



west virginia department of environmental protection

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

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

Tuesday, October 22, 2019
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit approval for KEITH STERN S-19HU
47-051-02244-00-00

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

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

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

James A. Martin
Chief

Operator's Well Number: KEITH STERN S-19HU
Farm Name: TH EXPLORATION, LLC
U.S. WELL NUMBER: 47-051-02244-00-00
Horizontal 6A New Drill
Date Issued: 10/22/2019

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.

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.



west virginia department of environmental protection

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

Barry K. Lay, Chairman
dep.wv.gov

September 17, 2019

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

RE: Application for Deep Well Permit – API #47-051-02244

COMPANY: Tug Hill Operating, LLC

FARM: TH Exploration, LLC Keith Stern S-19HU

COUNTY: Marshall DISTRICT: Meade QUAD: Glen Easton

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

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

1. Comments to Notice of Deviation filed? No
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners? Yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells: **yes; Docket 285-281 Exception Location Hearing
4. Provided a plat showing that the proposed location is a distance of 400 feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Susan Rose
Administrator

****Ten High 1S-14HU 47-051-01966; Heaven Hill 3-6HU 47-051-01968; Heaven Hill 3-7HU 47-051-01969; Heaven Hill 3-8HU 47-051-01967; Heaven Hill 3N-10HU 47-051-02016; Heaven Hill 2-6HU 47-051-01910; Heaven Hill 2-7HU 47-051-01911; Heaven Hill 2-8HU 47-051-01912; Heaven Hill 2W-12HU 47-051-01952; Heaven Hill 2W-13HU 47-051-01957; Keith Stern N-14HU 47-051-02252; Keith Stern N-15HU 47-051-02241; Keith Stern N-16HU 47-051-02242; Keith Stern S-18HU 47-051-02243; OE Burge U MSH 501H 47-051-01853**

WW-6B
(04/15)

API NO. 47-051 -
OPERATOR WELL NO. Keith Stern S-19HU
Well Pad Name: Keith Stern

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 S-19HU 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: 741.50' Elevation, proposed post-construction: 744.65'

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

(b) If Gas Shallow _____ Deep _____
Horizontal _____

6) Existing Pad: Yes or No No

JS
5/11/19

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Point Pleasant is the target formation at a depth of 11,132' - 11,254' - thickness of 122' and anticipated pressure of approx. 9500 psi.

8) Proposed Total Vertical Depth: 11,404'

9) Formation at Total Vertical Depth: Trenton

10) Proposed Total Measured Depth: 18,538'

11) Proposed Horizontal Leg Length: 6,723.51'

12) Approximate Fresh Water Strata Depths: 70' ; 390'

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

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 304' ; Pittsburgh Coal - 397'

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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WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. Keith Stern S-19HU
Well Pad Name: Keith Stern

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	120'	120'	259FT^3(CTS)
Fresh Water	20"	NEW	J55	106.5#	490'	490'	846 FT^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2200'	2200'	1,559FT^3(CTS)
Intermediate	9 5/8"	NEW	HPP110	47#	10,162'	10,162'	3,292FT^3(CTS)
Production	5 1/2"	NEW	P110	23#	18,538'	18,538'	4,419FT^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		11,451'	
Liners							

5/11/19

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

PACKERS

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

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WW-6B
(10/14)

API NO. 47-051 -

OPERATOR WELL NO. Keith Stern S-19HU

Well Pad Name: Keith Stern

JS
5/11/19

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

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

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

Well to be completed with approximately 16,805,000 lb proppant and 259,818 bbl of water. Max rate = 80 bpm; max psi = 12,000#.

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

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

*See Attachment

25) Proposed borehole conditioning procedures:

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

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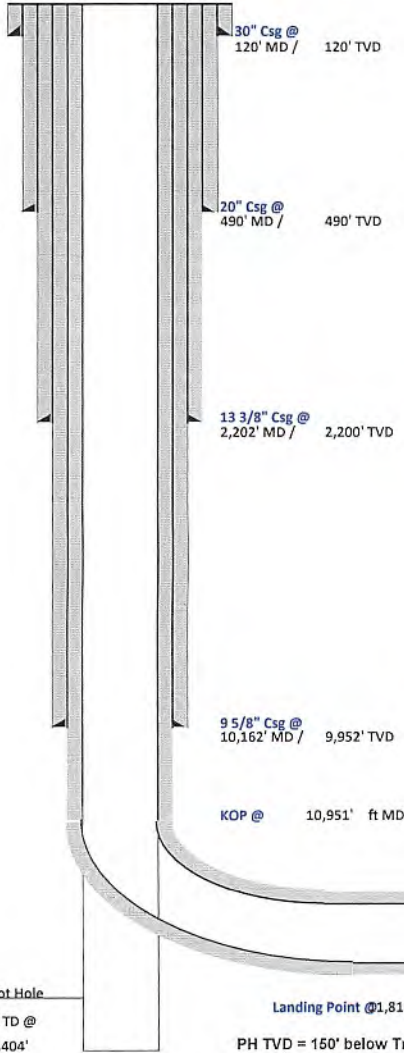
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*Note: Attach additional sheets as needed.



WELL NAME: Keith Stern S-19HU
 STATE: WV COUNTY: Marshall
 DISTRICT: Meade
 DF Elev: 744' GL Elev: 744'
 TD: 18,538'
 TH Latitude: 39.77483004
 TH Longitude: -80.69208048
 BH Latitude: 39.756931
 BH Longitude: 80.674059



FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	390'
Sewickley Coal	304'
Pittsburgh Coal	397'
Big Lime	1,611'
Berea	2,116'
Tully	6,137'
Marcellus	6,242'
Onondaga	6,293'
Salina	7,018'
Lockport	8,071'
Utica	10,828'
Point Pleasant	11,132'
Landing Depth	11,187'
Trenton	11,254'
Pilot Hole TD	11,404'

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cemen
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	26	20	490'	490'	106.5	J55	Surface
Intermediate 1	17 1/2	13 3/8	2,202'	2,200'	54.5	J55	Surface
Intermediate 2	12 1/4	9 5/8	10,162'	9,952'	47	HPP110	Surface
Production	8 1/2	5 1/2	18,538'	11,304'	23	HCP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	908	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	1,690	A	15	Air	1 Centralizer every other jt
Intermediate 2	2,826	A	14.5	Air	1 Centralizer every other jt
Production	3,879	A	15	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc

5/11/19

Pilot Hole
PH TD @
11,404'

Landing Point @ 1,816' MD / 11,187' TVD
PH TVD = 150' below Trenton Top

Lateral TD @ 18,538' ft MD
11,304' ft TVD

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4705102244



Tug Hill Operating, LLC Casing and Cement Program

Keith Stern S-19HU

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	20"	J55	26"	490'	CTS
Intermediate 1	13 3/8"	J55	17 1/2"	2,202'	CTS
Intermediate 2	9 5/8"	HPP110	12 1/4"	10,162'	CTS
Production	5 1/2"	HCP110	8 1/2"	18,538'	CTS

Cement

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

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

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

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

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

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

Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (08/06/2018) 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

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

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

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Page 1 of 6

Keith Stern S-19HU

Wells within 500' Buffer

Note: Well spots depicted on Area of Review map (page 3) are derived from State held coordinates. The spots may differ from those depicted on the Well Plat because the Plat

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation" ? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705100594	Wheeling Natural Gas	2,375' TVD	Gordon Sd	Unknown	No, the well is not deep enough to be within the expected fracture propagation from a Point Pleasant stimulation.	Well was producing as of 2017
4705100726	Hope Natural Gas Company	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents a shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	Well was producing as of 2017
4705130337	Valley Steel Products	2436' TVD	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	Well was plugged 10/30/1951
4705170728	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705170729	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705170780	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705170781	Manufacturers Light & Heat Co.	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705170784	South Penn Oil	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705170785	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705170786	Hope Natural Gas Company	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete

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WV Division of Environmental Protection
Well: County = 51 Permit = 20554
Location Information: Linn Co., WV
There is no Bottom Hole Location data for this well.
Operation Information: This well is not producing gas for this well.
Production Gas Information: A table with 12 columns (Date, Hourly Gas, etc.) and 12 rows of data.

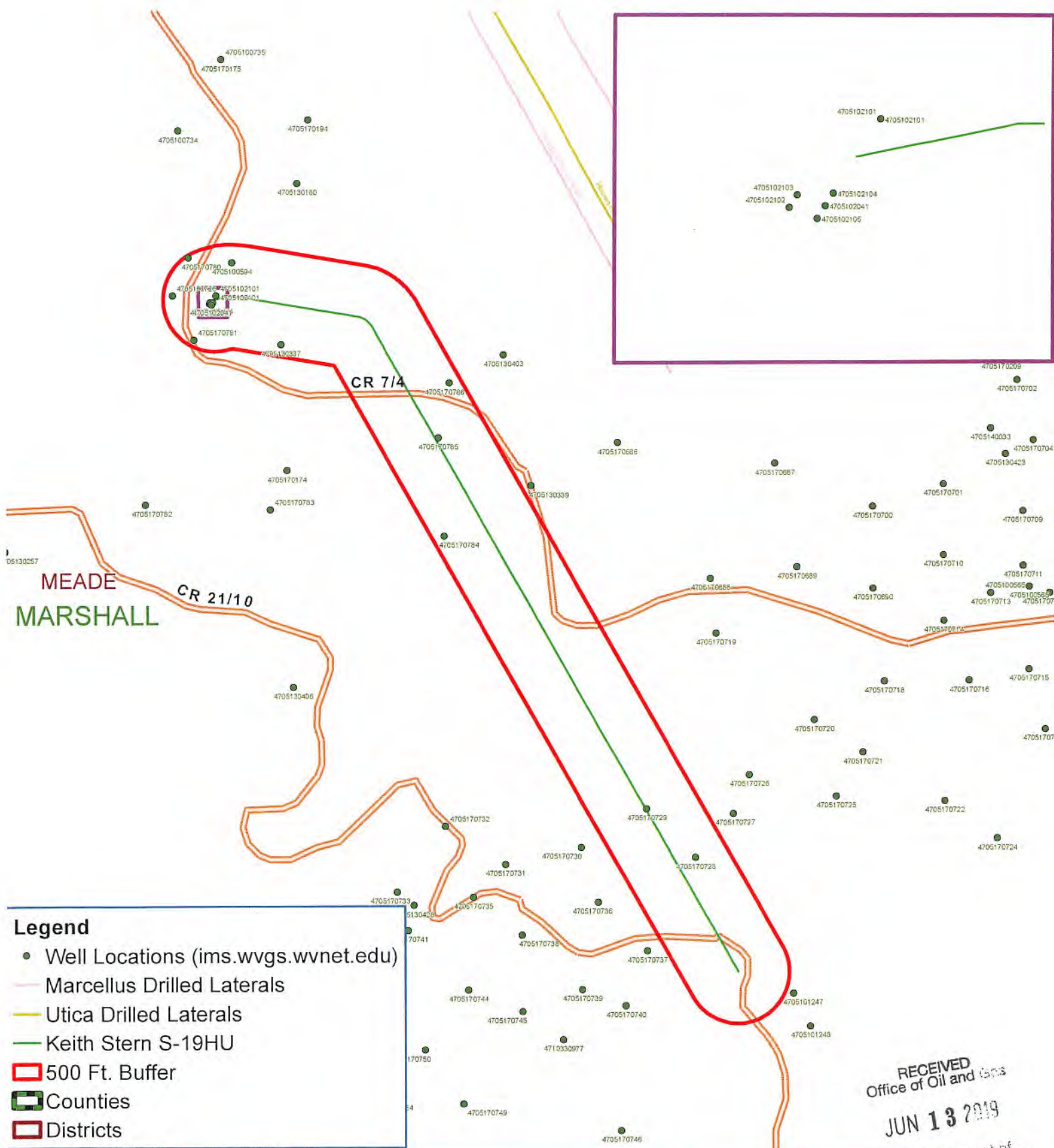
WV Division of Environmental Protection
Well: County = 51 Permit = 00735
Location Information: Boone Co., WV
There is no Bottom Hole Location data for this well.
Operation Information: This well is not producing gas for this well.
Production Gas Information: A table with 12 columns and 12 rows of data.

WV Division of Environmental Protection
Well: County = 51 Permit = 20527
Location Information: Boone Co., WV
There is no Bottom Hole Location data for this well.
Operation Information: This well is not producing gas for this well.
Production Gas Information: A table with 12 columns and 12 rows of data.

WV Division of Environmental Protection
Well: County = 51 Permit = 70722
Location Information: Boone Co., WV
There is no Bottom Hole Location data for this well.
Operation Information: This well is not producing gas for this well.
Production Gas Information: A table with 12 columns and 12 rows of data.

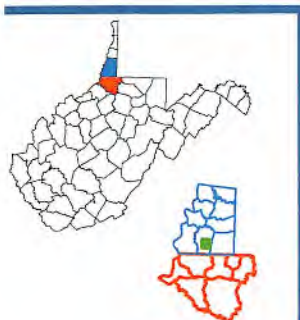
WV Division of Environmental Protection
Well: County = 51 Permit = 70720
Location Information: Boone Co., WV
There is no Bottom Hole Location data for this well.
Operation Information: This well is not producing gas for this well.
Production Gas Information: A table with 12 columns and 12 rows of data.





- Legend**
- Well Locations (ims.wvgs.wvnet.edu)
 - Marcellus Drilled Laterals
 - Utica Drilled Laterals
 - Keith Stern S-19HU
 - 500 Ft. Buffer
 - Counties
 - Districts

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Keith Stern S - 19HU Meade District Marshall County, WV



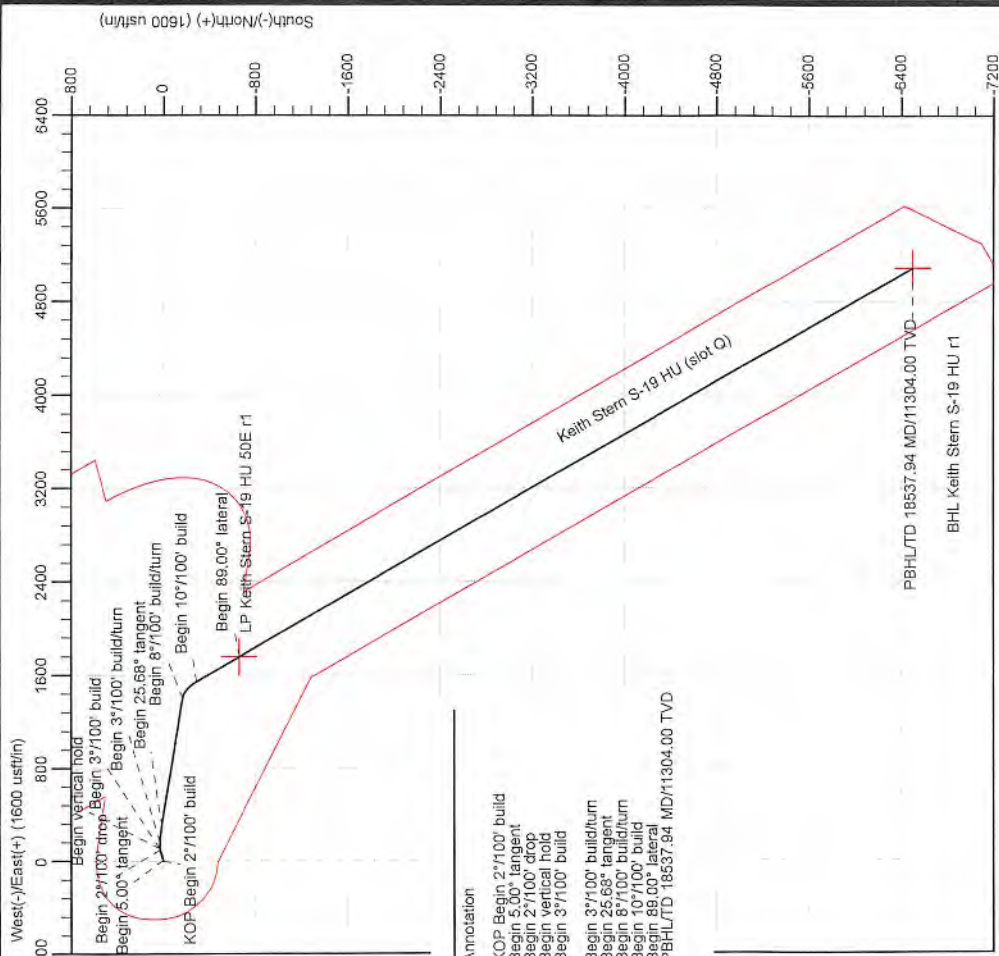
Map Created: April 9, 2019

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

4705102244

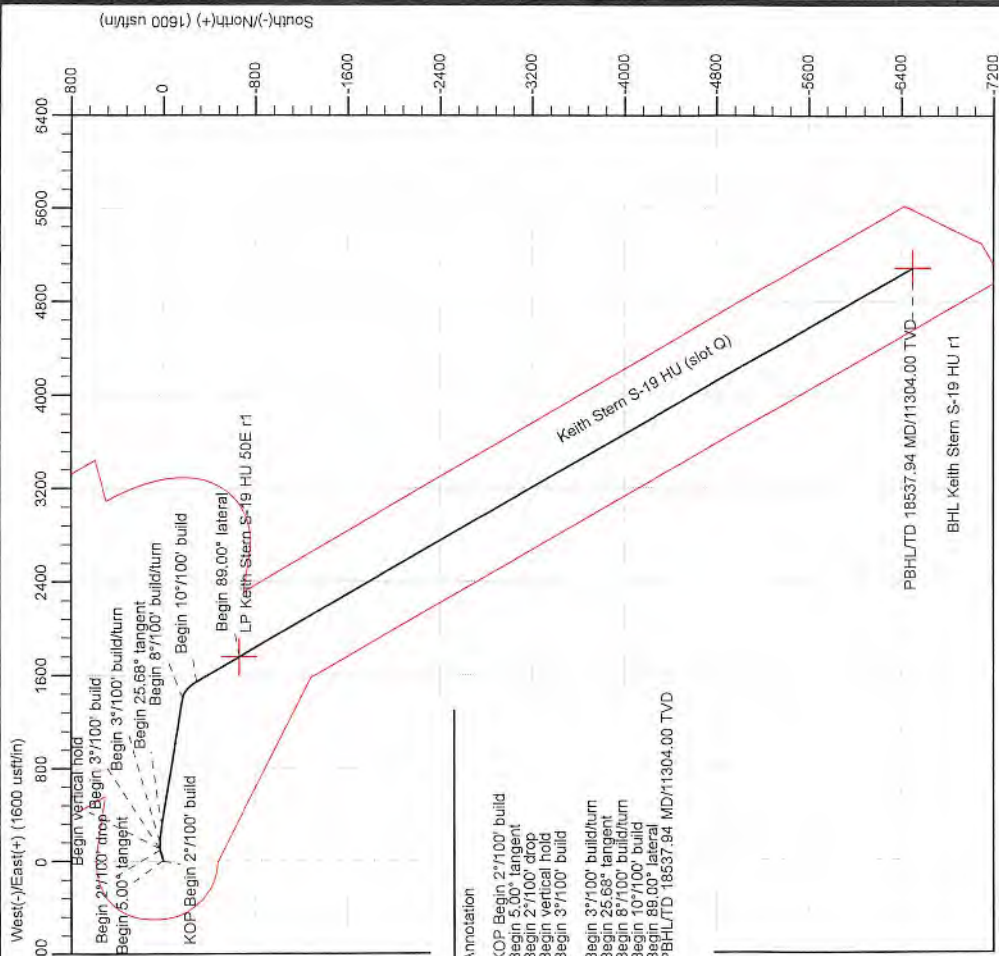


Well: Keith Stern S-19 HU (slot Q)
Site: Keith Stern
Project: Marshall County, West Virginia.
Design: rev1



SECTION DETAILS

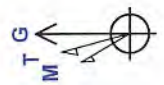
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1400.00	0.00	0.00	1400.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2'100' build
3	1650.00	5.00	75.00	1649.68	2.82	10.53	2.00	75.000	4.27	Begin 5.00' tangent
4	2700.00	5.00	75.00	2695.69	26.51	98.93	0.00	0.000	40.10	Begin 2'100' drop
5	2950.00	0.00	75.00	2945.37	29.33	109.46	2.00	190.000	44.37	Begin vertical hold
6	7504.63	0.00	75.00	7500.00	29.33	109.46	0.00	75.000	44.37	Begin 3'100' build
7	7671.30	5.00	90.00	7666.46	29.33	116.72	3.00	90.000	48.85	Begin 3'100' build/turn
8	7971.30	14.00	90.00	7962.04	29.33	186.19	3.00	0.000	79.34	Begin 25.68' tangent
9	8373.56	25.68	99.40	8339.87	15.05	301.32	3.00	19.776	173.88	Begin 8'100' build/turn
10	10950.59	25.68	99.40	10862.42	-167.25	1402.93	0.00	0.000	996.43	Begin 10'100' build/turn
11	11325.65	40.00	150.31	10982.44	-288.02	1546.09	8.00	86.175	179.13	Begin 88.00' lateral
12	11815.65	89.00	150.31	11187.00	-660.63	1795.53	10.00	0.000	163.73	Begin 10'100' build
13	18537.94	89.00	150.31	11304.00	-6499.60	9087.48	0.00	0.000	8253.92	PBHL/JTD 18537.94 MD/11304.00 TVD



Geospatial 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: 14444890.32
 Easting: 1726932.47
 Latitude: 38.77483004
 Longitude: -80.69208048

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.10°



Azimuths to Grid North
 True North: -0.20°
 Magnetic North: -8.91°
 Magnetic Field
 Strength: 52102.25nT
 Dip Angle: 66.90°
 Date: 11/02/2016
 Model: IGRF2015



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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern S-19 HU (slot Q)
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 S-19 HU (slot Q)	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 S-19 HU (slot Q)					
Well Position	+N/-S	0.00 usft	Northing:	14,444,890.33 usft	Latitude:	39.77483004
	+E/-W	0.00 usft	Easting:	1,726,932.47 usft	Longitude:	-80.69208048
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	1/18/2018	-8.713	66.896	52,102.18999238

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	141.95

Plan Survey Tool Program	Date	4/2/2019		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	18,537.94 rev1 (Original Hole)	MWD	MWD - Standard

