



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

Tuesday, April 13, 2021
WELL WORK PERMIT
Horizontal 6A / New Drill

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

Re: Permit approval for KEITH STERN N-2HM
47-051-02373-00-00

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

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

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

A blue ink signature of James A. Martin, Chief, is written over the text of the letter.

James A. Martin
Chief

Operator's Well Number: KEITH STERN N-2HM
Farm Name: TH EXPLORATION, LLC
U.S. WELL NUMBER: 47-051-02373-00-00
Horizontal 6A New Drill
Date Issued: 4/13/2021

PERMIT CONDITIONS

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

CONDITIONS

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

API Number: _____

PERMIT CONDITIONS

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov.

04/16/2021

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: Keith Stern N-2HM Well Pad Name: Keith Stern

3) Farm Name/Surface Owner: TH Exploration, LLC Public Road Access: Fish Creek Road (County Route 74)

4) Elevation, current ground: 747' Elevation, proposed post-construction: 747'

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

Other _____

(b) If Gas Shallow Deep _____

Horizontal _____

JM 10/9/2020

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 6250' - 6301', thickness of 51' and an anticipated approximate pressure of 3800 psi.

8) Proposed Total Vertical Depth: 6,401'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 13,740'

11) Proposed Horizontal Leg Length: 6,498.27'

12) Approximate Fresh Water Strata Depths: 70'; 406'

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

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 307' and Pittsburgh Coal - 400'

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#	490'	490'	690ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	490'	490'	690ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,201'	2,201'	714ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	13,740'	13,740'	3514ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#	6,223'		
Liners							

ju 10/9/2020

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							

PACKERS

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

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KS
10/19/2020

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 15,097,500 lb. proppant and 233,418 barrels of water.
Max rate = 80bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 10.35 acres

22) Area to be disturbed for well pad only, less access road (acres): 4.32 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.

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*Note: Attach additional sheets as needed.



Tug Hill Operating, LLC Casing and Cement Program

Keith Stern N-2HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	490'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,201'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	13,740'	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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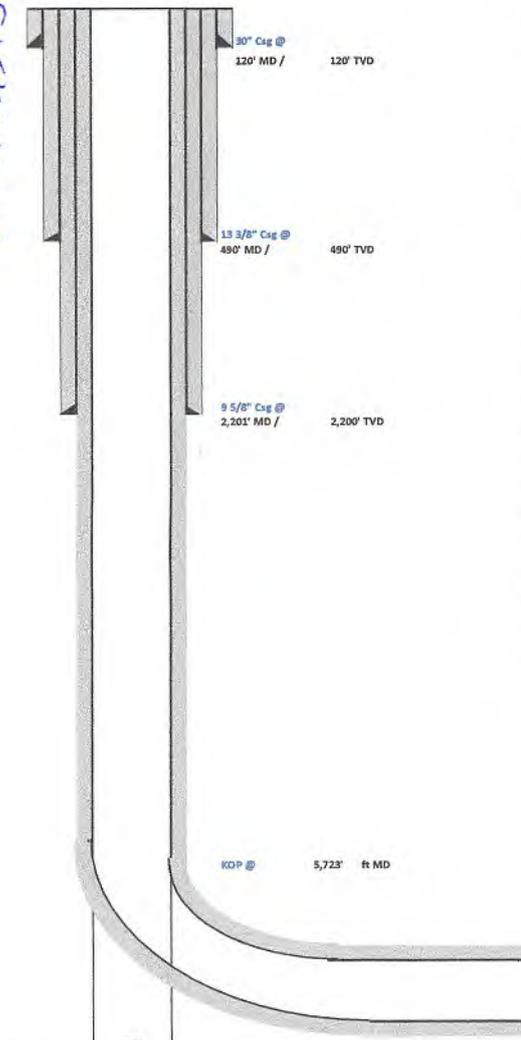


WELL NAME: Keith Stern N-2HM
 STATE: WV COUNTY: Marshall
 DISTRICT: Meade
 DF Elev: 747' GL Elev: 747'
 TD: 13,740'
 TH Latitude: 39.77491466
 TH Longitude: -80.69210958
 BH Latitude: 39.786872
 BH Longitude: -80.704895

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	406
Sewickley Coal	307
Pittsburgh Coal	400
Big Lime	1614
Weir	1927
Berea	2119
Gordon	2384
Rhinestreet	5595
Genesee/Burkett	6109
Tully	6140
Hamilton	6175
Marcellus	6250
Landing Depth	6287
Onondaga	6301
Pilot Hole Depth	6401

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	BW	Surface
Surface	17.5	13 3/8	490'	490'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,201'	2,200'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	13,740'	6,174'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	669	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	726	A	15	Air	1 Centralizer every other jt
Production	3,104	A	14.5	Air / SOBMM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



gm 10/9/2020

Pilot Hole
 PH TD @ 6,401' TVD
 Landing Point @ 7,243' MD / 6,287' TVD
 PH TD @ 100' below Onondaga Top
 KOP @ 5,723' R MD
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Lateral TD @ 13,740' ft MD
 6,174' ft TVD



Well: Keith Stern N-02 HM (slot H)
 Site: Keith Stern
 Project: Marshall County, West Virginia.
 Design: rev1

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Azimuths to Grid North
 True North: -0.20°
 Magnetic North: -8.91°
 Magnetic Field
 Strength: 52102.6snT
 Dip Angle: 66.90°
 Date: 1/17/2018
 Model: IGRF2015

SECTION DETAILS

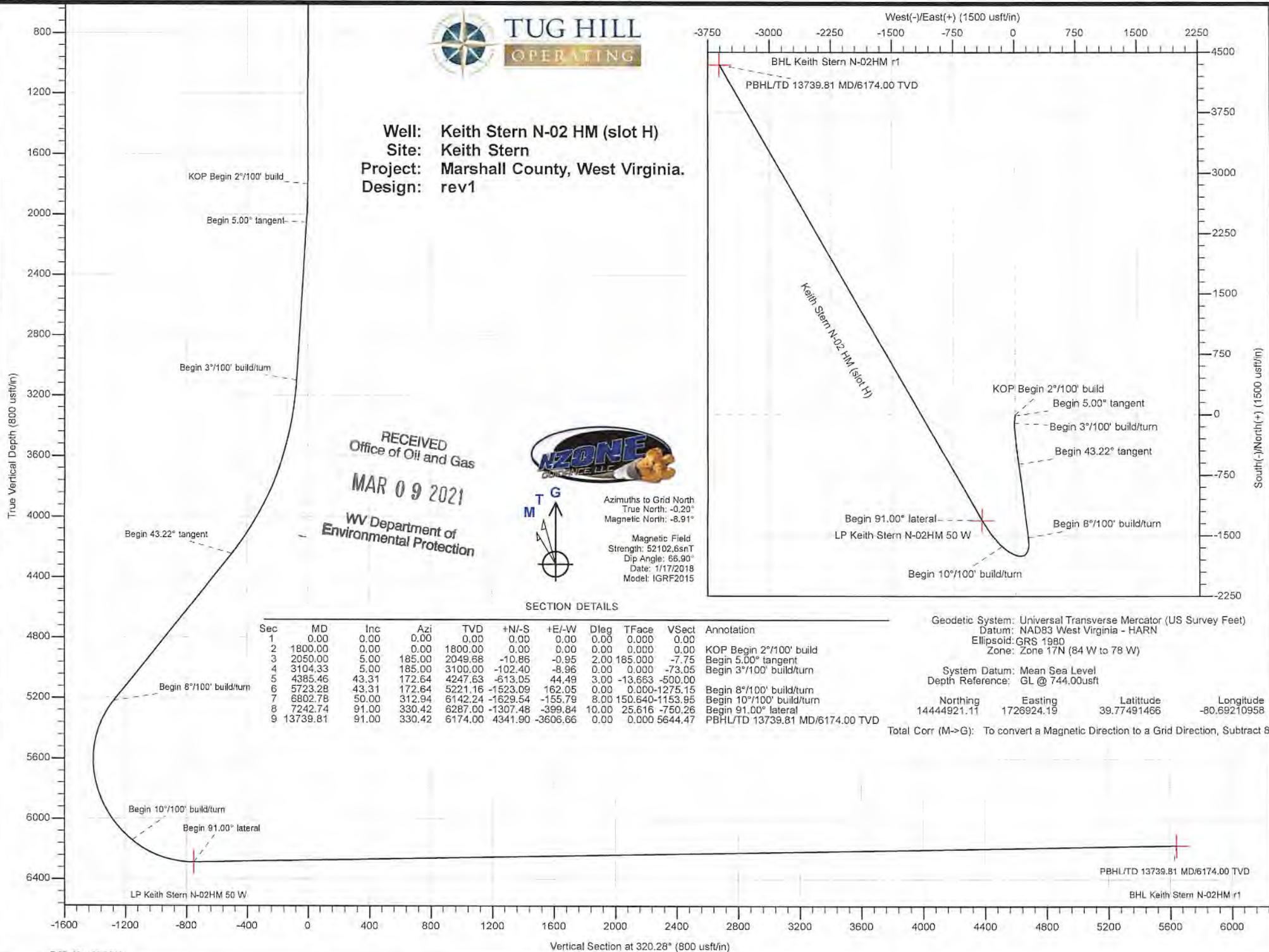
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSEct	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
2	1800.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2°/100' build
3	2050.00	5.00	185.00	2049.68	-10.86	-0.95	2.00	185.000	-7.75	Begin 5.00° tangent
4	3104.33	5.00	185.00	3100.00	-102.40	-8.96	0.00	0.000	-73.05	Begin 3°/100' build/turn
5	4385.46	43.31	172.64	4247.63	-613.05	44.49	3.00	-13.653	-500.00	Begin 8°/100' build/turn
6	5723.28	43.31	172.64	5221.16	-1523.09	162.05	0.00	0.000	-1275.15	Begin 10°/100' build/turn
7	6802.78	50.00	312.94	6142.24	-1629.54	-155.79	8.00	150.640	-1153.95	Begin 91.00° lateral
8	7242.74	91.00	330.42	6287.00	-1307.48	-399.84	10.00	25.616	-750.26	Begin 10°/100' build/turn
9	13739.81	91.00	330.42	6174.00	-4341.90	-3606.66	0.00	0.000	5644.47	PBHL/TD 13739.81 MD/6174.00 TVD

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 @ 744.00usft

Northing: 14444921.11
 Easting: 1726924.19
 Latitude: 39.77491466
 Longitude: -80.69210958

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.91°



4705102373



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern N-02 HM (slot H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 744.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 744.00usft
Site:	Keith Stern	North Reference:	Grid
Well:	Keith Stern N-02 HM (slot H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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	Keith Stern				
Site Position:		Northing:	14,444,890.33 usft	Latitude:	39.77483004
From:	Lat/Long	Easting:	1,726,932.47 usft	Longitude:	-80.69208048
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.197 °

Well	Keith Stern N-02 HM (slot H)					
Well Position	+N/-S	0.00 usft	Northing:	14,444,921.11 usft	Latitude:	39.77491466
	+E/-W	0.00 usft	Easting:	1,726,924.19 usft	Longitude:	-80.69210958
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	744.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/17/2018	-8.713	66.896	52,102.55372829

Design	rev1			
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	320.28

Plan Survey Tool Program	Date	5/6/2019		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	13,739.81 rev1 (Original Hole)	MWD	
			MWD - Standard	

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Plan Sections	WV Department of Environmental Protection									
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	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.000	
2,050.00	5.00	185.00	2,049.68	-10.86	-0.95	2.00	2.00	0.00	185.000	
3,104.33	5.00	185.00	3,100.00	-102.40	-8.96	0.00	0.00	0.00	0.000	
4,385.46	43.31	172.64	4,247.63	-613.05	44.49	3.00	2.99	-0.96	-13.663	
5,723.28	43.31	172.64	5,221.16	-1,523.09	162.05	0.00	0.00	0.00	0.000	
6,802.78	50.00	312.94	6,142.24	-1,629.54	-155.79	8.00	0.62	13.00	150.639	
7,242.74	91.00	330.42	6,287.00	-1,307.48	-399.84	10.00	9.32	3.97	25.616	
13,739.81	91.00	330.42	6,174.00	4,341.90	-3,606.66	0.00	0.00	0.00	0.000	BHL Keith Stern N-02

4705102373



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern N-02 HM (slot H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 744.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 744.00usft
Site:	Keith Stern	North Reference:	Grid
Well:	Keith Stern N-02 HM (slot H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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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
0.00	0.00	0.00	0.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
100.00	0.00	0.00	100.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
200.00	0.00	0.00	200.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
300.00	0.00	0.00	300.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
400.00	0.00	0.00	400.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
500.00	0.00	0.00	500.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
600.00	0.00	0.00	600.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
700.00	0.00	0.00	700.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
800.00	0.00	0.00	800.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
900.00	0.00	0.00	900.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
1,800.00	0.00	0.00	1,800.00	0.00	0.00	14,444,921.11	1,726,924.19	39.77491466	-80.69210958
KOP Begin 2°/100' build									
1,900.00	2.00	185.00	1,899.98	-1.74	-0.15	14,444,919.37	1,726,924.04	39.77490989	-80.69211014
2,000.00	4.00	185.00	1,999.84	-6.95	-0.61	14,444,914.16	1,726,923.58	39.77489558	-80.69211183
2,050.00	5.00	185.00	2,049.68	-10.86	-0.95	14,444,910.25	1,726,923.24	39.77488485	-80.69211309
Begin 5.00° tangent									
2,100.00	5.00	185.00	2,099.49	-15.20	-1.33	14,444,905.91	1,726,922.86	39.77487293	-80.69211450
2,200.00	5.00	185.00	2,199.11	-23.88	-2.09	14,444,897.23	1,726,922.10	39.77484909	-80.69211731
2,300.00	5.00	185.00	2,298.73	-32.57	-2.85	14,444,888.54	1,726,921.34	39.77482525	-80.69212012
2,400.00	5.00	185.00	2,398.35	-41.25	-3.61	14,444,879.86	1,726,920.58	39.77480142	-80.69212293
2,500.00	5.00	185.00	2,497.97	-49.93	-4.37	14,444,871.18	1,726,919.82	39.77477758	-80.69212574
2,600.00	5.00	185.00	2,597.59	-58.61	-5.13	14,444,862.50	1,726,919.06	39.77475374	-80.69212855
2,700.00	5.00	185.00	2,697.21	-67.30	-5.89	14,444,853.82	1,726,918.30	39.77472991	-80.69213136
2,800.00	5.00	185.00	2,796.83	-75.98	-6.65	14,444,845.13	1,726,917.54	39.77470607	-80.69213417
2,900.00	5.00	185.00	2,896.45	-84.66	-7.41	14,444,836.45	1,726,916.78	39.77468223	-80.69213698
3,000.00	5.00	185.00	2,996.07	-93.34	-8.17	14,444,827.77	1,726,916.02	39.77465840	-80.69213979
3,100.00	5.00	185.00	3,095.69	-102.03	-8.93	14,444,819.09	1,726,915.26	39.77463456	-80.69214260
3,104.33	5.00	185.00	3,100.00	-102.40	-8.96	14,444,818.71	1,726,915.23	39.77463353	-80.69214272
Begin 3°/100' build/turn									
3,200.00	7.82	180.01	3,195.06	-113.06	-9.32	14,444,808.05	1,726,914.86	39.77460425	-80.69214415
3,300.00	10.79	177.59	3,293.74	-129.22	-8.93	14,444,791.89	1,726,915.26	39.77455986	-80.69214295
3,400.00	13.78	176.20	3,391.44	-150.47	-7.75	14,444,770.64	1,726,916.44	39.77450151	-80.69213900
3,500.00	16.77	175.31	3,487.89	-176.73	-5.78	14,444,744.38	1,726,918.41	39.77442936	-80.69213231
3,600.00	19.76	174.67	3,582.84	-207.95	-3.03	14,444,713.16	1,726,921.16	39.77434360	-80.69212290
3,700.00	22.76	174.20	3,676.03	-244.04	0.50	14,444,677.07	1,726,924.69	39.77424447	-80.69211080
3,800.00	25.75	173.83	3,767.19	-284.89	4.79	14,444,636.22	1,726,928.97	39.77413224	-80.69209603
3,900.00	28.75	173.54	3,856.08	-330.40	9.83	14,444,590.71	1,726,934.02	39.77400721	-80.69207864
4,000.00	31.75	173.29	3,942.45	-380.44	15.61	14,444,540.67	1,726,939.80	39.77386974	-80.69205868
4,100.00	34.75	173.09	4,026.07	-434.87	22.11	14,444,486.24	1,726,946.30	39.77372019	-80.69203620
4,200.00	37.75	172.91	4,106.71	-493.55	29.32	14,444,427.56	1,726,953.51	39.77355898	-80.69201127
4,300.00	40.74	172.76	4,184.15	-556.31	37.21	14,444,364.80	1,726,961.40	39.77338654	-80.69198394
4,382.46	43.22	172.64	4,245.44	-611.01	44.22	14,444,310.10	1,726,968.41	39.77323625	-80.69195967
Begin 43.22° tangent									
4,385.46	43.31	172.64	4,247.63	-613.05	44.49	14,444,308.06	1,726,968.67	39.77323065	-80.69195876
4,400.00	43.31	172.64	4,258.21	-622.94	45.76	14,444,298.17	1,726,969.95	39.77320347	-80.69195433
4,500.00	43.31	172.64	4,330.98	-690.97	54.55	14,444,230.15	1,726,978.74	39.77301658	-80.69192389



