.98	14,447,382.899	1,717,198.915	39.781762059	-80.726695839	
1,800.00	6.00	270.000	1,799.45	0.00	-15.69	14,447,382.899	1,717,190.200	39.781762132	-80.726726860	
1,900.00	8.00	270.000	1,898.70	0.00	-27.88	14,447,382.899	1,717,178.013	39.781762234	-80.726770237	
2,000.00	10.00	270.000	1,997.47	0.00	-43.52	14,447,382.899	1,717,162.371	39.781762365	-80.726825915	
2,100.00	12.00	270.000	2,095.62	0.00	-62.60	14,447,382.899	1,717,143.291	39.781762525	-80.726893829	
2,200.00	14.00	270.000	2,193.06	0.00	-85.10	14,447,382.899	1,717,120.797	39.781762713	-80.726973895	
2,300.00	16.00	270.000	2,289.64	0.00	-110.98	14,447,382.899	1,717,094.916	39.781762930	-80.727066015	
Begin 8°/100' build/turn										
2,400.00	16.75	263.414	2,385.60	-1.65	-139.07	14,447,381.246	1,717,066.819	39.781758626	-80.727166042	
2,495.11	17.63	257.718	2,476.46	-6.29	-166.77	14,447,376.610	1,717,039.128	39.781746125	-80.727264659	
Begin 17.63° tangent										
2,500.00	17.63	257.718	2,481.12	-6.60	-168.21	14,447,376.294	1,717,037.680	39.781745271	-80.727269816	
2,600.00	17.63	257.718	2,576.42	-13.05	-197.82	14,447,369.850	1,717,008.078	39.781727820	-80.727375251	
2,700.00	17.63	257.718	2,671.72	-19.49	-227.42	14,447,363.406	1,716,978.476	39.781710370	-80.727480686	
2,800.00	17.63	257.718	2,767.02	-25.94	-257.02	14,447,356.961	1,716,948.875	39.781692919	-80.727586120	
2,900.00	17.63	257.718	2,862.32	-32.38	-286.62	14,447,350.517	1,716,919.273	39.781675468	-80.727691555	
3,000.00	17.63	257.718	2,957.62	-38.83	-316.22	14,447,344.072	1,716,889.672	39.781658017	-80.727796989	
3,100.00	17.63	257.718	3,052.93	-45.27	-345.82	14,447,337.628	1,716,860.070	39.781640566	-80.727902424	
3,200.00	17.63	257.718	3,148.23	-51.72	-375.43	14,447,331.183	1,716,830.468	39.781623114	-80.728007858	
3,300.00	17.63	257.718	3,243.53	-58.16	-405.03	14,447,324.739	1,716,800.867	39.781605663	-80.728113293	
3,400.00	17.63	257.718	3,338.83	-64.60	-434.63	14,447,318.294	1,716,771.265	39.781588212	-80.728218727	
3,500.00	17.63	257.718	3,434.13	-71.05	-464.23	14,447,311.850	1,716,741.664	39.781570760	-80.728324161	
3,600.00	17.63	257.718	3,529.43	-77.49	-493.83	14,447,305.405	1,716,712.062	39.781553309	-80.728429595	
3,700.00	17.63	257.718	3,624.73	-83.94	-523.43	14,447,298.961	1,716,682.461	39.781535857	-80.728535029	
3,800.00	17.63	257.718	3,720.03	-90.38	-553.04	14,447,292.517	1,716,652.859	39.781518405	-80.728640463	
3,900.00	17.63	257.718	3,815.33	-96.83	-582.64	14,447,286.072	1,716,623.257	39.781500953	-80.728745897	
4,000.00	17.63	257.718	3,910.63	-103.27	-612.24	14,447,279.628	1,716,593.656	39.781483501	-80.728851331	
4,100.00	17.63	257.718	4,005.93	-109.72	-641.84	14,447,273.183	1,716,564.054	39.781466049	-80.728956765	
4,200.00	17.63	257.718	4,101.23	-116.16	-671.44	14,447,266.739	1,716,534.453	39.781448597	-80.729062199	
4,300.00	17.63	257.718	4,196.53	-122.60	-701.04	14,447,260.294	1,716,504.851	39.781431145	-80.729167633	
4,400.00	17.63	257.718	4,291.83	-129.05	-730.65	14,447,253.850	1,716,475.249	39.781413692	-80.729273067	
4,500.00	17.63	257.718	4,387.13	-135.49	-760.25	14,447,247.405	1,716,445.648	39.781396240	-80.729378500	
4,600.00	17.63	257.718	4,482.44	-141.94	-789.85	14,447,240.961	1,716,416.046	39.781378787	-80.729483934	
4,700.00	17.63	257.718	4,577.74	-148.38	-819.45	14,447,234.516	1,716,386.445	39.781361335	-80.729589368	
4,800.00	17.63	257.718	4,673.04	-154.83	-849.05	14,447,228.072	1,716,356.843	39.781343882	-80.729694801	