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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern S-19 HU (slot Q)
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 S-19 HU (slot Q)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Plan Sections											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000		
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.000		
1,650.00	5.00	75.00	1,649.68	2.82	10.53	2.00	2.00	0.00	75.000		
2,700.00	5.00	75.00	2,695.69	26.51	98.93	0.00	0.00	0.00	0.000		
2,950.00	0.00	75.00	2,945.37	29.33	109.46	2.00	-2.00	0.00	180.000		
7,504.63	0.00	75.00	7,500.00	29.33	109.46	0.00	0.00	0.00	75.000		
7,671.30	5.00	90.00	7,666.46	29.33	116.72	3.00	3.00	0.00	90.000		
7,971.30	14.00	90.00	7,962.04	29.33	166.19	3.00	3.00	0.00	0.000		
8,373.56	25.68	99.40	8,339.87	15.05	301.32	3.00	2.90	2.34	19.776		
10,950.59	25.68	99.40	10,662.42	-167.25	1,402.93	0.00	0.00	0.00	0.000		
11,325.65	40.00	150.31	10,982.44	-288.02	1,546.09	8.00	3.82	13.57	86.175		
11,815.65	89.00	150.31	11,187.00	-660.63	1,758.53	10.00	10.00	0.00	0.000	LP Keith Stern S-19 F	
18,537.94	89.00	150.31	11,304.00	-6,499.60	5,087.48	0.00	0.00	0.00	0.000	BHL Keith Stern S-19	

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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern S-19 HU (slot Q)
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 S-19 HU (slot Q)	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
0.00	0.00	0.00	0.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
100.00	0.00	0.00	100.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
200.00	0.00	0.00	200.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
300.00	0.00	0.00	300.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
400.00	0.00	0.00	400.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
500.00	0.00	0.00	500.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
600.00	0.00	0.00	600.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
700.00	0.00	0.00	700.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
800.00	0.00	0.00	800.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
900.00	0.00	0.00	900.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,444,890.33	1,726,932.47	39.77483004	-80.69208048
KOP Begin 2°/100' build									
1,500.00	2.00	75.00	1,499.98	0.45	1.69	14,444,890.78	1,726,934.16	39.77483127	-80.69207448
1,600.00	4.00	75.00	1,599.83	1.81	6.74	14,444,892.13	1,726,939.21	39.77483494	-80.69205647
1,650.00	5.00	75.00	1,649.68	2.82	10.53	14,444,893.15	1,726,943.00	39.77483769	-80.69204297
Begin 5.00° tangent									
1,700.00	5.00	75.00	1,699.49	3.95	14.74	14,444,894.28	1,726,947.21	39.77484075	-80.69202798
1,800.00	5.00	75.00	1,799.11	6.21	23.16	14,444,896.53	1,726,955.63	39.77484686	-80.69199799
1,900.00	5.00	75.00	1,898.73	8.46	31.58	14,444,898.79	1,726,964.05	39.77485298	-80.69196800
2,000.00	5.00	75.00	1,998.35	10.72	39.99	14,444,901.04	1,726,972.46	39.77485909	-80.69193801
2,100.00	5.00	75.00	2,097.97	12.97	48.41	14,444,903.30	1,726,980.88	39.77486521	-80.69190802
2,200.00	5.00	75.00	2,197.59	15.23	56.83	14,444,905.55	1,726,989.30	39.77487133	-80.69187803
2,300.00	5.00	75.00	2,297.20	17.48	65.25	14,444,907.81	1,726,997.72	39.77487744	-80.69184804
2,400.00	5.00	75.00	2,396.82	19.74	73.67	14,444,910.07	1,727,006.14	39.77488356	-80.69181805
2,500.00	5.00	75.00	2,496.44	22.00	82.09	14,444,912.32	1,727,014.56	39.77488967	-80.69178806
2,599.99	5.00	75.00	2,596.06	24.25	90.51	14,444,914.58	1,727,022.98	39.77489579	-80.69175807
2,699.99	5.00	75.00	2,695.68	26.51	98.92	14,444,916.83	1,727,031.39	39.77490190	-80.69172808
2,700.00	5.00	75.00	2,695.69	26.51	98.93	14,444,916.83	1,727,031.40	39.77490190	-80.69172807
Begin 2°/100' drop									
2,799.99	3.00	75.00	2,795.43	28.31	105.66	14,444,918.64	1,727,038.13	39.77490680	-80.69170407
2,899.99	1.00	75.00	2,895.37	29.22	109.03	14,444,919.54	1,727,041.50	39.77490924	-80.69169206
2,950.00	0.00	75.00	2,945.37	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
Begin vertical hold									
2,999.99	0.00	0.00	2,995.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
3,099.99	0.00	0.00	3,095.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
3,199.99	0.00	0.00	3,195.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
3,299.99	0.00	0.00	3,295.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
3,399.99	0.00	0.00	3,395.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
3,499.99	0.00	0.00	3,495.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
3,599.99	0.00	0.00	3,595.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
3,699.99	0.00	0.00	3,695.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
3,799.99	0.00	0.00	3,795.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
3,899.99	0.00	0.00	3,895.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
3,999.99	0.00	0.00	3,995.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
4,099.99	0.00	0.00	4,095.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
4,199.99	0.00	0.00	4,195.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
4,299.99	0.00	0.00	4,295.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
4,399.99	0.00	0.00	4,395.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
4,499.99	0.00	0.00	4,495.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056
4,599.99	0.00	0.00	4,595.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056

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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern S-19 HU (slot Q)
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 S-19 HU (slot Q)	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	
4,699.99	0.00	0.00	4,695.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
4,799.99	0.00	0.00	4,795.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
4,899.99	0.00	0.00	4,895.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
4,999.99	0.00	0.00	4,995.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
5,099.99	0.00	0.00	5,095.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
5,199.99	0.00	0.00	5,195.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
5,299.99	0.00	0.00	5,295.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
5,399.99	0.00	0.00	5,395.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
5,499.99	0.00	0.00	5,495.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
5,599.99	0.00	0.00	5,595.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
5,699.99	0.00	0.00	5,695.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
5,799.99	0.00	0.00	5,795.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
5,899.99	0.00	0.00	5,895.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
5,999.99	0.00	0.00	5,995.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
6,099.99	0.00	0.00	6,095.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
6,199.99	0.00	0.00	6,195.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
6,299.99	0.00	0.00	6,295.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
6,399.99	0.00	0.00	6,395.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
6,499.99	0.00	0.00	6,495.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
6,599.99	0.00	0.00	6,595.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
6,699.99	0.00	0.00	6,695.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
6,799.99	0.00	0.00	6,795.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
6,899.99	0.00	0.00	6,895.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
6,999.99	0.00	0.00	6,995.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
7,099.99	0.00	0.00	7,095.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
7,199.99	0.00	0.00	7,195.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
7,299.99	0.00	0.00	7,295.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
7,399.99	0.00	0.00	7,395.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
7,499.99	0.00	0.00	7,495.36	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
7,504.63	0.00	0.00	7,500.00	29.33	109.46	14,444,919.65	1,727,041.93	39.77490955	-80.69169056	
Begin 3°/100' build										
7,599.98	2.86	90.00	7,595.32	29.33	111.84	14,444,919.65	1,727,044.30	39.77490953	-80.69168209	
7,671.30	5.00	90.00	7,666.46	29.33	116.72	14,444,919.65	1,727,049.19	39.77490948	-80.69166470	
7,699.98	5.86	90.00	7,695.01	29.33	119.44	14,444,919.65	1,727,051.91	39.77490946	-80.69165503	
7,799.98	8.86	90.00	7,794.18	29.33	132.25	14,444,919.65	1,727,064.72	39.77490934	-80.69160944	
7,899.98	11.86	90.00	7,892.54	29.33	150.23	14,444,919.65	1,727,082.70	39.77490917	-80.69154544	
7,971.30	14.00	90.00	7,962.04	29.33	166.19	14,444,919.65	1,727,098.66	39.77490901	-80.69148865	
Begin 3°/100' build/turn										
7,999.98	14.81	91.14	7,989.82	29.26	173.32	14,444,919.58	1,727,105.79	39.77490875	-80.69146326	
8,099.98	17.68	94.30	8,085.82	27.86	201.25	14,444,918.19	1,727,133.72	39.77490466	-80.69136387	
8,199.98	20.58	96.60	8,180.29	24.70	233.86	14,444,915.03	1,727,166.33	39.77489567	-80.69124784	
8,299.98	23.51	98.35	8,272.97	19.78	271.07	14,444,910.11	1,727,203.54	39.77488181	-80.69111548	
8,373.56	25.68	99.40	8,339.86	15.05	301.32	14,444,905.37	1,727,233.79	39.77486852	-80.69100787	
Begin 25.68° tangent										
8,399.98	25.68	99.40	8,363.68	13.18	312.62	14,444,903.50	1,727,245.09	39.77486328	-80.69096769	
8,499.98	25.68	99.40	8,453.80	6.10	355.36	14,444,896.43	1,727,287.83	39.77484344	-80.69081564	
8,599.98	25.68	99.40	8,543.93	-0.97	398.11	14,444,889.36	1,727,330.58	39.77482361	-80.69066359	
8,699.98	25.68	99.40	8,634.05	-8.04	440.86	14,444,882.28	1,727,373.33	39.77480378	-80.69051153	
8,799.98	25.68	99.40	8,724.18	-15.12	483.61	14,444,875.21	1,727,416.08	39.77478395	-80.69035948	
8,899.98	25.68	99.40	8,814.30	-22.19	526.35	14,444,868.14	1,727,458.82	39.77476411	-80.69020743	
8,999.98	25.68	99.40	8,904.43	-29.27	569.10	14,444,861.06	1,727,501.57	39.77474428	-80.69005537	
9,099.98	25.68	99.40	8,994.56	-36.34	611.85	14,444,853.99	1,727,544.32	39.77472445	-80.68990332	
9,199.98	25.68	99.40	9,084.68	-43.41	654.60	14,444,846.91	1,727,587.07	39.77470461	-80.68975127	
9,299.98	25.68	99.40	9,174.81	-50.49	697.34	14,444,839.84	1,727,629.81	39.77468478	-80.68959922	

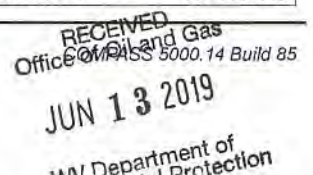
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WV Department of Environmental Protection



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern S-19 HU (slot Q)
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 S-19 HU (slot Q)	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	
9,399.98	25.68	99.40	9,264.93	-57.56	740.09	14,444,832.77	1,727,672.56	39.77466495	-80.68944716	
9,499.98	25.68	99.40	9,355.06	-64.63	782.84	14,444,825.69	1,727,715.31	39.77464511	-80.68929511	
9,599.98	25.68	99.40	9,445.18	-71.71	825.58	14,444,818.62	1,727,758.05	39.77462528	-80.68914306	
9,699.98	25.68	99.40	9,535.31	-78.78	868.33	14,444,811.54	1,727,800.80	39.77460544	-80.68899101	
9,799.98	25.68	99.40	9,625.43	-85.86	911.08	14,444,804.47	1,727,843.55	39.77458561	-80.68883896	
9,899.98	25.68	99.40	9,715.56	-92.93	953.83	14,444,797.40	1,727,886.30	39.77456577	-80.68868690	
9,999.98	25.68	99.40	9,805.68	-100.00	996.57	14,444,790.32	1,727,929.04	39.77454594	-80.68853485	
10,099.98	25.68	99.40	9,895.81	-107.08	1,039.32	14,444,783.25	1,727,971.79	39.77452610	-80.68838280	
10,199.98	25.68	99.40	9,985.94	-114.15	1,082.07	14,444,776.17	1,728,014.54	39.77442627	-80.68823075	
10,299.98	25.68	99.40	10,076.06	-121.23	1,124.81	14,444,769.10	1,728,057.28	39.77448843	-80.68807870	
10,399.98	25.68	99.40	10,166.19	-128.30	1,167.56	14,444,762.03	1,728,100.03	39.77446660	-80.68792664	
10,499.98	25.68	99.40	10,256.31	-135.37	1,210.31	14,444,754.95	1,728,142.78	39.77444676	-80.68777459	
10,599.98	25.68	99.40	10,346.44	-142.45	1,253.06	14,444,747.88	1,728,185.53	39.77442692	-80.68762254	
10,699.98	25.68	99.40	10,436.56	-149.52	1,295.80	14,444,740.80	1,728,228.27	39.77440709	-80.68747049	
10,799.98	25.68	99.40	10,526.69	-156.60	1,338.55	14,444,733.73	1,728,271.02	39.77438725	-80.68731844	
10,899.98	25.68	99.40	10,616.81	-163.67	1,381.30	14,444,726.66	1,728,313.77	39.77436741	-80.68716639	
10,950.59	25.68	99.40	10,662.43	-167.25	1,402.93	14,444,723.08	1,728,335.40	39.77435737	-80.68708943	
Begin 8°/100' build/turn										
10,999.98	26.22	108.35	10,706.85	-172.43	1,423.85	14,444,717.89	1,728,356.32	39.77434294	-80.68701504	
11,099.98	28.87	124.74	10,795.64	-193.18	1,464.72	14,444,697.15	1,728,397.19	39.77428558	-80.68686984	
11,199.98	33.14	137.91	10,881.43	-227.27	1,502.95	14,444,663.05	1,728,435.42	39.77419158	-80.68673423	
11,299.98	38.50	148.09	10,962.56	-274.06	1,537.78	14,444,616.27	1,728,470.25	39.77406275	-80.68661084	
11,325.65	40.00	150.31	10,982.44	-288.01	1,546.09	14,444,602.31	1,728,478.56	39.77402435	-80.68658143	
Begin 10°/100' build										
11,399.98	47.44	150.31	11,036.12	-332.61	1,571.51	14,444,557.72	1,728,503.98	39.77390164	-80.68649150	
11,499.98	57.44	150.31	11,097.01	-401.38	1,610.72	14,444,488.94	1,728,543.19	39.77371239	-80.68635281	
11,599.98	67.44	150.31	11,143.22	-478.30	1,654.58	14,444,412.03	1,728,587.05	39.77350075	-80.68619771	
11,699.98	77.44	150.31	11,173.36	-561.01	1,701.73	14,444,329.31	1,728,634.20	39.77327313	-80.68603090	
11,799.98	87.44	150.31	11,186.51	-647.02	1,750.77	14,444,243.31	1,728,683.24	39.77303646	-80.68585746	
11,815.65	89.00	150.31	11,187.00	-660.63	1,758.53	14,444,229.70	1,728,691.00	39.77299901	-80.68583001	
Begin 89.00° lateral										
11,899.98	89.00	150.31	11,188.47	-733.87	1,800.29	14,444,156.45	1,728,732.76	39.77279745	-80.68568231	
11,999.98	89.00	150.31	11,190.21	-820.73	1,849.81	14,444,069.59	1,728,782.28	39.77255844	-80.68550715	
12,099.98	89.00	150.31	11,191.95	-907.59	1,899.33	14,443,982.73	1,728,831.80	39.77231942	-80.68533200	
12,199.98	89.00	150.31	11,193.69	-994.45	1,948.85	14,443,895.87	1,728,881.32	39.77208040	-80.68515684	
12,299.98	89.00	150.31	11,195.43	-1,081.31	1,998.37	14,443,809.01	1,728,930.84	39.77184139	-80.68498169	
12,399.98	89.00	150.31	11,197.17	-1,168.17	2,047.89	14,443,722.15	1,728,980.36	39.77160237	-80.68480653	
12,499.98	89.00	150.31	11,198.91	-1,255.03	2,097.41	14,443,635.29	1,729,029.88	39.77136335	-80.68463138	
12,599.98	89.00	150.31	11,200.65	-1,341.89	2,146.94	14,443,548.43	1,729,079.40	39.77112433	-80.68445623	
12,699.97	89.00	150.31	11,202.39	-1,428.75	2,196.46	14,443,461.57	1,729,128.93	39.77088531	-80.68428108	
12,799.97	89.00	150.31	11,204.13	-1,515.61	2,245.98	14,443,374.71	1,729,178.45	39.77064630	-80.68410593	
12,899.97	89.00	150.31	11,205.87	-1,602.47	2,295.50	14,443,287.85	1,729,227.97	39.77040728	-80.68393079	
12,999.97	89.00	150.31	11,207.61	-1,689.33	2,345.02	14,443,201.00	1,729,277.49	39.77016826	-80.68375564	
13,099.97	89.00	150.31	11,209.35	-1,776.19	2,394.54	14,443,114.14	1,729,327.01	39.76992924	-80.68358050	
13,199.97	89.00	150.31	11,211.09	-1,863.05	2,444.06	14,443,027.28	1,729,376.53	39.76969022	-80.68340535	
13,299.97	89.00	150.31	11,212.83	-1,949.91	2,493.58	14,442,940.42	1,729,426.05	39.76945120	-80.68323021	
13,399.97	89.00	150.31	11,214.58	-2,036.77	2,543.10	14,442,853.56	1,729,475.57	39.76921218	-80.68305507	
13,499.97	89.00	150.31	11,216.32	-2,123.63	2,592.62	14,442,766.70	1,729,525.09	39.76897316	-80.68287993	
13,599.97	89.00	150.31	11,218.06	-2,210.49	2,642.15	14,442,679.84	1,729,574.62	39.76873414	-80.68270479	
13,699.97	89.00	150.31	11,219.80	-2,297.35	2,691.67	14,442,592.98	1,729,624.14	39.76849511	-80.68252966	
13,799.97	89.00	150.31	11,221.54	-2,384.21	2,741.19	14,442,506.12	1,729,673.66	39.76825609	-80.68235452	
13,899.97	89.00	150.31	11,223.28	-2,471.07	2,790.71	14,442,419.26	1,729,723.18	39.76801707	-80.68217938	
13,999.97	89.00	150.31	11,225.02	-2,557.93	2,840.23	14,442,332.40	1,729,772.70	39.76777805	-80.68200425	
14,099.97	89.00	150.31	11,226.76	-2,644.79	2,889.75	14,442,245.54	1,729,822.22	39.76753903	-80.68182912	





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Site:	Keith Stern	North Reference:	Grid
Well:	Keith Stern S-19 HU (slot Q)	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	
14,199.97	89.00	150.31	11,228.50	-2,731.65	2,939.27	14,442,158.68	1,729,871.74	39.76730000	-80.68165399	
14,299.97	89.00	150.31	11,230.24	-2,818.51	2,988.79	14,442,071.82	1,729,921.26	39.76706098	-80.68147886	
14,399.97	89.00	150.31	11,231.98	-2,905.37	3,038.31	14,441,984.96	1,729,970.78	39.76682196	-80.68130373	
14,499.97	89.00	150.31	11,233.72	-2,992.23	3,087.83	14,441,898.10	1,730,020.30	39.76658294	-80.68112860	
14,599.97	89.00	150.31	11,235.46	-3,079.09	3,137.36	14,441,811.24	1,730,069.83	39.76634391	-80.68095348	
14,699.97	89.00	150.31	11,237.20	-3,165.95	3,186.88	14,441,724.38	1,730,119.35	39.76610489	-80.68077835	
14,799.97	89.00	150.31	11,238.94	-3,252.80	3,236.40	14,441,637.52	1,730,168.87	39.76586586	-80.68060323	
14,899.97	89.00	150.31	11,240.68	-3,339.66	3,285.92	14,441,550.66	1,730,218.39	39.76562684	-80.68042810	
14,999.97	89.00	150.31	11,242.42	-3,426.52	3,335.44	14,441,463.80	1,730,267.91	39.76538781	-80.68025298	
15,099.97	89.00	150.31	11,244.16	-3,513.38	3,384.96	14,441,376.94	1,730,317.43	39.76514879	-80.68007786	
15,199.97	89.00	150.31	11,245.90	-3,600.24	3,434.48	14,441,290.08	1,730,366.95	39.76490976	-80.67990274	
15,299.97	89.00	150.31	11,247.64	-3,687.10	3,484.00	14,441,203.22	1,730,416.47	39.76467074	-80.67972762	
15,399.97	89.00	150.31	11,249.38	-3,773.96	3,533.52	14,441,116.36	1,730,465.99	39.76443171	-80.67955251	
15,499.97	89.00	150.31	11,251.12	-3,860.82	3,583.04	14,441,029.50	1,730,515.51	39.76419269	-80.67937739	
15,599.97	89.00	150.31	11,252.87	-3,947.68	3,632.57	14,440,942.64	1,730,565.04	39.76395366	-80.67920228	
15,699.97	89.00	150.31	11,254.61	-4,034.54	3,682.09	14,440,855.78	1,730,614.56	39.76371463	-80.67902717	
15,799.97	89.00	150.31	11,256.35	-4,121.40	3,731.61	14,440,768.92	1,730,664.08	39.76347561	-80.67885205	
15,899.97	89.00	150.31	11,258.09	-4,208.26	3,781.13	14,440,682.07	1,730,713.60	39.76323658	-80.67867694	
15,999.97	89.00	150.31	11,259.83	-4,295.12	3,830.65	14,440,595.21	1,730,763.12	39.76299755	-80.67850183	
16,099.97	89.00	150.31	11,261.57	-4,381.98	3,880.17	14,440,508.35	1,730,812.64	39.76275853	-80.67832673	
16,199.97	89.00	150.31	11,263.31	-4,468.84	3,929.69	14,440,421.49	1,730,862.16	39.76251950	-80.67815162	
16,299.97	89.00	150.31	11,265.05	-4,555.70	3,979.21	14,440,334.63	1,730,911.68	39.76228047	-80.67797651	
16,399.97	89.00	150.31	11,266.79	-4,642.56	4,028.73	14,440,247.77	1,730,961.20	39.76204144	-80.67780141	
16,499.97	89.00	150.31	11,268.53	-4,729.42	4,078.26	14,440,160.91	1,731,010.72	39.76180241	-80.67762630	
16,599.97	89.00	150.31	11,270.27	-4,816.28	4,127.78	14,440,074.05	1,731,060.25	39.76156338	-80.67745120	
16,699.97	89.00	150.31	11,272.01	-4,903.14	4,177.30	14,439,987.19	1,731,109.77	39.76132435	-80.67727610	
16,799.97	89.00	150.31	11,273.75	-4,990.00	4,226.82	14,439,900.33	1,731,159.29	39.76108532	-80.67710100	
16,899.97	89.00	150.31	11,275.49	-5,076.86	4,276.34	14,439,813.47	1,731,208.81	39.76084629	-80.67692590	
16,999.97	89.00	150.31	11,277.23	-5,163.72	4,325.86	14,439,726.61	1,731,258.33	39.76060726	-80.67675081	
17,099.97	89.00	150.31	11,278.97	-5,250.58	4,375.38	14,439,639.75	1,731,307.85	39.76036823	-80.67657571	
17,199.97	89.00	150.31	11,280.71	-5,337.44	4,424.90	14,439,552.89	1,731,357.37	39.76012920	-80.67640061	
17,299.97	89.00	150.31	11,282.45	-5,424.30	4,474.42	14,439,466.03	1,731,406.89	39.75989017	-80.67622552	
17,399.97	89.00	150.31	11,284.19	-5,511.16	4,523.94	14,439,379.17	1,731,456.41	39.75965114	-80.67605043	
17,499.97	89.00	150.31	11,285.93	-5,598.02	4,573.47	14,439,292.31	1,731,505.94	39.75941211	-80.67587534	
17,599.97	89.00	150.31	11,287.67	-5,684.88	4,622.99	14,439,205.45	1,731,555.46	39.75917308	-80.67570025	
17,699.96	89.00	150.31	11,289.42	-5,771.73	4,672.51	14,439,118.59	1,731,604.98	39.75893405	-80.67552516	
17,799.96	89.00	150.31	11,291.16	-5,858.59	4,722.03	14,439,031.73	1,731,654.50	39.75869501	-80.67535007	
17,899.96	89.00	150.31	11,292.90	-5,945.45	4,771.55	14,438,944.87	1,731,704.02	39.75845598	-80.67517498	
17,999.96	89.00	150.31	11,294.64	-6,032.31	4,821.07	14,438,858.01	1,731,753.54	39.75821695	-80.67499990	
18,099.96	89.00	150.31	11,296.38	-6,119.17	4,870.59	14,438,771.15	1,731,803.06	39.75797792	-80.67482481	
18,199.96	89.00	150.31	11,298.12	-6,206.03	4,920.11	14,438,684.29	1,731,852.58	39.75773888	-80.67464973	
18,299.96	89.00	150.31	11,299.86	-6,292.89	4,969.63	14,438,597.43	1,731,902.10	39.75749985	-80.67447465	
18,399.96	89.00	150.31	11,301.60	-6,379.75	5,019.15	14,438,510.57	1,731,951.62	39.75726081	-80.67429957	
18,499.96	89.00	150.31	11,303.34	-6,466.61	5,068.68	14,438,423.71	1,732,001.15	39.75702178	-80.67412449	
18,537.94	89.00	150.31	11,304.00	-6,499.60	5,087.48	14,438,390.73	1,732,019.95	39.75693100	-80.67405800	