Planning Report - Geographic

4705102373

Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Keith Stern
 Well: Keith Stern N-02 HM (slot H)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Keith Stern N-02 HM (slot H)
 TVD Reference: GL @ 744.00usft
 MD Reference: GL @ 744.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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Planned Survey										WV Department of Environmental Protection
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,600.00	43.31	172.64	4,403.75	-758.99	63.34	14,444,162.12	1,726,987.53	39.77282968	-80.69189344	
4,700.00	43.31	172.64	4,476.52	-827.01	72.13	14,444,094.10	1,726,996.31	39.77264279	-80.69186300	
4,800.00	43.31	172.64	4,549.29	-895.04	80.91	14,444,026.07	1,727,005.10	39.77245589	-80.69183256	
4,900.00	43.31	172.64	4,622.06	-963.06	89.70	14,443,958.05	1,727,013.89	39.77226899	-80.69180212	
5,000.00	43.31	172.64	4,694.83	-1,031.09	98.49	14,443,890.02	1,727,022.68	39.77202210	-80.69177168	
5,100.00	43.31	172.64	4,767.60	-1,099.11	107.28	14,443,822.00	1,727,031.47	39.77189520	-80.69174123	
5,200.00	43.31	172.64	4,840.37	-1,167.13	116.07	14,443,753.98	1,727,040.25	39.77170831	-80.69171079	
5,300.00	43.31	172.64	4,913.14	-1,235.16	124.85	14,443,685.95	1,727,049.04	39.77152141	-80.69168035	
5,400.00	43.31	172.64	4,985.91	-1,303.18	133.64	14,443,617.93	1,727,057.83	39.77133452	-80.69164991	
5,500.00	43.31	172.64	5,058.68	-1,371.21	142.43	14,443,549.90	1,727,066.62	39.77114762	-80.69161947	
5,600.00	43.31	172.64	5,131.45	-1,439.23	151.22	14,443,481.88	1,727,075.40	39.77096073	-80.69158903	
5,700.00	43.31	172.64	5,204.22	-1,507.26	160.00	14,443,413.85	1,727,084.19	39.77077383	-80.69155859	
5,723.28	43.31	172.64	5,221.16	-1,523.09	162.05	14,443,398.02	1,727,086.24	39.77073032	-80.69155150	
Begin 8°/100' build/turn										
5,800.00	38.05	177.52	5,279.34	-1,572.86	166.45	14,443,348.26	1,727,090.64	39.77059362	-80.69153645	
5,900.00	31.61	185.85	5,361.43	-1,629.81	165.11	14,443,291.30	1,727,089.30	39.77043723	-80.69154191	
6,000.00	25.93	197.63	5,449.12	-1,676.79	155.80	14,443,244.32	1,727,079.99	39.77030830	-80.69157562	
6,100.00	21.65	214.50	5,540.71	-1,712.88	138.71	14,443,208.23	1,727,062.89	39.77020933	-80.69163691	
6,200.00	19.69	236.62	5,634.41	-1,737.39	114.15	14,443,183.72	1,727,038.34	39.77014225	-80.69172459	
6,300.00	20.73	259.73	5,728.40	-1,749.84	82.62	14,443,171.27	1,727,006.80	39.77010837	-80.69183697	
6,400.00	24.39	278.40	5,820.85	-1,749.98	44.72	14,443,171.13	1,726,968.91	39.77010834	-80.69197185	
6,500.00	29.71	291.63	5,909.97	-1,737.81	1.19	14,443,183.30	1,726,925.38	39.77014217	-80.69212660	
6,600.00	35.96	300.88	5,994.01	-1,713.57	-47.11	14,443,207.54	1,726,877.07	39.77020920	-80.69229822	
6,700.00	42.73	307.63	6,071.34	-1,677.73	-99.26	14,443,243.38	1,726,824.93	39.77030812	-80.69248336	
6,800.00	49.80	312.81	6,140.45	-1,630.99	-154.23	14,443,290.13	1,726,769.95	39.77043700	-80.69267843	
6,802.78	50.00	312.94	6,142.24	-1,629.54	-155.79	14,443,291.57	1,726,768.40	39.77044099	-80.69268395	
Begin 10°/100' build/turn										
6,900.00	58.87	317.83	6,198.75	-1,573.19	-211.12	14,443,347.92	1,726,713.07	39.77059625	-80.69288017	
7,000.00	68.16	321.98	6,243.31	-1,504.73	-268.58	14,443,416.38	1,726,655.61	39.77078481	-80.69308384	
7,100.00	77.54	325.62	6,272.77	-1,427.68	-324.88	14,443,493.43	1,726,599.31	39.77099695	-80.69328325	
7,200.00	86.96	329.00	6,286.24	-1,344.37	-378.30	14,443,576.74	1,726,545.89	39.77122623	-80.69347234	
7,242.74	91.00	330.42	6,287.00	-1,307.48	-399.84	14,443,613.63	1,726,524.34	39.77132775	-80.69354858	
Begin 91.00° lateral										
7,300.00	91.00	330.42	6,286.00	-1,257.69	-428.11	14,443,663.42	1,726,496.08	39.77146475	-80.69364855	
7,400.00	91.00	330.42	6,284.26	-1,170.74	-477.46	14,443,750.37	1,726,446.72	39.77170401	-80.69382315	
7,500.00	91.00	330.42	6,282.53	-1,083.78	-526.82	14,443,837.33	1,726,397.37	39.77194326	-80.69399776	
7,600.00	91.00	330.42	6,280.79	-996.83	-576.18	14,443,924.28	1,726,348.01	39.77218252	-80.69417236	
7,700.00	91.00	330.42	6,279.05	-909.88	-625.54	14,444,011.23	1,726,298.65	39.77242178	-80.69434697	
7,800.00	91.00	330.42	6,277.31	-822.93	-674.90	14,444,098.18	1,726,249.29	39.77266104	-80.69452157	
7,900.00	91.00	330.42	6,275.57	-735.97	-724.25	14,444,185.14	1,726,199.93	39.77290030	-80.69469618	
8,000.00	91.00	330.42	6,273.83	-649.02	-773.61	14,444,272.09	1,726,150.58	39.77313955	-80.69487079	
8,100.00	91.00	330.42	6,272.09	-562.07	-822.97	14,444,359.04	1,726,101.22	39.77337881	-80.69504540	
8,200.00	91.00	330.42	6,270.35	-475.12	-872.33	14,444,446.00	1,726,051.86	39.77361807	-80.69522001	
8,300.00	91.00	330.42	6,268.61	-388.16	-921.68	14,444,532.95	1,726,002.50	39.77385732	-80.69539462	
8,400.00	91.00	330.42	6,266.87	-301.21	-971.04	14,444,619.90	1,725,953.15	39.77409658	-80.69556923	
8,500.00	91.00	330.42	6,265.13	-214.26	-1,020.40	14,444,706.85	1,725,903.79	39.77433583	-80.69574385	
8,600.00	91.00	330.42	6,263.39	-127.30	-1,069.76	14,444,793.81	1,725,854.43	39.77457509	-80.69591846	
8,700.00	91.00	330.42	6,261.65	-40.35	-1,119.12	14,444,880.76	1,725,805.07	39.77481434	-80.69609308	
8,800.00	91.00	330.42	6,259.92	46.60	-1,168.47	14,444,967.71	1,725,755.71	39.77505360	-80.69626770	
8,900.00	91.00	330.42	6,258.18	133.55	-1,217.83	14,445,054.66	1,725,706.36	39.77529285	-80.69644232	
9,000.00	91.00	330.42	6,256.44	220.51	-1,267.19	14,445,141.62	1,725,657.00	39.77553211	-80.69661694	
9,100.00	91.00	330.42	6,254.70	307.46	-1,316.55	14,445,228.57	1,725,607.64	39.77577136	-80.69679156	
9,200.00	91.00	330.42	6,252.96	394.41	-1,365.91	14,445,315.52	1,725,558.28	39.77601062	-80.69696618	
9,300.00	91.00	330.42	6,251.22	481.37	-1,415.26	14,445,402.48	1,725,508.92	39.77624987	-80.69714081	

4705102373



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern N-02 HM (slot H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 744.00usft
Project:	Marshall County, West Virginia,	MD Reference:	GL @ 744.00usft
Site:	Keith Stern	North Reference:	Grid
Well:	Keith Stern N-02 HM (slot H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,400.00	91.00	330.42	6,249.48	568.32	-1,464.62	14,445,489.43	1,725,459.57	39.77648912	-80.69731543
9,500.00	91.00	330.42	6,247.74	655.27	-1,513.98	14,445,576.38	1,725,410.21	39.77672838	-80.69749006
9,600.00	91.00	330.42	6,246.00	742.22	-1,563.34	14,445,663.33	1,725,360.85	39.77696763	-80.69766469
9,700.00	91.00	330.42	6,244.26	829.18	-1,612.69	14,445,750.29	1,725,311.49	39.77720688	-80.69783931
9,800.00	91.00	330.42	6,242.52	916.13	-1,662.05	14,445,837.24	1,725,262.14	39.77744613	-80.69801395
9,900.00	91.00	330.42	6,240.78	1,003.08	-1,711.41	14,445,924.19	1,725,212.78	39.77768538	-80.69818858
10,000.00	91.00	330.42	6,239.04	1,090.03	-1,760.77	14,446,011.14	1,725,163.42	39.77792464	-80.69836321
10,100.00	91.00	330.42	6,237.31	1,176.99	-1,810.13	14,446,098.10	1,725,114.06	39.77816389	-80.69853784
10,200.00	91.00	330.42	6,235.57	1,263.94	-1,859.48	14,446,185.05	1,725,064.70	39.77840314	-80.69871248
10,300.00	91.00	330.42	6,233.83	1,350.89	-1,908.84	14,446,272.00	1,725,015.35	39.77864239	-80.69888711
10,400.00	91.00	330.42	6,232.09	1,437.85	-1,958.20	14,446,358.96	1,724,965.99	39.77888164	-80.69906175
10,500.00	91.00	330.42	6,230.35	1,524.80	-2,007.56	14,446,445.91	1,724,916.63	39.77912089	-80.69923639
10,600.00	91.00	330.42	6,228.61	1,611.75	-2,056.91	14,446,532.86	1,724,867.27	39.77936014	-80.69941103
10,700.00	91.00	330.42	6,226.87	1,698.70	-2,106.27	14,446,619.81	1,724,817.92	39.77959939	-80.69958567
10,800.00	91.00	330.42	6,225.13	1,785.66	-2,155.63	14,446,706.77	1,724,768.56	39.77983864	-80.69976031
10,900.00	91.00	330.42	6,223.39	1,872.61	-2,204.99	14,446,793.72	1,724,719.20	39.78007789	-80.69993496
11,000.00	91.00	330.42	6,221.65	1,959.56	-2,254.35	14,446,880.67	1,724,669.84	39.78031714	-80.70010960
11,100.00	91.00	330.42	6,219.91	2,046.51	-2,303.70	14,446,967.63	1,724,620.48	39.78055639	-80.70028425
11,200.00	91.00	330.42	6,218.17	2,133.47	-2,353.06	14,447,054.58	1,724,571.13	39.78079564	-80.70045889
11,300.00	91.00	330.42	6,216.43	2,220.42	-2,402.42	14,447,141.53	1,724,521.77	39.78103488	-80.70063354
11,400.00	91.00	330.42	6,214.70	2,307.37	-2,451.78	14,447,228.48	1,724,472.41	39.78127413	-80.70080819
11,500.00	91.00	330.42	6,212.96	2,394.33	-2,501.13	14,447,315.44	1,724,423.05	39.78151338	-80.70098284
11,600.00	91.00	330.42	6,211.22	2,481.28	-2,550.49	14,447,402.39	1,724,373.70	39.78175263	-80.70115749
11,700.00	91.00	330.42	6,209.48	2,568.23	-2,599.85	14,447,489.34	1,724,324.34	39.78199187	-80.70133215
11,800.00	91.00	330.42	6,207.74	2,655.18	-2,649.21	14,447,576.29	1,724,274.98	39.78223112	-80.70150680
11,900.00	91.00	330.42	6,206.00	2,742.14	-2,698.57	14,447,663.25	1,724,225.62	39.78247037	-80.70168146
12,000.00	91.00	330.42	6,204.26	2,829.09	-2,747.92	14,447,750.20	1,724,176.26	39.78270961	-80.70185611
12,100.00	91.00	330.42	6,202.52	2,916.04	-2,797.28	14,447,837.15	1,724,126.91	39.78294886	-80.70203077
12,200.00	91.00	330.42	6,200.78	3,003.00	-2,846.64	14,447,924.11	1,724,077.55	39.78318810	-80.70220543
12,300.00	91.00	330.42	6,199.04	3,089.95	-2,896.00	14,448,011.06	1,724,028.19	39.78342735	-80.70238009
12,400.00	91.00	330.42	6,197.30	3,176.90	-2,945.36	14,448,098.01	1,723,978.83	39.78366660	-80.70255475
12,500.00	91.00	330.42	6,195.56	3,263.85	-2,994.71	14,448,184.96	1,723,929.47	39.78390584	-80.70272941
12,600.00	91.00	330.42	6,193.82	3,350.81	-3,044.07	14,448,271.92	1,723,880.12	39.78414509	-80.70290408
12,700.00	91.00	330.42	6,192.08	3,437.76	-3,093.43	14,448,358.87	1,723,830.76	39.78438433	-80.70307874
12,800.00	91.00	330.42	6,190.35	3,524.71	-3,142.79	14,448,445.82	1,723,781.40	39.78462357	-80.70325341
12,900.00	91.00	330.42	6,188.61	3,611.66	-3,192.14	14,448,532.77	1,723,732.04	39.78486282	-80.70342808
13,000.00	91.00	330.42	6,186.87	3,698.62	-3,241.50	14,448,619.73	1,723,682.69	39.78510206	-80.70360275
13,100.00	91.00	330.42	6,185.13	3,785.57	-3,290.86	14,448,706.68	1,723,633.33	39.78534130	-80.70377742
13,200.00	91.00	330.42	6,183.39	3,872.52	-3,340.22	14,448,793.63	1,723,583.97	39.78558055	-80.70395209
13,300.00	91.00	330.42	6,181.65	3,959.48	-3,389.58	14,448,880.59	1,723,534.61	39.78581979	-80.70412676
13,400.00	91.00	330.42	6,179.91	4,046.43	-3,438.93	14,448,967.54	1,723,485.25	39.78605903	-80.70430143
13,500.00	91.00	330.42	6,178.17	4,133.38	-3,488.29	14,449,054.49	1,723,435.90	39.78629828	-80.70447611
13,600.00	91.00	330.42	6,176.43	4,220.33	-3,537.65	14,449,141.44	1,723,386.54	39.78653752	-80.70465078
13,700.00	91.00	330.42	6,174.69	4,307.29	-3,587.01	14,449,228.40	1,723,337.18	39.78677676	-80.70482546
13,739.81	91.00	330.42	6,174.00	4,341.90	-3,606.66	14,449,263.01	1,723,317.53	39.78687200	-80.70489500