Planning Report – Geographic

Database:	DB_Feb2822	Local Co-ordinate Reference:	Well Van Winkle S-11 HM (slot L)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 753.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 753.00ft
Site:	Van Winkle	North Reference:	Grid
Well:	Van Winkle S-11 HM (slot L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,900.00	17.63	257.718	4,768.34	-161.27	-878.65	14,447,221.628	1,716,327.241	39.781326429	-80.729800235	
5,000.00	17.63	257.718	4,863.64	-167.72	-908.26	14,447,215.183	1,716,297.640	39.781308976	-80.729905668	
5,100.00	17.63	257.718	4,958.94	-174.16	-937.86	14,447,208.739	1,716,268.038	39.781291523	-80.730011101	
5,200.00	17.63	257.718	5,054.24	-180.61	-967.46	14,447,202.294	1,716,238.437	39.781274070	-80.730116535	
5,300.00	17.63	257.718	5,149.54	-187.05	-997.06	14,447,195.850	1,716,208.835	39.781256617	-80.730221968	
5,400.00	17.63	257.718	5,244.84	-193.49	-1,026.66	14,447,189.405	1,716,179.233	39.781239164	-80.730327401	
5,500.00	17.63	257.718	5,340.14	-199.94	-1,056.26	14,447,182.961	1,716,149.632	39.781221710	-80.730432834	
5,600.00	17.63	257.718	5,435.44	-206.38	-1,085.87	14,447,176.516	1,716,120.030	39.781204257	-80.730538267	
5,617.07	17.63	257.718	5,451.71	-207.48	-1,090.92	14,447,175.416	1,716,114.977	39.781201277	-80.730556265	
Begin 8°/100' build/turn										
5,650.00	17.03	249.101	5,483.15	-210.27	-1,100.30	14,447,172.634	1,716,105.596	39.781193714	-80.730589687	
5,700.00	16.86	235.361	5,531.00	-217.00	-1,113.11	14,447,165.897	1,716,092.783	39.781175318	-80.730635367	
5,750.00	17.59	222.053	5,578.77	-226.74	-1,124.15	14,447,156.160	1,716,081.750	39.781148670	-80.730674740	
5,800.00	19.13	210.296	5,626.24	-239.43	-1,133.34	14,447,143.471	1,716,072.552	39.781113898	-80.730707614	
5,850.00	21.29	200.529	5,673.17	-255.01	-1,140.66	14,447,127.892	1,716,065.234	39.781071173	-80.730733830	
5,900.00	23.91	192.646	5,719.34	-273.40	-1,146.06	14,447,109.498	1,716,059.831	39.781020703	-80.730753260	
5,950.00	26.85	186.317	5,764.52	-294.52	-1,149.53	14,447,088.379	1,716,056.369	39.780962734	-80.730765809	
6,000.00	30.03	181.194	5,808.49	-318.26	-1,151.03	14,447,064.638	1,716,054.865	39.780897547	-80.730771416	
6,050.00	33.36	176.989	5,851.03	-344.51	-1,150.57	14,447,038.391	1,716,055.326	39.780825461	-80.730770053	
6,100.00	36.82	173.478	5,891.94	-373.13	-1,148.14	14,447,009.765	1,716,057.751	39.780746827	-80.730761728	
6,150.00	40.36	170.497	5,931.02	-404.00	-1,143.77	14,446,978.900	1,716,062.128	39.780662028	-80.730746481	
6,200.00	43.97	167.924	5,968.08	-436.95	-1,137.46	14,446,945.946	1,716,068.434	39.780571476	-80.730724386	
6,250.00	47.63	165.669	6,002.93	-471.84	-1,129.25	14,446,911.065	1,716,076.641	39.780475614	-80.730695551	
6,282.12	50.00	164.356	6,024.08	-495.18	-1,123.00	14,446,887.720	1,716,082.895	39.780411452	-80.730673537	
Begin 10°/100' build/turn										
6,300.00	51.66	163.499	6,035.37	-508.50	-1,119.16	14,446,874.399	1,716,086.735	39.780374837	-80.730660015	
6,350.00	56.33	161.294	6,064.76	-547.03	-1,106.91	14,446,835.866	1,716,098.985	39.780268914	-80.730616825	
6,400.00	61.04	159.318	6,090.74	-587.23	-1,092.50	14,446,795.669	1,716,113.392	39.780158404	-80.73055975	
6,450.00	65.77	157.515	6,113.12	-628.79	-1,076.05	14,446,754.114	1,716,129.847	39.780044146	-80.730507852	
6,500.00	70.52	155.841	6,131.73	-671.38	-1,057.67	14,446,711.517	1,716,146.223	39.779927011	-80.730442899	
6,550.00	75.29	154.264	6,146.42	-714.70	-1,037.51	14,446,668.202	1,716,168.382	39.779807891	-80.730371611	
6,600.00	80.07	152.753	6,157.09	-758.40	-1,015.72	14,446,624.499	1,716,190.170	39.779687691	-80.730294529	
6,650.00	84.85	151.287	6,163.64	-802.16	-992.47	14,446,580.741	1,716,213.421	39.779567327	-80.730212240	
6,693.27	89.00	150.036	6,165.96	-839.82	-971.31	14,446,543.085	1,716,234.588	39.779463736	-80.730137306	
Begin 89.00° lateral										
6,700.00	89.00	150.036	6,166.08	-845.65	-967.95	14,446,537.255	1,716,237.948	39.779447700	-80.730125407	
6,800.00	89.00	150.036	6,167.83	-932.27	-918.01	14,446,450.635	1,716,287.886	39.779209403	-80.729948593	
6,900.00	89.00	150.036	6,169.59	-1,018.89	-868.07	14,446,364.014	1,716,337.824	39.778971106	-80.729771780	
7,000.00	89.00	150.036	6,171.34	-1,105.51	-818.13	14,446,277.394	1,716,387.761	39.778732809	-80.729594968	
7,100.00	89.00	150.036	6,173.09	-1,192.13	-768.20	14,446,190.773	1,716,437.699	39.778494511	-80.729418157	
7,200.00	89.00	150.036	6,174.84	-1,278.75	-718.26	14,446,104.153	1,716,487.637	39.778256214	-80.729241348	
7,300.00	89.00	150.036	6,176.59	-1,365.37	-668.32	14,446,017.532	1,716,537.575	39.778017916	-80.729064540	
7,400.00	89.00	150.036	6,178.34	-1,451.99	-618.38	14,445,930.912	1,716,587.512	39.777779618	-80.728887733	
7,500.00	89.00	150.036	6,180.09	-1,538.61	-568.44	14,445,844.291	1,716,637.450	39.777541319	-80.728710927	
7,600.00	89.00	150.036	6,181.85	-1,625.23	-518.51	14,445,757.671	1,716,687.388	39.777303020	-80.728534123	
7,700.00	89.00	150.036	6,183.60	-1,711.85	-468.57	14,445,671.050	1,716,737.325	39.777064721	-80.728357319	
7,800.00	89.00	150.036	6,185.35	-1,798.47	-418.63	14,445,584.430	1,716,787.263	39.776826422	-80.728180517	
7,900.00	89.00	150.036	6,187.10	-1,885.09	-368.69	14,445,497.809	1,716,837.201	39.776588122	-80.728003716	
8,000.00	89.00	150.036	6,188.85	-1,971.71	-318.76	14,445,411.188	1,716,887.139	39.776349822	-80.727826917	
8,100.00	89.00	150.036	6,190.60	-2,058.34	-268.82	14,445,324.568	1,716,937.076	39.776111522	-80.727650118	
8,200.00	89.00	150.036	6,192.36	-2,144.96	-218.88	14,445,237.947	1,716,987.014	39.775873222	-80.727473321	
8,300.00	89.00	150.036	6,194.11	-2,231.58	-168.94	14,445,151.327	1,717,036.952	39.775634921	-80.727296525	
8,400.00	89.00	150.036	6,195.86	-2,318.20	-119.00	14,445,064.706	1,717,086.890	39.775396620	-80.727119730	