PBHL/TD 18537.94 MD/11304.00 TVD

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JUN 13 2019

WV Department of
Environmental Protection
800 MASS 5000, 14 Build 85



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Site:	Keith Stern	North Reference:	Grid
Well:	Keith Stern S-19 HU (slot Q)	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									
LP Keith Stern S-19 HU - plan hits target center - Point	0.00	0.00	11,187.00	-660.63	1,758.53	14,444,229.69	1,728,691.00	39.77299900	-80.68583001
BHL Keith Stern S-19 HI - plan hits target center - Point	0.00	0.00	11,304.00	-6,499.60	5,087.48	14,438,390.73	1,732,019.95	39.75693100	-80.67405800

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
1,400.00	1,400.00	0.00	0.00	KOP Begin 2°/100' build	
1,650.00	1,649.68	2.82	10.53	Begin 5.00° tangent	
2,700.00	2,695.69	26.51	98.93	Begin 2°/100' drop	
2,950.00	2,945.37	29.33	109.46	Begin vertical hold	
7,504.63	7,500.00	29.33	109.46	Begin 3°/100' build	
7,971.30	7,962.04	29.33	166.19	Begin 3°/100' build/turn	
8,373.56	8,339.86	15.05	301.32	Begin 25.68° tangent	
10,950.59	10,662.43	-167.25	1,402.93	Begin 8°/100' build/turn	
11,325.65	10,982.44	-288.01	1,546.09	Begin 10°/100' build	
11,815.65	11,187.00	-660.63	1,758.53	Begin 89.00° lateral	
18,537.94	11,304.00	-6,499.60	5,087.48	PBHL/TD 18537.94 MD/11304.00 TVD	

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Office of Oil and Gas
JUN 13 2019

WV Department of
Environmental Protection
COMPASS 5000.14 Build 85

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Keith Stern S-19HU

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 / WW0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386426)

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

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

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

Company Official Signature James T Pancake

Company Official (Typed Name) Jim Pancake

Company Official Title Vice President Geoscience

RECEIVED
Office of Oil and Gas

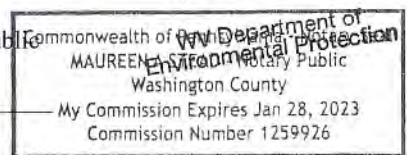
Subscribed and sworn before me this 30 day of APRIL, 20 19

JUN 13 2019

Maureen A Stead

Notary Public

My commission expires 1/28/23



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 Nicholas*

Comments: _____

Title: Oil and Gas Inspector

Date: 5/1/19

Field Reviewed? () Yes () No

RECEIVED
Office of Oil and Gas

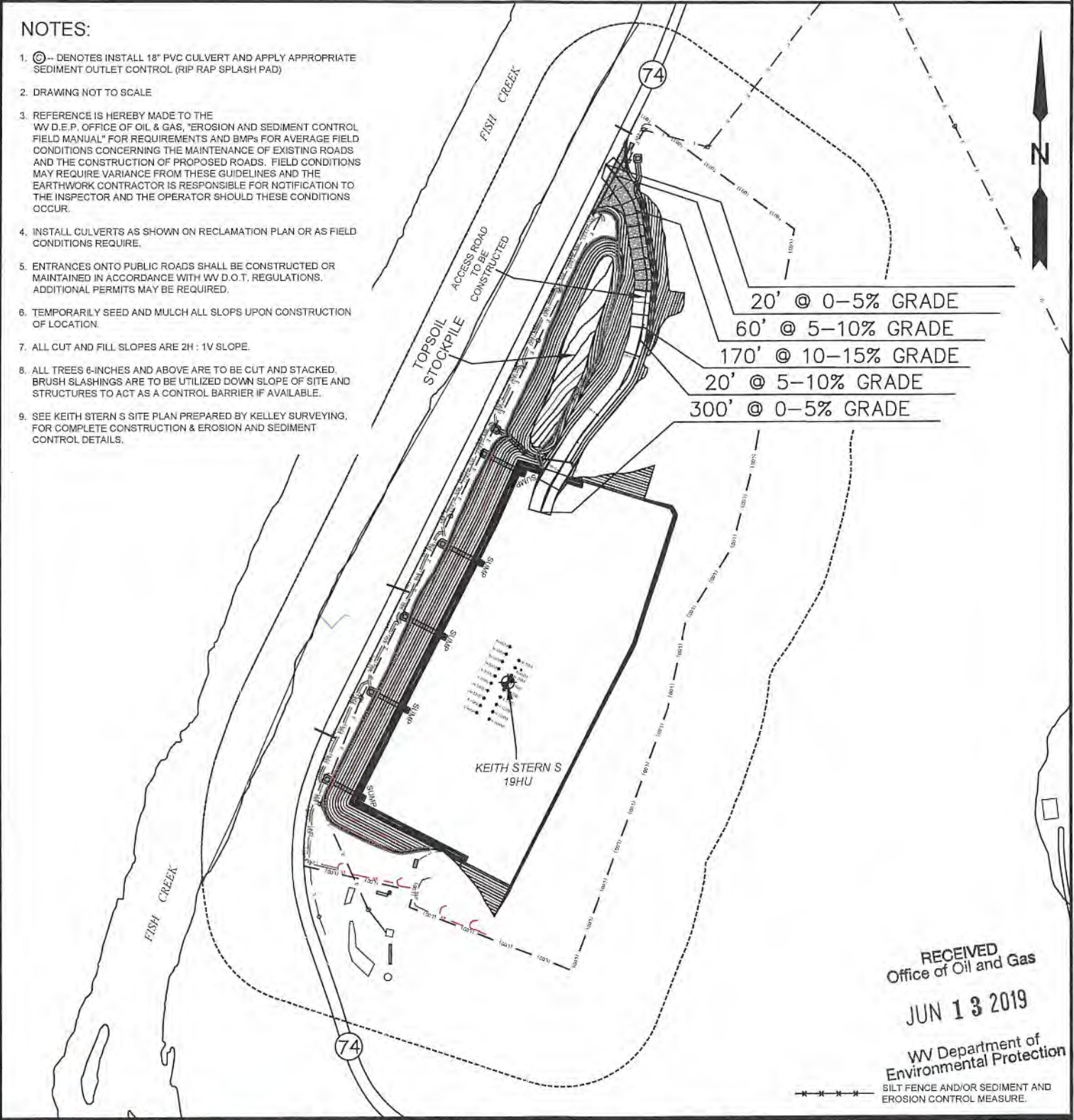
JUN 13 2019

WV Department of
Environmental Protection

PROPOSED KEITH STERN S - 19HU

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.



RECEIVED
Office of Oil and Gas

JUN 13 2019

WV Department of
Environmental Protection

SILT FENCE AND/OR SEDIMENT AND EROSION CONTROL MEASURE.

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

COUNTY	DISTRICT
MARSHALL	MEADE

DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8811	05/01/2019	NONE

DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8811	05/01/2019	NONE



**TUG HILL
OPERATING**



Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 462-5634
www.slsurveys.com



Well Site Safety Plan

Tug Hill Operating, LLC

5/10/19

Well Name: Keith Stern S-19HU

Pad Location: Keith Stern

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17

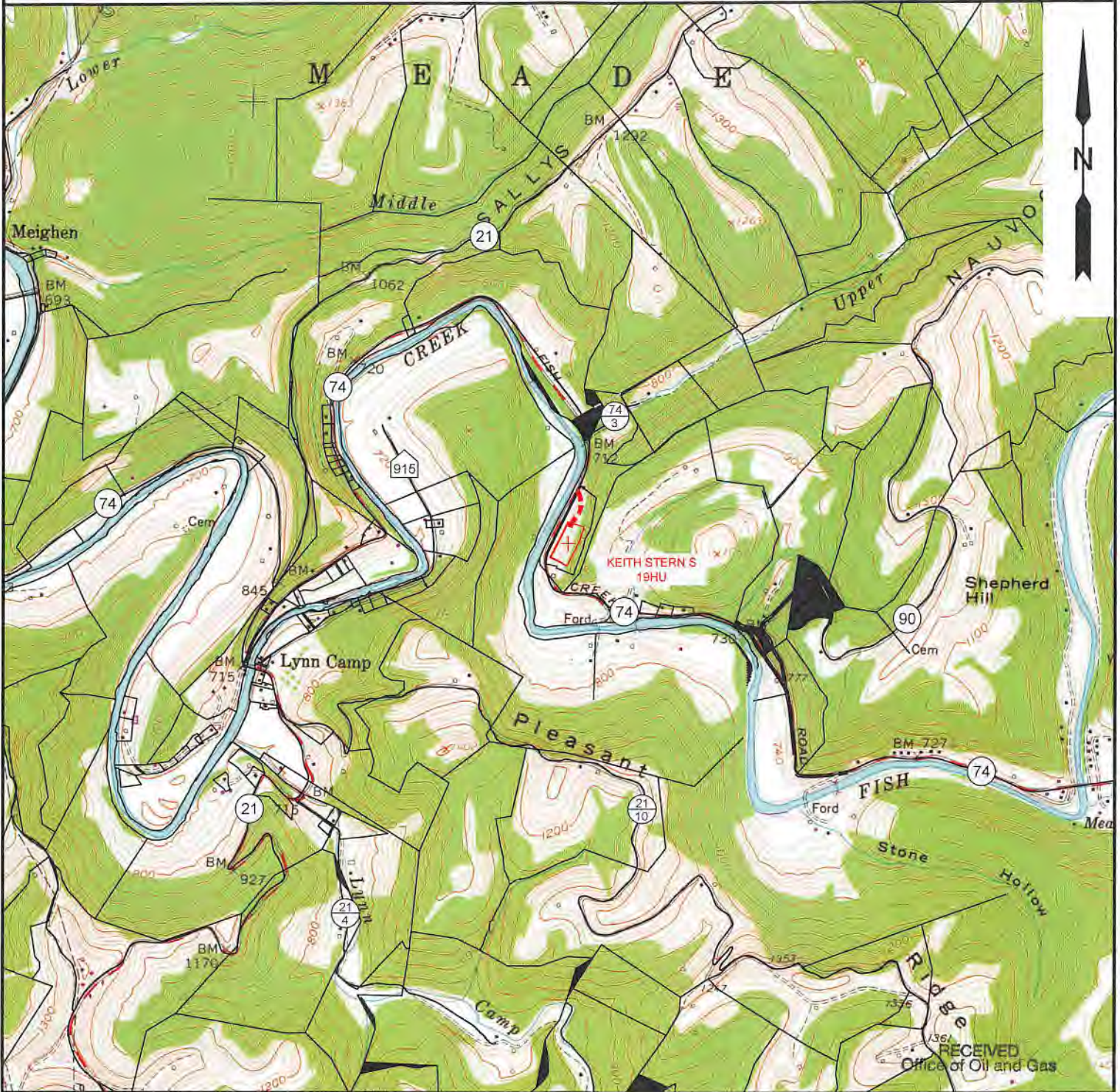
Northing: 4,402,811.38

Easting: 526,370.07

May 2019

RECEIVED
Office of Oil and Gas
JUN 13 2019
WV Department of
Environmental Protection

PROPOSED KEITH STERN S - 19HU



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 S WELL PAD LOCATION.

JUN 13 2019

WV Department of
Environmental Protection

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 482-5634
www.slsurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8811	05/01/2019	1" = 2000'

TUG HILL
OPERATING

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC±
WELL 19HU
TUG HILL OPERATING**

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

MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
9-13-11.1	SAMUEL & HEATHER SUHDDOLSKI	0.49
9-13-14	MARGARET K. FOX - LIFE	3.90
9-14-1.1	MICHAEL L. ALVAREZ	1.6
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. ERAZMUS, 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.
9-14-11.1	PATRICK J. SCHELLHASE EST - TRUST	7.617
9-14-11.2	LOYE A. BLAKE	4.00
9-14-26	PATRICK J. SCHELLHASE EST - TRUST	12.588
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	MARHA JANE FAZZARO	1.512
9-15-40	ROBERT WILLIAM BERISFORD	13.50
9-15-41	CHARLES RICHARD MCCOY, ET UX	4.50
9-15-42	ROBERT MATHEW MASON	2.63

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

NAD'83 S.P.C.(FT)	N. 466,555.46	E. 1,633,457.30
NAD'83 GEO.	LAT-(N) 39.774830	LONG-(W) 80.692080
NAD'83 UTM (M)	N. 4,402,811.38	E. 526,370.07

LANDING POINT

NAD'83 S.P.C.(FT)	N. 466,865.3	E. 1,635,205.1
NAD'83 GEO.	LAT-(N) 39.772999	LONG-(W) 80.685830
NAD'83 UTM (M)	N. 4,402,610.0	E. 526,906.1

BOTTOM HOLE

NAD'83 S.P.C.(FT)	N. 459,969.6	E. 1,636,437.2
NAD'83 GEO.	LAT-(N) 39.756931	LONG-(W) 80.674058
NAD'83 UTM (M)	N. 4,400,830.3	E. 527,920.7

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

6.133' T.H.

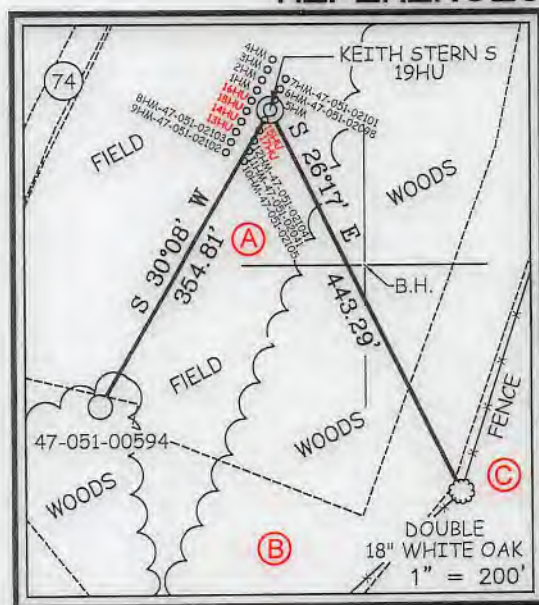
12.653' B.H.



NOTES ON SURVEY

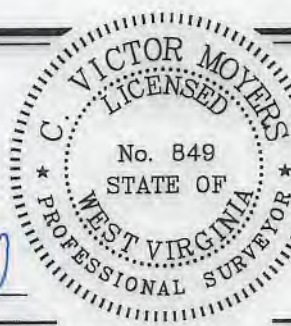
- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE ARE 1"=2000'
- PROPOSED LATERAL OR TOP HOLE OF KEITH STERN S-19HU IS WITHIN 3000' OF THE TOP HOLES OR LATERALS OF THE FOLLOWING:
PROPOSED KEITH STERN N-13HU,14HU,15HU & 16HU,
PROPOSED KEITH STERN S-17HU & 18HU,
PROPOSED KNOB CREEK N-13HU,
PROPOSED KNOB CREEK S-16HU
& PROPOSED HEAVEN HILL 3-6HU,

REFERENCES



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 MAY 1, 20 19

REVISED JUNE 11, 20 19

OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 - 051 - 02244

STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500

FILE NO. 8811P19HUR.dwg

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK)

SCALE 1" = 2000'

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

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

LOCATION: GROUND = 745.00' 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 POINT PLEASANT ESTIMATED DEPTH TVD: 11,404' / TMD: 18,538'

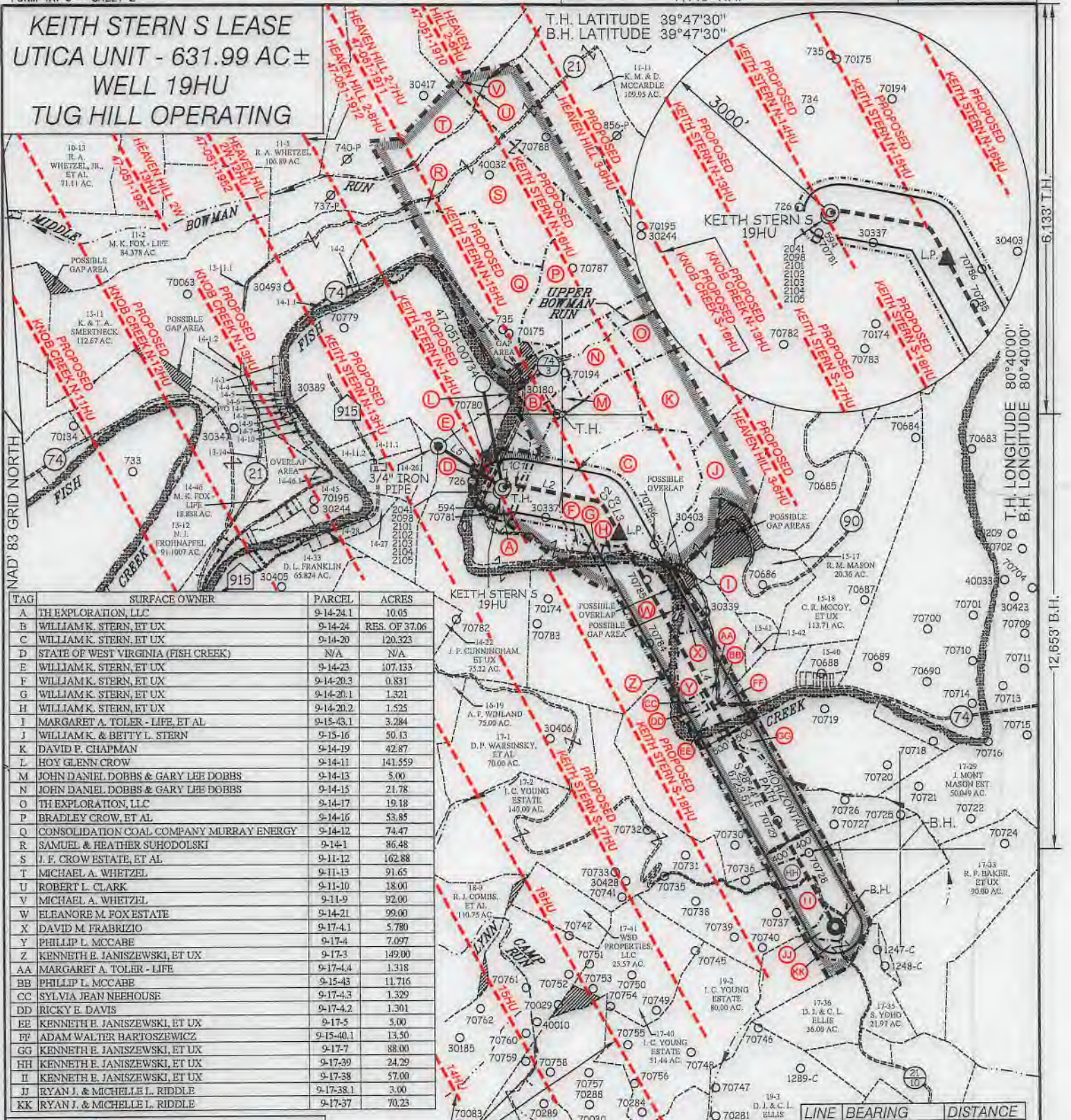
WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER

ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD

FORT WORTH, TX 76107 CHARLESTON, WV 25313

COUNTY NAME PERMIT

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC±
WELL 19HU
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	STATE OF WEST VIRGINIA (FISH CREEK)	N/A	N/A
E	WILLIAM K. STERN, ET UX	9-14-23	107.133
F	WILLIAM K. STERN, ET UX	9-14-20.3	0.831
G	WILLIAM K. STERN, ET UX	9-14-20.1	1.321
H	WILLIAM K. STERN, ET UX	9-14-20.2	1.525
I	MARGARET A. TOLER - LIFE, ET AL.	9-15-43.1	3.284
J	WILLIAM K. & BETTY L. STERN	9-15-16	50.13
K	DAVID P. CHAPMAN	9-14-19	42.87
L	HOY GLENN CROW	9-14-11	141.559
M	JOHN DANIEL DOBBS & GARY LEE DOBBS	9-14-13	5.00
N	JOHN DANIEL DOBBS & GARY LEE DOBBS	9-14-15	21.78
O	TH EXPLORATION, LLC	9-14-17	19.18
P	BRADLEY CROW, ET AL.	9-14-16	53.85
Q	CONSOLIDATION COAL COMPANY MURRAY ENERGY	9-14-12	74.47
R	SAMUEL & HEATHER SUHODOLSKI	9-14-1	86.48
S	J. F. CROW ESTATE, ET AL.	9-11-12	162.88
T	MICHAEL A. WHETZEL	9-11-13	91.65
U	ROBERT L. CLARK	9-11-10	18.00
V	MICHAEL A. WHETZEL	9-11-9	92.00
W	ELEANORE M. FOX ESTATE	9-14-21	99.00
X	DAVID M. FRABRIZIO	9-17-4.1	5.780
Y	PHILLIP L. MCCABE	9-17-4	7.097
Z	KENNETH E. JANISZEWSKI, ET UX	9-17-3	149.00
AA	MARGARET A. TOLER - LIFE	9-17-4.4	1.318
BB	PHILLIP L. MCCABE	9-15-43	11.716
CC	SYLVIA JEAN NEHOUSE	9-17-4.3	1.329
DD	RICKY E. DAVIS	9-17-4.2	1.301
EE	KENNETH E. JANISZEWSKI, ET UX	9-17-5	5.00
FF	ADAM WALTER BARTOSZEWICZ	9-15-40.1	13.50
GG	KENNETH E. JANISZEWSKI, ET UX	9-17-7	88.00
HH	KENNETH E. JANISZEWSKI, ET UX	9-17-39	24.29
II	KENNETH E. JANISZEWSKI, ET UX	9-17-38	57.00
JJ	RYAN J. & MICHELLE L. RIDDLE	9-17-38.1	3.00
KK	RYAN J. & MICHELLE L. RIDDLE	9-17-37	70.23

LINE	BEARING	DISTANCE
L1	N 75°57' E	113.35'
L2	S 79°40' E	1147.59'
L3	S 28°44' E	429.07'
L5	N 57°46' W	1150.18'
L6	N 11°12' W	1574.29'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	162.20'	852.74'	S 85°40' E	161.96'
C2	118.77'	182.69'	S 58°04' E	116.69'
C3	74.62'	404.04'	S 34°26' E	74.52'

P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 482-5634
www.slsww.com

P.S. 849 *C. Victor Moyers*

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

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NAD'83 GEO.	LAT-(N) 39.756931	LONG-(W) 80.674058
NAD'83 UTM (M)	N. 4,400,830.3	E. 527,920.7



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

LEGEND

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

SCALE 1" = 2000' FILE NO. 8811P19HUR.dwg
KEITH STERN S-19HU-REV1

DATE MAY 1, 20 19
REVISED JUNE 11, 20 19

OPERATORS WELL NO. KEITH STERN S-19HU

API WELL 47 - 051 - 02244

NO. STATE COUNTY PERMIT

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

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

COUNTY NAME
PERMIT

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC±
WELL 19HU
TUG HILL OPERATING**



NO.	Lease ID	Tag	Parcel	Grantor, Lessor, Etc.	Deed Book/Page
1	10*15605	A	9-14-24.1	ISAAC CROW ET UX	74 394
2	10*15605	B	9-14-24	ISAAC CROW ET UX	74 394
3	10*15509	C	9-14-20	WILLIAM K STERN AND BETTY L STERN	718 320
4	10*23458	D	WV - FISH CREEK	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	1019 373
5	10*15812	E	9-14-23	WILLIAM K STERN AND BETTY L STERN	687 220
6	10*16436	E	9-14-23	REAGAN D YEATTS AND CHRISTOPHER M YEATTS	961 339
7	10*18269	E	9-14-23	GENELDA MASON	942 460
8	10*18299	E	9-14-23	CAROL L BOBBY AND DONALD J BOBBY	929 281
9	10*18354	E	9-14-23	DEBORAH L TURLEY	931 352
10	10*18355	E	9-14-23	JUDITH F TEMPLE AND LOUIS I TEMPLE	931 350
11	10*18356	E	9-14-23	LARRY W ALLEY	931 348
12	10*18357	E	9-14-23	DEBORAH SUE KYLE	931 346
13	10*18358	E	9-14-23	SHARLA ROLLINS AND GARY ROLLINS	931 358
14	10*18419	E	9-14-23	CARLA MAE ALLEY	932 539
15	10*18420	E	9-14-23	VICTOR E ALLEY JR AND DEBRA A ALLEY	932 582
16	10*18421	E	9-14-23	DONNA JUNE STRAIT AND GARY E STRAIT	932 588
17	10*18429	E	9-14-23	GEORGE L DUNN AND NANCY MARIE DUNN	932 601
18	10*18430	E	9-14-23	JAMES DUNN AND DONNA K DUNN	932 604
19	10*18432	E	9-14-23	ROSEMARIE BERISFORD	932 572
20	10*18484	E	9-14-23	BRENDA REED	933 107
21	10*18485	E	9-14-23	BARBARA JO BEVERIDGE	933 109
22	10*18490	E	9-14-23	STACY L BARNHART	933 123
23	10*18491	E	9-14-23	LORI A FARMER AND DANIEL K FARMER	933 131
24	10*18512	E	9-14-23	CHRISTINA NESTELL AND CHARLES E NESTELL III	933 566
25	10*18515	E	9-14-23	WILLIAM P DAUBE	933 573
26	10*18518	E	9-14-23	SUSAN I BAKER	933 580
27	10*18520	E	9-14-23	CHRISTOPHER SAUDERS	933 584
28	10*18612	E	9-14-23	NANNETTE BERLETCHE	932 542
29	10*18617	E	9-14-23	SHEILA SIMMONS AND JEFFREY R SIMMONS	934 613
30	10*18644	E	9-14-23	FRANK A STORCH JR AND SUSAN STORCH	936 149
31	10*18645	E	9-14-23	SANDRA SUE HALL AND DAVID HALL	936 155
32	10*18647	E	9-14-23	PETER G STORCH AND LAURIE L STORCH	936 152
33	10*18648	E	9-14-23	LAWRENCE E CHIAPPETTA AND PATRICIA A CHIAPPETTA	936 161
34	10*18649	E	9-14-23	RODNEY K BANE AND CATHIE J BANE	936 164
35	10*18652	E	9-14-23	BECKY LANDRIS	936 172
36	10*18653	E	9-14-23	DALE R ALLEY	936 174
37	10*18673	E	9-14-23	RACHEL THORNE AND FRED THORNE JR	938 574
38	10*18674	E	9-14-23	JOHN T CRISWELL AND CATHERINE A CRISWELL	938 579
39	10*18675	E	9-14-23	JEFFREY BRYAN CRISWELL	938 582
40	10*18676	E	9-14-23	JENNIFER SHAWN GLOVER	938 576
41	10*18677	E	9-14-23	PATRICIA DOKKA	938 585
42	10*18678	E	9-14-23	WILLIAM LINSLEY CRISWELL	938 588
43	10*18763	E	9-14-23	VAUGHN HONE SR & LINDA MARIE HONE	938 225
44	10*18766	E	9-14-23	TOM ALLEY	938 223
45	10*18797	E	9-14-23	DORETTA RUSH	937 622
46	10*18808	E	9-14-23	PATRICIA KIRCHNER	937 644
47	10*18809	E	9-14-23	JUDITH C LORADITCH	937 647
48	10*19392	E	9-14-23	RODNEY W RUSH AND CRYSTAL D RUSH	940 336
49	10*19400	E	9-14-23	BULA F YOST	940 342
50	10*19405	E	9-14-23	ANN MARIE STEVENS AND CURTIS STEVENS	939 287
51	10*19417	E	9-14-23	SYLVIA R SPALENY AND ROBERT A SPALENY	939 596
52	10*19423	E	9-14-23	KEITH W STORCH AND DEBORAH A STORCH	934 600
53	10*19477	E	9-14-23	DEBORAH A MILLER	941 320
54	10*19479	E	9-14-23	DENISE WILLIAMSON	941 329
55	10*19510	E	9-14-23	REED O MILLER	933 571
56	10*19525	E	9-14-23	AUGUSTUS R MCMAHON III AND MICHELE M MCMAHON TRUSTEES OF THE AUGUSTUS R MCMAHON III LIVING TRUST	943 509
57	10*19527	E	9-14-23	AUGUSTUS RUSH MCMAHON III TRUSTEE OF THE PAMELA J MCMAHON REVOCBLE TRUST	953 339
58	10*19530	E	9-14-23	SHAROL K CASADA	943 1
59	10*19531	E	9-14-23	DELBERT D RUSH AND BETTY RUTH RUSH	942 615
60	10*19625	E	9-14-23	DURR SUCKEL & ELIZABETH SUCKEL	944 150
61	10*19626	E	9-14-23	LAURIE R BROWN	944 153
62	10*19676	E	9-14-23	RONALD W REINBEAU	944 456
63	10*19677	E	9-14-23	NEIL SCHAFER AND CHRISTAL L SHAFER	944 147
64	10*19681	E	9-14-23	TIMOTHY LEE COLLEY	944 140
65	10*19683	E	9-14-23	TERESA ALLEY	944 145
66	10*19686	E	9-14-23	KAREN J AND MICHAEL E BRUGGEMAN	944 142
67	10*19712	E	9-14-23	CHAZ AARON COLLEY AND DANA COLLINS	957 139
68	10*19723	E	9-14-23	REID ELATTRACHE AND TONYA ELATTRACHE	957 131
69	10*19859	E	9-14-23	ELIZABETH A STARC	945 603
70	10*19860	E	9-14-23	AUCIA N STARC	945 601
71	10*19861	E	9-14-23	JOSEPH F STARC JR AND DONNA STARC	945 605
72	10*19862	E	9-14-23	STACY R BENNETT	945 608
73	10*19864	E	9-14-23	JOE Y KELLER JR AND SHARON MARIE KELLER	945 610
74	10*19935	E	9-14-23	SARA E STARC	948 553
75	10*19936	E	9-14-23	SHERWOOD MASON NILA JUNE MASON	948 255
76	10*19940	E	9-14-23	EMMA JO CRISWELL	948 551
77	10*21028	E	9-14-23	BRENDA GILBERT	951 159
78	10*21094	E	9-14-23	KATHERINE DEGROOT AND DANIEL DEGROOT	951 151
79	10*21111	E	9-14-23	DONNA G AND PAUL L CHMELYSKI	951 154
80	10*21209	E	9-14-23	CHARLES R WILLIAMSON JR	951 157
81	10*21228	E	9-14-23	CHARLES F HORNER & LORAIN G HORNER	952 434
82	10*21229	E	9-14-23	TARA E CAUSEY	952 432
83	10*21395	E	9-14-23	DANIEL L LANDRIS AND JOAN L LANDRIS	956 625
84	10*21396	E	9-14-23	MICHAEL D ZUCKER	956 647
85	10*21441	E	9-14-23	JOSEPH A MURPHY AND VIRGINIA ANNE MURPHY	956 631
86	10*21443	E	9-14-23	ROBERT L LANDRIS AND LIBERTY JANE LANDRIS	956 628
87	10*21490	E	9-14-23	DANIELE WILLIAMSON AND HEATHER R WILLIAMSON	957 153
88	10*21493	E	9-14-23	DENZIL ALLEY JR	958 64
89	10*21497	E	9-14-23	KATHLEEN G WILLIAMSON	957 324
90	10*21837	E	9-14-23	WILLIAM BRYAN COLLEY	959 627
91	10*21873	E	9-14-23	MICHAEL WAYNE ALLEY AND LINDA ALLEY	953 501
92	10*21961	E	9-14-23	JOHN WILLIAMSON JR	960 24
93	10*21972	E	9-14-23	CATHERINE I AND ERNEST M SILVERIO	960 586
94	10*21979	E	9-14-23	CHARLES C SEAMON	954 340
95	10*21991	E	9-14-23	THE JOANN REILLY TRUST KIMBERLY MAEZ TRUSTEE	953 341
96	10*21997	E	9-14-23	MICHAEL SAUDERS AND AMI SAUDERS	953 505
97	10*22004	E	9-14-23	RALPH EDWARD WILLIAMSON	953 507
98	10*22037	E	9-14-23	JOSHUA W SEAMON	953 503

FILE NO. 8811P19HUR.dwg
KEITH STERN S-19HU-REV1

DATE MAY 1, 20 19

REVISED JUNE 11, 20 19

OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 — 051 — 02244
STATE COUNTY PERMIT



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



P.S. 849 *C. Victor Moyers*

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

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

COUNTY NAME PERMIT

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC ±
WELL 19HU
TUG HILL OPERATING**



99	10*22053	E	9-14-23	LARRY R CRANE	953	344
100	10*22089	E	9-14-23	MARCIA A LUKE	961	333
101	10*22110	E	9-14-23	JENNIFER ALLEY FISHER & ROBERT D FISHER	961	347
102	10*22127	E	9-14-23	JUDITH L BENEDICT AND LOUIS G BENEDICT	961	343
103	10*22150	E	9-14-23	CHAD ERIC BENNETT AND MARY A BENNETT	954	338
104	10*22257	E	9-14-23	CHARLES F ALLEY TRUST EMMANUEL PREVOLES TRUSTEE	970	26
105	10*22328	E	9-14-23	JUDITH S KNIGHT	962	276
106	10*22329	E	9-14-23	EARL FRAZIER AND LYDIA ARMENTA	963	128
107	10*22380	E	9-14-23	BRIAN R MORGAN	964	453
108	10*22411	E	9-14-23	DIANNA LEA SHEPARD	970	30
109	10*22461	E	9-14-23	DANNY E COCHRAN AND LORI ANN COCHRAN	972	40
110	10*22501	E	9-14-23	RANDY W MORRIS SR AND CHERYL MORRIS	966	465
111	10*22502	E	9-14-23	JULIA RAE BROOKS	977	30
112	10*22775	E	9-14-23	SUSAN EXLINE	977	32
113	10*22778	E	9-14-23	AUBREY E RBILLY	977	26
114	10*22833	E	9-14-23	BRENDAN Q REILLY	977	28
115	10*22848	E	9-14-23	SUSAN I GOLDSBERRY	952	549
116	10*22854	E	9-14-23	SALLY M COTEREL-CHANEY	962	547
117	10*22878	E	9-14-23	LINDA K AND MICHAEL HUMES	948	372
118	10*22879	E	9-14-23	JAMES P MILLER	946	215
119	10*23148	E	9-14-23	IDA A ALLEY AND J F ALLEY	117	45
120	10*15957	F	9-14-20.3	BRADLEY CROW AND BETTY L CROW	768	350
121	10*15958	F	9-14-20.3	GLADYS CROW	769	609
122	10*15959	F	9-14-20.3	LEWIS M QUIGLEY AND MAXINE V QUIGLEY	769	603
123	10*15960	F	9-14-20.3	CONNIE HECKLE	770	547
124	10*15961	F	9-14-20.3	H GLENN CROW	770	565
125	10*15962	G	9-14-20.1	BRADLEY CROW AND BETTY L CROW	768	362
126	10*15963	G	9-14-20.1	LEWIS M QUIGLEY AND MAXINE V QUIGLEY	769	416
127	10*15964	G	9-14-20.1	GLADYS CROW	769	410
128	10*15965	G	9-14-20.1	H GLENN CROW	770	535
129	10*15966	G	9-14-20.1	CONNIE HECKLE	770	541
130	10*15509	H	9-14-20.2	WILLIAM K STERN AND BETTY L STERN	718	320
131	10*15836	I	9-15-43.1	LUCINDA RAE ALLEN AND DAVID A ALLEN	742	79
132	10*15837	I	9-15-43.1	ANITA DIANE ANTILL AND TERRY ANTILL	742	85
133	10*15842	I	9-15-43.1	HOMER L SIMMONS AND GLADYS R SIMMONS	742	329
134	10*17887	I	9-15-43.1	LEO C HILKE AND BETTY M HILKE	924	531
135	10*22376	I	9-15-43.1	MARGARET KUCHARZ AND JAMES C KUCHARZ	962	270
136	10*47051.219.33	I	9-15-43.1	JOHN H HILKE AND AUDA HILKE	898	602
137	10*47051.219.37	I	9-15-43.1	SUSAN H KEY	898	621
138	10*47051.219.39	I	9-15-43.1	AJICE THIPPHAVONG AND VISITH THIPPHAVONG	902	437
139	10*15813	J	9-15-16	ROBERT B THOMAS	692	235
140	10*15814	J	9-15-16	MARY E BASSETT	694	499
141	10*15815	J	9-15-16	FORREST M THOMAS	694	516
142	10*15816	J	9-15-16	SALLY CYNTHIA HOPKINS	697	116
143	10*15817	J	9-15-16	RUTH MEADOWS	703	583
144	10*15818	J	9-15-16	ELIZABETH ANN STRAUSBAUGH	703	578
145	10*15819	J	9-15-16	JANET LEA BLANKENSHIP	708	114
146	10*17445	J	9-15-16	GENEVA BASSETT SANCHEZ	929	292
147	10*21814	J	9-15-16	STONE HILL MINERALS HOLDINGS LLC	953	335
148	10*21818	J	9-15-16	STONE HILL MINERALS HOLDINGS LLC	953	337
149	10*21862	J	9-15-16	NOBLE MARCELLUS LP	961	641
150	10*15813	K	9-14-19	ROBERT B THOMAS	692	235
151	10*15814	K	9-14-19	MARY E BASSETT	694	499
152	10*15815	K	9-14-19	FORREST M THOMAS	694	516
153	10*15816	K	9-14-19	SALLY CYNTHIA HOPKINS	697	116
154	10*15817	K	9-14-19	RUTH MEADOWS	703	583
155	10*15818	K	9-14-19	ELIZABETH ANN STRAUSBAUGH	703	578
156	10*15819	K	9-14-19	JANET LEA BLANKENSHIP	708	114
157	10*17445	K	9-14-19	GENEVA BASSETT SANCHEZ	929	292
158	10*21814	K	9-14-19	STONE HILL MINERALS HOLDINGS LLC	953	335
159	10*21818	K	9-14-19	STONE HILL MINERALS HOLDINGS LLC	953	337
160	10*21862	K	9-14-19	NOBLE MARCELLUS LP	961	641
161	10*23053	L	9-14-11	CE YOUNG	63	146
162	10*15605	M	9-14-13	ISAAC CROW ET UX	74	394
163	10*15592	N	9-14-15	JOHN DANIEL DOBBS	694	125
164	10*15593	N	9-14-15	GARY L DOBBS	693	289
165	10*18189	N	9-14-15	WILLIAM C WEST AND DEBRA WEST	928	622
166	10*18297	N	9-14-15	ROBERT E WEST	929	279
167	10*19614	N	9-14-15	KAREN SUE BLAKE	937	318
168	10*17929	O	9-14-17	STONE HILL MINERALS HOLDINGS LLC	931	372
169	10*15469	P	9-14-16	HARRIET J ANDERSON	920	11
170	10*15470	P	9-14-16	BETTY L LOGES	921	286
171	10*15473	P	9-14-16	WILLIAM F MCDONALD AND SHIRLEY MCDONALD	921	198
172	10*15476	P	9-14-16	CURITS W WEST JR AND DIANE WEST	921	263
173	10*15488	P	9-14-16	NANCY F FYE & STEPHEN M FYE	921	226
174	10*15495	P	9-14-16	BARBARA BARNHART AND WALTER BARNHART	921	222
175	10*15694	P	9-14-16	DEBORAH L MERCER	921	271
176	10*15695	P	9-14-16	JOHN R AND LOIS L GORBY	929	259
177	10*15696	P	9-14-16	JOSEPH JEREMY PALMER	921	275
178	10*15741	P	9-14-16	LOHRN S GORBY	929	641
179	10*16152	P	9-14-16	CONNIE HECKLE	920	29
180	10*16153	P	9-14-16	LARRY JACK EMERY	920	13
181	10*16186	P	9-14-16	DEBORAH KAY COOLEY AND ROBERT T BECK	920	65
182	10*16187	P	9-14-16	PATRICIA D BABL AND JOHN J BABL	920	31
183	10*16191	P	9-14-16	MADLYN E MOSSOR DO NOT USE	920	76
184	10*16403	P	9-14-16	WILLIAM C EDGAR AND CHRISTY E EDGAR	920	61
185	10*16404	P	9-14-16	KATHRYN M WHIPKEY	921	194
186	10*16406	P	9-14-16	ARELENA B HORNER AND QUAY ALLEN HORNER	921	240
187	10*16407	P	9-14-16	JANICE F BROOKOVER	920	74
188	10*16408	P	9-14-16	KATHLEEN J FRANCIS	921	196
189	10*16409	P	9-14-16	JEANETTE M HEATH	920	72
190	10*16425	P	9-14-16	WILLIAMA MASON JR AND ROBIN MASON	920	25
191	10*16428	P	9-14-16	BRUCE LYNN JOHNSON AND KIMBERLY A JOHNSON	920	50
192	10*16438	P	9-14-16	AJICE MARLENE PERSINGER	921	236
193	10*16468	P	9-14-16	LARRY W JOHNSON	920	57
194	10*16469	P	9-14-16	JAMES EARL AND MARGARET L SIBURT	921	245
195	10*16470	P	9-14-16	CAROLYN SUE FRANKUN AND RAYMOND EUGENE FRANKUN	921	219
196	10*16472	P	9-14-16	JUDY DELORIS SIBURT	929	643
197	10*16473	P	9-14-16	LINDA ELAINE AND RICHARD LEROY LITTELL	929	256
198	10*16474	P	9-14-16	BARBARA KAY SIBURT	921	266
199	10*16475	P	9-14-16	MARY LOUISE GORBY	921	234