PBHL/TD 13739.81 MD/6174.00 TVD

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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern N-02 HM (slot H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 744.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 744.00usft
Site:	Keith Stern	North Reference:	Grid
Well:	Keith Stern N-02 HM (slot H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
BHL Keith Stern N-02HM - plan hits target center - Point	0.00	0.00	6,174.00	4,341.90	-3,606.66	14,449,263.01	1,723,317.53	39.78687200	-80.70489500
LP Keith Stern N-02HM - plan misses target center by 0.15usft at 7242.68usft MD (6287.00 TVD, -1307.53 N, -399.82 E) - Point	0.00	0.00	6,287.00	-1,307.46	-399.69	14,443,613.66	1,726,524.50	39.77132781	-80.69354803

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,800.00	1,800.00	0.00	0.00	KOP Begin 2°/100' build
2,050.00	2,049.68	-10.86	-0.95	Begin 5.00° tangent
3,104.33	3,100.00	-102.40	-8.96	Begin 3°/100' build/turn
4,382.46	4,245.44	-611.01	44.22	Begin 43.22° tangent
5,723.28	5,221.16	-1,523.09	162.05	Begin 8°/100' build/turn
6,802.78	6,142.24	-1,629.54	-155.79	Begin 10°/100' build/turn
7,242.74	6,287.00	-1,307.48	-399.84	Begin 91.00° lateral
13,739.81	6,174.00	4,341.90	-3,606.66	PBHL/TD 13739.81 MD/6174.00 TVD

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WW-9
(4/16)

API Number 47 - 051 - 02313

Operator's Well No. Keith Stern N-2HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

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

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

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

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

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

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

Company Official Signature [Signature]

Company Official (Typed Name) Jim Pancake

Company Official Title Vice President Geoscience

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Subscribed and sworn before me this 19 day of AUGUST, 20 20

[Signature]

Notary Public
Commonwealth of Pennsylvania - Notary Seal
David Gabriel Delallo, Notary Public
Washington County
My commission expires February 16, 2024
Commission number 1267492
Member, Pennsylvania Association of Notaries

My commission expires 2/16/2024

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 19.18 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

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

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Jim Wickham

Comments: _____

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Title: Oil and Gas Inspector Date: 10/9/2020

Field Reviewed? () Yes () No

Area of Review

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

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

Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (12/5/2018) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

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

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

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

4705102373

WV Geologist's Database Survey Well: County = 81 Permit = 70780

Location Information: Well Name: [faded text]

There is no Bottom Hole Location data for this well

Owner Information: [faded text]

Completion Information: [faded text]

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (Log) data for this well

There is no Plugging data for this well

There is no Seismic data for this well

WV Geologist's Database Survey Well: County = 81 Permit = 70781

Location Information: Well Name: [faded text]

There is no Bottom Hole Location data for this well

Owner Information: [faded text]

Completion Information: [faded text]

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (Log) data for this well

There is no Plugging data for this well

There is no Seismic data for this well

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Keith Stern N - 02HM Meade District Marshall County, WV

0 650 1,300 2,600 Feet

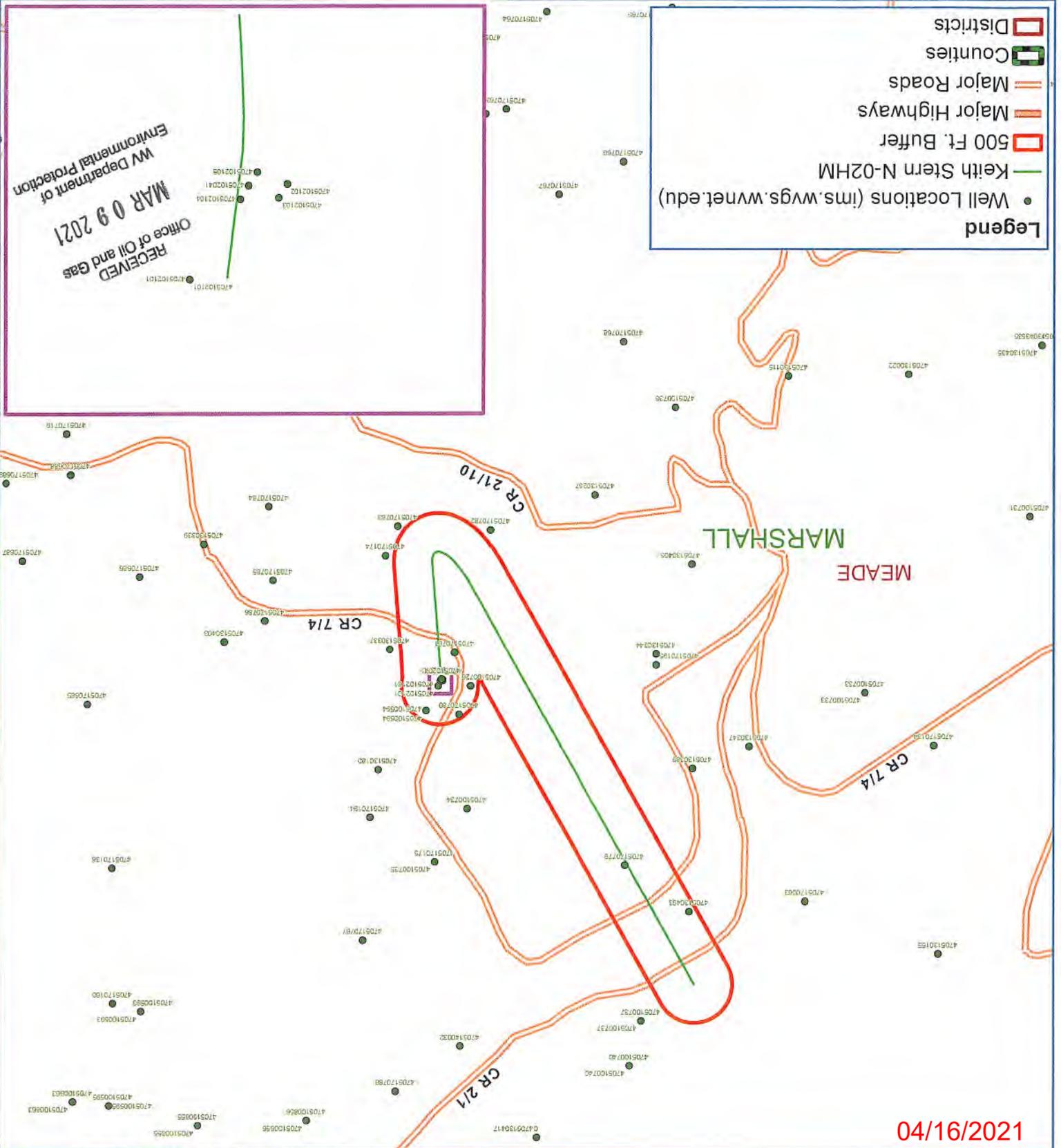
Notes:
 All locations are approximate and are for visualization purposes only.

Map Created: December 5, 2018
 Map Current As Of: December 5, 2018



Legend

- Well Locations (ms.wvgs.wvnet.edu)
- Keith Stern N-02HM
- 500 Ft. Buffer
- Major Highways
- Major Roads
- ▭ Counties
- ▭ Districts



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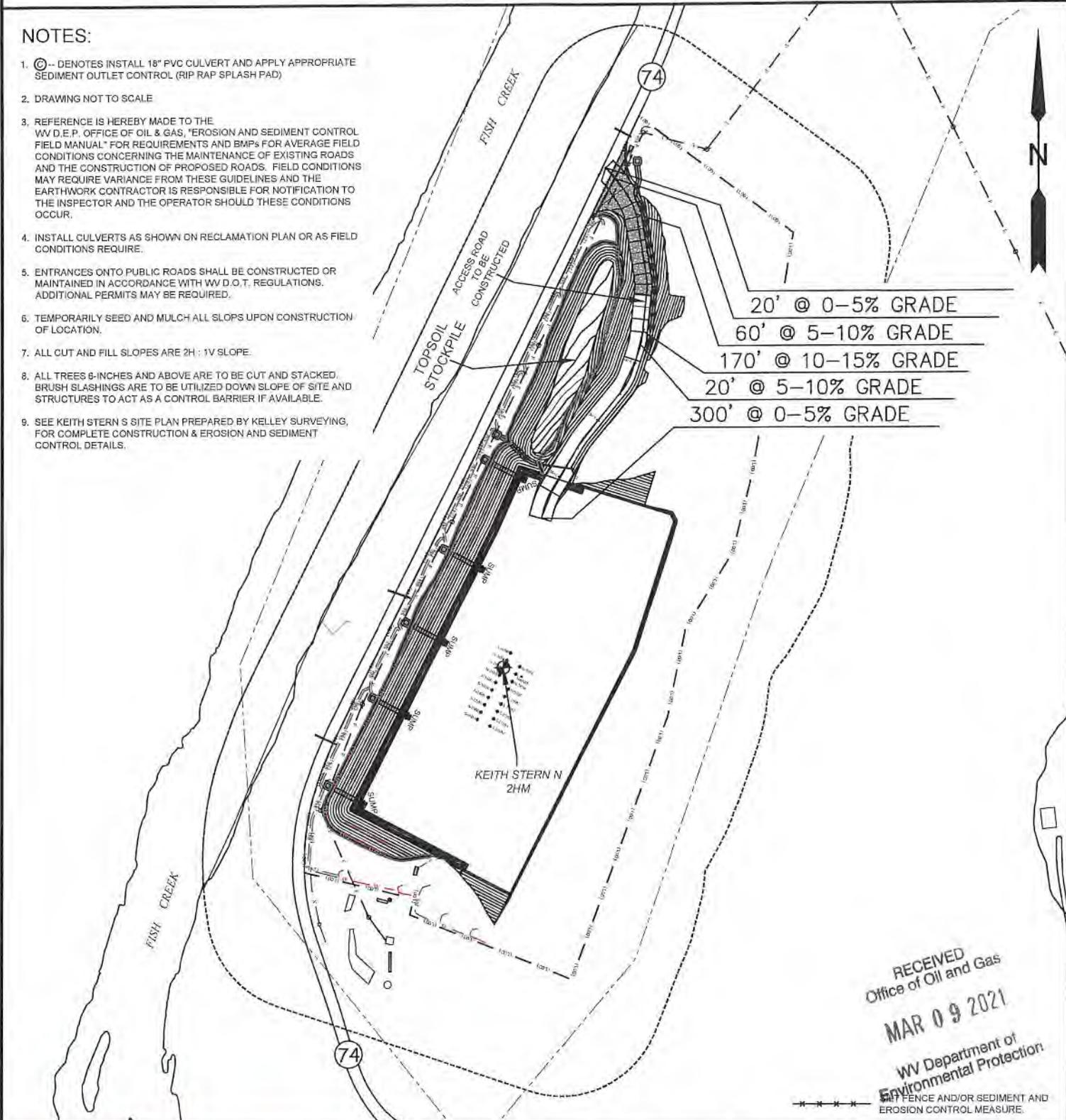
04/16/2021

4705702373

PROPOSED KEITH STERN N - 2HM

NOTES:

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



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***** FENCE AND/OR SEDIMENT AND EROSION CONTROL MEASURE.