Planning Report - Geographic

Database:	DB_Feb2822	Local Co-ordinate Reference:	Well Van Winkle S-11 HM (slot L)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 753.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 753.00ft
Site:	Van Winkle	North Reference:	Grid
Well:	Van Winkle S-11 HM (slot L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,500.00	89.00	150.036	6,197.61	-2,404.82	-69.07	14,444,978.086	1,717,136.827	39.775158318	-80.726942936
8,600.00	89.00	150.036	6,199.36	-2,491.44	-19.13	14,444,891.485	1,717,186.765	39.774920017	-80.726766144
8,700.00	89.00	150.036	6,201.11	-2,578.06	30.81	14,444,804.845	1,717,236.703	39.774681715	-80.726589353
8,800.00	89.00	150.036	6,202.86	-2,664.68	80.75	14,444,718.224	1,717,286.640	39.774443413	-80.726412563
8,900.00	89.00	150.036	6,204.62	-2,751.30	130.89	14,444,631.604	1,717,336.578	39.774205111	-80.726235774
9,000.00	89.00	150.036	6,206.37	-2,837.92	180.62	14,444,544.983	1,717,386.516	39.773966808	-80.726058987
9,100.00	89.00	150.036	6,208.12	-2,924.54	230.56	14,444,458.363	1,717,436.454	39.773728505	-80.725882200
9,200.00	89.00	150.036	6,209.87	-3,011.16	280.50	14,444,371.742	1,717,486.391	39.773490202	-80.725705415
9,300.00	89.00	150.036	6,211.62	-3,097.78	330.44	14,444,285.122	1,717,536.329	39.773251898	-80.725528631
9,400.00	89.00	150.036	6,213.37	-3,184.40	380.37	14,444,198.501	1,717,586.267	39.773013594	-80.725351849
9,500.00	89.00	150.036	6,215.13	-3,271.03	430.31	14,444,111.881	1,717,636.204	39.772775290	-80.725175067
9,600.00	89.00	150.036	6,216.88	-3,357.65	480.25	14,444,025.260	1,717,686.142	39.772536986	-80.724998287
9,700.00	89.00	150.036	6,218.63	-3,444.27	530.19	14,443,938.640	1,717,736.080	39.772298682	-80.724821508
9,800.00	89.00	150.036	6,220.38	-3,530.89	580.13	14,443,852.019	1,717,786.018	39.772060377	-80.724644730
9,900.00	89.00	150.036	6,222.13	-3,617.51	630.06	14,443,765.399	1,717,835.955	39.771822072	-80.724467954
10,000.00	89.00	150.036	6,223.88	-3,704.13	680.00	14,443,678.778	1,717,885.893	39.771583766	-80.724291178
10,100.00	89.00	150.036	6,225.64	-3,790.75	729.94	14,443,592.157	1,717,935.831	39.771345460	-80.724114404
10,200.00	89.00	150.036	6,227.39	-3,877.37	779.88	14,443,505.537	1,717,985.768	39.771107154	-80.723937631
10,300.00	89.00	150.036	6,229.14	-3,963.99	829.81	14,443,418.916	1,718,035.706	39.770868848	-80.723760860
10,400.00	89.00	150.036	6,230.89	-4,050.61	879.75	14,443,332.296	1,718,085.644	39.770630542	-80.723584089
10,500.00	89.00	150.036	6,232.64	-4,137.23	929.69	14,443,245.675	1,718,135.582	39.770392235	-80.723407320
10,600.00	89.00	150.036	6,234.39	-4,223.85	979.63	14,443,159.055	1,718,185.519	39.770153928	-80.723230552
10,700.00	89.00	150.036	6,236.14	-4,310.47	1,029.57	14,443,072.434	1,718,235.457	39.769915621	-80.723053785
10,800.00	89.00	150.036	6,237.90	-4,397.09	1,079.50	14,442,985.814	1,718,285.395	39.769677313	-80.722877019
10,900.00	89.00	150.036	6,239.65	-4,483.71	1,129.44	14,442,899.193	1,718,335.333	39.769439005	-80.722700255
11,000.00	89.00	150.036	6,241.40	-4,570.34	1,179.38	14,442,812.573	1,718,385.270	39.769200697	-80.722523492
11,100.00	89.00	150.036	6,243.15	-4,656.96	1,229.32	14,442,725.952	1,718,435.208	39.768962388	-80.722346730
11,200.00	89.00	150.036	6,244.90	-4,743.58	1,279.26	14,442,639.332	1,718,485.146	39.768724080	-80.722169969
11,300.00	89.00	150.036	6,246.65	-4,830.20	1,329.19	14,442,552.711	1,718,535.083	39.768485771	-80.721993209
11,400.00	89.00	150.036	6,248.41	-4,916.82	1,379.13	14,442,466.091	1,718,585.021	39.768247462	-80.721816451
11,500.00	89.00	150.036	6,250.16	-5,003.44	1,429.07	14,442,379.470	1,718,634.959	39.768009152	-80.721639694
11,600.00	89.00	150.036	6,251.91	-5,090.06	1,479.01	14,442,292.850	1,718,684.897	39.767770842	-80.721462938
11,700.00	89.00	150.036	6,253.66	-5,176.68	1,528.94	14,442,206.229	1,718,734.834	39.767532532	-80.721286183
11,800.00	89.00	150.036	6,255.41	-5,263.30	1,578.88	14,442,119.609	1,718,784.772	39.767294222	-80.721109430
11,900.00	89.00	150.036	6,257.16	-5,349.92	1,628.82	14,442,032.988	1,718,834.710	39.767055911	-80.720932677
12,000.00	89.00	150.036	6,258.91	-5,436.54	1,678.76	14,441,946.368	1,718,884.647	39.766817600	-80.720755926
12,100.00	89.00	150.036	6,260.67	-5,523.16	1,728.70	14,441,859.747	1,718,934.585	39.766579289	-80.720579177
12,200.00	89.00	150.036	6,262.42	-5,609.78	1,778.63	14,441,773.126	1,718,984.523	39.766340978	-80.720402428
12,300.00	89.00	150.036	6,264.17	-5,696.40	1,828.57	14,441,686.506	1,719,034.461	39.766102666	-80.720225681
12,400.00	89.00	150.036	6,265.92	-5,783.03	1,878.51	14,441,599.885	1,719,084.398	39.765864354	-80.720048934
12,500.00	89.00	150.036	6,267.67	-5,869.65	1,928.45	14,441,513.265	1,719,134.336	39.765626042	-80.719872189
12,600.00	89.00	150.036	6,269.42	-5,956.27	1,978.38	14,441,426.644	1,719,184.274	39.765387729	-80.719695446
12,700.00	89.00	150.036	6,271.18	-6,042.89	2,028.32	14,441,340.024	1,719,234.212	39.765149416	-80.719518703
12,800.00	89.00	150.036	6,272.93	-6,129.51	2,078.26	14,441,253.403	1,719,284.149	39.764911103	-80.719341962
12,900.00	89.00	150.036	6,274.68	-6,216.13	2,128.20	14,441,166.783	1,719,334.087	39.764672790	-80.719165222
13,000.00	89.00	150.036	6,276.43	-6,302.75	2,178.14	14,441,080.162	1,719,384.025	39.764434476	-80.718988483
13,100.00	89.00	150.036	6,278.18	-6,389.37	2,228.07	14,440,993.542	1,719,433.962	39.764196162	-80.718811745
13,200.00	89.00	150.036	6,279.93	-6,475.99	2,278.01	14,440,906.921	1,719,483.900	39.763957848	-80.718635009
13,300.00	89.00	150.036	6,281.68	-6,562.61	2,327.95	14,440,820.301	1,719,533.838	39.763719533	-80.718458273
13,400.00	89.00	150.036	6,283.44	-6,649.23	2,377.89	14,440,733.680	1,719,583.776	39.763481219	-80.718281539
13,500.00	89.00	150.036	6,285.19	-6,735.85	2,427.83	14,440,647.060	1,719,633.713	39.763242904	-80.718104807
13,600.00	89.00	150.036	6,286.94	-6,822.47	2,477.76	14,440,560.439	1,719,683.651	39.763004588	-80.717928075
13,700.00	89.00	150.036	6,288.69	-6,909.09	2,527.70	14,440,473.819	1,719,733.589	39.762766273	-80.717751345
13,800.00	89.00	150.036	6,290.44	-6,995.72	2,577.64	14,440,387.198	1,719,783.526	39.762527957	-80.717574615