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OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 — 051 — 02244
STATE COUNTY PERMIT



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



P.S. 849 *C. Victor Moyers*

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

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

COUNTY NAME

PERMIT

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC±
WELL 19HU
TUG HILL OPERATING**



200	10*16476	P	9-14-16	ROGER ALLAN AND CYNTHIA L JOHNSON	921	257
201	10*16477	P	9-14-16	BRENDA K YOHO	921	228
202	10*16550	P	9-14-16	CHARLES LEROY LEACH AND MARTHA G LEACH	920	19
203	10*16551	P	9-14-16	JACK L CROW JR AND VIRGINIA L CROW	921	260
204	10*16867	P	9-14-16	APRIL M WEED	921	279
205	10*16883	P	9-14-16	VICKIE LYNN PAPE AND JOHN EDWARD PAPE	921	248
206	10*16884	P	9-14-16	DELORES A BOWERS & LEONARD B BOWERS	921	281
207	10*16916	P	9-14-16	ROGER LEE WEST	921	277
208	10*16971	P	9-14-16	LEONA M SIBURT	921	238
209	10*16972	P	9-14-16	SCOTT BRADLEY GRIMM & SHERRY ANN GRIMM	921	242
210	10*16973	P	9-14-16	NANCY C KESSELING & CARL E KESSELING	920	22
211	10*17358	P	9-14-16	KAREN LOUISE AND ROGER L DUNHAM	921	254
212	10*17359	P	9-14-16	JULIA ALLISON CROW	921	224
213	10*17361	P	9-14-16	SHEILA RAMONA CROW	920	78
214	10*17362	P	9-14-16	NILA VIRGINIA AND FREDERICK EUGENE STREIGHT	921	251
215	10*17366	P	9-14-16	SYLVIA DEE WOOD	921	230
216	10*17367	P	9-14-16	JERRY HOWELL	920	37
217	10*17368	P	9-14-16	DONALD PAUL CROW AND CRYSTAL LYNN CROW	921	201
218	10*17369	P	9-14-16	DELORES A WALLACE	920	63
219	10*17371	P	9-14-16	MACK A AND CAROL A CROW	921	204
220	10*17372	P	9-14-16	DONNIE JASON HEDGEPEETH AND KAREN L HEDGEPEETH	920	42
221	10*17373	P	9-14-16	NILA F HEDGEPEETH	920	45
222	10*17374	P	9-14-16	EZRA HOWARD COCHRAN	920	27
223	10*17380	P	9-14-16	DEBORAH IRENE PIERCE AND BARRETT LEE PIERCE	920	34
224	10*17381	P	9-14-16	CINDY J AND DARNELL L FLUKS	921	268
225	10*17382	P	9-14-16	HELEN MARIE AND DAVID E MCCRAY	920	47
226	10*17389	P	9-14-16	MELBA EILEEN HUDDLESTUN	920	53
227	10*17390	P	9-14-16	HAROLD B CROW AND CONNIE SUE CROW	921	207
228	10*17391	P	9-14-16	BETTY LOU AND OLLIE CHARLES HUGGINS	921	210
229	10*17392	P	9-14-16	BEVERLY KATHRYN GODDARD	920	55
230	10*17393	P	9-14-16	CHARLIE M TURNER AND BESSIE M TURNER	920	39
231	10*17394	P	9-14-16	JUDY LOUISE GLOVER	921	232
232	10*17397	P	9-14-16	PAT DARRELL TURNER AND TINA DENISE TURNER	925	117
233	10*17399	P	9-14-16	RONALD EDWARD WATSON AND DIANA L WATSON	925	120
234	10*17401	P	9-14-16	JOHN M HAUGHT JR AND CHERYL A HAUGHT	925	182
235	10*17402	P	9-14-16	DIANA LYNN BUMGARDNER	920	68
236	10*17403	P	9-14-16	JAMES B CROW AND PENNY G CROW	925	187
237	10*17404	P	9-14-16	BRIAN K CROW	925	185
238	10*17408	P	9-14-16	WILLIAM JAMES HEDGEPEETH AND ERIN ELIZABETH HEDGEPEETH	924	572
239	10*17409	P	9-14-16	JUDY A AND CLYDE E ELIZEY	924	569
240	10*17410	P	9-14-16	LILLIE L GAREY	924	567
241	10*17420	P	9-14-16	DAVID LEE AND ANN F BAKER	924	564
242	10*17490	P	9-14-16	CONNIE SUE DOUGLAS AND RONNIE J DOUGLAS	924	578
243	10*17491	P	9-14-16	THOMAS LEE AND CLARA J HAUGHT	924	575
244	10*17598	P	9-14-16	TERRY LEE PETTIT AND STEPHANIE LYNN PETTIT	921	288
245	10*17710	P	9-14-16	DEBRA JEAN LANCASTER AND DARRELL R LANCASTER	929	634
246	10*17811	P	9-14-16	PANSY M ASTON AND ELMER L ASTON	921	216
247	10*17821	P	9-14-16	GREGORY S CROW	929	639
248	10*17902	P	9-14-16	SUSAN LYNN SEDGMEYER	920	59
249	10*17904	P	9-14-16	RICKY LEE AND TAMMY J WATSON	921	213
250	10*17958	P	9-14-16	SANDRA KAY RICHMOND	929	632
251	10*18250	P	9-14-16	BRENDA KAY COFFIELD AND WILLIAM E COFFIELD	928	546
252	10*18251	P	9-14-16	BARBARA JEAN TOMASZCZYK AND LAWRENCE M TOMASZCZYK	928	575
253	10*18252	P	9-14-16	SHARON L AND DONALD N KAISER	928	572
254	10*18253	P	9-14-16	JOAN M SCHRANTZ	928	569
255	10*18285	P	9-14-16	KATHERINE LYNN SMITH	929	637
256	10*18303	P	9-14-16	WILLIAM E MOORE AND CYNTHIA M MOORE	944	438
257	10*18304	P	9-14-16	EVA L FAWCETT	929	321
258	10*18305	P	9-14-16	MARY L WOLFKILL AND HARRY H WOLFKILL	929	324
259	10*18306	P	9-14-16	MILAN B MARINCOV AND ELIZABETH E MARINCOV	929	327
260	10*18307	P	9-14-16	DEBORAH S KACKLEY AND ROBERT A KACKLEY	929	330
261	10*18308	P	9-14-16	LINDA A DAVIS AND JAMES M DAVIS	929	333
262	10*18309	P	9-14-16	LARRY W HOBOKEN AND KATHRYN J HOBOKEN	929	336
263	10*18310	P	9-14-16	VIRGINIA A PASQUALUCCI	945	478
264	10*18311	P	9-14-16	JOYCE D JONES	929	339
265	10*18347	P	9-14-16	ELMA LOU LADNER	931	397
266	10*18348	P	9-14-16	FORREST N SIBURT AND ARLENE G SIBURT	931	362
267	10*18349	P	9-14-16	DAWN C GOSKY AND GLENN P GOSKY	931	365
268	10*18400	P	9-14-16	CHERYL ANN VYHNAL AND FRANK T VYHNAL	932	609
269	10*18457	P	9-14-16	SHEILA M KRULL AND JAMES W KRULL	933	177
270	10*18459	P	9-14-16	SANDRA K NELSON AND RICKY A NELSON	933	174
271	10*18460	P	9-14-16	ROBERT W CERMAK AND PATRICIA LYNN CERMAK	933	171
272	10*18461	P	9-14-16	STEVEN E RUNION AND JAN M RUNION	933	168
273	10*18462	P	9-14-16	NANCY L PAULETTE AND JOSEPH L PAULETTE	933	165
274	10*18463	P	9-14-16	MILANA L REDLINGER AND ROBERT W REDLINGER	933	162
275	10*18464	P	9-14-16	ROBERTA J EDDY AND RONALD D EDDY	933	159
276	10*18465	P	9-14-16	GAYLE C HATHAWAY	933	156
277	10*18466	P	9-14-16	REBECCA M PENNINGTON	933	154
278	10*18467	P	9-14-16	SAMANTHA L BOYLES AND DARRELL L BOYLES	933	145
279	10*18468	P	9-14-16	PATTY J LICITIS AND GEORGE LICITIS	933	142
280	10*18523	P	9-14-16	KENT R HARRIS	933	600
281	10*18525	P	9-14-16	WAYNE M CERMAK	933	594
282	10*18574	P	9-14-16	DAE MARIE WARDEN	935	24
283	10*18575	P	9-14-16	DEAN P PENNINGTON	935	14
284	10*18576	P	9-14-16	SCOTT D VANNEHOUSE	935	12
285	10*18577	P	9-14-16	KELLY ANN DENOON	935	10
286	10*18578	P	9-14-16	KIMBERLY ELLEN DENOON	935	8
287	10*18579	P	9-14-16	ROGER EDWARD DENOON JR	935	6
288	10*18580	P	9-14-16	BRADLEY R CROW	935	4
289	10*18611	P	9-14-16	DARYL MCGUFFIN AND NALENA H MCGUFFIN	934	598
290	10*18627	P	9-14-16	GERALDINE MAY SPONAUIGLE AND JUNIOR RICHARD SPONAUIGLE	936	234
291	10*18629	P	9-14-16	THOMAS D ULLOM AND CATHERINE A ULLOM	936	230
292	10*18630	P	9-14-16	TIMOTHY D ULLOM AND NANCY M ULLOM	936	232
293	10*18634	P	9-14-16	KATHRYN E SIBURT	936	236
294	10*18635	P	9-14-16	GLADYS CROW	936	238
295	10*18705	P	9-14-16	DELORES JEAN POLAND	938	535
296	10*18708	P	9-14-16	DELORES KOLAKOWSKI	938	540
297	10*18709	P	9-14-16	CONSTANCE M SIMPSON AND DANIEL L SIMPSON	938	537
298	10*18710	P	9-14-16	LEWIS M QUIGLEY AND MAXINE V QUIGLEY	938	267
299	10*18711	P	9-14-16	H GLENN CROW	938	269
300	10*18712	P	9-14-16	KENNETH R BURCH	938	272

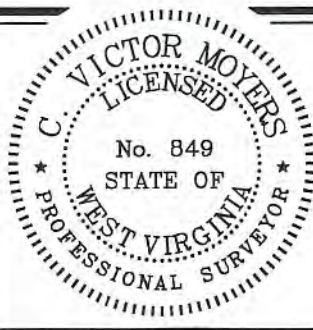
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KEITH STERN S-19HU-REV1

DATE MAY 1, 20 19

REVISED JUNE 11, 20 19

OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 — 051 — 02244
STATE COUNTY PERMIT



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



P.S. 849 *C. Victor Moyers*

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

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

COUNTY NAME PERMIT

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC±
WELL 19HU
TUG HILL OPERATING**



301	10*18713	P	9-14-16	GEORGE A JOHNS JR AND KAREN L JOHNS	938	275
302	10*18830	P	9-14-16	GERALD Q MOORE AND SYLVIA JUDITH MOORE	937	393
303	10*18831	P	9-14-16	JACQUELYN A ROBERTS	937	395
304	10*18832	P	9-14-16	DAN HELTON AND PEGGY ANNA HELTON	937	397
305	10*18833	P	9-14-16	WILLIAM J ULLOM	937	399
306	10*18834	P	9-14-16	JAMES R ROCKEY	938	1
307	10*18939	P	9-14-16	PEGGY J CROW	939	384
308	10*18940	P	9-14-16	STEVEN T JOHNS AND KAREN A JOHNS	939	277
309	10*18941	P	9-14-16	MARGARET E JONES AND CHARLES T JONES	939	393
310	10*18942	P	9-14-16	MARY JO ROCKEY	939	391
311	10*18953	P	9-14-16	CYNTHIA M GROSS AND MICHAEL D GROSS	941	299
312	10*18954	P	9-14-16	ROBERT E TOEPFER JR AND ELIZABETH A TOEPFER	941	295
313	10*18955	P	9-14-16	CHARLES W LADNER	941	293
314	10*18956	P	9-14-16	MICHELE T VALYKED	941	297
315	10*19506	P	9-14-16	MARK R MOORE AND ASHTYN C MOORE	942	610
316	10*19603	P	9-14-16	JAMES KEITH NATIONS BY HIS COURT APPTD GUARDIAN AD LITEM DAVID C WHITE ESQ	944	134
317	10*19609	P	9-14-16	LLOYD T HALL AND LORNA K HALL	937	320
318	10*19664	P	9-14-16	PAUL EUGENE SUTTON JR & NICKIE L SUTTON	944	436
319	10*19665	P	9-14-16	GAIL L SUTTON	944	138
320	10*19836	P	9-14-16	SUSAN E MARTIN	945	582
321	10*19837	P	9-14-16	SHARON K LEONARD	944	440
322	10*19839	P	9-14-16	PAMELA DOYLE BROWN	945	584
323	10*19840	P	9-14-16	PHYLLIS JEAN CROW HEWITT	945	586
324	10*19890	P	9-14-16	JO ANN FORRESTER	948	569
325	10*19891	P	9-14-16	TWILA J GORDON AND ALEXANDER J GORDON	945	475
326	10*19974	P	9-14-16	RONDA L SKILTON AND THOMAS A SKILTON	948	200
327	10*21010	P	9-14-16	LISA A HALL AND KYLE W HALL	951	185
328	10*21038	P	9-14-16	LAURA A WALSH AND MICHAEL P WALSH SR	951	188
329	10*21040	P	9-14-16	VICKIE L POND AND SIDNEY P POND	949	360
330	10*21049	P	9-14-16	JOHN J HENRY III	951	175
331	10*21059	P	9-14-16	JOHN B HIZER AND SONYA L HIZER	951	172
332	10*21060	P	9-14-16	PETER DOMINICK DENOON & DENISE J DENOON	951	170
333	10*21134	P	9-14-16	NANCY J ULLOM	951	179
334	10*21135	P	9-14-16	CHARLES K NATIONS	953	53
335	10*21136	P	9-14-16	STEVEN J KIM AND LIGIA B KIM	953	51
336	10*21137	P	9-14-16	GLORIA JEAN SELMON	951	177
337	10*21187	P	9-14-16	JEFFREY S HIZER AND BONNIE LYNN HIZER	951	183
338	10*21188	P	9-14-16	TERRY S WEEKLEY AND KRISTAL D WEEKLEY	951	181
339	10*21247	P	9-14-16	GLORIA LUCAS	953	57
340	10*21248	P	9-14-16	ESSIE BUCHANAN	953	219
341	10*21249	P	9-14-16	PEGGY HARTLEY	953	55
342	10*21338	P	9-14-16	DOROTHY I WHITE	953	217
343	10*21339	P	9-14-16	MICHAEL W SMITH	953	212
344	10*21340	P	9-14-16	MARY ANN BURNS AND SIDNEY P BURNS	953	214
345	10*21413	P	9-14-16	CHIKAKO YAMASHIRO HIZER	956	598
346	10*21446	P	9-14-16	LAURA L GORBY	956	594
347	10*21447	P	9-14-16	GINA L LUPDEGRAFF	956	596
348	10*21477	P	9-14-16	PAUL EUGENE SUTTON SR	944	136
349	10*21555	P	9-14-16	HOWARD A BLAKE & SHARON ANN BLAKE HOWARD A BLAKE POA FOR SHARON ANN BLAKE	957	390
350	10*21610	P	9-14-16	THERESA E CREEGER AND GREGORY J CREEGER	958	467
351	10*21611	P	9-14-16	KEITH GOUDY AND NANCY GOUDY	959	459
352	10*21612	P	9-14-16	YANCY R ARRINGTON AND TERESA C ARRINGTON	959	457
353	10*21881	P	9-14-16	HELEN LOUISE HUGHES	953	221
354	10*21933	P	9-14-16	BRENDA WEEKLEY BEAVER & DANIEL T BEAVER	960	4
355	10*22151	P	9-14-16	GERALD W LUNA AND CHERI E LUNA	954	342
356	10*22289	P	9-14-16	KAREN ELAINE WOLFE AND JAMES BRENT WOLFE	962	285
357	10*22290	P	9-14-16	DAVID W HUMMEL SR	962	281
358	10*22297	P	9-14-16	MARK L ADAMS	962	283
359	10*22399	P	9-14-16	WILLIAM T SCHMITT AND PENNY E SCHMITT	963	118
360	10*22400	P	9-14-16	NANCY A CHURCH & RALPH E CHURCH	963	115
361	10*22401	P	9-14-16	DEBORAH L ONEAL	963	113
362	10*22402	P	9-14-16	RUSSELL B GODDARD	963	111
363	10*22403	P	9-14-16	DONNA M TAYLOR	963	109
364	10*22409	P	9-14-16	LORI ANN OAKS AND LARRY D OAKS	963	121
365	10*22416	P	9-14-16	ADA M MOORE	963	350
366	10*22456	P	9-14-16	MICHAEL V GODDARD	964	460
367	10*22457	P	9-14-16	CATHERINE M MESSNER	964	462
368	10*22522	P	9-14-16	JAMES D COCHRAN AND LINDA M COCHRAN	966	493
369	10*22523	P	9-14-16	DEBRA E MOORE AND SCOTT MOORE	966	490
370	10*22543	P	9-14-16	MITCHELL FORRESTER AND CECELIA FORRESTER	966	188
371	10*22544	P	9-14-16	MELODIE J HOFF AND DOUGLAS T HOFF	966	191
372	10*22602	P	9-14-16	CYNTHIA JO MOORE	966	484
373	10*22603	P	9-14-16	APRIL BERISFORD AND MICHAEL BERISFORD	966	487
374	10*22628	P	9-14-16	JAMES C BALL	966	586
375	10*22629	P	9-14-16	LISA R GODDARD	966	588
376	10*22782	P	9-14-16	JULIE LYNN SCOTT	972	43
377	10*23005	P	9-14-16	VIRGINIA E SAKALO AND MICHAEL A SAKALO	984	40
378	10*23331	P	9-14-16	JAQUELINE A PATTERSON AND CHARLES ALLEN PATTERSON	988	82
379	10*23453	P	9-14-16	ROGER W RHODES	1008	303
380	10*23457	P	9-14-16	GEORGIA MITCHELL ETAL HERMAN LANTZ, SPECIAL COMMISSIONER	108	305
381	10*23952	P	9-14-16	MATTHEW S BRITTON, A MINOR ERIC GORDON, SPECIAL COMMISSIONER	1020	247
382	10*24083	P	9-14-16	JOSEPH B CROW JR	1021	134
383	10*24240	P	9-14-16	ALF THOMAS MOORE AND CHERYL A MOORE	1022	362
384	10*24275	P	9-14-16	GEORGE B CROW JR AND SHIRLEY CROW	1023	485
385	10*24276	P	9-14-16	MARTHA L PULVER	1023	483
386	10*24277	P	9-14-16	HOWARD L KUHN AND MARY L KUHN	1023	488
387	10*24292	P	9-14-16	MARK CURTIS	1023	520
388	10*24401	P	9-14-16	JOSEPH KOLAKOWSKI JR	1024	322
389	10*24410	P	9-14-16	MICHAEL KOLAKOWSKI AND LEA KOLAKOWSKI	1024	319
390	10*24411	P	9-14-16	MARGIE M MILTON	1025	156
391	10*24412	P	9-14-16	JAMES P DERROW AND CHRISTINE M DERROW	1024	315
392	10*24414	P	9-14-16	ROBERT ALLEN SUTTON AND MICKIE L SUTTON	1024	313
393	10*24435	P	9-14-16	JAMES C ADAMS AND NICOLE D ADAMS	1025	158
394	10*24675	P	9-14-16	MICHELLE M KOLAKOWSKI	1027	126
395	10*24676	P	9-14-16	THERESA THOMAS	1025	338
396	10*24735	P	9-14-16	EARL SELMON	1027	304
397	10*24736	P	9-14-16	SUSAN L SCHULTE	1027	300
398	10*24764	P	9-14-16	MARLENA PENNINGTON ET AL	1027	594
399	10*24765	P	9-14-16	CRYSTAL CURTIS	1027	592

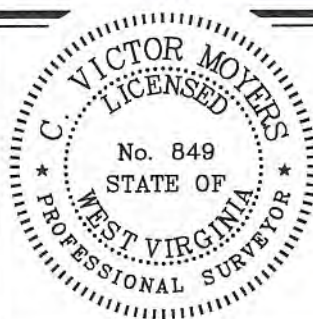
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OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 — 061 — 02244
STATE COUNTY PERMIT



STATE OF WEST VIRGINIA
DIVISION OF
ENVIRONMENTAL PROTECTION
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P.S. 849 *C. Victor Moyers*

COUNTY NAME

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WELL OPERATOR TUG HILL OPERATING, LLC
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CHARLESTON, WV 25313