12 Venturian Drive | P.O. Box 130 | Glenview, WV 26031 | 204.462.5634
1412 Kinsley's Boulevard, Box 1 | Charleston, WV 25301 | 304.346.3932
254 East Barkley Avenue | Beckley, WV 25801 | 304.255.0256
slsvw.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	MEADE		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8811	08/25/2020	NONE

**TUG HILL
OPERATING**
04/16/2021



Well Site Safety Plan

Tug Hill Operating, LLC

JK
10/9/2020

Well Name: Keith Stern N-2HM

Pad Location: Keith Stern Pad

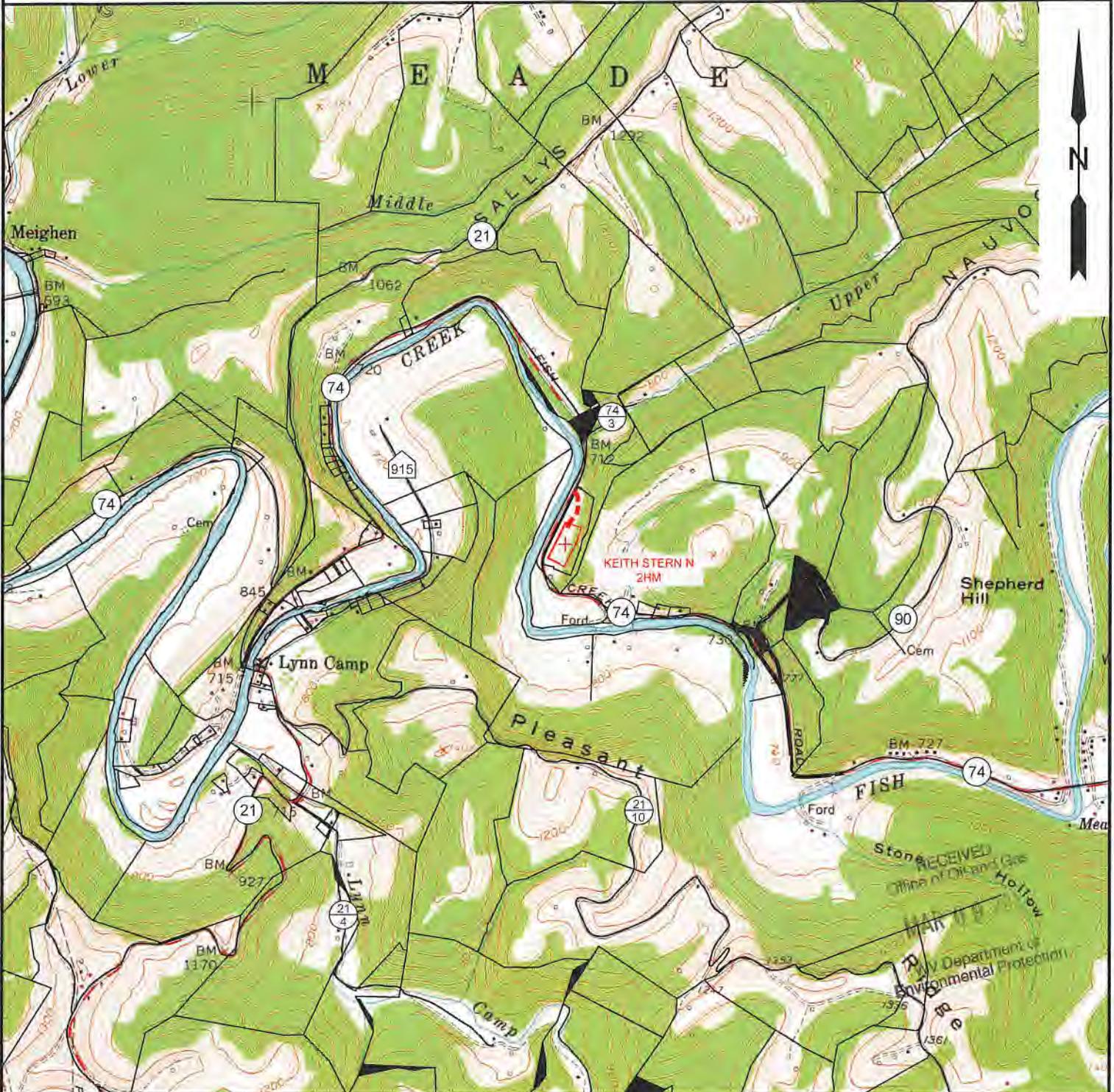
Marshall County, West Virginia

UTM meters , NAD83, Zone 17:
Northing: 4,402,820.76
Easting: 526,367.55

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MAR 09 2021
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4705102373

PROPOSED KEITH STERN N - 2HM



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

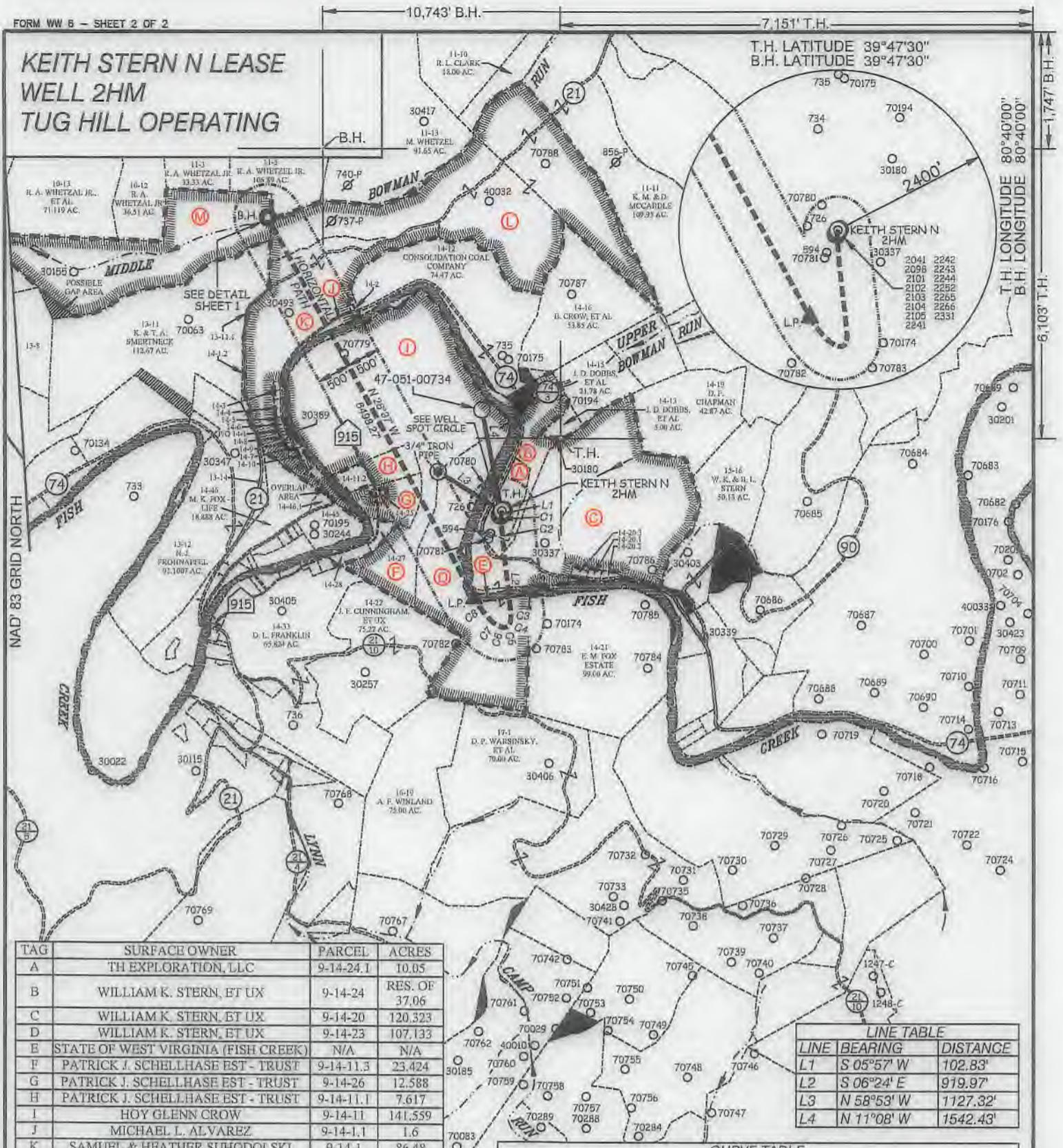
LAT: 39.7137712
LON: -80.8258327
LOCATED: S 60°11'49" W AT 43,719.31' FROM THE CENTER OF KEITH STERN N WELL PAD LOCATION.

 <p>12 Vestham Drive P.O. Box 150 Glenville, WV 26031 304.482.5634 1419 Parkview Boulevard, East Charleston, WV 25301 304.346.3922 254 East Beckley Bypass Beckley, WV 25801 304.255.5299 sllw.com</p>	TOPO SECTION: GLEN EASTON 7.5'		OPERATOR: PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		 <p>TUG HILL OPERATING 04/16/2021</p>		
	COUNTY MARSHALL	DISTRICT MEADE	DRAWN BY K.G.M.	JOB NO. 8811		DATE 08/24/2020	SCALE 1" = 2000'

10,743' B.H.

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

**KEITH STERN N LEASE
WELL 2HM
TUG HILL OPERATING**



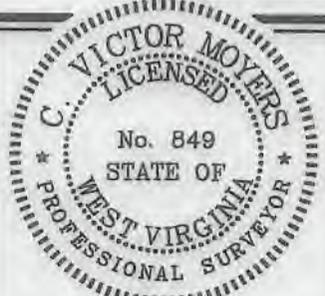
TAG	SURFACE OWNER	PARCEL	ACRES
A	TH EXPLORATION, LLC	9-14-24.1	10.05
B	WILLIAM K. STERN, ET UX	9-14-24	RES. OF 37.06
C	WILLIAM K. STERN, ET UX	9-14-20	120.323
D	WILLIAM K. STERN, ET UX	9-14-23	107.133
E	STATE OF WEST VIRGINIA (FISH CREEK)	N/A	N/A
F	PATRICK J. SCHELLHASE EST - TRUST	9-14-11.3	23.424
G	PATRICK J. SCHELLHASE EST - TRUST	9-14-26	12.588
H	PATRICK J. SCHELLHASE EST - TRUST	9-14-11.1	7.617
I	HOY GLENN CROW	9-14-11	141.559
J	MICHAEL L. ALVAREZ	9-14-1.1	1.6
K	SAMUEL & HEATHER SUHODOLSKI	9-14-1	86.48
L	J. F. CROW ESTATE, ET AL	9-11-12	162.88
M	MARGARET K. FOX (LIFE)	9-11-2	84.378

LINE TABLE		
LINE	BEARING	DISTANCE
L1	S 05°57' W	102.83'
L2	S 06°24' E	919.97'
L3	N 58°53' W	1127.32'
L4	N 11°08' W	1542.43'

CURVE TABLE				
CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	48.12'	447.92'	S 00°29' E	48.10'
C2	463.66'	10425.20'	S 05°29' E	463.62'
C3	132.05'	445.69'	S 01°13' W	131.57'
C4	80.75'	144.71'	S 26°18' W	79.71'
C5	69.45'	87.98'	S 69°25' W	67.66'
C6	90.92'	208.18'	N 73°26' W	90.20'
C7	165.91'	581.99'	N 52°50' W	165.35'
C8	405.60'	1418.52'	N 36°12' W	404.22'



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 1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
 254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5266
 slswv.com



(+) 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
- LEASE # (SEE WW-6A1)
- SURFACE OWNER (SEE TABLE)

SCALE 1" = 2000' FILE NO. 8811P2HMR.dwg
 KEITH STERN N-2HM-REV1
 DATE JULY 31 20 18
 REVISED AUGUST 19 20 20
 OPERATORS WELL NO. KEITH STERN N-2HM
 API WELL NO. 47-051-02373 HGA
 NO. STATE COUNTY PERMIT

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

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

04/16/2024

COUNTY NAME PERMIT

**KEITH STERN N LEASE
WELL 2HM
TUG HILL OPERATING**

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

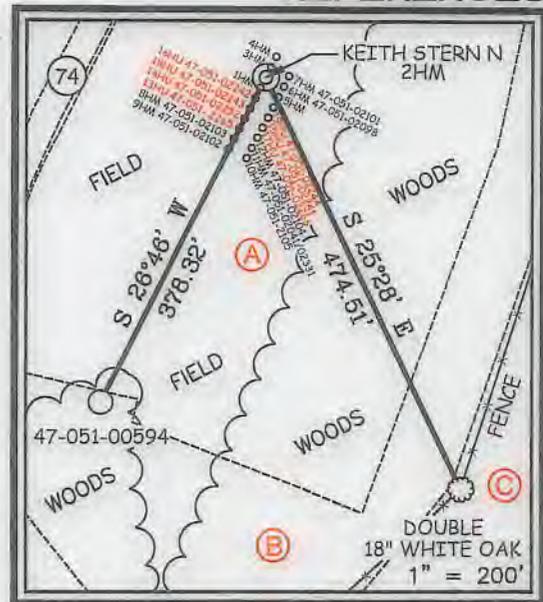
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD'83 S.P.C.(FT)	N. 466,586.39	E. 1,633,449.53	
NAD'83 GEO.	LAT-(N) 39.774915	LONG-(W) 80.692110	
NAD'83 UTM (M)	N. 4,402,820.76	E. 526,367.55	
LANDING POINT			
NAD'83 S.P.C.(FT)	N. 465,285.3	E. 1,633,027.8	
NAD'83 GEO.	LAT-(N) 39.771328	LONG-(W) 80.693549	
NAD'83 UTM (M)	N. 4,402,422.2	E. 526,245.7	
BOTTOM HOLE			
NAD'83 S.P.C.(FT)	N. 470,989.4	E. 1,629,914.7	
NAD'83 GEO.	LAT-(N) 39.786872	LONG-(W) 80.704895	
NAD'83 UTM (M)	N. 4,404,144.2	E. 525,268.2	

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°40'00"
6,103' T.H.

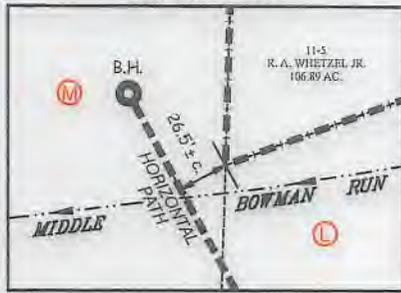
MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
9-13-11.1	SAMUEL & HEATHER SUHODOLSKI	0.49
9-13-14	MARGARET K. FOX - LIFE	3.00
9-14-1.2	KENNETH N. & TERESA A. SMERTNECK	1.02
9-14-2	MICHAEL L. ALVAREZ	0.75
9-14-3	MICHAEL L. ALVAREZ	NORTH P/O 3 PCLS
9-14-4	MICHAEL L. ALVAREZ	3 PCLS & 1/8 AC.
9-14-5	MICHAEL L. ALVAREZ	200 X 60 PCL.
9-14-6	MICHAEL L. ALVAREZ	120 X 200 PCL.
9-14-7	JOHN T. FRAZMUS, III	0.25
9-14-8	JOHNNY C. HOLCOMB & JOHNNY C. HOLCOMB, II	2/5 AC.
9-14-9	JOHN E. DUFFY, ET UX	2/5 AC.
9-14-10	ROBERT I. DUFFY - LIFE	25/100 AC.
9-14-11.2	LOYE A. BLAKE	4.00
9-14-20.1	WILLIAM K. STERN, ET UX	1.321
9-14-20.2	WILLIAM K. STERN, ET UX	1.525
9-14-20.3	WILLIAM K. STERN, ET UX	0.831
9-14-25	PATRICIA A. DUGAS	0.559
9-14-27	PATRICK J. SCHELLHASE EST - TRUST	3.004
9-14-28	CHARLES R. SCHELLHASE, ET UX	3.029
9-14-45	GEORGE R. TAYLOR, ET UX	10.98
9-14-46.1	MARIA JANE FAZZARO	1.512

T.H.