Planning Report - Geographic

Database:	DB_Feb2822	Local Co-ordinate Reference:	Well Van Winkle S-11 HM (slot L)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 753.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 753.00ft
Site:	Van Winkle	North Reference:	Grid
Well:	Van Winkle S-11 HM (slot L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,900.00	89.00	150.036	6,292.19	-7,082.34	2,627.58	14,440,300.578	1,719,833.464	39.762289641	-80.717397887
14,000.00	89.00	150.036	6,293.95	-7,168.96	2,677.51	14,440,213.957	1,719,883.402	39.762051324	-80.717221161
14,100.00	89.00	150.036	6,295.70	-7,255.58	2,727.45	14,440,127.337	1,719,933.340	39.761813008	-80.717044435
14,200.00	89.00	150.036	6,297.45	-7,342.20	2,777.39	14,440,040.716	1,719,983.277	39.761574691	-80.716867711
14,300.00	89.00	150.036	6,299.20	-7,428.82	2,827.33	14,439,954.095	1,720,033.215	39.761336374	-80.716690988
14,400.00	89.00	150.036	6,300.95	-7,515.44	2,877.27	14,439,867.475	1,720,083.153	39.761098056	-80.716514266
14,500.00	89.00	150.036	6,302.70	-7,602.06	2,927.20	14,439,780.854	1,720,133.090	39.760859738	-80.716337545
14,600.00	89.00	150.036	6,304.46	-7,688.68	2,977.14	14,439,694.234	1,720,183.028	39.760621420	-80.716160826
14,700.00	89.00	150.036	6,306.21	-7,775.30	3,027.08	14,439,607.613	1,720,232.966	39.760383102	-80.715984108
14,800.00	89.00	150.036	6,307.96	-7,861.92	3,077.02	14,439,520.993	1,720,282.904	39.760144784	-80.715807391
14,900.00	89.00	150.036	6,309.71	-7,948.54	3,126.95	14,439,434.372	1,720,332.841	39.759906465	-80.715630675
15,000.00	89.00	150.036	6,311.46	-8,035.16	3,176.89	14,439,347.752	1,720,382.779	39.759668146	-80.715453960
15,100.00	89.00	150.036	6,313.21	-8,121.78	3,226.83	14,439,261.131	1,720,432.717	39.759429827	-80.715277247
15,200.00	89.00	150.036	6,314.96	-8,208.41	3,276.77	14,439,174.511	1,720,482.655	39.759191507	-80.715100535
15,300.00	89.00	150.036	6,316.72	-8,295.03	3,326.71	14,439,087.890	1,720,532.592	39.758953187	-80.714923824
15,400.00	89.00	150.036	6,318.47	-8,381.65	3,376.64	14,439,001.270	1,720,582.530	39.758714867	-80.714747114
15,500.00	89.00	150.036	6,320.22	-8,468.27	3,426.58	14,438,914.649	1,720,632.468	39.758476546	-80.714570405
15,600.00	89.00	150.036	6,321.97	-8,554.89	3,476.52	14,438,828.029	1,720,682.405	39.758238226	-80.714393698
15,700.00	89.00	150.036	6,323.72	-8,641.51	3,526.46	14,438,741.408	1,720,732.343	39.757999905	-80.714216992
15,800.00	89.00	150.036	6,325.47	-8,728.13	3,576.40	14,438,654.788	1,720,782.281	39.757761583	-80.714040287
15,900.00	89.00	150.036	6,327.23	-8,814.75	3,626.33	14,438,568.167	1,720,832.219	39.757523262	-80.713863584
16,000.00	89.00	150.036	6,328.98	-8,901.37	3,676.27	14,438,481.547	1,720,882.156	39.757284940	-80.713686881
16,100.00	89.00	150.036	6,330.73	-8,987.99	3,726.21	14,438,394.926	1,720,932.094	39.757046618	-80.713510180
16,200.00	89.00	150.036	6,332.48	-9,074.61	3,776.15	14,438,308.306	1,720,982.032	39.756808295	-80.713333480
16,300.00	89.00	150.036	6,334.23	-9,161.23	3,826.08	14,438,221.685	1,721,031.969	39.756569972	-80.713156781
16,400.00	89.00	150.036	6,335.98	-9,247.85	3,876.02	14,438,135.064	1,721,081.907	39.756331649	-80.712980084
16,500.00	89.00	150.036	6,337.73	-9,334.47	3,925.96	14,438,048.444	1,721,131.845	39.756093326	-80.712803387
16,600.00	89.00	150.036	6,339.49	-9,421.10	3,975.90	14,437,961.823	1,721,181.783	39.755855003	-80.712626692
16,700.00	89.00	150.036	6,341.24	-9,507.72	4,025.84	14,437,875.203	1,721,231.720	39.755616679	-80.712449998
16,800.00	89.00	150.036	6,342.99	-9,594.34	4,075.77	14,437,788.582	1,721,281.658	39.755378355	-80.712273305
16,900.00	89.00	150.036	6,344.74	-9,680.96	4,125.71	14,437,701.962	1,721,331.596	39.755140030	-80.712096614
17,000.00	89.00	150.036	6,346.49	-9,767.58	4,175.65	14,437,615.341	1,721,381.534	39.754901706	-80.711919924
17,100.00	89.00	150.036	6,348.24	-9,854.20	4,225.59	14,437,528.721	1,721,431.471	39.754663381	-80.711743234
17,200.00	89.00	150.036	6,350.00	-9,940.82	4,275.52	14,437,442.100	1,721,481.409	39.754425056	-80.711566547
17,300.00	89.00	150.036	6,351.75	-10,027.44	4,325.46	14,437,355.480	1,721,531.347	39.754186730	-80.711389860
17,400.00	89.00	150.036	6,353.50	-10,114.06	4,375.40	14,437,268.859	1,721,581.284	39.753948404	-80.711213175
17,500.00	89.00	150.036	6,355.25	-10,200.68	4,425.34	14,437,182.239	1,721,631.222	39.753710078	-80.711036490
17,600.00	89.00	150.036	6,357.00	-10,287.30	4,475.28	14,437,095.618	1,721,681.160	39.753471752	-80.710859807
17,700.00	89.00	150.036	6,358.75	-10,373.92	4,525.21	14,437,008.998	1,721,731.098	39.753233426	-80.710683126
17,800.00	89.00	150.036	6,360.50	-10,460.54	4,575.15	14,436,922.377	1,721,781.035	39.752995099	-80.710506445
17,900.00	89.00	150.036	6,362.26	-10,547.16	4,625.09	14,436,835.757	1,721,830.973	39.752756772	-80.710329766
18,000.00	89.00	150.036	6,364.01	-10,633.78	4,675.03	14,436,749.136	1,721,880.911	39.752518444	-80.710153087
18,100.00	89.00	150.036	6,365.76	-10,720.41	4,724.97	14,436,662.516	1,721,930.848	39.752280117	-80.709976410
18,200.00	89.00	150.036	6,367.51	-10,807.03	4,774.90	14,436,575.895	1,721,980.786	39.752041789	-80.709799735
18,300.00	89.00	150.036	6,369.26	-10,893.65	4,824.84	14,436,489.275	1,722,030.724	39.751803460	-80.709623060
18,400.00	89.00	150.036	6,371.01	-10,980.27	4,874.78	14,436,402.654	1,722,080.662	39.751565132	-80.709446387
18,500.00	89.00	150.036	6,372.77	-11,066.89	4,924.72	14,436,316.033	1,722,130.599	39.751326803	-80.709269715
18,600.00	89.00	150.036	6,374.52	-11,153.51	4,974.65	14,436,229.413	1,722,180.537	39.751088474	-80.709093044
18,700.00	89.00	150.036	6,376.27	-11,240.13	5,024.59	14,436,142.792	1,722,230.475	39.750850145	-80.708916374
18,800.00	89.00	150.036	6,378.02	-11,326.75	5,074.53	14,436,056.172	1,722,280.412	39.750611815	-80.708739706
18,900.00	89.00	150.036	6,379.77	-11,413.37	5,124.47	14,435,969.551	1,722,330.350	39.750373485	-80.708563039
19,000.00	89.00	150.036	6,381.52	-11,499.99	5,174.41	14,435,882.931	1,722,380.288	39.750135155	-80.708386373
19,100.00	89.00	150.036	6,383.28	-11,586.61	5,224.34	14,435,796.310	1,722,430.226	39.749897825	-80.708209708
19,200.00	89.00	150.036	6,385.03	-11,673.23	5,274.28	14,435,709.690	1,722,480.163	39.749659494	-80.708033044