**KEITH STERN S LEASE
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WELL 19HU
TUG HILL OPERATING**



400	10*24766	P	9-14-16	LLOYD E YOHO	1027	590
401	10*24857	P	9-14-16	JANET KIMBLE AND JOHN KIMBLE	1028	109
402	10*24873	P	9-14-16	WAYNE PRICE	1028	117
403	10*24874	P	9-14-16	DONALD SMOTHERMAN AND MARGARET SMOTHERMAN	1028	115
404	10*24876	P	9-14-16	JAMES D WHITE AND BRITNEY C WHITE	1028	113
405	10*24877	P	9-14-16	DEBORAH LEDGER AND JOHN H LEDGER	1028	111
406	10*25011	P	9-14-16	JOHN DAVID CROW	1029	537
407	10*25012	P	9-14-16	LARRY B PATTERSON	1029	535
408	10*25219	P	9-14-16	THE ESTATE OF PAUL W BLAKE	1030	125
409	10*25220	P	9-14-16	MISTY MOORE	1030	127
410	10*25221	P	9-14-16	CHARLES ROY SUTTON	1030	129
411	10*25321	P	9-14-16	CINDY LAND KERRY L WINTERS	1031	571
412	10*25498	P	9-14-16	DAN AND SHARON CVETANOVICH	1034	232
413	10*26626	P	9-14-16	MARLENA PENNINGTON	1027	594
414	10*23087	Q	9-14-12	REASON AND CATHERINE V YOUNG	68	69
415	10*19621	R	9-14-1	MARY RUTH FROHNAPFEL	938	595
416	10*19622	R	9-14-1	KENNETH D SIBURT JR AND LORI SIBURT	938	597
417	10*19623	R	9-14-1	SANDRA SIBURT FROWEN & GEORGE FROWEN	938	600
418	10*19627	R	9-14-1	RONALD S YOUNG	944	192
419	10*19655	R	9-14-1	CHESTNUT HOLDINGS INC	949	309
420	10*19678	R	9-14-1	WILLIAM O. JOBES	944	188
421	10*19679	R	9-14-1	DAVID A DARRAH SR AND ANITA SLOUGH-DARRAH	946	54
422	10*19725	R	9-14-1	MAMIE V ARNOLD	944	454
423	10*21213	R	9-14-1	JAMES B SIBURT AND DELIA D SIBURT	957	1077
424	10*21214	R	9-14-1	VICKI J CHERRY AND RUCKEY E CHERRY	949	139
425	10*21215	R	9-14-1	ALAN K SIBURT ET UX	949	136
426	10*21216	R	9-14-1	RODNEY L SIBURT	949	142
427	10*21559	R	9-14-1	GUY L BUZZARD TRUSTEE THE GUY L BUZZARD 2017 IRREVOCABLE TRUST	957	388
428	10*22464	R	9-14-1	DONNA KYLE	964	470
429	10*22465	R	9-14-1	LOIS KURPIL FKA LOIS HERCULES	964	472
430	10*22466	R	9-14-1	JUDITH MAY CONNER	964	468
431	10*22516	R	9-14-1	SHARON RUSSELL	964	464
432	10*22518	R	9-14-1	GEORGE EDWARDS	964	466
433	10*22856	R	9-14-1	CHARLES W MILLER AND ESTHER JEAN MILLER	977	51
434	10*23435	R	9-14-1	LLOYD C. ARNOLD & JUDITH C. ARNOLD	1008	301
435	10*15510	S	9-11-12	ELAINE PHELPS ET VIR	718	326
436	10*15511	S	9-11-12	DAVID E CROW	718	376
437	10*15512	S	9-11-12	FRANCES COFFEY	718	378
438	10*15513	S	9-11-12	KAY KEYES	718	330
439	10*15514	S	9-11-12	L PAUL CROW	718	336
440	10*15515	S	9-11-12	DESIRE L CROW	718	334
441	10*15516	S	9-11-12	ROSE MARIE KIELGCZEWSKI	718	354
442	10*15517	S	9-11-12	DIANNE GELLNER & GARY GELLNER	718	345
443	10*15518	S	9-11-12	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
444	10*15519	S	9-11-12	JOHN CROW	725	580
445	10*15520	S	9-11-12	TIMOTHY CROW	725	582
446	10*19685	S	9-11-12	MORGAN H MOSSER AND NANCY MOSSER	944	445
447	10*21093	S	9-11-12	DUNCAN S UNN AND POLLY LU BROWN	952	157
448	10*21492	S	9-11-12	JUDITH FISK	957	282
449	10*21494	S	9-11-12	EILEEN M SLATE AND DALE A SLATE	957	284
450	10*21495	S	9-11-12	E JEN BAIRD AND GEORGE S BAIRD AMENDED REVOCABLE TRUST AGREEMENT	966	618
451	10*21843	S	9-11-12	JOHN B HOAGLAND AND PATRICIA A HOAGLAND	969	620
452	10*21923	S	9-11-12	DOROTHY JEAN BURKLE BOYD	953	468
453	10*22090	S	9-11-12	KATHERINE ANN BOYD BLAKE	953	473
454	10*22153	S	9-11-12	JODY A SCHOTTLER AND THOMAS A SCHOTTLER	953	470
455	10*22462	S	9-11-12	ROBERT CALDWELL MEAD	964	490
456	10*22606	S	9-11-12	SARAH BAIRD LINN	966	620
457	10*22666	S	9-11-12	JOSEPH W LINN JR AND TAMMY S LINN	968	230
458	10*22771	S	9-11-12	KATHARINE B SILBAUGH AND DANIEL JURAYJ	970	24
459	10*22855	S	9-11-12	KIM O MAGHAN AND JAMES G MAGHAN	977	49
460	10*23024	S	9-11-12	KATHRYN A TAGGART AND EVERETT TAGGART JR	977	289
461	10*23059	S	9-11-12	GAIL W STEWART	977	287
462	10*23105	S	9-11-12	EDITH BOYD ORR AND WENDELL FRANKLIN ORR	984	68
463	10*23389	S	9-11-12	LEESA O THOMPSON	972	45
464	10*23427	S	9-11-12	SANDY VINCENT AND STEVEN VINCENT	1008	307
465	10*23652	S	9-11-12	KATHARINE A TWOOD AND MICHAEL GRITTON	1009	291
466	10*23686	S	9-11-12	RANDALL T ULLOM AND ROSAUE FERMO-ULLOM	1010	400
467	10*23687	S	9-11-12	ELIZABETH F BAIRD	1010	402
468	10*23688	S	9-11-12	MELISSA DUBOIS BAIRD	1010	404
469	10*23692	S	9-11-12	WILLIAM ATWOOD AND ELIZABETH ATWOOD	1010	408
470	10*23693	S	9-11-12	JOHN ATWOOD AND ANNETTE ATWOOD	1010	406
471	10*24222	S	9-11-12	SALVATION ARMY	1022	371
472	10*24282	S	9-11-12	CLARA OSBORNE DOUGLAS	1023	481
473	10*24296	S	9-11-12	KATHARINE D LINN	1023	522
474	10*24400	S	9-11-12	JANE W VARDY ET AL	1024	317
475	10*47051.123.1	S	9-11-12	LLOYD G BAKER	865	389
476	10*47051.123.2	S	9-11-12	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
477	10*16258	T	9-11-13	CHESTNUT HOLDINGS INC	848	234
478	10*15582	U	9-11-10	ROBERT L CLARK	685	239
479	10*47051.108.1	V	9-11-9	MICHAEL A WHETZEL	885	51
480	10*47051.243.1	W	9-14-21	MARY A FOX	879	332
481	10*47051.243.2	W	9-14-21	PAUL G FOX	879	335
482	10*47051.243.3	W	9-14-21	MARK H FOX	879	338
483	10*47051.243.4	W	9-14-21	DAVID E FOX	876	55
484	10*47051.243.5	W	9-14-21	LOUIS T FOX AND KAREN A FOX	876	58
485	10*47051.243.6	W	9-14-21	THOMAS J FOX	876	61
486	10*15837	X	9-17-4.1	ANITA DIANE ANTILL AND TERRY ANTILL	742	85
487	10*15836	X	9-17-4.1	LUCINDA RAE ALLEN AND DAVID A ALLEN	742	79
488	10*15842	X	9-17-4.1	HOMER L SIMMONS AND GLADYS R SIMMONS	742	329
489	10*16007	X	9-17-4.1	MARY LOU KITTELBERGER AND FREDERICK W KITTELBERGER	799	436
490	10*16008	X	9-17-4.1	DONNA KAY ALLEN AND ROGER ALLEN	801	222
491	10*17500	X	9-17-4.1	TRACY L AND KEITH W BARNBY	916	116
492	10*17666	X	9-17-4.1	LILA FAYE BONAR SNOODGRASS AND DONALD T SNOODGRASS	949	172
493	10*17673	X	9-17-4.1	JAMES PERRY COCHRAN	932	567
494	10*17707	X	9-17-4.1	JACQUELYN S FERRARI AND JOHN C FERRARI	949	177
495	10*17709	X	9-17-4.1	CAROL GONGOLA	949	167
496	10*17765	X	9-17-4.1	ROBERTA YOUNG	949	163
497	10*17840	X	9-17-4.1	RONALD D KOONTZ & BETH ANN KOONTZ	942	432
498	10*17886	X	9-17-4.1	ANNETTE CAIN HANKINS AND HOWARD RONALD HANKINS	924	536
499	10*17887	X	9-17-4.1	LEO C HILKE AND BETTY M HILKE	924	531
500	10*17977	X	9-17-4.1	BRANNEN DAUGHERTY	925	359

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501	10*17980	X	9-17-4.1	ANITA RAE MILLER	925	370
502	10*17981	X	9-17-4.1	MICHAEL E SWIFT AND MELODY A SWIFT	925	372
503	10*18031	X	9-17-4.1	LEE ANNE MILLER	927	222
504	10*18092	X	9-17-4.1	DAVID MCDOWELL AND CRYSTAL MCDOWELL	927	283
505	10*18093	X	9-17-4.1	JENNIFER WHEATON	927	289
506	10*18094	X	9-17-4.1	BONNIE GRISELL	927	231
507	10*18095	X	9-17-4.1	TEXYN L MILLER AND GEORGIA A MILLER	927	287
508	10*18096	X	9-17-4.1	LISA ANN MCDOWELL AND ROBERT JOSEPH HILL	939	263
509	10*18099	X	9-17-4.1	RAE ELLEN FLOYD AND KENNETH FLOYD	927	233
510	10*18107	X	9-17-4.1	ANITA MAE MASON	927	238
511	10*18167	X	9-17-4.1	NBL CALL AND MELINDA CALL	927	492
512	10*18168	X	9-17-4.1	SANDRA YANAGAWA	927	498
513	10*18169	X	9-17-4.1	KAREN K WILLIAMS	927	628
514	10*18170	X	9-17-4.1	KAREN MCDOWELL CECIL AND JAMES E CECIL	927	633
515	10*18192	X	9-17-4.1	STEPHEN S MASON AND CAROLE K MASON	928	625
516	10*18193	X	9-17-4.1	CAROLYN LEE FUREY AND MARTIN J FUREY	949	158
517	10*18194	X	9-17-4.1	PAMELA BEYLER AND CHAD R BEYLER	928	630
518	10*18197	X	9-17-4.1	BARBARA K BURLEY AND DAVID K BURLEY	928	641
519	10*18198	X	9-17-4.1	MARY THERESA SOLEAU AND THOMAS SOLEAU	928	643
520	10*18199	X	9-17-4.1	LAWRENCE J VAUGHN AND GAIL L VAUGHN	928	532
521	10*18260	X	9-17-4.1	GEMMA RUDY AND TIMOTHY RUDY	928	584
522	10*18295	X	9-17-4.1	THOMAS R BAKER AND VICKIE L BAKER	929	262
523	10*18298	X	9-17-4.1	MAUREEN GREGG	929	273
524	10*18300	X	9-17-4.1	ROBERT W ODOM AND CASSANDRA L ODOM	929	263
525	10*18361	X	9-17-4.1	MARY JO CAIN	931	407
526	10*18417	X	9-17-4.1	CHERYLL HILL	932	577
527	10*18457	X	9-17-4.1	NANCY L STANGEL AND JOHN J STANGEL	933	113
528	10*18488	X	9-17-4.1	CHARLINE M ENGLE AND KEVIN E ENGLE	933	118
529	10*18508	X	9-17-4.1	PATRICIA LUANNE BONAR	925	351
530	10*18517	X	9-17-4.1	LORI SHANAHAN AND PATRICK SHANAHAN	933	575
531	10*18613	X	9-17-4.1	JANE LOUISE CAIN AND DANIEL CARL HOLTZ	934	603
532	10*18625	X	9-17-4.1	PATRICIA L LEHN	936	95
533	10*18656	X	9-17-4.1	PAMELA CALL	936	100
534	10*18658	X	9-17-4.1	ELIZABETH JANE KELLER	936	107
535	10*18659	X	9-17-4.1	CATHERINE P MASON	936	112
536	10*18799	X	9-17-4.1	CHARLES J DARMAFALL DECEASED	937	634
537	10*18805	X	9-17-4.1	CINDY STEVENS TOZIER	937	628
538	10*19373	X	9-17-4.1	JESSICA WHEATON	931	411
539	10*19403	X	9-17-4.1	LAWRENCE R LOTZ	951	114
540	10*19404	X	9-17-4.1	HOWARD M CAIN AND EMMA JEAN CAIN	939	283
541	10*19476	X	9-17-4.1	WINONA RIDDLE	941	331
542	10*19689	X	9-17-4.1	EDMOND TURGEON JR AND CATHY STEVENS TURGEON	944	156
543	10*19718	X	9-17-4.1	CHRISTOPHER DAUGHERTY & JENNIFER R DAUGHERTY	944	412
544	10*19879	X	9-17-4.1	MARY V GILSON AND WALTER M GILSON	945	588
545	10*19933	X	9-17-4.1	MARY ANN GRIFFITH	948	555
546	10*19937	X	9-17-4.1	JAMES D STEVENS AND DOROTHY M STEVENS	949	151
547	10*19938	X	9-17-4.1	JOHN H STEVENS AND LYNDA L STEVENS	949	164
548	10*21026	X	9-17-4.1	NANCY M MORGAN	951	110
549	10*21211	X	9-17-4.1	NILA JEAN BAYLES	951	118
550	10*21841	X	9-17-4.1	ENERGY DEEP RESOURCES INC	959	631
551	10*21842	X	9-17-4.1	JOSEPH NOKOVICH	959	635
552	10*21927	X	9-17-4.1	BLACK GOLD GROUP LTD	964	474
553	10*21940	X	9-17-4.1	ALYSIA JORDAN & TERRY M JORDAN	953	346
554	10*22376	X	9-17-4.1	MARGARET KUCHARZ AND JAMES C KUCHARZ	962	270
555	10*22412	X	9-17-4.1	CHAD E LONGFELLOW	963	124
556	10*22599	X	9-17-4.1	BRYANT R SWIFT AND KATHY SWIFT	966	456
557	10*22776	X	9-17-4.1	JAMES ROBERT WELLS	970	19
558	10*22849	X	9-17-4.1	NEL MCELROY AND SUE MASON MCELROY	977	44
559	10*22851	X	9-17-4.1	JOHN J HELLSTERN AND LYNN D HELLSTERN	977	39
560	10*22853	X	9-17-4.1	RONALD LEE HENSLEY AND MARY ANN HENSLEY	977	34
561	10*23076	X	9-17-4.1	JACK R BERISFORD AKA RANDY BERISFORD	984	43
562	10*23260	X	9-17-4.1	IDA M TRAVIS ET AL DAVID C WHITE AS SPECIAL COMMISSIONER	988	73
563	10*23668	X	9-17-4.1	THE ESTATE OF RUTH N LUTHER SUZANNE L WOZNIAK EXECUTRIX	1009	286
564	10*47051.219.27	X	9-17-4.1	MARSHA BERISFORD	902	425
565	10*47051.219.33	X	9-17-4.1	JOHN H HILKE AND AUDA HILKE	898	602
566	10*47051.219.36	X	9-17-4.1	GAREN MCDOWELL AND ELIZABETH MCDOWELL	898	615
567	10*47051.219.37	X	9-17-4.1	SUSAN H KEY	898	621
568	10*47051.219.38	X	9-17-4.1	TIMOTHY MCDOWELL AND CYNTHIA MCDOWELL	902	431
569	10*47051.219.39	X	9-17-4.1	ALICE THIPPHAVONG AND VISITH THIPPHAVONG	902	437
570	10*17169	X	9-17-4.1	ALMA L VAN SCYOC	692	404
571	10*17171	X	9-17-4.1	OPAL MCKEY	690	631
572	10*17173	X	9-17-4.1	LLOYD R. EVANS	694	526
573	10*47051.219.1	X	9-17-4.1	DAVID LEE FRANKLIN	574	312
574	10*19702	X	9-17-4.1	WV MINERALS INC	951	108
575	10*15836	Y	9-17-4	LUCINDA RAE ALLEN AND DAVID A ALLEN	742	79
576	10*15837	Y	9-17-4	ANITA DIANE ANTILL AND TERRY ANTILL	742	85
577	10*15842	Y	9-17-4	HOMER L SIMMONS AND GLADYS R SIMMONS	742	329
578	10*16007	Y	9-17-4	MARY LOU KITTELBERGER AND FREDERICK W KITTELBERGER	799	436
579	10*16008	Y	9-17-4	DONNA KAY ALLEN AND ROGER ALLEN	801	222
580	10*17500	Y	9-17-4	TRACY L AND KEITH W BARNBY	916	116
581	10*17666	Y	9-17-4	LILA FAYE BONAR SNODGRASS AND DONALD T SNODGRASS	949	172
582	10*17673	Y	9-17-4	JAMES PERRY COCHRAN	932	567
583	10*17707	Y	9-17-4	JACQUELYN S FERRARI AND JOHN C FERRARI	949	177
584	10*17709	Y	9-17-4	CAROL GONGOLA	949	167
585	10*17765	Y	9-17-4	ROBERTA YOUNG	949	163
586	10*17840	Y	9-17-4	RONALD D KOONTZ & BETH ANN KOONTZ	942	432
587	10*17886	Y	9-17-4	ANNETTE CAIN HANKINS AND HOWARD RONALD HANKINS	924	536
588	10*17887	Y	9-17-4	LEO C HILKE AND BETTY M HILKE	924	531
589	10*17977	Y	9-17-4	BRANNEN DAUGHERTY	925	359
590	10*17980	Y	9-17-4	ANITA RAE MILLER	925	370
591	10*17981	Y	9-17-4	MICHAEL E SWIFT AND MELODY A SWIFT	925	372
592	10*18031	Y	9-17-4	LEE ANNE MILLER	927	222
593	10*18092	Y	9-17-4	DAVID MCDOWELL AND CRYSTAL MCDOWELL	927	283
594	10*18093	Y	9-17-4	JENNIFER WHEATON	927	289
595	10*18094	Y	9-17-4	BONNIE GRISELL	927	231
596	10*18095	Y	9-17-4	TEXYN L MILLER AND GEORGIA A MILLER	927	287
597	10*18098	Y	9-17-4	LISA ANN MCDOWELL AND ROBERT JOSEPH HILL	939	263
598	10*18099	Y	9-17-4	RAE ELLEN FLOYD AND KENNETH FLOYD	927	233
599	10*18107	Y	9-17-4	ANITA MAE MASON	927	238
600	10*18167	Y	9-17-4	NBL CALL AND MELINDA CALL	927	492
601	10*18168	Y	9-17-4	SANDRA YANAGAWA	927	498

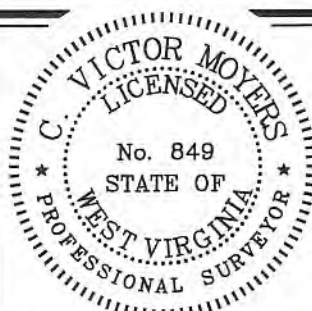
FILE NO. 8811P19HUR.dwg
KEITH STERN S-19HU-REV1

DATE MAY 1, 20 19

REVISED JUNE 11, 20 19

OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 — 051 — 02244
STATE COUNTY PERMIT



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



P.S. 849 *C. Victor Moyers*

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

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

COUNTY NAME
PERMIT

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC±
WELL 19HU
TUG HILL OPERATING**