REFERENCES



DETAIL
SCALE: 1" = 100'

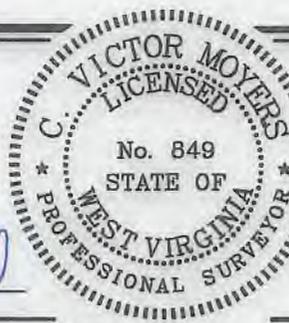


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1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3252
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5295
slswv.com

NOTES ON SURVEY

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

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 31 , 20 18
REVISED AUGUST 19 , 20 20
OPERATORS WELL NO. KEITH STERN N-2HM
API WELL NO. 47 - 051 - 02373 HGA
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8811P2HMR.dwg
KEITH STERN N-2HM-REV1
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 INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW
LOCATION: GROUND = 742.10' ELEVATION PROPOSED = 744.65' WATERSHED FISH CREEK (HUC 10)
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'
SURFACE OWNER TH EXPLORATION, LLC ACREAGE 10.05±
ROYALTY OWNER ISAAC CROW, ET AL - SEE WW-6A1 ACREAGE 10.05
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: 6,401' / TMD: 13,740'

COUNTY NAME PERMIT

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

04/16/2024

4705102373

WW-6A1
(5/13)

Operator's Well No. Keith Stern N-2HM

**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**

RECEIVED
Office of Oil and Gas
MAR 09 2021
WV Department of
Environmental Protection

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 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	Assignment	Assignment	Assignment	
10*15605	9-14-24.1	A	ISAAC CROW ET UX	JOHN G CRAWFORD	1/8+	74 394	Wheeling Natural Gas Company to The Manufacturers Light & Heat Company: 148/389	Manufacturers to Union Gasoline & Oil Corp: 197/120	Union to The Preston Oil Company: 2/136	Preston to Manufacturers Light & Heat Company: 2/225	Cert. of Merger of Manufactureres Light & Heat Company into Columbia Gas Transmission Corp: 422/204	Columbia Gas Trans. Corp. To Columbia Natural Resources, Inc: 537/518	Columbia Natural Resource Inc. to Nicole Gas Production, LTD: 13/623	Nicole Gas Production, LTD to William F. Dobbs, Trustee of Pennsylvania Land Holdings Corp: 619/499	Pennsylvania Land Holdings Corp. appoints Dennis N. Broglio as Successor Trustee: 624/654	Dennis N. Broglio, Successor Trustee to Tri-County Oil & Gas, Inc: 14/471	Tri-County Oil & Gas Inc. merged into Leatherwood, Inc. on Oct. 24, 2007	CNX Gas Company LLC to TH Exploration, LLC: 42/140	
10*15605	9-14-24	B	ISAAC CROW ET UX	JOHN G CRAWFORD	1/8+	74 394	Wheeling Natural Gas Company to The Manufacturers Light & Heat Company: 148/389	Manufacturers to Union Gasoline & Oil Corp: 197/120	Union to The Preston Oil Company: 2/136	Preston to Manufacturers Light & Heat Company: 2/225	Cert. of Merger of Manufactureres Light & Heat Company into Columbia Gas Transmission Corp: 422/204	Columbia Gas Trans. Corp. To Columbia Natural Resources, Inc: 537/518	Columbia Natural Resource Inc. to Nicole Gas Production, LTD: 13/623	Nicole Gas Production, LTD to William F. Dobbs, Trustee of Pennsylvania Land Holdings Corp: 619/499	Pennsylvania Land Holdings Corp. appoints Dennis N. Broglio as Successor Trustee: 624/654	Dennis N. Broglio, Successor Trustee to Tri-County Oil & Gas, Inc: 14/471	Tri-County Oil & Gas Inc. merged into Leatherwood, Inc. on Oct. 24, 2007	CNX Gas Company LLC to TH Exploration, LLC: 42/140	
10*28223	9-14-24	B	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	TH EXPLORATION LLC	1/8+	1068 313	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*15509	9-14-20	C	WILLIAM K STERN AND BETTY L STERN	NPAR, LLC	1/8+	718 320	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	AB Resources LLC & NPAR LLC to Chief Expl. & Devel. LLC and Radler 2000 Ltd Prtshp: 24/466	Chief, Radler & Enerplus Resources Corp. to Chevron USA Inc: 26/130	NPAR LLC to Chevron USA Inc: 756/332	Chevron USA Inc to TH Exploration LLC: 36/148
10*28223	9-14-20	C	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	TH EXPLORATION LLC	1/8+	1068 313	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*15812	9-14-23	D	WILLIAM K STERN AND BETTY L STERN	CHESAPEAKE APPALACHIA LLC	1/8+	687 220	N/A	N/A	N/A	N/A	N/A	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 22/506	Chesapeake Appalachia LLC to SWN Production Company: 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC: 33/424	Merger - SWN Exchange Titleholder LLC and SWN Production Company LLC: 19/624	SWN Production Company to TH Exploration LLC: 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC: 36/455	
10*16436	9-14-23	D	REAGAN D YEATTS AND CHRISTOPHER M YEATTS	TH EXPLORATION LLC	1/8+	961 339	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*18269	9-14-23	D	GENELDA MASON	TH EXPLORATION LLC	1/8+	942 460	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*18299	9-14-23	D	CAROL L BOBBY AND DONALD J BOBBY	TH EXPLORATION LLC	1/8+	929 281	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*18354	9-14-23	D	DEBORAH L TURLEY	TH EXPLORATION LLC	1/8+	931 352	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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| 10*18355 | 9-14-23 | D | JUDITH F TEMPLE AND LOUIS I TEMPLE | TH EXPLORATION LLC | 1/8+ | 931 | 350 | N/A |
| 10*18356 | 9-14-23 | D | LARRY W ALLEY | TH EXPLORATION LLC | 1/8+ | 931 | 348 | N/A |
| 10*18357 | 9-14-23 | D | DEBORAH SUE KYLE | TH EXPLORATION LLC | 1/8+ | 931 | 346 | N/A |
| 10*18358 | 9-14-23 | D | SHARLA ROLLINS AND GARY ROLLINS | TH EXPLORATION LLC | 1/8+ | 931 | 358 | N/A |
| 10*18419 | 9-14-23 | D | CARLA MAE ALLEY | TH EXPLORATION LLC | 1/8+ | 932 | 539 | N/A |
| 10*18420 | 9-14-23 | D | VICTOR E ALLEY JR AND DEBRA A ALLEY | TH EXPLORATION LLC | 1/8+ | 932 | 582 | N/A |
| 10*18421 | 9-14-23 | D | DONNA JUNE STRAIT AND GARY E STRAIT | TH EXPLORATION LLC | 1/8+ | 932 | 588 | N/A |
| 10*18429 | 9-14-23 | D | GEORGE L DUNN AND NANCY MARIE DUNN | TH EXPLORATION LLC | 1/8+ | 932 | 601 | N/A |
| 10*18430 | 9-14-23 | D | JAMES DUNN AND DONNA K DUNN | TH EXPLORATION LLC | 1/8+ | 932 | 604 | N/A |
| 10*18432 | 9-14-23 | D | ROSEMARIE BERISFORD | TH EXPLORATION LLC | 1/8+ | 932 | 572 | N/A |

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| 10*18484 | 9-14-23 | D | BRENDA REED | TH EXPLORATION LLC | 1/8+ | 933 107 | N/A |
| 10*18485 | 9-14-23 | D | BARBARA JO BEVERIDGE | TH EXPLORATION LLC | 1/8+ | 933 109 | N/A |
| 10*18490 | 9-14-23 | D | STACY L BARNHART | TH EXPLORATION LLC | 1/8+ | 933 123 | N/A |
| 10*18491 | 9-14-23 | D | LORI A FARMER AND DANIEL K FARMER | TH EXPLORATION LLC | 1/8+ | 933 131 | N/A |
| 10*18512 | 9-14-23 | D | CHRISTINA NESTELL AND CHARLES E NESTELL III | TH EXPLORATION LLC | 1/8+ | 933 565 | N/A |
| 10*18515 | 9-14-23 | D | WILLIAM P DAUBE | TH EXPLORATION LLC | 1/8+ | 933 573 | N/A |
| 10*18518 | 9-14-23 | D | SUSAN I BAKER | TH EXPLORATION LLC | 1/8+ | 933 580 | N/A |
| 10*18520 | 9-14-23 | D | CHRISTOPHER SAUDERS | TH EXPLORATION LLC | 1/8+ | 933 584 | N/A |
| 10*18612 | 9-14-23 | D | NANNETTE BERLETCH | TH EXPLORATION LLC | 1/8+ | 932 542 | N/A |
| 10*18617 | 9-14-23 | D | SHEILA SIMMONS AND JEFFREY R SIMMONS | TH EXPLORATION LLC | 1/8+ | 934 613 | N/A |

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| 10*18644 | 9-14-23 | D | FRANK A STORCH JR AND SUSAN STORCH | TH EXPLORATION LLC | 1/8+ | 936 149 | N/A |
| 10*18645 | 9-14-23 | D | SANDRA SUE HALL AND DAVID HALL | TH EXPLORATION LLC | 1/8+ | 936 155 | N/A |
| 10*18647 | 9-14-23 | D | PETER G STORCH AND LAURIE L STORCH | TH EXPLORATION LLC | 1/8+ | 936 152 | N/A |
| 10*18648 | 9-14-23 | D | LAWRENCE E CHIAPPETTA AND PATRICIA A CHIAPPETTA | TH EXPLORATION LLC | 1/8+ | 936 161 | N/A |
| 10*18649 | 9-14-23 | D | RODNEY K BANE AND CATHIE J BANE | TH EXPLORATION LLC | 1/8+ | 936 164 | N/A |
| 10*18652 | 9-14-23 | D | BECKY LANDRIS | TH EXPLORATION LLC | 1/8+ | 936 172 | N/A |
| 10*18653 | 9-14-23 | D | DALE R ALLEY | TH EXPLORATION LLC | 1/8+ | 936 174 | N/A |
| 10*18673 | 9-14-23 | D | RACHEL THORNE AND FRED THORNE JR | TH EXPLORATION LLC | 1/8+ | 938 574 | N/A |
| 10*18674 | 9-14-23 | D | JOHN T CRISWELL AND CATHERINE A CRISWELL | TH EXPLORATION LLC | 1/8+ | 938 579 | N/A |
| 10*18675 | 9-14-23 | D | JEFFREY BRYAN CRISWELL | TH EXPLORATION LLC | 1/8+ | 938 582 | N/A |

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| 10*18676 | 9-14-23 | D | JENNIFER SHAWN GLOVER | TH EXPLORATION LLC | 1/8+ | 938 576 | N/A |
| 10*18677 | 9-14-23 | D | PATRICIA DOFKA | TH EXPLORATION LLC | 1/8+ | 938 585 | N/A |
| 10*18678 | 9-14-23 | D | WILLIAM LINSLEY CRISWELL | TH EXPLORATION LLC | 1/8+ | 938 588 | N/A |
| 10*18763 | 9-14-23 | D | VAUGHN HONE SR & LINDA MARIE HONE | TH EXPLORATION LLC | 1/8+ | 938 225 | N/A |
| 10*18766 | 9-14-23 | D | TOM ALLEY | TH EXPLORATION LLC | 1/8+ | 938 223 | N/A |
| 10*18797 | 9-14-23 | D | DORETTA RUSH | TH EXPLORATION LLC | 1/8+ | 937 622 | N/A |
| 10*18808 | 9-14-23 | D | PATRICIA KIRCHNER | TH EXPLORATION LLC | 1/8+ | 937 644 | N/A |
| 10*18809 | 9-14-23 | D | JUDITH C LORADITCH | TH EXPLORATION LLC | 1/8+ | 937 647 | N/A |
| 10*19392 | 9-14-23 | D | RODNEY W RUSH AND CRYSTAL D RUSH | TH EXPLORATION LLC | 1/8+ | 940 336 | N/A |
| 10*19400 | 9-14-23 | D | BUJA F YOST | TH EXPLORATION LLC | 1/8+ | 940 342 | N/A |

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| 10*19405 | 9-14-23 | D | ANN MARIE STEVENS AND CURTIS STEVENS | TH EXPLORATION LLC | 1/8+ | 939 287 | N/A |
| 10*19417 | 9-14-23 | D | SYLVIA R SPALENY AND ROBERT A SPALENY | TH EXPLORATION LLC | 1/8+ | 939 595 | N/A |
| 10*19423 | 9-14-23 | D | KEITH W STORCH AND DEBORAH A STORCH | TH EXPLORATION LLC | 1/8+ | 934 600 | N/A |
| 10*19477 | 9-14-23 | D | DEBORAH A MILLER | TH EXPLORATION LLC | 1/8+ | 941 320 | N/A |
| 10*19479 | 9-14-23 | D | DENISE WILLIAMSON | TH EXPLORATION LLC | 1/8+ | 941 329 | N/A |
| 10*19510 | 9-14-23 | D | REED O MILLER | TH EXPLORATION LLC | 1/8+ | 933 571 | N/A |
| 10*19525 | 9-14-23 | D | AUGUSTUS R MCMAHON III AND MICHELE M MCMAHON TRUSTEES OF THE AUGUSTUS R MCMAHON III LIVING TRUST | TH EXPLORATION LLC | 1/8+ | 942 635 | N/A |
| 10*19527 | 9-14-23 | D | AUGUSTUS RUSH MCMAHON III TRUSTEE OF THE PAMELA J MCMAHON REVOCABLE TRUST | TH EXPLORATION LLC | 1/8+ | 953 339 | N/A |
| 10*19530 | 9-14-23 | D | SHAROL K CASADA | TH EXPLORATION LLC | 1/8+ | 943 1 | N/A |
| 10*19531 | 9-14-23 | D | DELBERT D RUSH AND BETTY RUTH RUSH | TH EXPLORATION LLC | 1/8+ | 942 615 | N/A |

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| 10*19625 | 9-14-23 | D | DURR SUCKEL & ELIZABETH SUCKEL | TH EXPLORATION LLC | 1/8+ | 944 150 | N/A |
| 10*19626 | 9-14-23 | D | LAURIE R BROWN | TH EXPLORATION LLC | 1/8+ | 944 153 | N/A |
| 10*19676 | 9-14-23 | D | RONALD W REINBEAU | TH EXPLORATION LLC | 1/8+ | 944 456 | N/A |
| 10*19677 | 9-14-23 | D | NEIL SCHAFER AND CHRISTAL L SHAFER | TH EXPLORATION LLC | 1/8+ | 944 147 | N/A |
| 10*19681 | 9-14-23 | D | TIMOTHY LEE COLLEY | TH EXPLORATION LLC | 1/8+ | 944 140 | N/A |
| 10*19683 | 9-14-23 | D | TERESA ALLEY | TH EXPLORATION LLC | 1/8+ | 944 145 | N/A |
| 10*19686 | 9-14-23 | D | KAREN J AND MICHAEL E BRUGGEMAN | TH EXPLORATION LLC | 1/8+ | 944 142 | N/A |
| 10*19712 | 9-14-23 | D | HAZ AARON COLLEY AND DANA COLLINS | TH EXPLORATION LLC | 1/8+ | 957 139 | N/A |
| 10*19723 | 9-14-23 | D | REID ELATRACHE AND TONYA ELATRACHE | TH EXPLORATION LLC | 1/8+ | 957 131 | N/A |
| 10*19859 | 9-14-23 | D | ELIZABETH A STARC | TH EXPLORATION LLC | 1/8+ | 945 603 | N/A |