Planning Report - Geographic

Database:	DB_Feb2822	Local Co-ordinate Reference:	Well Van Winkle S-11 HM (slot L)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 753.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 753.00ft
Site:	Van Winkle	North Reference:	Grid
Well:	Van Winkle S-11 HM (slot L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
19,300.00	89.00	150.036	6,386.78	-11,759.85	5,324.22	14,435,623.069	1,722,530.101	39.749420163	-80.707856382	
19,400.00	89.00	150.036	6,388.53	-11,846.47	5,374.16	14,435,536.449	1,722,580.039	39.749181832	-80.707679721	
19,500.00	89.00	150.036	6,390.28	-11,933.10	5,424.09	14,435,449.828	1,722,629.977	39.748943501	-80.707503061	
19,600.00	89.00	150.036	6,392.03	-12,019.72	5,474.03	14,435,363.208	1,722,679.914	39.748705169	-80.707326402	
19,700.00	89.00	150.036	6,393.78	-12,106.34	5,523.97	14,435,276.587	1,722,729.852	39.748466837	-80.707149745	
19,800.00	89.00	150.036	6,395.54	-12,192.96	5,573.91	14,435,189.967	1,722,779.790	39.748228505	-80.706973088	
19,900.00	89.00	150.036	6,397.29	-12,279.58	5,623.85	14,435,103.346	1,722,829.727	39.747990172	-80.706796433	
20,000.00	89.00	150.036	6,399.04	-12,366.20	5,673.78	14,435,016.726	1,722,879.665	39.747751839	-80.706619779	
20,100.00	89.00	150.036	6,400.79	-12,452.82	5,723.72	14,434,930.105	1,722,929.603	39.747513506	-80.706443127	
20,200.00	89.00	150.036	6,402.54	-12,539.44	5,773.66	14,434,843.485	1,722,979.541	39.747275173	-80.706266475	
20,300.00	89.00	150.036	6,404.29	-12,626.06	5,823.60	14,434,756.864	1,723,029.478	39.747036839	-80.706089825	
20,400.00	89.00	150.036	6,406.05	-12,712.68	5,873.54	14,434,670.244	1,723,079.416	39.746798505	-80.705913176	
20,500.00	89.00	150.036	6,407.80	-12,799.30	5,923.47	14,434,583.623	1,723,129.354	39.746560171	-80.705736528	
20,600.00	89.00	150.036	6,409.55	-12,885.92	5,973.41	14,434,497.002	1,723,179.291	39.746321836	-80.705559882	
20,700.00	89.00	150.036	6,411.30	-12,972.54	6,023.35	14,434,410.382	1,723,229.229	39.746083501	-80.705383236	
20,800.00	89.00	150.036	6,413.05	-13,059.16	6,073.29	14,434,323.761	1,723,279.167	39.745845166	-80.705206593	
20,900.00	89.00	150.036	6,414.80	-13,145.79	6,123.22	14,434,237.141	1,723,329.105	39.745606831	-80.705029950	
21,000.00	89.00	150.036	6,416.55	-13,232.41	6,173.16	14,434,150.520	1,723,379.042	39.745368495	-80.704853309	
21,100.00	89.00	150.036	6,418.31	-13,319.03	6,223.10	14,434,063.900	1,723,428.980	39.745130159	-80.704676668	
21,200.00	89.00	150.036	6,420.06	-13,405.65	6,273.04	14,433,977.279	1,723,478.918	39.744891823	-80.704500029	
21,300.00	89.00	150.036	6,421.81	-13,492.27	6,322.98	14,433,890.659	1,723,528.856	39.744653487	-80.704323391	
21,400.00	89.00	150.036	6,423.56	-13,578.89	6,372.91	14,433,804.038	1,723,578.793	39.744415150	-80.704146754	
21,500.00	89.00	150.036	6,425.31	-13,665.51	6,422.85	14,433,717.418	1,723,628.731	39.744176813	-80.703970118	
21,600.00	89.00	150.036	6,427.06	-13,752.13	6,472.79	14,433,630.797	1,723,678.669	39.743938476	-80.703793484	
21,700.00	89.00	150.036	6,428.82	-13,838.75	6,522.73	14,433,544.177	1,723,728.606	39.743700138	-80.703616850	
21,794.46	89.00	150.036	6,430.47	-13,920.57	6,569.90	14,433,462.353	1,723,775.779	39.743475000	-80.703450000	
PBHL/TD 21794.46 MD 6430.47 TVD										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Van Winkle S-11HM LP I - hit/miss target - Shape - Point	0.00	0.000	6,166.00	-839.75	-981.90	14,446,543.149	1,716,223.997	39.779464000	-80.730175000	- plan misses target center by 9.15ft at 6688.03ft MD (6165.85 TVD, -835.28 N, -973.92 E)
Van Winkle S-11HM PBI - plan hits target center - Point	0.00	0.000	6,430.47	-13,920.57	6,569.90	14,433,462.353	1,723,775.779	39.743475000	-80.703450000	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,500.00	1,500.00	0.00	0.00	KOP Begin 2°/100' build	
2,300.00	2,289.64	0.00	-110.98	Begin 8°/100' build/turn	
2,495.11	2,476.46	-8.29	-166.77	Begin 17.63° tangent	
5,617.07	5,451.71	-207.48	-1,090.92	Begin 8°/100' build/turn	
6,282.12	6,024.08	-495.18	-1,123.00	Begin 10°/100' build/turn	
6,693.27	6,165.96	-839.82	-971.31	Begin 89.00° lateral	
21,794.46	6,430.47	-13,920.57	6,569.90	PBHL/TD 21794.46 MD 6430.47 TVD	



TUG HILL
OPERATING

Well Site Safety Plan
Part A – Site Specific Data and Figures

Well Name: Van Winkle S-11HM

Pad Name: Hunter Pethtel

County: Marshall

UTM (meters), NAD83, Zone 17

Northing: 4,403,571.14

Easting: 523,405.42

RECEIVED
Office of Oil and Gas
SEP 7 2022
WV Department of
Environmental Protection

**KEY CONTACT FOR WELL SITE SAFETY PLAN
DEVELOPMENT AND MAINTENANCE**

Jerry V. DeRosa, Director EH&S Affairs

(724) 338-2029 (office)

(412) 736-5767 (cellular)

24-HOUR EMERGENCY PHONE NUMBER

(800) 921-9745

SM
8/25/22

09/30/2022

10,343' B.H.

5,154' T.H.

**HUNTER PETHTEL LEASE
VAN WINKLE S 11HM WELL
TUG HILL OPERATING**

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. 469,211.16	E. 1,623,770.52
NAD'83 GEO.	LAT-(N) 39.781762	LONG-(W) 80.726671
NAD'83 UTM (M)	N. 4,403,571.14	E. 523,405.42
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 468,387.3	E. 1,622,784.9
NAD'83 GEO.	LAT-(N) 39.779464	LONG-(W) 80.730137
NAD'83 UTM (M)	N. 4,403,315.1	E. 523,109.3
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 455,178.0	E. 1,630,109.0
NAD'83 GEO.	LAT-(N) 39.743475	LONG-(W) 80.703450
NAD'83 UTM (M)	N. 4,399,328.1	E. 525,407.9

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

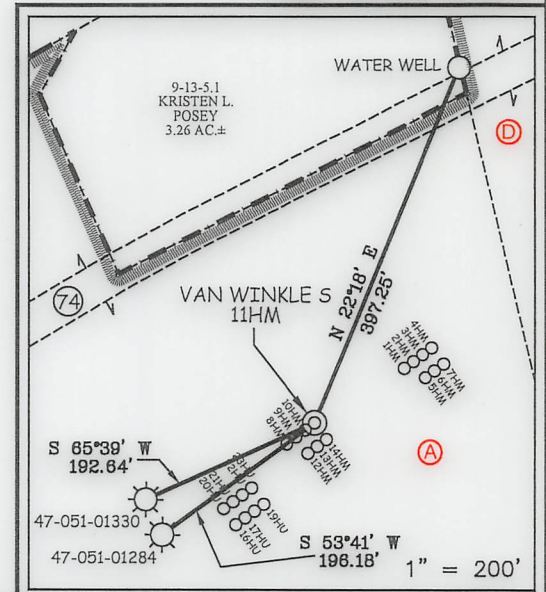
3,608' T.H.
2,377' B.H.