602	10*18169	Y	9-17-4	KAREN K WILLIAMS	927	628
603	10*18170	Y	9-17-4	KAREN MCDOWELL CECIL AND JAMES E CECIL	927	633
604	10*18192	Y	9-17-4	STEPHEN S MASON AND CAROLE K MASON	928	625
605	10*18193	Y	9-17-4	CAROLYN LEE FUREY AND MARTIN J FUREY	949	158
606	10*18194	Y	9-17-4	PAMELA BEYLER AND CHAD R BEYLER	928	630
607	10*18197	Y	9-17-4	BARBARA K BURLEY AND DAVID K BURLEY	928	641
608	10*18198	Y	9-17-4	MARY THERESA SOLEAU AND THOMAS SOLEAU	928	643
609	10*18199	Y	9-17-4	LAWRENCE J VAUGHN AND GAIL L VAUGHN	928	532
610	10*18260	Y	9-17-4	GEMMA RUDY AND TIMOTHY RUDY	928	584
611	10*18295	Y	9-17-4	THOMAS R BAKER AND VICKIE L BAKER	929	262
612	10*18298	Y	9-17-4	MAUREEN GREGG	929	273
613	10*18300	Y	9-17-4	ROBERT W ODOM AND CASSANDRA L ODOM	929	283
614	10*18361	Y	9-17-4	MARY JO CAIN	931	407
615	10*18417	Y	9-17-4	CHERYL L HILL	932	577
616	10*18487	Y	9-17-4	NANCY L STANGEL AND JOHN J STANGEL	933	113
617	10*18488	Y	9-17-4	CHARLINE M ENGLE AND KEVIN E ENGLE	933	118
618	10*18508	Y	9-17-4	PATRICIA LUANNE BONAR	925	351
619	10*18517	Y	9-17-4	LORI SHANAHAN AND PATRICK SHANAHAN	933	575
620	10*18613	Y	9-17-4	JANE LOUISE CAIN AND DANIEL CARL HOLTZ	934	603
621	10*18655	Y	9-17-4	PATRICIA L LEHN	936	95
622	10*18656	Y	9-17-4	PAMELA CALL	936	100
623	10*18658	Y	9-17-4	ELIZABETH JANE KELLER	936	107
624	10*18659	Y	9-17-4	CATHERINE P MASON	936	112
625	10*18799	Y	9-17-4	CHARLES J DARMAFALL DECEASED	937	634
626	10*18805	Y	9-17-4	CINDY STEVENS TOZIER	937	628
627	10*19373	Y	9-17-4	JESSICA WHEATON	931	411
628	10*19403	Y	9-17-4	LAWRENCE R LOTZ	951	114
629	10*19404	Y	9-17-4	HOWARD M CAIN AND EMMA JEAN CAIN	939	283
630	10*19476	Y	9-17-4	WINONA RIDDLE	941	331
631	10*19689	Y	9-17-4	EDMOND TURGEON JR AND CATHY STEVENS TURGEON	944	156
632	10*19718	Y	9-17-4	CHRISTOPHER DAUGHERTY & JENNIFER R DAUGHERTY	944	412
633	10*19879	Y	9-17-4	MARY V GILSON AND WALTER M GILSON	945	588
634	10*19933	Y	9-17-4	MARY ANN GRIFFITH	948	555
635	10*19937	Y	9-17-4	JAMES D STEVENS AND DOROTHY M STEVENS	949	151
636	10*19938	Y	9-17-4	JOHN H STEVENS AND LYNDA L STEVENS	949	144
637	10*21026	Y	9-17-4	NANCY M MORGAN	951	110
638	10*21211	Y	9-17-4	NILA JEAN BAYLES	951	118
639	10*21841	Y	9-17-4	ENERGY DEEP RESOURCES INC	959	631
640	10*21842	Y	9-17-4	JOSEPH NOKOVICH	959	635
641	10*21927	Y	9-17-4	BLACK GOLD GROUP LTD	964	474
642	10*21940	Y	9-17-4	ALYSIA JORDAN & TERRY M JORDAN	953	346
643	10*22376	Y	9-17-4	MARGARET KUCHARZ AND JAMES C KUCHARZ	962	270
644	10*22412	Y	9-17-4	CHAD E LONGFELLOW	963	124
645	10*22599	Y	9-17-4	BRYANT R SWIFT AND KATHY SWIFT	966	456
646	10*22776	Y	9-17-4	JAMES ROBERT WELLS	970	19
647	10*22849	Y	9-17-4	NEIL MCELROY AND SUE MASON MCELROY	977	44
648	10*22851	Y	9-17-4	JOHN J HELLSTERN AND LYNN D HELLSTERN	977	39
649	10*22853	Y	9-17-4	RONALD LEE HENSLEY AND MARY ANN HENSLEY	977	34
650	10*23076	Y	9-17-4	JACK R BERISFORD AKA RANDY BERISFORD	984	43
651	10*23260	Y	9-17-4	IDA M TRAVIS ET AL DAVID C WHITE AS SPECIAL COMMISSIONER	988	73
652	10*23668	Y	9-17-4	THE ESTATE OF RUTH N LUTHER SUZANNE L WOZNIAK EXECUTRIX	1009	286
653	10*47051.219.27	Y	9-17-4	MARSHA BERISFORD	902	425
654	10*47051.219.33	Y	9-17-4	JOHN H HILKE AND ALIDA HILKE	898	602
655	10*47051.219.36	Y	9-17-4	GAREN MCDOWELL AND ELIZABETH MCDOWELL	898	615
656	10*47051.219.37	Y	9-17-4	SUSAN H KEY	898	621
657	10*47051.219.38	Y	9-17-4	TIMOTHY MCDOWELL AND CYNTHIA MCDOWELL	902	431
658	10*47051.219.39	Y	9-17-4	ALICE THIPPHAVONG AND VISITH THIPPHAVONG	902	437
659	10*17169	Y	9-17-4	ALMA L VAN SCYOC	692	404
660	10*17171	Y	9-17-4	OPAL MICKY	690	631
661	10*17173	Y	9-17-4	LLOYD R EVANS	694	526
662	10*47051.219.1	Y	9-17-4	DAVID LEE FRANKLIN	874	312
663	10*19702	Y	9-17-4	WV MINERALS INC	951	108
664	10*15832	Z	9-17-3	ANITA DIANE ANTILL AND TERRY ANTILL	742	121
665	10*15835	Z	9-17-3	LUCINDA RAE ALLEN AND DAVID A ALLEN	742	104
666	10*15847	Z	9-17-3	ROGER BRIGHT AND SUSAN LEIMER - DECEASED	743	285
667	10*15848	Z	9-17-3	HOMER L SIMMONS AND GLADYS R SIMMONS	745	194
668	10*15855	Z	9-17-3	ALICE THIPPHAVONG AND VISITH THIPPHAVONG	747	635
669	10*15856	Z	9-17-3	LEO C HILKE AND BETTY M HILKE	747	629
670	10*15870	Z	9-17-3	JOHN H HILKE AND ALIDA HILKE	750	206
671	10*15872	Z	9-17-3	SUSAN H KEY	751	191
672	10*15836	AA	9-17-4.4	LUCINDA RAE ALLEN AND DAVID A ALLEN	742	79
673	10*15837	AA	9-17-4.4	ANITA DIANE ANTILL AND TERRY ANTILL	742	85
674	10*15842	AA	9-17-4.4	HOMER L SIMMONS AND GLADYS R SIMMONS	742	329
675	10*16007	AA	9-17-4.4	MARY LOU KITTELBERGER AND FREDERICK W KITTELBERGER	799	436
676	10*16008	AA	9-17-4.4	DONNA KAY ALLEN AND ROGER ALLEN	801	222
677	10*17500	AA	9-17-4.4	TRACY LAND KEITH W BARNBY	916	116
678	10*17666	AA	9-17-4.4	LILA FAYE BONAR SNODGRASS AND DONALD T SNODGRASS	949	172
679	10*17673	AA	9-17-4.4	JAMES PERRY COCHRAN	932	567
680	10*17707	AA	9-17-4.4	JACQUELYN S FERRARI AND JOHN C FERRARI	949	177
681	10*17709	AA	9-17-4.4	CAROL GONGOLA	949	167
682	10*17765	AA	9-17-4.4	ROBERTA YOUNG	949	163
683	10*17840	AA	9-17-4.4	RONALD D KOONTZ & BETH ANN KOONTZ	942	452
684	10*17886	AA	9-17-4.4	ANNETTE CAIN HANKINS AND HOWARD RONALD HANKINS	924	536
685	10*17887	AA	9-17-4.4	LEO C HILKE AND BETTY M HILKE	924	531
686	10*17977	AA	9-17-4.4	BRANNEN DAUGHERTY	925	359
687	10*17980	AA	9-17-4.4	ANITA RAE MILLER	925	370
688	10*17981	AA	9-17-4.4	MICHAEL E SWIFT AND MELODY A SWIFT	925	372
689	10*18613	AA	9-17-4.4	JANE LOUISE CAIN AND DANIEL CARL HOLTZ	934	603
690	10*18031	AA	9-17-4.4	LEE ANNE MILLER	927	222
691	10*18092	AA	9-17-4.4	DAVID MCDOWELL AND CRYSTAL MCDOWELL	927	283
692	10*18093	AA	9-17-4.4	JENNIFER WHEATON	927	289
693	10*18094	AA	9-17-4.4	BONNIE GRISELL	927	231
694	10*18095	AA	9-17-4.4	TEXYN L MILLER AND GEORGIA A MILLER	927	287
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697	10*18107	AA	9-17-4.4	ANITA MAE MASON	927	238
698	10*18167	AA	9-17-4.4	NEIL CALLAND MELINDA CALL	927	492
699	10*18168	AA	9-17-4.4	SANDRA YANAGAWA	927	498
700	10*18169	AA	9-17-4.4	KAREN K WILLIAMS	927	628
701	10*18170	AA	9-17-4.4	KAREN MCDOWELL CECIL AND JAMES E CECIL	927	633
702	10*18192	AA	9-17-4.4	STEPHEN S MASON AND CAROLE K MASON	928	625

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KEITH STERN S-19HU-REV1

DATE MAY 1, 20 19

REVISED JUNE 11, 20 19

OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 — 051 — 02244
STATE COUNTY PERMIT



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



P.S. 849 *C. Victor Moyers*

COUNTY NAME

PERMIT

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

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

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC ±
WELL 19HU
TUG HILL OPERATING**



703	10*18193	AA	9-17-4.4	CAROLYN LEE FUREY AND MARTIN J FUREY	949	158
704	10*18194	AA	9-17-4.4	PAMELA BEYLER AND CHAD R BEYLER	928	630
705	10*18197	AA	9-17-4.4	BARBARA K BURLEY AND DAVID K BURLEY	928	641
706	10*18198	AA	9-17-4.4	MARY THERESA SOLEAU AND THOMAS SOLEAU	928	643
707	10*18199	AA	9-17-4.4	LAWRENCE J VAUGHN AND GAIL L VAUGHN	928	532
708	10*18260	AA	9-17-4.4	GEMMA RUDY AND TIMOTHY RUDY	928	584
709	10*18295	AA	9-17-4.4	THOMAS R BAKER AND VICKIE L BAKER	929	262
710	10*18298	AA	9-17-4.4	MAUREEN GREGG	929	273
711	10*18300	AA	9-17-4.4	ROBERT W ODOM AND CASSANDRA L ODOM	929	283
712	10*18361	AA	9-17-4.4	MARY JO CAIN	931	407
713	10*18417	AA	9-17-4.4	CHERYL L HILL	932	577
714	10*18487	AA	9-17-4.4	NANCY L STANGEL AND JOHN J STANGEL	933	113
715	10*18488	AA	9-17-4.4	CHARLINE M ENGLE AND KEVIN E ENGLE	933	118
716	10*18508	AA	9-17-4.4	PATRICIA LUANNE BONAR	925	351
717	10*18517	AA	9-17-4.4	LORI SHANAHAN AND PATRICK SHANAHAN	933	575
718	10*18655	AA	9-17-4.4	PATRICIA L LEHN	936	95
719	10*18656	AA	9-17-4.4	PAMELA CALL	936	100
720	10*18658	AA	9-17-4.4	ELIZABETH JANE KELLER	936	107
721	10*18659	AA	9-17-4.4	CATHERINE P MASON	936	112
722	10*18799	AA	9-17-4.4	CHARLES J DARMAFALL DECEASED	937	634
723	10*18805	AA	9-17-4.4	CINDY STEVENS TOZIER	937	628
724	10*19373	AA	9-17-4.4	JESSICA WHEATON	931	411
725	10*19403	AA	9-17-4.4	LAWRENCE R LOTZ	951	114
726	10*19404	AA	9-17-4.4	HOWARD M CAIN AND EMMA JEAN CAIN	939	283
727	10*19476	AA	9-17-4.4	WINONA RIDDLE	941	331
728	10*19689	AA	9-17-4.4	EDMOND TURGEON JR AND CATHY STEVENS TURGEON	944	156
729	10*19718	AA	9-17-4.4	CHRISTOPHER DAUGHERTY & JENNIFER R DAUGHERTY	944	412
730	10*19879	AA	9-17-4.4	MARY V GILSON AND WALTER M GILSON	945	588
731	10*19933	AA	9-17-4.4	MARY ANN GRIFFITH	948	555
732	10*19937	AA	9-17-4.4	JAMES D STEVENS AND DOROTHY M STEVENS	949	151
733	10*19938	AA	9-17-4.4	JOHN H STEVENS AND LYNDA L STEVENS	949	144
734	10*21026	AA	9-17-4.4	NANCY M MORGAN	951	110
735	10*21211	AA	9-17-4.4	NILA JEAN BAYLES	951	118
736	10*21841	AA	9-17-4.4	ENERGY DEEP RESOURCES INC	959	631
737	10*21842	AA	9-17-4.4	JOSEPH NOKOVICH	959	635
738	10*21927	AA	9-17-4.4	BLACK GOLD GROUP LTD	964	474
739	10*21940	AA	9-17-4.4	ALYSIA JORDAN & TERRY M JORDAN	953	346
740	10*22376	AA	9-17-4.4	MARGARET KUCHARZ AND JAMES C KUCHARZ	962	270
741	10*22412	AA	9-17-4.4	CHAD E LONGFELLOW	963	124
742	10*22599	AA	9-17-4.4	BRYANT R SWIFT AND KATHY SWIFT	966	456
743	10*22776	AA	9-17-4.4	JAMES ROBERT WELLS	970	19
744	10*22849	AA	9-17-4.4	NEIL MCELROY AND SUE MASON MCELROY	977	44
745	10*22851	AA	9-17-4.4	JOHN J HELLSTERN AND LYNN D HELLSTERN	977	39
746	10*22853	AA	9-17-4.4	RONALD LEE HENSLEY AND MARY ANN HENSLEY	977	34
747	10*23076	AA	9-17-4.4	JACK R BERISFORD AKA RANDY BERISFORD	984	43
748	10*23260	AA	9-17-4.4	IDA M TRAVIS ET AL DAVID C WHITE AS SPECIAL COMMISSIONER	988	73
749	10*23668	AA	9-17-4.4	THE ESTATE OF RUTH N LUTHER SUZANNE L WOZNIAK EXECUTRIX	1009	286
750	10*47051.219.27	AA	9-17-4.4	MARSHA BERISFORD	902	425
751	10*47051.219.33	AA	9-17-4.4	JOHN H HILKE AND ALIDA HILKE	898	602
752	10*47051.219.36	AA	9-17-4.4	GAREN MCDOWELL AND ELIZABETH MCDOWELL	898	615
753	10*47051.219.37	AA	9-17-4.4	SUSAN H KEY	898	621
754	10*47051.219.38	AA	9-17-4.4	TIMOTHY MCDOWELL AND CYNTHIA MCDOWELL	902	431
755	10*47051.219.39	AA	9-17-4.4	ALICE THIPPHAVONG AND VISITH THIPPHAVONG	902	437
756	10*17169	AA	9-17-4.4	ALMA L VAN SCYOC	692	404
757	10*17171	AA	9-17-4.4	OPAL MICKY	690	631
758	10*17173	AA	9-17-4.4	LLOYD R. EVANS	694	526
759	10*47051.219.1	AA	9-17-4.4	DAVID LEE FRANKUN	874	312
760	10*19702	AA	9-17-4.4	WV MINERALS INC	951	108
761	10*15974	BB	9-15-43	ROGER BRIGHT AND SUSAN LEIMER - DECEASED	777	222
762	10*17887	BB	9-15-43	LEO C HILKE AND BETTY M HILKE	924	531
763	10*18486	BB	9-15-43	LUCINDA RAE ALLEN AND DAVID A ALLEN	933	111
764	10*18618	BB	9-15-43	ANITA DIANE ANTILL AND TERRY ANTILL	934	615
765	10*18767	BB	9-15-43	HOMER L SIMMONS AND GLADYS R SIMMONS	938	486
766	10*18767	BB	9-15-43	HOMER L SIMMONS AND GLADYS R SIMMONS	938	486
767	10*47051.219.33	BB	9-15-43	JOHN H HILKE AND ALIDA HILKE	898	602
768	10*47051.219.37	BB	9-15-43	SUSAN H KEY	898	621
769	10*47051.219.39	BB	9-15-43	ALICE THIPPHAVONG AND VISITH THIPPHAVONG	902	437
770	10*15837	CC	9-17-4.3	ANITA DIANE ANTILL AND TERRY ANTILL	742	85
771	10*15836	CC	9-17-4.3	LUCINDA RAE ALLEN AND DAVID A ALLEN	742	79
772	10*15842	CC	9-17-4.3	HOMER L SIMMONS AND GLADYS R SIMMONS	742	329
773	10*16007	CC	9-17-4.3	MARY LOU KITTELBERGER AND FREDERICK W KITTELBERGER	799	436
774	10*16008	CC	9-17-4.3	DONNA KAY ALLEN AND ROGER ALLEN	801	222
775	10*17500	CC	9-17-4.3	TRACY L AND KEITH W BARNBY	916	116
776	10*17666	CC	9-17-4.3	LILA FAYE BONAR SNODGRASS AND DONALD T SNODGRASS	949	172
777	10*17673	CC	9-17-4.3	JAMES PERRY COCHRAN	932	567
778	10*17707	CC	9-17-4.3	JACQUELYN S FERRARI AND JOHN C FERRARI	949	177
779	10*17709	CC	9-17-4.3	CAROL GONGOLA	949	167
780	10*17785	CC	9-17-4.3	ROBERTA YOUNG	949	163
781	10*17840	CC	9-17-4.3	RONALD D KOONTZ & BETH ANN KOONTZ	942	432
782	10*17886	CC	9-17-4.3	ANNETTE CAIN HANKINS AND HOWARD RONALD HANKINS	924	536
783	10*17887	CC	9-17-4.3	LEO C HILKE AND BETTY M HILKE	924	531
784	10*17977	CC	9-17-4.3	BRANNEN DAUGHERTY	925	359
785	10*17980	CC	9-17-4.3	ANITA RAE MILLER	925	370
786	10*17981	CC	9-17-4.3	MICHAEL E SWIFT AND MELODY A SWIFT	925	372
787	10*18031	CC	9-17-4.3	LEE ANNE MILLER	927	222
788	10*18092	CC	9-17-4.3	DAVID MCDOWELL AND CRYSTAL MCDOWELL	927	283
789	10*18093	CC	9-17-4.3	JENNIFER WHEATON	927	289
790	10*18094	CC	9-17-4.3	BONNIE GRISELL	927	231
791	10*18095	CC	9-17-4.3	TEXYN L MILLER AND GEORGIA A MILLER	927	287
792	10*18098	CC	9-17-4.3	LISA ANN MCDOWELL AND ROBERT JOSEPH HILL	939	263
793	10*18099	CC	9-17-4.3	RAE ELLEN FLOYD AND KENNETH FLOYD	927	233
794	10*18107	CC	9-17-4.3	ANITA MAE MASON	927	238
795	10*18167	CC	9-17-4.3	NEIL CALL AND MELINDA CALL	927	492
796	10*18168	CC	9-17-4.3	SANDRA YANAGAWA	927	498
797	10*18169	CC	9-17-4.3	KAREN K WILLIAMS	927	628
798	10*18170	CC	9-17-4.3	KAREN MCDOWELL CECIL AND JAMES E CECIL	927	633
799	10*18192	CC	9-17-4.3	STEPHEN S MASON AND CAROLE K MASON	928	625
800	10*18193	CC	9-17-4.3	CAROLYN LEE FUREY AND MARTIN J FUREY	949	158
801	10*18194	CC	9-17-4.3	PAMELA BEYLER AND CHAD R BEYLER	928	630
802	10*18197	CC	9-17-4.3	BARBARA K BURLEY AND DAVID K BURLEY	928	641
803	10*18198	CC	9-17-4.3	MARY THERESA SOLEAU AND THOMAS SOLEAU	928	643

FILE NO. 8811P19HUR.dwg
KEITH STERN S-19HU-REV1

DATE MAY 1, 20 19

REVISED JUNE 11, 20 19

OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 — 051 — 02244
STATE COUNTY PERMIT



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



P.S. 849 *C. Victor Moyers*

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

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

COUNTY NAME PERMIT

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC ±
WELL 19HU
TUG HILL OPERATING**