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| 10*19860 | 9-14-23 | D | ALICIA N STARC | TH EXPLORATION LLC | 1/8+ | 945 601 | N/A |
| 10*19861 | 9-14-23 | D | JOSEPH F STARC JR AND DONNA STARC | TH EXPLORATION LLC | 1/8+ | 945 605 | N/A |
| 10*19862 | 9-14-23 | D | STACY R BENNETT | TH EXPLORATION LLC | 1/8+ | 945 608 | N/A |
| 10*19864 | 9-14-23 | D | JOE Y KELLER JR AND SHARON MARIE KELLER | TH EXPLORATION LLC | 1/8+ | 945 610 | N/A |
| 10*19935 | 9-14-23 | D | SARA E STARC | TH EXPLORATION LLC | 1/8+ | 948 553 | N/A |
| 10*19936 | 9-14-23 | D | SHERWOOD MASON NILA JUNE MASON | TH EXPLORATION LLC | 1/8+ | 948 255 | N/A |
| 10*19940 | 9-14-23 | D | EMMA JO CRISWELL | TH EXPLORATION LLC | 1/8+ | 948 551 | N/A |
| 10*21028 | 9-14-23 | D | BRENDA GILBERT | TH EXPLORATION LLC | 1/8+ | 951 159 | N/A |
| 10*21094 | 9-14-23 | D | KATHERINE DEGROOT AND DANIEL DEGROOT | TH EXPLORATION LLC | 1/8+ | 951 151 | N/A |
| 10*21111 | 9-14-23 | D | DONNA G AND PAUL L CHMELYSKI | TH EXPLORATION LLC | 1/8+ | 951 154 | N/A |

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| 10*21209 | 9-14-23 | D | CHARLES R WILLIAMSON JR | TH EXPLORATION LLC | 1/8+ | 951 157 | N/A |
| 10*21228 | 9-14-23 | D | CHARLES F HORNER & LORAIN G HORNER | TH EXPLORATION LLC | 1/8+ | 952 434 | N/A |
| 10*21229 | 9-14-23 | D | TARA E CAUSEY | TH EXPLORATION LLC | 1/8+ | 952 432 | N/A |
| 10*21395 | 9-14-23 | D | DANIEL L LANDRIS AND JOAN L LANDRIS | TH EXPLORATION LLC | 1/8+ | 956 625 | N/A |
| 10*21396 | 9-14-23 | D | MICHAEL D ZUCKER | TH EXPLORATION LLC | 1/8+ | 956 647 | N/A |
| 10*21441 | 9-14-23 | D | JOSEPH A MURPHY AND VIRGINIA ANNE MURPHY | TH EXPLORATION LLC | 1/8+ | 956 631 | N/A |
| 10*21443 | 9-14-23 | D | ROBERT L LANDRIS AND LIBERTY JANE LANDRIS | TH EXPLORATION LLC | 1/8+ | 956 628 | N/A |
| 10*21490 | 9-14-23 | D | DANIEL E WILLIAMSON AND HEATHER R WILLIAMSON | TH EXPLORATION LLC | 1/8+ | 957 153 | N/A |
| 10*21493 | 9-14-23 | D | DENZIL ALLEY JR | TH EXPLORATION LLC | 1/8+ | 958 64 | N/A |
| 10*21497 | 9-14-23 | D | KATHLEEN G WILLIAMSON | TH EXPLORATION LLC | 1/8+ | 957 324 | N/A |

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| 10*21837 | 9-14-23 | D | WILLIAM BRYAN COLLEY | TH EXPLORATION LLC | 1/8+ | 959 627 | N/A |
| 10*21873 | 9-14-23 | D | MICHAEL WAYNE ALLEY AND LINDA ALLEY | TH EXPLORATION LLC | 1/8+ | 953 501 | N/A |
| 10*21961 | 9-14-23 | D | JOHN WILLIAMSON JR | TH EXPLORATION LLC | 1/8+ | 960 24 | N/A |
| 10*21972 | 9-14-23 | D | CATHERINE I AND ERNEST M SILVERIO | TH EXPLORATION LLC | 1/8+ | 960 586 | N/A |
| 10*21979 | 9-14-23 | D | CHARLES C SEAMON | TH EXPLORATION LLC | 1/8+ | 954 340 | N/A |
| 10*21991 | 9-14-23 | D | THE JOANN REILLY TRUST KIMBERLY MAEZ TRUSTEE | TH EXPLORATION LLC | 1/8+ | 953 341 | N/A |
| 10*21997 | 9-14-23 | D | MICHAEL SAUDERS AND AMI SAUDERS | TH EXPLORATION LLC | 1/8+ | 953 505 | N/A |
| 10*22004 | 9-14-23 | D | RALPH EDWARD WILLIAMSON | TH EXPLORATION LLC | 1/8+ | 953 507 | N/A |
| 10*22037 | 9-14-23 | D | JOSHUA W SEAMON | TH EXPLORATION LLC | 1/8+ | 953 503 | N/A |
| 10*22053 | 9-14-23 | D | LARRY R CRANE | TH EXPLORATION LLC | 1/8+ | 953 344 | N/A |

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| 10*22089 | 9-14-23 | D | MARCIA A LUKE | TH EXPLORATION LLC | 1/8+ | 961 333 | N/A |
| 10*22110 | 9-14-23 | D | JENNIFER ALLEY FISHER & ROBERT D FISHER | TH EXPLORATION LLC | 1/8+ | 961 347 | N/A |
| 10*22127 | 9-14-23 | D | JUDITH L BENEDICT AND LOUIS G BENEDICT | TH EXPLORATION LLC | 1/8+ | 961 343 | N/A |
| 10*22150 | 9-14-23 | D | CHAD ERIC BENNETT AND MARY A BENNETT | TH EXPLORATION LLC | 1/8+ | 954 338 | N/A |
| 10*22257 | 9-14-23 | D | CHARLES F ALLEY TRUST EMMANUEL PREVOLES TRUSTEE | TH EXPLORATION LLC | 1/8+ | 970 26 | N/A |
| 10*22328 | 9-14-23 | D | SUSAN L GOLDSBERRY | TH EXPLORATION LLC | 1/8+ | 962 549 | N/A |
| 10*22329 | 9-14-23 | D | SALLY M COTEREL-CHANEY | TH EXPLORATION LLC | 1/8+ | 962 547 | N/A |
| 10*22380 | 9-14-23 | D | JUDITH S KNIGHT | TH EXPLORATION LLC | 1/8+ | 962 276 | N/A |
| 10*22411 | 9-14-23 | D | EARL FRAZIER AND LYDIA ARMENTA | TH EXPLORATION LLC | 1/8+ | 963 128 | N/A |
| 10*22461 | 9-14-23 | D | BRIAN R MORGAN | TH EXPLORATION LLC | 1/8+ | 964 453 | N/A |

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|----------|---------|-----|--------------------------------------|---------------------------------|---------|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------------------------------------------------------------------|
| 10*22501 | 9-14-23 | D | LINDA K AND MICHAEL HUMES | AMERICAN PETROLEUM PARTNERS LLC | 1/8+ | 948 372 | N/A | American Petroleum Partners Operating LLC to TH Exploration LLC: 42/109 |
| 10*22502 | 9-14-23 | D | JAMES P MILLER | AMERICAN PETROLEUM PARTNERS LLC | 1/8+ | 946 215 | N/A | American Petroleum Partners Operating LLC to TH Exploration LLC: 42/109 |
| 10*22775 | 9-14-23 | D | DIANNA LEA SHEPARD | TH EXPLORATION LLC | 1/8+ | 970 30 | N/A |
| 10*22778 | 9-14-23 | D | DANNY E COCHRAN AND LORI ANN COCHRAN | TH EXPLORATION LLC | 1/8+ | 972 40 | N/A |
| 10*22833 | 9-14-23 | D | RANDY W MORRIS SR AND CHERYL MORRIS | TH EXPLORATION LLC | 1/8+ | 966 465 | N/A |
| 10*22848 | 9-14-23 | D | JULIA RAE BROOKS | TH EXPLORATION LLC | 1/8+ | 977 30 | N/A |
| 10*22854 | 9-14-23 | D | SUSAN EXLINE | TH EXPLORATION LLC | 1/8+ | 977 32 | N/A |
| 10*22878 | 9-14-23 | D | AUBREY E REILLY | TH EXPLORATION LLC | 1/8+ | 977 26 | N/A |
| 10*22879 | 9-14-23 | D | BRENDAN Q REILLY | TH EXPLORATION LLC | 1/8+ | 977 28 | N/A |
| 10*27947 | 9-14-23 | D | STONE HILL MINERALS HOLDINGS LLC | TH EXPLORATION LLC | 1/8+ | 1063 568 | N/A |

Lease ID	Parcel	Tag	Grantor, Lessor, Etc	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*23148	9-14-23	D	IDA A ALLEY AND J F ALLEY	HOPE NATURAL GAS CO	1/8+	117 45	N/A	N/A	N/A	N/A	N/A	Hope Natural Gas Company to AM Snider & Duane M Snider dba Hundred Gas Company: DB 446/186	AM Snider, Duane M Snider & Kathleen Rinehart dba Hundred Gas Company to Hundred Gas Company: DB 620/630	Hundred Gas Company to Carl D Perkins: DB 451/418	Carl D Perkins to Perkins Oil & Gas Inc: DB 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation: AB 26/322	Stone Energy Corporation to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: AB 48/21
10*23458	FISH CREEK	E	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	TH EXPLORATION LLC	1/8+	1019 373	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*23053	9-14-11.3	F	CE YOUNG	TG STILES	1/8+	63 146	N/A	N/A	N/A	N/A	TG Stiles to South Penn Oil Company: DB 60/367	Hope Natural Gas Company to AM Snider & Duane M Snider dba Hundred Gas Company: DB 446/186	AM Snider, Duane M Snider & Kathleen Rinehart dba Hundred Gas Company to Hundred Gas Company: DB 620/630	Hundred Gas Company to Carl D Perkins: DB 451/418	Carl D Perkins to Perkins Oil & Gas Inc: DB 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation: AB 26/322	Stone Energy Corporation to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: AB 48/21
10*23053	9-14-26	G	CE YOUNG	TG STILES	1/8+	63 146	N/A	N/A	N/A	N/A	TG Stiles to South Penn Oil Company: DB 60/367	Hope Natural Gas Company to AM Snider & Duane M Snider dba Hundred Gas Company: DB 446/186	AM Snider, Duane M Snider & Kathleen Rinehart dba Hundred Gas Company to Hundred Gas Company: DB 620/630	Hundred Gas Company to Carl D Perkins: DB 451/418	Carl D Perkins to Perkins Oil & Gas Inc: DB 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation: AB 26/322	Stone Energy Corporation to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: AB 48/21
10*23053	9-14-11.1	H	CE YOUNG	TG STILES	1/8+	63 146	N/A	N/A	N/A	N/A	TG Stiles to South Penn Oil Company: DB 60/367	Hope Natural Gas Company to AM Snider & Duane M Snider dba Hundred Gas Company: DB 446/186	AM Snider, Duane M Snider & Kathleen Rinehart dba Hundred Gas Company to Hundred Gas Company: DB 620/630	Hundred Gas Company to Carl D Perkins: DB 451/418	Carl D Perkins to Perkins Oil & Gas Inc: DB 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation: AB 26/322	Stone Energy Corporation to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: AB 48/21
10*23053	9-14-11	I	CE YOUNG	TG STILES	1/8+	63 146	N/A	N/A	N/A	N/A	TG Stiles to South Penn Oil Company: DB 60/367	Hope Natural Gas Company to AM Snider & Duane M Snider dba Hundred Gas Company: DB 446/186	AM Snider, Duane M Snider & Kathleen Rinehart dba Hundred Gas Company to Hundred Gas Company: DB 620/630	Hundred Gas Company to Carl D Perkins: DB 451/418	Carl D Perkins to Perkins Oil & Gas Inc: DB 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation: AB 26/322	Stone Energy Corporation to EQT Production Company: AB 38/75	EQT Production Company to TH Exploration LLC: AB 48/21
10*19621	9-14-1.1	J	MARY RUTH FROHNAPFEL	TH EXPLORATION LLC	1/8+	938 595	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*19622	9-14-1.1	J	KENNETH D SIBURT JR AND LORI SIBURT	TH EXPLORATION LLC	1/8+	938 597	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*19623	9-14-1.1	J	SANDRA SIBURT FROWEN & GEORGE FROWEN	TH EXPLORATION LLC	1/8+	938 600	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*19627	9-14-1.1	J	RONALD S YOUNG	TH EXPLORATION LLC	1/8+	944 192	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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| 10*19655 | 9-14-1.1 | J | CHESTNUT HOLDINGS INC | TH EXPLORATION LLC | 1/8+ | 949 309 | N/A |
| 10*19678 | 9-14-1.1 | J | WILLIAM O. JOBES | TH EXPLORATION LLC | 1/8+ | 944 188 | N/A |
| 10*19679 | 9-14-1.1 | J | DAVID A DARRAH SR AND ANITA SLOUGH-DARRAH | TH EXPLORATION LLC | 1/8+ | 946 54 | N/A |
| 10*19725 | 9-14-1.1 | J | MAMIE V ARNOLD | TH EXPLORATION LLC | 1/8+ | 944 454 | N/A |
| 10*21213 | 9-14-1.1 | J | JAMES B SIBURT AND DELILA D SIBURT | TH EXPLORATION LLC | 1/8+ | 957 1077 | N/A |
| 10*21214 | 9-14-1.1 | J | VICKI J CHERRY | TH EXPLORATION LLC | 1/8+ | 949 139 | N/A |
| 10*21215 | 9-14-1.1 | J | ALAN K SIBURT ET UX | TH EXPLORATION LLC | 1/8+ | 949 136 | N/A |
| 10*21216 | 9-14-1.1 | J | RODNEY L SIBURT | TH EXPLORATION LLC | 1/8+ | 949 142 | N/A |
| 10*21559 | 9-14-1.1 | J | GUY L BUZZARD TRUSTEE THE GUY L BUZZARD 2017 IRREVOCABLE TRUST | TH EXPLORATION LLC | 1/8+ | 957 388 | N/A |
| 10*22464 | 9-14-1.1 | J | DONNA KYLE | TH EXPLORATION LLC | 1/8+ | 964 470 | N/A |

| Lease ID | Parcel | Tag | Grantor, Lessor, Etc | Grantee, Lessee, Etc. | Royalty | Deed Book/Page | | Assignment |
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| 10*22465 | 9-14-1.1 | J | LOIS KURPIL FKA LOIS HERCULES | TH EXPLORATION LLC | 1/8+ | 964 | 472 | N/A |
| 10*22466 | 9-14-1.1 | J | JUDITH MAY CONNER | TH EXPLORATION LLC | 1/8+ | 964 | 468 | N/A |
| 10*22516 | 9-14-1.1 | J | SHARON RUSSELL | TH EXPLORATION LLC | 1/8+ | 964 | 464 | N/A |
| 10*22518 | 9-14-1.1 | J | GEORGE EDWARDS | TH EXPLORATION LLC | 1/8+ | 964 | 466 | N/A |
| 10*22856 | 9-14-1.1 | J | CHARLES W MILLER AND ESTHER JEAN MILLER | TH EXPLORATION LLC | 1/8+ | 977 | 51 | N/A |
| 10*23435 | 9-14-1.1 | J | LLOYD C. ARNOLD & JUDITH C. ARNOLD | TH EXPLORATION LLC | 1/8+ | 1008 | 301 | N/A |
| 10*19621 | 9-14-1 | K | MARY RUTH FROHNAPFEL | TH EXPLORATION LLC | 1/8+ | 938 | 595 | N/A |
| 10*19622 | 9-14-1 | K | KENNETH D SIBURT JR AND LORI SIBURT | TH EXPLORATION LLC | 1/8+ | 938 | 597 | N/A |
| 10*19623 | 9-14-1 | K | SANDRA SIBURT FROWEN & GEORGE FROWEN | TH EXPLORATION LLC | 1/8+ | 938 | 600 | N/A |
| 10*19627 | 9-14-1 | K | RONALD S YOUNG | TH EXPLORATION LLC | 1/8+ | 944 | 192 | N/A |