B.H.

T.H.

PARCEL	SURFACE ADJOINER	ACRES
9-13-5.1	MICHAEL WALKER & JOSEPH BLAKE	3.26
9-18-15.1	NICHOLAS FROHNAPFEL, ET UX	0.68
9-18-16.1	NICHOLAS FROHNAPFEL, ET UX	1.50
9-18-16.2	JOHN F. WAYMAN	2.17
9-18-16.3	BERNARD KLUG, ET UX ESTS.	1.818
9-18-18.1	JOHN F. WAYMAN	1.10

REFERENCES



NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND 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.

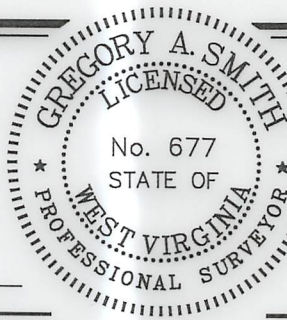


12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slswv.com

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.
677

Gregory A. Smith



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

DATE JANUARY 19, 20 21

REVISED JULY 14, 2022

OPERATORS WELL NO. VAN WINKLE S 11HM MOD

API WELL NO. 47 - 051 - 02360 H6A
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8952P11HMR.dwg
VAN WINKLE S 11HM-REV3
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 753.50' WATERSHED FISH CREEK (HUC 10)

DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER TH EXPLORATION, LLC ACREAGE 16.10 ±

ROYALTY OWNER DENNIS HUNTER, ET AL - SEE WW-6A1 ACREAGE 190.10 ±

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: 6,281' / TMD: 21,794'

LEASE NO. SEE WW-6A1

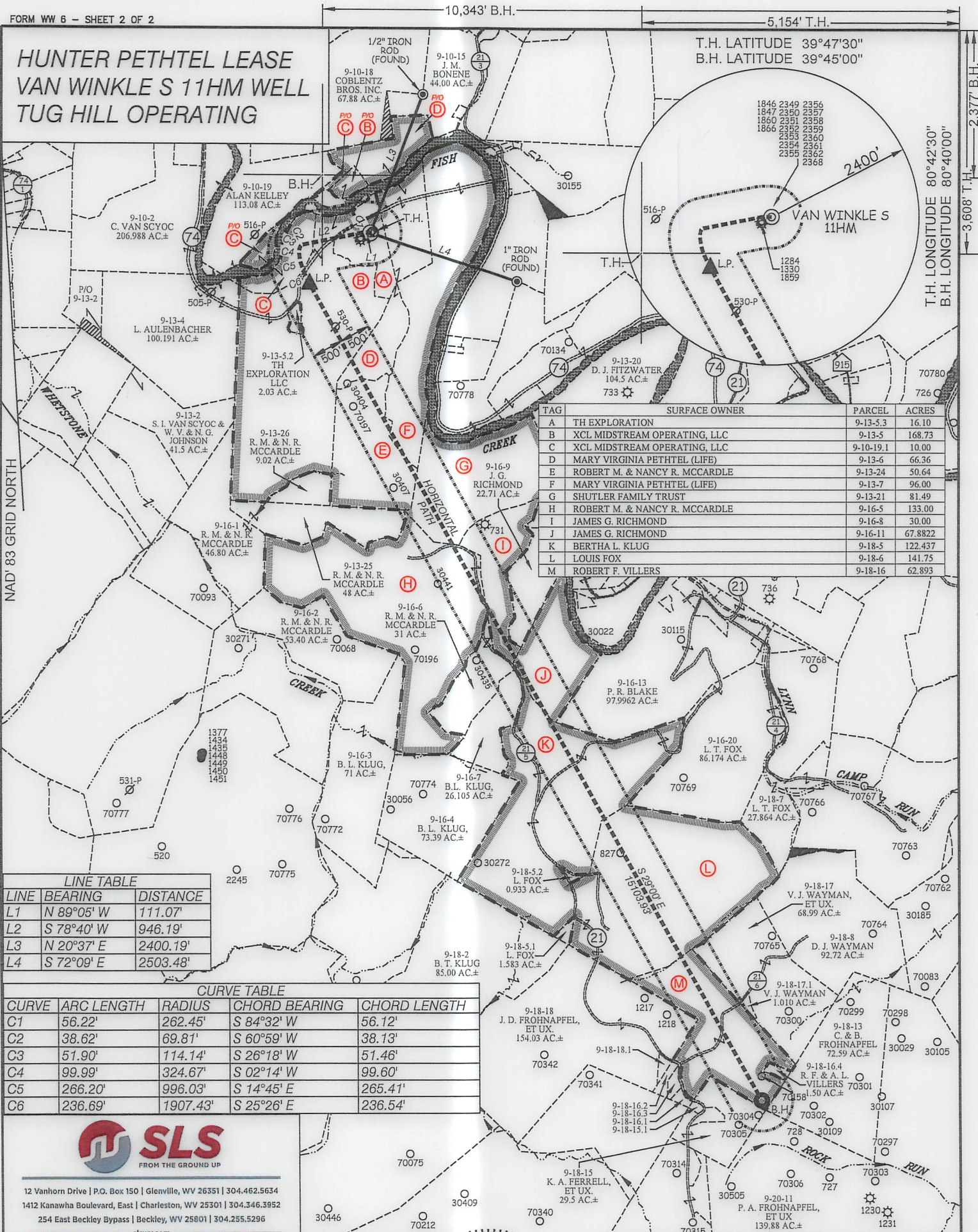
WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DARREN BROWN CT CORPORATION

ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107 ADDRESS 5098 WASHINGTON ST. W, STE 407 CHARLESTON, WV 25313-1561

COUNTY NAME PERMIT

09/30/2022

HUNTER PETHTEL LEASE VAN WINKLE S 11HM WELL TUG HILL OPERATING



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

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

TAG	SURFACE OWNER	PARCEL	ACRES
A	TH EXPLORATION	9-13-5.3	16.10
B	XCL MIDSTREAM OPERATING, LLC	9-13-5	168.73
C	XCL MIDSTREAM OPERATING, LLC	9-10-19.1	10.00
D	MARY VIRGINIA PETHTEL (LIFE)	9-13-6	66.36
E	ROBERT M. & NANCY R. MCCARDLE	9-13-24	50.64
F	MARY VIRGINIA PETHTEL (LIFE)	9-13-7	96.00
G	SHUTLER FAMILY TRUST	9-13-21	81.49
H	ROBERT M. & NANCY R. MCCARDLE	9-16-5	133.00
I	JAMES G. RICHMOND	9-16-8	30.00
J	JAMES G. RICHMOND	9-16-11	67.8822
K	BERTHA L. KLUG	9-18-5	122.437
L	LOUIS FOX	9-18-6	141.75
M	ROBERT F. VILLERS	9-18-16	62.893

LINE	BEARING	DISTANCE
L1	N 89°05' W	111.07'
L2	S 78°40' W	946.19'
L3	N 20°37' E	2400.19'
L4	S 72°09' E	2503.48'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	56.22'	262.45'	S 84°32' W	56.12'
C2	38.62'	69.81'	S 60°59' W	38.13'
C3	51.90'	114.14'	S 26°18' W	51.46'
C4	99.99'	324.67'	S 02°14' W	99.60'
C5	266.20'	996.03'	S 14°45' E	265.41'
C6	236.69'	1907.43'	S 25°26' E	236.54'

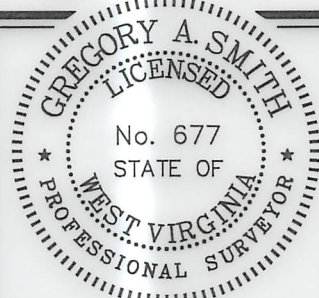


12 Vanhorn Drive | P.O. Box 150 | Glenview, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slswv.com

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 469,211.16 E. 1,623,770.52
 NAD'83 GEO. LAT-(N) 39.781762 LONG-(W) 80.726671
 NAD'83 UTM (M) N. 4,403,571.14 E. 523,405.42

LANDING POINT
 NAD'83 S.P.C.(FT) N. 468,387.3 E. 1,622,784.9
 NAD'83 GEO. LAT-(N) 39.779464 LONG-(W) 80.730137
 NAD'83 UTM (M) N. 4,403,315.1 E. 523,109.3

BOTTOM HOLE
 NAD'83 S.P.C.(FT) N. 455,178.0 E. 1,630,109.0
 NAD'83 GEO. LAT-(N) 39.743475 LONG-(W) 80.703450
 NAD'83 UTM (M) N. 4,399,328.1 E. 525,407.9



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

P.S. 677 *Gregory A. Smith*

LEASE LINE	— — — — —
SURFACE LINE	— — — — —
WELL LATERAL	— — — — —
OFFSET LINE	— — — — —
TIE LINE	— — — — —
CREEK	— — — — —
ROAD	— — — — —
COUNTY ROUTE	— — — — —
PROPOSED WELL	⊙
EXISTING WELL	⊙
PERMITTED WELL	⊙
TAX MAP-PARCEL	00-00
SURFACE OWNER (SEE TABLE)	(A)
LEASE # (SEE WW-6A1)	(A)

SCALE 1" = 2000' FILE NO. 8952P11HMR.dwg
 VAN WINKLE S 11HM-REV3
 DATE JANUARY 19, 20 21
 REVISED JULY 14, 2022
 OPERATORS WELL NO. VAN WINKLE S 11HM Mod
 API WELL NO. 47 — 051 — 02360 H6A
 STATE COUNTY PERMIT

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

DARREN BROWN
 CT CORPORATION
 ADDRESS 5098 WASHINGTON ST. W, STE 407
 CHARLESTON, WV 25313-1561

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

COUNTY NAME
 PERMIT

09/30/2022

**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
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*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. Morris *Amy L. Morris*
 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*31312	9-13-5.3	A	DENNIS W HUNTER AND KATHY A HUNTER	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	668	155	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Central Michigan Exploration LLC to Stone Energy Corp.: AB 21/288 & 21/497	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31312	9-13-5	B	DENNIS W HUNTER AND KATHY A HUNTER	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	668	155	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Central Michigan Exploration LLC to Stone Energy Corp.: AB 21/288 & 21/497	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31352	9-10-19.1	C	DENNIS W HUNTER AND KATHY A HUNTER	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	690	60	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Central Michigan Exploration LLC to Stone Energy Corp.: AB 21/497	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31303	9-13-6	D	MARY V PETHTEL AND FRANK E PETHTEL	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	668	525	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Central Michigan Exploration LLC to Stone Energy Corp.: AB 21/288 & 21/356	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31304	9-13-6	D	MARY V PETHTEL AND FRANK E PETHTEL	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	672	171	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Central Michigan Exploration LLC to Stone Energy Corp.: AB 21/288 & 21/356	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31306	9-13-6	D	RICHARD CUNNINGHAM	STONE ENERGY CORPORATION	1/8+	859	595	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31307	9-13-6	D	LINDA DANLEY	STONE ENERGY CORPORATION	1/8+	859	593	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31308	9-13-6	D	SUZY WALKER	STONE ENERGY CORPORATION	1/8+	859	591	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*21131	9-13-24	E	ROBERT M MCCARDLE & NANCY R MCCARDLE	TH EXPLORATION LLC	1/8+	951	621	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*28341	9-13-24	E	WILLIAM BRAD FOX	TH EXPLORATION LLC	1/8+	1071	466	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*28622	9-13-24	E	LINDA SMITH	TH EXPLORATION LLC	1/8+	1075	33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*28623	9-13-24	E	ANN MILLER	TH EXPLORATION LLC	1/8+	1075	31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*31313	9-13-24	E	MARY V PETHTEL AND FRANK E PETHTEL	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	674	354	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Central Michigan Exploration LLC to Stone Energy Corp.: AB 21/288 & 21/356	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31314	9-13-24	E	JOHN FOX	STONE ENERGY CORPORATION	1/8+	703	276	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31315	9-13-24	E	MICHAEL SHUTLER	STONE ENERGY CORPORATION	1/8+	715	207	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31316	9-13-24	E	SUSAN WALKER	STONE ENERGY CORPORATION	1/8+	864	563	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21

10*31317	9-13-24	E	RICHARD CUNNINGHAM	STONE ENERGY CORPORATION	1/8+	164A	416	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31318	9-13-24	E	LINDA DANLEY	STONE ENERGY CORPORATION	1/8+	868	438	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31319	9-13-24	E	AARON MURRAY AND REGINA MURRAY	STONE ENERGY CORPORATION	1/8+	868	436	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31320	9-13-24	E	THOMAS JOHN FOX	STONE ENERGY CORPORATION	1/8+	872	355	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31321	9-13-24	E	MARK H FOX	STONE ENERGY CORPORATION	1/8+	872	349	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31322	9-13-24	E	PAUL G FOX	STONE ENERGY CORPORATION	1/8+	872	351	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31323	9-13-24	E	LOUIS T FOX	STONE ENERGY CORPORATION	1/8+	872	353	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31324	9-13-24	E	MARY A FOX	STONE ENERGY CORPORATION	1/8+	872	357	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31325	9-13-24	E	DAVID E FOX	STONE ENERGY CORPORATION	1/8+	872	347	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31326	9-13-24	E	ROBERT FRANCIS VILLERS AND APRIL VILLERS	STONE ENERGY CORPORATION	1/8+	870	126	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31327	9-13-24	E	MARY JOSEPHINE NICE AND JACOB W NICE	STONE ENERGY CORPORATION	1/8+	870	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31328	9-13-24	E	DEBRA COURTWRIGHT	STONE ENERGY CORPORATION	1/8+	702	376	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31329	9-13-24	E	DAVID C YEAGER	STONE ENERGY CORPORATION	1/8+	702	368	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31330	9-13-24	E	HERBERT YEAGER	STONE ENERGY CORPORATION	1/8+	702	370	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21

10*31331	9-13-24	E	HOWARD FOX	STONE ENERGY CORPORATION	1/8+	697	431	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31332	9-13-24	E	ROBERT L SHUTLER	STONE ENERGY CORPORATION	1/8+	697	435	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31333	9-13-24	E	CHARLOTTE JACKLEY	STONE ENERGY CORPORATION	1/8+	697	433	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31334	9-13-24	E	BETTY PERSINGER	STONE ENERGY CORPORATION	1/8+	702	374	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31335	9-13-24	E	BETTY JEAN OTTE	STONE ENERGY CORPORATION	1/8+	702	346	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31336	9-13-24	E	JEANIE HUFF	STONE ENERGY CORPORATION	1/8+	702	358	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31337	9-13-24	E	JANE FOX	STONE ENERGY CORPORATION	1/8+	702	354	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31338	9-13-24	E	KIM JONES	STONE ENERGY CORPORATION	1/8+	702	364	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31339	9-13-24	E	MARY VIRGINIA PETHTEL AND FRANK E PETHTEL	STONE ENERGY CORPORATION	1/8+	702	362	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31340	9-13-24	E	MARY JANE FERKOL	STONE ENERGY CORPORATION	1/8+	702	350	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31341	9-13-24	E	MARY KAY FRENCH	STONE ENERGY CORPORATION	1/8+	702	348	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31342	9-13-24	E	MARY ELLEN YEAGER	STONE ENERGY CORPORATION	1/8+	702	366	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31343	9-13-24	E	ROBERTA FROHNAPFEL	STONE ENERGY CORPORATION	1/8+	702	356	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31344	9-13-24	E	MARTI SNYDER	STONE ENERGY CORPORATION	1/8+	702	384	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21