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| 10*19655 | 9-14-1 | K | CHESTNUT HOLDINGS INC | TH EXPLORATION LLC | 1/8+ | 949 309 | N/A |
| 10*19678 | 9-14-1 | K | WILLIAM O. JOBES | TH EXPLORATION LLC | 1/8+ | 944 188 | N/A |
| 10*19679 | 9-14-1 | K | DAVID A DARRAH SR AND ANITA SLOUGH-DARRAH | TH EXPLORATION LLC | 1/8+ | 946 54 | N/A |
| 10*19725 | 9-14-1 | K | MAMIE V ARNOLD | TH EXPLORATION LLC | 1/8+ | 944 454 | N/A |
| 10*21213 | 9-14-1 | K | JAMES B SIBURT AND DELILA D SIBURT | TH EXPLORATION LLC | 1/8+ | 957 1077 | N/A |
| 10*21214 | 9-14-1 | K | VICKI J CHERRY | TH EXPLORATION LLC | 1/8+ | 949 139 | N/A |
| 10*21215 | 9-14-1 | K | ALAN K SIBURT ET UX | TH EXPLORATION LLC | 1/8+ | 949 136 | N/A |
| 10*21216 | 9-14-1 | K | RODNEY L SIBURT | TH EXPLORATION LLC | 1/8+ | 949 142 | N/A |
| 10*21559 | 9-14-1 | K | GUY L BUZZARD TRUSTEE THE GUY L BUZZARD 2017 IRREVOCABLE TRUST | TH EXPLORATION LLC | 1/8+ | 957 388 | N/A |
| 10*22464 | 9-14-1 | K | DONNA KYLE | TH EXPLORATION LLC | 1/8+ | 964 470 | N/A |

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| 10*22465 | 9-14-1 | K | LOIS KURPIL FKA LOIS HERCULES | TH EXPLORATION LLC | 1/8+ | 964 472 | N/A |
| 10*22466 | 9-14-1 | K | JUDITH MAY CONNER | TH EXPLORATION LLC | 1/8+ | 964 468 | N/A |
| 10*22516 | 9-14-1 | K | SHARON RUSSELL | TH EXPLORATION LLC | 1/8+ | 964 464 | N/A |
| 10*22518 | 9-14-1 | K | GEORGE EDWARDS | TH EXPLORATION LLC | 1/8+ | 964 466 | N/A |
| 10*22856 | 9-14-1 | K | CHARLES W MILLER AND ESTHER JEAN MILLER | TH EXPLORATION LLC | 1/8+ | 977 51 | N/A |
| 10*23435 | 9-14-1 | K | LLOYD C. ARNOLD & JUDITH C. ARNOLD | TH EXPLORATION LLC | 1/8+ | 1008 301 | N/A |
| 10*19685 | 9-11-12 | L | MORGAN H MOSSER AND NANCY MOSSER | TH EXPLORATION LLC | 1/8+ | 944 445 | N/A |
| 10*21093 | 9-11-12 | L | DUNCAN S LINN AND POLLY LU BROWN | TH EXPLORATION LLC | 1/8+ | 952 157 | N/A |
| 10*21492 | 9-11-12 | L | JUDITH FISK | TH EXPLORATION LLC | 1/8+ | 957 282 | N/A |
| 10*21494 | 9-11-12 | L | EILEEN M SLATE AND DALE A SLATE | TH EXPLORATION LLC | 1/8+ | 957 284 | N/A |

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| 10*21495 | 9-11-12 | L | E JEN BAIRD AND GEORGE S BAIRD AMENDED REVOCABLE TRUST AGREEMENT | TH EXPLORATION LLC | 1/8+ | 966 618 | N/A |
| 10*21843 | 9-11-12 | L | JOHN B HOAGLAND AND PATRICIA A HOAGLAND | TH EXPLORATION LLC | 1/8+ | 959 620 | N/A |
| 10*21923 | 9-11-12 | L | DOROTHY JEAN BURKLE BOYD | TH EXPLORATION LLC | 1/8+ | 953 468 | N/A |
| 10*22090 | 9-11-12 | L | KATHERINE ANN BOYD BLAKE | TH EXPLORATION LLC | 1/8+ | 953 473 | N/A |
| 10*22153 | 9-11-12 | L | JODY A SCHOTTLER AND THOMAS A SCHOTTLER | TH EXPLORATION LLC | 1/8+ | 953 470 | N/A |
| 10*22462 | 9-11-12 | L | ROBERT CALDWELL MEAD | TH EXPLORATION LLC | 1/8+ | 964 490 | N/A |
| 10*22608 | 9-11-12 | L | SARAH BAIRD LINN | TH EXPLORATION LLC | 1/8+ | 966 620 | N/A |
| 10*22666 | 9-11-12 | L | JOSEPH W LINN JR AND TAMMY S LINN | TH EXPLORATION LLC | 1/8+ | 968 230 | N/A |
| 10*22771 | 9-11-12 | L | KATHARINE B SILBAUGH AND DANIEL JURAYJ | TH EXPLORATION LLC | 1/8+ | 970 24 | N/A |
| 10*22855 | 9-11-12 | L | KIM O MAGHAN AND JAMES G MAGHAN | TH EXPLORATION LLC | 1/8+ | 977 49 | N/A |

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| 10*23024 | 9-11-12 | L | KATHRYN A TAGGART AND EVERETT TAGGART JR | TH EXPLORATION LLC | 1/8+ | 977 289 | N/A |
| 10*23059 | 9-11-12 | L | GAIL W STEWART | TH EXPLORATION LLC | 1/8+ | 977 287 | N/A |
| 10*23165 | 9-11-12 | L | EDITH BOYD ORR AND WENDELL FRANKLIN ORR | TH EXPLORATION LLC | 1/8+ | 984 68 | N/A |
| 10*23389 | 9-11-12 | L | LEESA O THOMPSON | TH EXPLORATION LLC | 1/8+ | 972 45 | N/A |
| 10*23427 | 9-11-12 | L | SANDY VINCENT AND STEVEN VINCENT | TH EXPLORATION LLC | 1/8+ | 1008 307 | N/A |
| 10*23652 | 9-11-12 | L | KATHARINE ATWOOD AND MICHAEL GRITTON | TH EXPLORATION LLC | 1/8+ | 1009 291 | N/A |
| 10*23686 | 9-11-12 | L | RANDALL T ULLOM AND ROSALIE FERMO-ULLOM | TH EXPLORATION LLC | 1/8+ | 1010 400 | N/A |
| 10*23687 | 9-11-12 | L | ELIZABETH F BAIRD | TH EXPLORATION LLC | 1/8+ | 1010 402 | N/A |
| 10*23688 | 9-11-12 | L | MELISSA DUBOIS BAIRD | TH EXPLORATION LLC | 1/8+ | 1010 404 | N/A |
| 10*23692 | 9-11-12 | L | WILLIAM ATWOOD AND ELIZABETH ATWOOD | TH EXPLORATION LLC | 1/8+ | 1010 408 | N/A |

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| 10*23693 | 9-11-12 | L | JOHN ATWOOD AND ANNETTE ATWOOD | TH EXPLORATION LLC | 1/8+ | 1010 406 | N/A |
| 10*24222 | 9-11-12 | L | SALVATION ARMY | TH EXPLORATION LLC | 1/8+ | 1022 371 | N/A |
| 10*24282 | 9-11-12 | L | CLARA OSBORNE DOUGLAS | TH EXPLORATION LLC | 1/8+ | 1023 481 | N/A |
| 10*24296 | 9-11-12 | L | KATHARINE D LINN | TH EXPLORATION LLC | 1/8+ | 1023 522 | N/A |
| 10*24400 | 9-11-12 | L | JANE W VARDY ET AL | TH EXPLORATION LLC | 1/8+ | 1024 317 | N/A |
| 10*27947 | 9-11-12 | L | STONE HILL MINERALS HOLDINGS LLC | TH EXPLORATION LLC | 1/8+ | 1063 568 | N/A |
| 10*47051.243.1 | 9-11-2 | M | MARY A FOX | TH EXPLORATION LLC | 1/8+ | 879 332 | N/A |
| 10*47051.243.2 | 9-11-2 | M | PAUL G FOX | TH EXPLORATION LLC | 1/8+ | 879 335 | N/A |
| 10*47051.243.3 | 9-11-2 | M | MARK H FOX | TH EXPLORATION LLC | 1/8+ | 879 338 | N/A |
| 10*47051.243.4 | 9-11-2 | M | DAVID E FOX | TH EXPLORATION LLC | 1/8+ | 876 55 | N/A |

| Lease ID | Parcel | Tag | Grantor, Lessor, Etc | Grantee, Lessee, Etc. | Royalty | Deed Book/Page | | Assignment |
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| 10*47051.243.5 | 9-11-2 | M | LOUIS T FOX AND KAREN A FOX | TH EXPLORATION LLC | 1/8+ | 876 | 58 | N/A |
| 10*47051.243.6 | 9-11-2 | M | THOMAS J FOX | TH EXPLORATION LLC | 1/8+ | 876 | 61 | N/A |

PARTIAL ASSIGNMENT OF OIL AND GAS LEASES

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

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

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

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

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Office of Oil and Gas
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WV Department of
Environmental Protection

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "*Assignment*") is from STATOIL USA ONSHORE PROPERTIES INC., a Delaware corporation ("*Assignor*"), to TH Exploration, LLC, a Texas limited liability company ("*Assignee*"), and is executed on August 22, 2016 (the "*Effective Date*"). Assignor and Assignee may be referred to herein collectively as the "*Parties*," or individually as a "*Party*." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated June 19, 2016 (the "*Acreage Trade Agreement*").

ARTICLE 1 ASSIGNMENT OF ASSETS

Section 1.1 Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on Exhibit A attached hereto (the "*Leases*") INSOFAR AND ONLY INSOFAR as they cover the Target Formations and INSOFAR AND ONLY INSOFAR as they cover those lands described on Exhibit A (the "*Leasehold Rights*") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "*Conveyed Assets*"). Assignor does hereby reserve unto itself the right and subsurface easement to drill through the Leasehold Rights to access the those depths and formations in the Leases other than the Target Formations and (y) to shoot seismic, sonic, or other energy or waves through the Leasehold Rights and to receive, record and evaluate such energy or waves, including those reflected from or in any way pertaining to the reserved depths, and to utilize any and all other exploration technologies that image the subsurface of the leasehold including the reserved depths and to receive, record and evaluate all images resulting therefrom.

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

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

ARTICLE 2 SPECIAL WARRANTY OF TITLE AND DISCLAIMERS

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

Section 2.2 Disclaimers of Warranties and Representations.

(a) EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN SECTION VI OF THE ACREAGE TRADE AGREEMENT OR THIS ASSIGNMENT, ASSIGNOR MAKES NO, AND HEREBY EXPRESSLY DISCLAIMS, ANY REPRESENTATION OR WARRANTY, EXPRESS, IMPLIED OR STATUTORY, INCLUDING AS TO (I) TITLE TO THE LEASEHOLD RIGHTS, (II) THE CONTENTS, CHARACTER OR NATURE OF ANY

STATE OF WEST VIRGINIA §
§
COUNTY OF MARSHALL §

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 18th day of May, 2018, and made effective December 12, 2017 (the "Effective Date"), by and between **AMERICAN PETROLEUM PARTNERS OPERATING, LLC**, (hereinafter "Assignor") and **TH EXPLORATION, LLC** (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated December 12, 2017 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

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

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

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

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

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

2. Special Warranty. Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the

Marshall County
Jan Pest, Clerk
Instrument 1440860
05/25/2018 @ 02:36:09 PM
ASSIGNMENTS
Book 42 @ Page 109
Pages Recorded 9
Recording Cost \$ 15.00

WI-AGIR-0009

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



March 5, 2021

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

RE: Keith Stern N-2HM

Subject: Marshall County Route 74 and Route 21 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 74 and Route 21 in the area reflected on the Keith Stern N-2HM well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

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

Sincerely,

Amy L. Morris
Permitting Specialist - Appalachia



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

Date of Notice Certification: 03/05/2021

API No. 47- 051 - _____
Operator's Well No. Keith Stern N-1HM
Well Pad Name: Keith Stern

Notice has been given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>526,365.94</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,817.48</u>
District:	<u>Meade</u>	Public Road Access:	<u>Fish Creek Road (CR 74)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>TH Exploration, LLC</u>	
Watershed:	<u>Fish Creek (HUC 10)</u>			

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

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p>OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p>
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MAR 09 2021
WV Department of
Environmental Protection

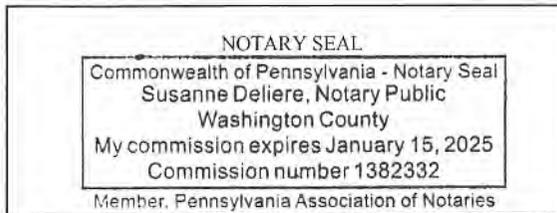
Required Attachments:

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

Certification of Notice is hereby given:

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

Well Operator:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Boulevard, Plaza II, Suite 200</u>
By:	<u>Amy L. Morris <i>Amy Morris</i></u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Permitting Specialist - Appalachia Region</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>724-749-8388</u>	Email:	<u>amorris@tug-hillop.com</u>



Subscribed and sworn before me this 5th day of March 2021
Susanne Deliere Notary Public
 My Commission Expires 1/15/2025

Oil and Gas Privacy Notice:

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

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

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

Date of Notice: 2/24/2021 Date Permit Application Filed: 2/25/2021

Notice of:

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

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

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

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

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

SURFACE OWNER(s)

Name: TH Exploration, LLC (Access Road and Well Pad)
Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15318

Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)

Name: _____
Address: _____

Name: _____
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)

Name: _____
Address: _____

COAL OWNER OR LESSEE

Name: CONSOL Energy, Inc. Attn: Casey Saunders
Address: 1000 CONSOL Energy Drive
Canonsburg, PA 15317

COAL OPERATOR
Name: _____
Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)

Name: *See attached list
Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: _____
Address: _____

*Please attach additional forms if necessary

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MAR 09 2021

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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Environmental Protection

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

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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WW-6A
(8-13)

API NO. 47-051 - 02313
OPERATOR WELL NO. see attached list
Well Pad Name: Kelth Stern

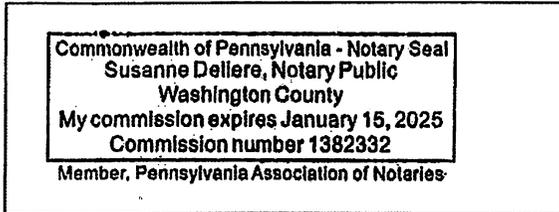
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 23rd day of February, 2021
Susanne Dellere Notary Public
My Commission Expires 1/15/2025

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WV Department of
Environmental Protection