10*31345	9-13-24	E	JAMES D FROHNAPFEL	STONE ENERGY CORPORATION	1/8+	702	360	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31346	9-13-24	E	HELEN SHUTLER	STONE ENERGY CORPORATION	1/8+	702	382	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31347	9-13-24	E	DOROTHY ARGENTA	STONE ENERGY CORPORATION	1/8+	702	352	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31348	9-13-24	E	KAREN EVANS	STONE ENERGY CORPORATION	1/8+	703	274	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31349	9-13-24	E	ROBERT L FROHNAPFEL	STONE ENERGY CORPORATION	1/8+	703	278	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31350	9-13-24	E	RUTH ANN SOUTH	STONE ENERGY CORPORATION	1/8+	702	378	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31351	9-13-24	E	CAROLINE J SHUTLER-CANALES	STONE ENERGY CORPORATION	1/8+	702	380	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31303	9-13-7	F	MARY V PETHTEL AND FRANK E PETHTEL	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	668	525	N/A	N/A	N/A	N/A	N/A	N/A	Central Michigan Exploration LLC to Stone Energy Corp.: AB 21/288 & 21/356	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31304	9-13-7	F	MARY V PETHTEL AND FRANK E PETHTEL	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	672	171	N/A	N/A	N/A	N/A	N/A	N/A	Central Michigan Exploration LLC to Stone Energy Corp.: AB 21/288 & 21/356	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31305	9-13-7	F	MARY V PETHTEL AND FRANK E PETHTEL	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	677	401	N/A	N/A	N/A	N/A	N/A	N/A	Central Michigan Exploration LLC to Stone Energy Corp.: AB 38/54	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31309	9-13-7	F	RICHARD CUNNINGHAM	STONE ENERGY CORPORATION	1/8+	870	122	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31310	9-13-7	F	SUSAN WALKER	STONE ENERGY CORPORATION	1/8+	870	139	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*31311	9-13-7	F	LINDA DANLEY	STONE ENERGY CORPORATION	1/8+	870	141	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corp. to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*23197	9-13-21	G	J W KELLEY AND R A KELLEY	TG STILES	1/8+	63	156	N/A	TG Stiles to South Penn Oil Company: 60/367	South Penn Oil Company to Hope Natural Gas Company: 209/552	Hope natural Gas Company to AM Snider & Duane Snyder dba Hundred Gas Company: 446/186	Hundred Gas Company to Carl D Perkins: 451/132	Carl D Perkins to Perkins Oil and Gas Inc: 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation: 26/322	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21

Production
Company to TH
Location LLC:
48/21

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48/21

Production
Company to TH
Location LLC:
48/21

10*28268	9-16-5	H	JOSEPH SHUTLER AND ELIZABETH SHUTLER	TG STILES	1/8+	63 81	203 451	TG Stiles to South Penn Oil Company: 60/366	South Penn Oil Company to Tri-State Gas Company: 80/150	Tri-State Gas Company to The Manufacturers Light & Heat Co: 148/388	The Manufacturers Light & Heat Company to AM Snider & Duane Snider dba Hundred Gas Company: 4/489	Hundred Gas Company to Carl D Perkins: 451/132	Carl D Perkins to Perkins Oil and Gas Inc: 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation: 26/322	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*23197	9-16-8	I	J W KELLEY AND R A KELLEY	TG STILES	1/8+	63	156	N/A	TG Stiles to South Penn Oil Company: 60/367	South Penn Oil Company to Hope Natural Gas Company: 209/552	Hope natural Gas Company to AM Snider & Duane Snyder dba Hundred Gas Company: 446/186	Hundred Gas Company to Carl D Perkins: 451/132	Carl D Perkins to Perkins Oil and Gas Inc: 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation: 26/322	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*16481	9-16-11	J	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	Fossil Creek Ohio LLC to Gulfport Energy Corporation: 32/307 & 34/410	Gulfport Energy Corp & Fossil Creek Ohio LLC to American Petroleum Partners Operating LLC: 36/588	American Petroleum Partners Operating LLC to TH Exploration LLC: 42/109
10*28268	9-18-5	K	JOSEPH SHUTLER AND ELIZABETH SHUTLER	TG STILES	1/8+	63 81	203 451	TG Stiles to South Penn Oil Company: 60/366	South Penn Oil Company to Tri-State Gas Company: 80/150	Tri-State Gas Company to The Manufacturers Light & Heat Co: 148/388	The Manufacturers Light & Heat Company to AM Snider & Duane Snider dba Hundred Gas Company: 4/489	Hundred Gas Company to Carl D Perkins: 451/132	Carl D Perkins to Perkins Oil and Gas Inc: 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation: 26/322	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*28268	9-18-6	L	JOSEPH SHUTLER AND ELIZABETH SHUTLER	TG STILES	1/8+	63 81	203 451	TG Stiles to South Penn Oil Company: 60/366	South Penn Oil Company to Tri-State Gas Company: 80/150	Tri-State Gas Company to The Manufacturers Light & Heat Co: 148/388	The Manufacturers Light & Heat Company to AM Snider & Duane Snider dba Hundred Gas Company: 4/489	Hundred Gas Company to Carl D Perkins: 451/132	Carl D Perkins to Perkins Oil and Gas Inc: 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation: 26/322	Stone Energy Corporation to EQT Production Company: 38/75	EQT Production Company to TH Exploration LLC: 48/21
10*28265	9-18-16	M	ROBERT F VILLERS AND APRIL L VILLERS	TH EXPLORATION LLC	1/8+	1073	381	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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

SEP 7 2022

WV Department of
Environmental Protection

09/30/2022



September 1, 2022

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

VIA USPS

RE: **Van Winkle S-11HM API # 47-051-02360 (H6A Permit Modification)**
Meade District, Marshall County, WV

RECEIVED
Office of Oil and Gas

SEP 7 2022

WV Department of
Environmental Protection

Dear Wade:

Tug Hill Operating, LLC is submitting a permit modification for its permitted well, Van Winkle S-11HM to add 369.72' 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
- As-built construction set

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

CHK# 058344
Amt \$2500
Date 7/28/22

Enclosures



Stansberry, Wade A <wade.a.stansberry@wv.gov>

Modification Horizontal H6A Well Work Permit (47-051-02360)

1 message

Stansberry, Wade A <wade.a.stansberry@wv.gov>

Mon, Sep 26, 2022 at 10:13 AM

To: Amy Morris <amorris@tug-hilop.com>, Eric Buzzard <ebuzzard@marshallcountywv.org>, Strader C Gower <strader.c.gower@wv.gov>, "Blevins, Cragin" <cragin.blevins@wv.gov>


I have attached a copy of the newly issued well permit number(s). This will serve as your copy.

47-051-02360 - VAN WINKLE S-11HM

If you have any questions, then please contact us here at the Office of Oil and Gas.

Thank you,

Wade A. Stansberry**Environmental Resource Specialist 3****West Virginia Department of Environmental Protection****Office of Oil & Gas****601 57th St. SE****Charleston, WV 25304****(304) 926-0499 ext. 41115****(304) 926-0452 fax****Wade.A.Stansberry@wv.gov**

2 attachments **47-051-02360 - mod.pdf**
4336K **IR-26 Blank.pdf**
169K**09/30/2022**