04/16/2021

4705702373

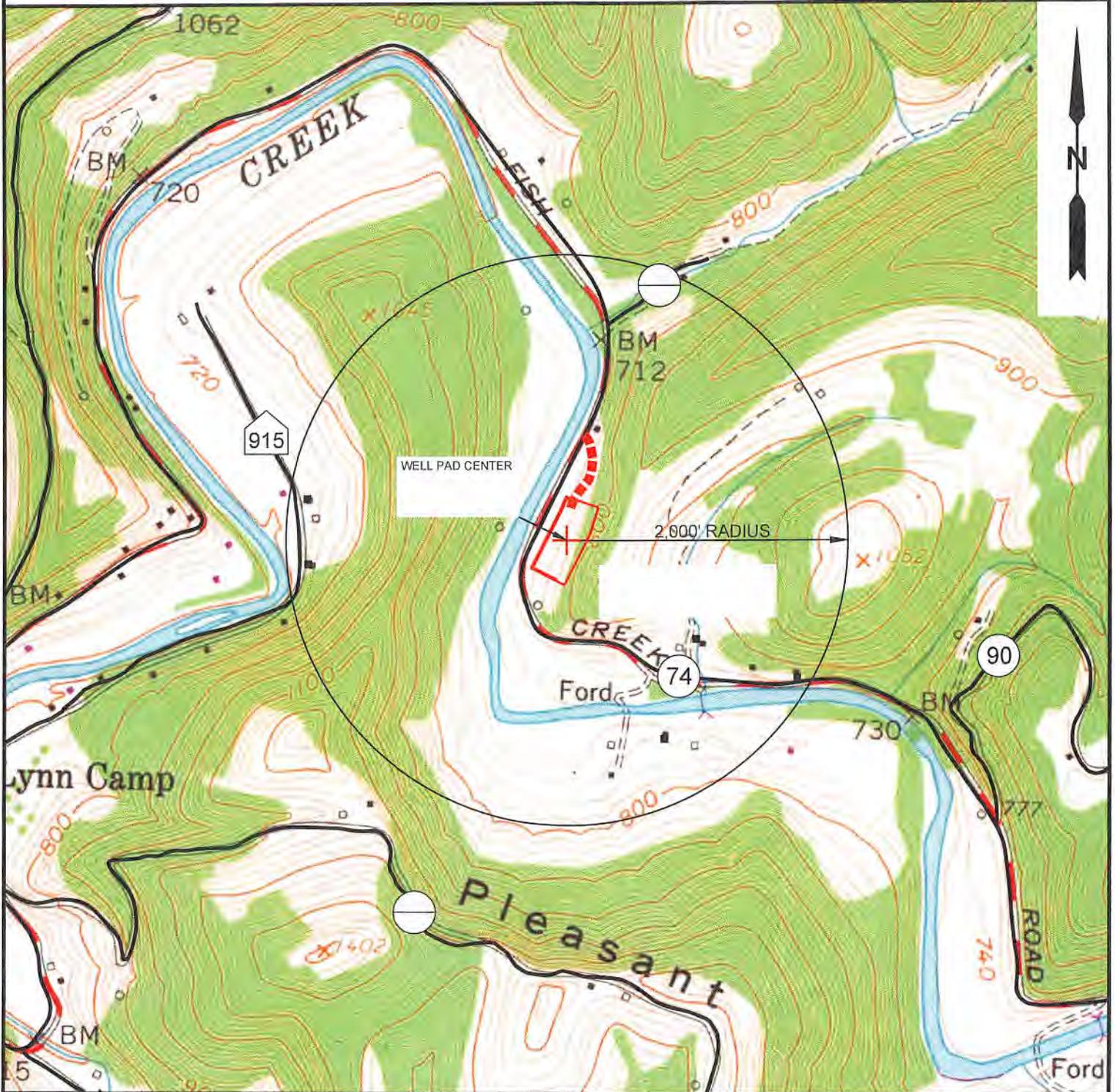
**WW-6A Notice of Application
Well Number Attachment**

- Keith Stern N-1HM
- Keith Stern N-2HM
- Keith Stern N-3HM
- Keith Stern N-4HM
- Keith Stern N-5HM
- Keith Stern N-6HM (47-051-02098)
- Keith Stern N-7HM (47-051-02101)
- Keith Stern S-8HM (47-051-02103)
- Keith Stern S-9HM (47-051-02102)
- Keith Stern S-10HM (47-051-02105)
- Keith Stern S-12HM (47-051-02104)

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4705102373

PROPOSED KEITH STERN N - 2HM



NOTE: THERE APPEARS TO BE FIVE (5) POSSIBLE WATER SOURCES WITHIN 2,000'.



17 Ventnor Drive | PO Box 150 | Glenville, WV 26031 | 304.482.5634
 1412 Kanawha Boulevard East | Charleston, WV 25301 | 304.346.1953
 234 East Beckley Bypass | Beckley, WV 25801 | 304.255.5238
 slswv.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	MEADE		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8811	08/24/2020	1" = 1000'



TUG HILL
OPERATING

04/16/2021

Exhibit WW-6A**Supplement Pg. 1A**

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

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

Well: KEITH STERN N – 2HM
 District: Meade (House #'s 1-5)
 State: WV

There are five (5) residences, no businesses, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

<p>House 1 TM 14 Pcl. 20 William K. Stern, Et Ux Phone: 304-843-1478 (Per Address – Keith, Betty & Ginger Sue Stern) Physical Address: 14912 Fish Creek Rd. Glen Easton, WV 26039 Tax Address: Same</p>	<p>House 2 TM 14 Pcl. 20.1 William K. Stern, Et Ux Phone: 304-843-1478 (Per Address – Keith, Betty & Ginger Sue Stern) Physical Address: 15056 Fish Creek Rd. Glen Easton, WV 26039 Tax Address: 14912 Fish Creek Rd. Glen Easton, WV 26039</p>	<p>House 3 TM 14 Pcl. 21 Eleanore M. Fox Est. Phone: 304-845-6016 (Per Tax Address – Thomas Fox) Physical Address: None Found – Appears to be an old home. Tax Address: 100 Lynn Camp Ln. Glen Easton, WV 26039-9707</p>
<p>House 4 TM 14 Pcl. 27 Patrick J. Shellhase Phone: 304-845-0742; 304-810-0258 Physical Address: 593 Crow Dr. Glen Easton, WV 26039 Tax Address: 2300 7th St. Moundsville, WV 26041</p>	<p>House 5 TM 14 Pcl. 25 Patricia A. Dugas Phone: None Found Physical Address: 681 Crow Dr. Glen Easton, WV 26039 Tax Address: Same</p>	

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 WV Department of
 Environmental Protection

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

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

Date of Notice: 12/11/17 **Date of Planned Entry:** 12/18/17

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

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

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

Notice is hereby provided to:

SURFACE OWNER(S) ✓

Name: TH Exploration, LLC (Access Road and Well Pad)

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15318

Name: _____

Address: _____

Name: _____

Address: _____

COAL OWNER OR LESSEE ✓

Name: Consol Energy, Inc.

Address: CNX Center, 1000 Consol Energy Drive
Canonsburg, PA 15317

MINERAL OWNER(S) ✓

Name: William K. and Betty L. Stern

Address: 14912 Fish Creek Road
Glen Easton, WV 26039

*please attach additional forms if necessary

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Notice is hereby given:

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

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>39.7748867; -80.6920362</u>
County: <u>Marshall</u>	Public Road Access: <u>Fish Creek Road (County Route 74)</u>
District: <u>Meade</u>	Watershed: <u>Fish Creek (HUC 10)</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>TH Exploration, LLC</u>

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

Notice is hereby given by:

Well Operator: <u>Tug Hill Operating, LLC</u>	Address: <u>380 Southpointe Boulevard, Plaza II, Suite 200</u>
Telephone: <u>724-749-8388</u>	<u>Canonsburg, PA 15317</u>
Email: <u>amiller@tug-hillop.com</u>	Facsimile: <u>724-338-2030</u>

Oil and Gas Privacy Notice:

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

WW-6A5
(1/12)

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

Notice Time Requirement: notice shall be provided no later than the **filing date of permit application.**
Date of Notice: 02/24/2021 **Date Permit Application Filed:** 03/08/2021

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

- CERTIFIED MAIL RETURN RECEIPT REQUESTED
- HAND DELIVERY

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

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Office of Oil and Gas

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

MAR 09 2021

Name: TH Exploration, LLC
Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15318

Name: _____
Address: _____
WV Department of Environmental Protection

Notice is hereby given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>526,367.55</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,820.76</u>
District:	<u>Meade</u>	Public Road Access:	<u>Fish Creek Road (County Route 74)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>TH Exploration, LLC</u>	
Watershed:	<u>Fish Creek (HUC 10)</u>			

This Notice Shall Include:

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

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

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

Oil and Gas Privacy Notice:

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



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Byrd E. White, III
Secretary of Transportation

August 20, 2020

Jimmy Wriston, P. E.
Deputy Secretary/
Acting Commissioner

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

Subject: DOH Permit for the Keith Stern Pad, Marshall County
Keith Stern N-2HM Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2018-0068 issued to Tug Hill Operating for access to the State Road for a well site located off Marshall County Route 74 SLS.

This operator is in compliance with §22-6A-20 of the WV Code. Operator has signed a STATEWIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated October 1, 2018.

Very Truly Yours,

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

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Environmental Protection

Cc: Amy Morris
Tug Hill Operating
CH, OM, D-6
File



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Keith Stern Wells

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

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WEST VIRGINIA COUNTY MAP



**WVDEP OOG
ACCEPTED AS-BUILT**

WV 7/7/2020

Keith Stern Well Site
Site Design, Construction Plan, &
Erosion and Sediment Control Plans
Tug Hill Operating
Marshall County
Meade District
Latitude 39.77487986°
Longitude -80.69201248°
Middle Fish Creek Watershed

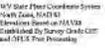
Pertinent Site Information
Keith Stern Well Site
Emergency Number: 504-645-1970
Meade District, Marshall County, WV
Watershed: Middle Fish Creek Watershed
Site 911 Address

Tug Hill Contact Number: 1-817-632-3400

Property Owner Information - Keith Stern Well Site

Owner	Address	City	County	State	Zip	Phone	Fax
Tug Hill Operating, LLC	12345 Main St	Marshall	Marshall	WV	24501	304-261-1234	304-261-5678

Exhibit A: As-Built



Access Road

Access Point	Start Point	End Point	Length	Notes
1	Station 1+00.00	Station 1+50.00	50.00	Gravel

Disturbed Area

Area	Length	Width	Area	Notes
1	100.00	10.00	1000.00	Gravel

Keith Stern Well Site Quantities

Item	Quantity	Unit	Notes
Gravel	1000.00	cu yd	
Asphalt	500.00	sq yd	

Well ID	Coordinates (Easting, Northing)	Depth (ft)	Notes
WV-N-AD-01	100000.00, 4000000.00	100	
WV-N-AD-02	100000.00, 4000000.00	100	
WV-N-AD-03	100000.00, 4000000.00	100	
WV-N-AD-04	100000.00, 4000000.00	100	
WV-N-AD-05	100000.00, 4000000.00	100	
WV-N-AD-06	100000.00, 4000000.00	100	
WV-N-AD-07	100000.00, 4000000.00	100	
WV-N-AD-08	100000.00, 4000000.00	100	
WV-N-AD-09	100000.00, 4000000.00	100	
WV-N-AD-10	100000.00, 4000000.00	100	
WV-N-AD-11	100000.00, 4000000.00	100	
WV-N-AD-12	100000.00, 4000000.00	100	
WV-N-AD-13	100000.00, 4000000.00	100	
WV-N-AD-14	100000.00, 4000000.00	100	
WV-N-AD-15	100000.00, 4000000.00	100	
WV-N-AD-16	100000.00, 4000000.00	100	
WV-N-AD-17	100000.00, 4000000.00	100	
WV-N-AD-18	100000.00, 4000000.00	100	
WV-N-AD-19	100000.00, 4000000.00	100	
WV-N-AD-20	100000.00, 4000000.00	100	
WV-N-AD-21	100000.00, 4000000.00	100	
WV-N-AD-22	100000.00, 4000000.00	100	
WV-N-AD-23	100000.00, 4000000.00	100	
WV-N-AD-24	100000.00, 4000000.00	100	
WV-N-AD-25	100000.00, 4000000.00	100	
WV-N-AD-26	100000.00, 4000000.00	100	
WV-N-AD-27	100000.00, 4000000.00	100	
WV-N-AD-28	100000.00, 4000000.00	100	
WV-N-AD-29	100000.00, 4000000.00	100	
WV-N-AD-30	100000.00, 4000000.00	100	
WV-N-AD-31	100000.00, 4000000.00	100	
WV-N-AD-32	100000.00, 4000000.00	100	
WV-N-AD-33	100000.00, 4000000.00	100	
WV-N-AD-34	100000.00, 4000000.00	100	
WV-N-AD-35	100000.00, 4000000.00	100	
WV-N-AD-36	100000.00, 4000000.00	100	
WV-N-AD-37	100000.00, 4000000.00	100	
WV-N-AD-38	100000.00, 4000000.00	100	
WV-N-AD-39	100000.00, 4000000.00	100	
WV-N-AD-40	100000.00, 4000000.00	100	
WV-N-AD-41	100000.00, 4000000.00	100	
WV-N-AD-42	100000.00, 4000000.00	100	
WV-N-AD-43	100000.00, 4000000.00	100	
WV-N-AD-44	100000.00, 4000000.00	100	
WV-N-AD-45	100000.00, 4000000.00	100	
WV-N-AD-46	100000.00, 4000000.00	100	
WV-N-AD-47	100000.00, 4000000.00	100	
WV-N-AD-48	100000.00, 4000000.00	100	
WV-N-AD-49	100000.00, 4000000.00	100	
WV-N-AD-50	100000.00, 4000000.00	100	
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WV-N-AD-65	100000.00, 4000000.00	100	
WV-N-AD-66	100000.00, 4000000.00	100	
WV-N-AD-67	100000.00, 4000000.00	100	
WV-N-AD-68	100000.00, 4000000.00	100	
WV-N-AD-69	100000.00, 4000000.00	100	
WV-N-AD-70	100000.00, 4000000.00	100	
WV-N-AD-71	100000.00, 4000000.00	100	
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WV-N-AD-83	100000.00, 4000000.00	100	
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WV-N-AD-85	100000.00, 4000000.00	100	
WV-N-AD-86	100000.00, 4000000.00	100	
WV-N-AD-87	100000.00, 4000000.00	100	
WV-N-AD-88	100000.00, 4000000.00	100	
WV-N-AD-89	100000.00, 4000000.00	100	
WV-N-AD-90	100000.00, 4000000.00	100	
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WV-N-AD-94	100000.00, 4000000.00	100	
WV-N-AD-95	100000.00, 4000000.00	100	
WV-N-AD-96	100000.00, 4000000.00	100	
WV-N-AD-97	100000.00, 4000000.00	100	
WV-N-AD-98	100000.00, 4000000.00	100	
WV-N-AD-99	100000.00, 4000000.00	100	
WV-N-AD-100	100000.00, 4000000.00	100	

6/22/2020

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WV Department of
Environmental Protection

TUG HILL



Keith Stern Well Site

Meade District
Marshall County, WV

USGS 7.5' Quadrangle: Gita Estate
Watershed: Middle Fish Creek

Site Location (OAD 27)	Coordinates (Easting, Northing)
1	100000.00, 4000000.00
2	100000.00, 4000000.00
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