804	10*18199	CC	9-17-4.3	LAWRENCE J VAUGHN AND GAIL L VAUGHN	928	532
805	10*18260	CC	9-17-4.3	GEMMA RUDY AND TIMOTHY RUDY	928	584
806	10*18295	CC	9-17-4.3	THOMAS R BAKER AND VICKIE L BAKER	929	262
807	10*18298	CC	9-17-4.3	MAUREEN GREGG	929	273
808	10*18300	CC	9-17-4.3	ROBERT W ODOM AND CASSANDRA L ODOM	929	283
809	10*18361	CC	9-17-4.3	MARY JO CAIN	931	407
810	10*18417	CC	9-17-4.3	CHERYL L HILL	932	577
811	10*18487	CC	9-17-4.3	NANCY L STANGEL AND JOHN J STANGEL	933	113
812	10*18488	CC	9-17-4.3	CHARLINE M ENGLE AND KEVIN E ENGLE	933	118
813	10*18508	CC	9-17-4.3	PATRICIA LUANNE BONAR	925	351
814	10*18517	CC	9-17-4.3	LORI SHANAHAN AND PATRICK SHANAHAN	933	575
815	10*18613	CC	9-17-4.3	JANE LOUISE CAIN AND DANIEL CARL HOLTZ	934	603
816	10*18655	CC	9-17-4.3	PATRICIA L LEHN	935	95
817	10*18656	CC	9-17-4.3	PAMELA CALL	936	100
818	10*18658	CC	9-17-4.3	ELIZABETH JANE KELLER	936	107
819	10*18659	CC	9-17-4.3	CATHERINE P MASON	936	112
820	10*18799	CC	9-17-4.3	CHARLES J DARMAFALL DECEASED	937	634
821	10*18805	CC	9-17-4.3	CINDY STEVENS TOZIER	937	628
822	10*19373	CC	9-17-4.3	JESSICA WHEATON	931	411
823	10*19403	CC	9-17-4.3	LAWRENCE R LOTZ	951	114
824	10*19404	CC	9-17-4.3	HOWARD M CAIN AND EMMA JEAN CAIN	939	283
825	10*19476	CC	9-17-4.3	WINONA RIDDLE	941	331
826	10*19689	CC	9-17-4.3	EDMOND TURGEON JR AND CATHY STEVENS TURGEON	944	156
827	10*19718	CC	9-17-4.3	CHRISTOPHER DAUGHERTY & JENNIFER R DAUGHERTY	944	412
828	10*19879	CC	9-17-4.3	MARY V GILSON AND WALTER M GILSON	945	588
829	10*19933	CC	9-17-4.3	MARY ANN GRIFFITH	948	555
830	10*19937	CC	9-17-4.3	JAMES D STEVENS AND DOROTHY M STEVENS	949	151
831	10*19938	CC	9-17-4.3	JOHN H STEVENS AND LYNDA L STEVENS	949	144
832	10*21026	CC	9-17-4.3	NANCY M MORGAN	951	110
833	10*21211	CC	9-17-4.3	NILA JEAN BAYLES	951	118
834	10*21841	CC	9-17-4.3	ENERGY DEEP RESOURCES INC	959	631
835	10*21842	CC	9-17-4.3	JOSEPH NOKOVICH	959	635
836	10*21927	CC	9-17-4.3	BLACK GOLD GROUP LTD	964	474
837	10*21940	CC	9-17-4.3	ALYSIA JORDAN & TERRY M JORDAN	953	346
838	10*22376	CC	9-17-4.3	MARGARET KUCHARZ AND JAMES C KUCHARZ	962	270
839	10*22412	CC	9-17-4.3	CHAD E LONGFELLOW	963	124
840	10*22599	CC	9-17-4.3	BRYANT R SWIFT AND KATHY SWIFT	966	456
841	10*22776	CC	9-17-4.3	JAMES ROBERT WELLS	970	19
842	10*22849	CC	9-17-4.3	NEIL MCELROY AND SUE MASON MCELROY	977	44
843	10*22851	CC	9-17-4.3	JOHN J HELSTERN AND LYNN D HELSTERN	977	39
844	10*22853	CC	9-17-4.3	RONALD LEE HENSLEY AND MARY ANN HENSLEY	977	34
845	10*23076	CC	9-17-4.3	JACK R BERISFORD AKA RANDY BERISFORD	984	43
846	10*23260	CC	9-17-4.3	IDA M TRAVIS ET AL DAVID C WHITE AS SPECIAL COMMISSIONER	988	73
847	10*23568	CC	9-17-4.3	THE ESTATE OF RUTH N LUTHER SUZANNE L WOZNIAK EXECUTRIX	1009	286
848	10*47051.219.27	CC	9-17-4.3	MARSHA BERISFORD	902	425
849	10*47051.219.33	CC	9-17-4.3	JOHN H HILKE AND AUDA HILKE	898	602
850	10*47051.219.35	CC	9-17-4.3	GAREN MCDOWELL AND ELIZABETH MCDOWELL	898	615
851	10*47051.219.37	CC	9-17-4.3	SUSAN H KEY	898	621
852	10*47051.219.38	CC	9-17-4.3	TIMOTHY MCDOWELL AND CYNTHIA MCDOWELL	902	431
853	10*47051.219.39	CC	9-17-4.3	ALICE THIPPHAVONG AND VISITH THIPPHAVONG	902	437
854	10*17169	CC	9-17-4.3	ALMA L VAN SCYOC	692	404
855	10*17171	CC	9-17-4.3	OPAL MICKEY	690	631
856	10*17173	CC	9-17-4.3	LLOYD R EVANS	694	526
857	10*47051.219.1	CC	9-17-4.3	DAVID LEE FRANKLIN	874	312
858	10*19702	CC	9-17-4.3	WV MINERALS INC	951	108
859	10*15836	DD	9-17-4.2	LUCINDA RAE ALLEN AND DAVID A ALLEN	742	79
860	10*15837	DD	9-17-4.2	ANITA DIANE ANTILL AND TERRY ANTILL	742	85
861	10*15842	DD	9-17-4.2	HOMER L SIMMONS AND GLADYS R SIMMONS	742	329
862	10*16007	DD	9-17-4.2	MARY LOU KITTELBERGER AND FREDERICK W KITTELBERGER	799	436
863	10*16008	DD	9-17-4.2	DONNA KAY ALLEN AND ROGER ALLEN	801	222
864	10*17500	DD	9-17-4.2	TRACY LAND KEITH W BARNBY	916	116
865	10*17566	DD	9-17-4.2	LILA FAYE BONAR SNODGRASS AND DONALD T SNODGRASS	949	172
866	10*17573	DD	9-17-4.2	JAMES PERRY COCHRAN	932	567
867	10*17707	DD	9-17-4.2	JACQUELYN S FERRARI AND JOHN C FERRARI	949	177
868	10*17709	DD	9-17-4.2	CAROL GONGOLA	949	167
869	10*17765	DD	9-17-4.2	ROBERTA YOUNG	949	163
870	10*17840	DD	9-17-4.2	RONALD D KOONTZ & BETH ANN KOONTZ	942	432
871	10*17886	DD	9-17-4.2	ANNETTE CAIN HANKINS AND HOWARD RONALD HANKINS	924	536
872	10*17887	DD	9-17-4.2	LEO C HILKE AND BETTY M HILKE	924	531
873	10*17977	DD	9-17-4.2	BRANNEN DAUGHERTY	925	359
874	10*17980	DD	9-17-4.2	ANITA RAE MILLER	925	370
875	10*17981	DD	9-17-4.2	MICHAEL E SWIFT AND MELODY A SWIFT	925	372
876	10*18613	DD	9-17-4.2	JANE LOUISE CAIN AND DANIEL CARL HOLTZ	934	603
877	10*18031	DD	9-17-4.2	LEE ANNE MILLER	927	222
878	10*18092	DD	9-17-4.2	DAVID MCDOWELL AND CRYSTAL MCDOWELL	927	283
879	10*18093	DD	9-17-4.2	JENNIFER WHEATON	927	289
880	10*18094	DD	9-17-4.2	BONNIE GRISELL	927	231
881	10*18095	DD	9-17-4.2	TEXYN L MILLER AND GEORGIA A MILLER	927	287
882	10*18098	DD	9-17-4.2	LISA ANN MCDOWELL AND ROBERT JOSEPH HILL	939	263
883	10*18099	DD	9-17-4.2	RAE ELLEN FLOYD AND KENNETH FLOYD	927	233
884	10*18107	DD	9-17-4.2	ANITA MAE MASON	927	238
885	10*18167	DD	9-17-4.2	NEIL CALL AND MELINDA CALL	927	492
886	10*18168	DD	9-17-4.2	SANDRA YANAGAWA	927	498
887	10*18169	DD	9-17-4.2	KAREN K WILLIAMS	927	628
888	10*18170	DD	9-17-4.2	KAREN MCDOWELL CECIL AND JAMES E CECIL	927	633
889	10*18192	DD	9-17-4.2	STEPHEN S MASON AND CAROLE K MASON	928	625
890	10*18193	DD	9-17-4.2	CAROLYN LEE FUREY AND MARTIN J FUREY	949	158
891	10*18194	DD	9-17-4.2	PAMELA BEYLER AND CHAD R BEYLER	928	630
892	10*18197	DD	9-17-4.2	BARBARA K BURLEY AND DAVID K BURLEY	928	641
893	10*18198	DD	9-17-4.2	MARY THERESA SOLEAU AND THOMAS SOLEAU	928	643
894	10*18199	DD	9-17-4.2	LAWRENCE J VAUGHN AND GAIL L VAUGHN	928	532
895	10*18260	DD	9-17-4.2	GEMMA RUDY AND TIMOTHY RUDY	928	584
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899	10*18361	DD	9-17-4.2	MARY JO CAIN	931	407
900	10*18417	DD	9-17-4.2	CHERYL L HILL	932	577
901	10*18487	DD	9-17-4.2	NANCY L STANGEL AND JOHN J STANGEL	933	113
902	10*18488	DD	9-17-4.2	CHARLINE M ENGLE AND KEVIN E ENGLE	933	118
903	10*18508	DD	9-17-4.2	PATRICIA LUANNE BONAR	925	351
904	10*18517	DD	9-17-4.2	LORI SHANAHAN AND PATRICK SHANAHAN	933	575

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DATE MAY 1, 20 19

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OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 — 057 — 02244
STATE COUNTY PERMIT



STATE OF WEST VIRGINIA
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ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS



P.S. 849 *C. Victor Moyers*

COUNTY NAME

PERMIT

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

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

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC±
WELL 19HU
TUG HILL OPERATING**



905	10*18655	DD	9-17-4.2	PATRICIA L LEHN	936	95
906	10*18656	DD	9-17-4.2	PAMELA CALL	936	100
907	10*18658	DD	9-17-4.2	ELIZABETH JANE KELLER	936	107
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916	10*19718	DD	9-17-4.2	CHRISTOPHER DAUGHERTY & JENNIFER R DAUGHERTY	944	412
917	10*19879	DD	9-17-4.2	MARY V GILSON AND WALTER M GILSON	945	588
918	10*19933	DD	9-17-4.2	MARY ANN GRIFFITH	948	555
919	10*19937	DD	9-17-4.2	JAMES D STEVENS AND DOROTHY M STEVENS	949	151
920	10*19938	DD	9-17-4.2	JOHN H STEVENS AND LYNDA L STEVENS	949	144
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931	10*22849	DD	9-17-4.2	NEL MCELROY AND SUE MASON MCELROY	977	44
932	10*22851	DD	9-17-4.2	JOHN J HELLSSTERN AND LYNN D HELLSSTERN	977	39
933	10*22853	DD	9-17-4.2	RONALD LEE HENSLEY AND MARY ANN HENSLEY	977	34
934	10*23075	DD	9-17-4.2	JACK R BERISFORD AKA RANDY BERISFORD	984	43
935	10*23260	DD	9-17-4.2	IDA M TRAVIS ET AL DAVID C WHITE AS SPECIAL COMMISSIONER	988	73
936	10*23668	DD	9-17-4.2	THE ESTATE OF RUTH N LUTHER SUZANNE L WOZNIAK EXECUTRIX	1009	286
937	10*4705 L 219.27	DD	9-17-4.2	MARSHA BERISFORD	902	425
938	10*4705 L 219.33	DD	9-17-4.2	JOHN H HILKE AND AUDA HILKE	898	602
939	10*4705 L 219.36	DD	9-17-4.2	GAREN MCDOWELL AND ELIZABETH MCDOWELL	898	615
940	10*4705 L 219.37	DD	9-17-4.2	SUSAN H KEY	898	621
941	10*4705 L 219.38	DD	9-17-4.2	TIMOTHY MCDOWELL AND CYNTHIA MCDOWELL	902	431
942	10*4705 L 219.39	DD	9-17-4.2	ALICE THIPPHAVONG AND VISITH THIPPHAVONG	902	437
943	10*17169	DD	9-17-4.2	ALMA L VAN SCYOC	692	404
944	10*17171	DD	9-17-4.2	OPAL MCKEY	690	631
945	10*17173	DD	9-17-4.2	LLOYD R. EVANS	694	526
946	10*4705 L 219.1	DD	9-17-4.2	DAVID LEE FRANKLIN	874	312
947	10*19702	DD	9-17-4.2	WV MINERALS INC	951	108
948	10*15836	EE	9-17-5	LUCINDA RAE ALLEN AND DAVID A ALLEN	742	79
949	10*15837	EE	9-17-5	ANITA DIANE ANTILL AND TERRY ANTILL	742	85
950	10*15842	EE	9-17-5	HOMER L SIMMONS AND GLADYS R SIMMONS	742	329
951	10*16007	EE	9-17-5	MARY LOU KITTELBERGER AND FREDERICK W KITTELBERGER	799	436
952	10*17500	EE	9-17-5	TRACY LAND KEITH W BARNBY	916	116
953	10*17666	EE	9-17-5	LILA FAYE BONAR SNOODGRASS AND DONALD T SNOODGRASS	949	172
954	10*17673	EE	9-17-5	JAMES PERRY COCHRAN	932	567
955	10*17707	EE	9-17-5	JACQUELYN S FERRARI AND JOHN C FERRARI	949	177
956	10*17709	EE	9-17-5	CAROL GONGOLA	949	167
957	10*17765	EE	9-17-5	ROBERTA YOUNG	949	163
958	10*17840	EE	9-17-5	RONALD D KOONTZ & BETH ANN KOONTZ	942	432
959	10*17886	EE	9-17-5	ANNETTE CAIN HANKINS AND HOWARD RONALD HANKINS	924	536
960	10*17887	EE	9-17-5	LEO C HILKE AND BETTY M HILKE	924	531
961	10*17977	EE	9-17-5	BRANNEN DAUGHERTY	925	359
962	10*17980	EE	9-17-5	ANITA RAE MILLER	925	370
963	10*17981	EE	9-17-5	MICHAEL E SWIFT AND MELODY A SWIFT	925	372
964	10*18019	EE	9-17-5	SUSAN H KEY	927	272
965	10*18020	EE	9-17-5	ALICE THIPPHAVONG AND VISITH THIPPHAVONG	927	270
966	10*18031	EE	9-17-5	LEE ANNE MILLER	927	222
967	10*18032	EE	9-17-5	DAVID MCDOWELL AND CRYSTAL MCDOWELL	927	283
968	10*18093	EE	9-17-5	JENNIFER WHEATON	927	289
969	10*18094	EE	9-17-5	BONNIE GRISSELL	927	231
970	10*18095	EE	9-17-5	TEXYN L MILLER AND GEORGIA A MILLER	927	287
971	10*18098	EE	9-17-5	USA ANN MCDOWELL AND ROBERT JOSEPH HILL	989	263
972	10*18099	EE	9-17-5	RAE ELLEN FLOYD AND KENNETH FLOYD	927	233
973	10*18107	EE	9-17-5	ANITA MAE MASON	927	238
974	10*18113	EE	9-17-5	JOHN H HILKE	927	159
975	10*18167	EE	9-17-5	NEL CALL AND MELINDA CALL	927	492
976	10*18168	EE	9-17-5	SANDRA YANAGAWA	927	498
977	10*18169	EE	9-17-5	KAREN K WILLIAMS	927	628
978	10*18170	EE	9-17-5	KAREN MCDOWELL CECIL AND JAMES E CECIL	927	633
979	10*18192	EE	9-17-5	STEPHEN S MASON AND CAROLE K MASON	928	625
980	10*18193	EE	9-17-5	CAROLYN LEE FUREY AND MARTIN J FUREY	949	158
981	10*18194	EE	9-17-5	PAMELA BEYLER AND CHAD R BEYLER	928	630
982	10*18197	EE	9-17-5	BARBARA K BURLEY AND DAVID K BURLEY	928	641
983	10*18198	EE	9-17-5	MARY THERESA SOLEAU AND THOMAS SOLEAU	928	643
984	10*18199	EE	9-17-5	LAWRENCE J VAUGHN AND GAIL VAUGHN	928	532
985	10*18260	EE	9-17-5	GEMMA RUDY AND TIMOTHY RUDY	928	584
986	10*18295	EE	9-17-5	THOMAS R BAKER AND VICKIE L BAKER	929	262
987	10*18298	EE	9-17-5	MAUREEN GREGG	929	273
988	10*18300	EE	9-17-5	ROBERT W ODOM AND CASSANDRA L ODOM	929	283
989	10*18361	EE	9-17-5	MARY JO CAIN	931	407
990	10*18417	EE	9-17-5	CHERYLL HILL	932	577
991	10*18487	EE	9-17-5	NANCY L STANGEL AND JOHN J STANGEL	933	113
992	10*18488	EE	9-17-5	CHARLINE M ENGLE AND KEVIN E ENGLE	933	118
993	10*18508	EE	9-17-5	PATRICIA LUANNE BONAR	925	351
994	10*18517	EE	9-17-5	LORI SHANAHAN AND PATRICK SHANAHAN	933	575
995	10*18613	EE	9-17-5	JANE LOUISE CAIN AND DANIEL CARL HOLTZ	934	608
996	10*18655	EE	9-17-5	PATRICIA L LEHN	936	95
997	10*18656	EE	9-17-5	PAMELA CALL	936	100
998	10*18658	EE	9-17-5	ELIZABETH JANE KELLER	936	107
999	10*18659	EE	9-17-5	CATHERINE P MASON	936	112
1000	10*18799	EE	9-17-5	CHARLES J DARMAFALL DECEASED	937	634
1001	10*18805	EE	9-17-5	CINDY STEVENS TOZIER	937	628
1002	10*19373	EE	9-17-5	JESSICA WHEATON	931	411
1003	10*19403	EE	9-17-5	LAWRENCE R LOTZ	951	114
1004	10*19404	EE	9-17-5	HOWARD M CAIN AND EMMA JEAN CAIN	939	283
1005	10*19476	EE	9-17-5	WINONA RIDDLE	941	331

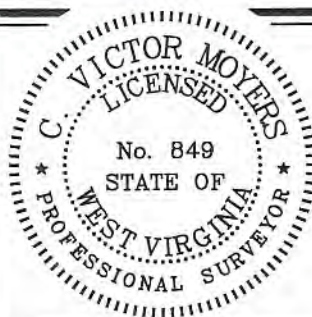
FILE NO. 8811P19HUR.dwg
KEITH STERN S-19HU-REV1

DATE MAY 1, 20 19

REVISED JUNE 11, 20 19

OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 STATE 051 COUNTY 02244 PERMIT



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



P.S. 849 *C. Victor Moyers*

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

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

COUNTY NAME

PERMIT

**KEITH STERN S LEASE
UTICA UNIT - 631.99 AC ±
WELL 19HU
TUG HILL OPERATING**



1006	10*19689	EE	9-17-5	EDMOND TURGEON JR AND CATHY STEVENS TURGEON	944	156
1007	10*19718	EE	9-17-5	CHRISTOPHER DAUGHERTY & JENNIFER R DAUGHERTY	944	412
1008	10*19879	EE	9-17-5	MARY V GILSON AND WALTER M GILSON	945	588
1009	10*19933	EE	9-17-5	MARY ANN GRIFFITH	948	555
1010	10*19937	EE	9-17-5	JAMES D STEVENS AND DOROTHY M STEVENS	949	151
1011	10*19938	EE	9-17-5	JOHN H STEVENS AND LYNDA L STEVENS	949	144
1012	10*21026	EE	9-17-5	NANCY M MORGAN	951	110
1013	10*21211	EE	9-17-5	NILA JEAN BAYLES	951	118
1014	10*21841	EE	9-17-5	ENERGY DEEP RESOURCES INC	959	631
1015	10*21842	EE	9-17-5	JOSEPH NOKOVICH	959	635
1016	10*21927	EE	9-17-5	BLACK GOLD GROUP LTD	964	474
1017	10*21940	EE	9-17-5	ALYSA JORDAN & TERRY M JORDAN	953	346
1018	10*22376	EE	9-17-5	MARGARET KUCHARZ AND JAMES C KUCHARZ	962	270
1019	10*22412	EE	9-17-5	CHAD E LONGFELLOW	963	124
1020	10*22599	EE	9-17-5	BRYANT R SWIFT AND KATHY SWIFT	966	456
1021	10*22776	EE	9-17-5	JAMES ROBERT WELLS	970	19
1022	10*22849	EE	9-17-5	NEIL MCELROY AND SUE MASON MCELROY	977	44
1023	10*22851	EE	9-17-5	JOHN J HELLSTERN AND LYNN D HELLSTERN	977	39
1024	10*22853	EE	9-17-5	RONALD LEE HENSLEY AND MARY ANN HENSLEY	977	34
1025	10*23076	EE	9-17-5	JACK R BERISFORD AKA RANDY BERISFORD	984	43
1026	10*23260	EE	9-17-5	IDA M TRAVIS ET AL DAVID C WHITE AS SPECIAL COMMISSIONER	988	73
1027	10*23668	EE	9-17-5	THE ESTATE OF RUTH N LUTHER SUZANNE L WOZNIAK EXECUTRIX	1009	286
1028	10*47051.219.27	EE	9-17-5	MARSHA BERISFORD	902	425
1029	10*47051.219.36	EE	9-17-5	GAREN MCDOWELL AND ELIZABETH MCDOWELL	898	615
1030	10*19702	EE	9-17-5	WV MINERALS INC	951	108
1031	10*17169	EE	9-17-5	ALMA L VAN SCYOC	692	404
1032	10*17171	EE	9-17-5	OPAL MICKY	690	631
1033	10*17173	EE	9-17-5	LLOYD R. EVANS	694	526
1034	10*47051.219.1	EE	9-17-5	DAVID LEE FRANKLIN	874	312
1035	10*21095	FF	9-15-40.1	TIMOTHY LEE COLLEY	951	200
1036	10*21096	FF	9-15-40.1	GEORGE L DUNN AND NANCY MARIE DUNN	951	194
1037	10*21097	FF	9-15-40.1	JAMES DUNN AND DONNA K DUNN	951	197
1038	10*21205	FF	9-15-40.1	RONALD W REINBEAU	953	86
1039	10*21207	FF	9-15-40.1	KEITH W STORCH AND DEBORAH A STORCH	951	209
1040	10*21208	FF	9-15-40.1	JOHN T CRISWELL AND CATHERINE A CRISWELL	951	206
1041	10*21210	FF	9-15-40.1	PETER G STORCH AND LAURIE L STORCH	951	203
1042	10*21231	FF	9-15-40.1	JENNIFER SHAWN GLOVER	953	89
1043	10*21232	FF	9-15-40.1	JEFFREY BRYAN CRISWELL	953	92
1044	10*21233	FF	9-15-40.1	WILLIAM LINSLEY CRISWELL	953	95
1045	10*21398	FF	9-15-40.1	LYNN ELLIOTT AND JUDITH ELLIOTT	957	301
1046	10*21872	FF	9-15-40.1	ROSEMARIE BERISFORD	953	484
1047	10*21399	FF	9-15-40.1	MARY M MORRIS	956	642
1048	10*21528	FF	9-15-40.1	PATRICIA KIRCHNER	959	305
1049	10*21839	FF	9-15-40.1	WILLIAM BRYAN COLLEY	959	445
1050	10*21845	FF	9-15-40.1	PATRICIA DOFKA	959	448
1051	10*21865	FF	9-15-40.1	FRANK A STORCH JR AND SUSAN STORCH	959	442
1052	10*21874	FF	9-15-40.1	CHAZ AARON COLLEY AND DANA COLLINS	953	475
1053	10*21957	FF	9-15-40.1	CATHERINE I AND ERNEST M SILVERIO	960	15
1054	10*21966	FF	9-15-40.1	DAVID HALL AND SANDRA SUE HALL	959	644
1055	10*21973	FF	9-15-40.1	REID ELATRACHE AND TONYA ELATRACHE	960	502
1056	10*21980	FF	9-15-40.1	CHARLES C SEAMON	954	344
1057	10*21989	FF	9-15-40.1	NEIL SCHAFER AND CHRISTAL L SHAFER	953	481
1058	10*22112	FF	9-15-40.1	EMMA JO CRISWELL	961	349
1059	10*22127	FF	9-15-40.1	JUDITH L BENEDICT AND LOUIS G BENEDICT	961	343
1060	10*22199	FF	9-15-40.1	JOSHUA W SEAMON	963	478
1061	10*22833	FF	9-15-40.1	RANDY W MORRIS SR AND CHERYL MORRIS	966	465
1062	10*25524	FF	9-15-40.1	JAMES P MILLER	1009	375
1063	10*25534	FF	9-15-40.1	LINDA K AND MICHAEL HUMES	1010	565
1064	10*24721	FF	9-15-40.1	JAMES R SNIDER AND CYNTHIA L SNIDER	1025	617
1065	10*15833	GG	9-17-7	LUCINDA RAE ALLEN AND DAVID A ALLEN	742	73
1066	10*15834	GG	9-17-7	ANITA DIANE ANTILL AND TERRY ANTILL	742	110
1067	10*15841	GG	9-17-7	HOMER L SIMMONS AND GLADYS R SIMMONS	742	366
1068	10*24120	GG	9-17-7	CHARLES E THOSS	1022	360
1069	10*24490	GG	9-17-7	GREGORY M TARR AND KEREN B TARR	1025	353
1070	10*25620	GG	9-17-7	THE GRACIA BAKER REVOCABLE LIVING TRUST DATED JULY 12 2011	1033	300
1071	10*26423	GG	9-17-7	PATRICIA & MICHAEL QUARANTO	1034	593
1072	10*26695	GG	9-17-7	DEBORAH JEAN TARR-UNKNOWN HEIRS	1041	437
1073	10*26905	GG	9-17-7	JONATHAN RANKIN	1036	117
1074	10*26906	GG	9-17-7	ELIZABETH A GREEN TRUST	1036	111
1075	PENDING	GG	9-17-7	CHRISTINE RANKIN SMALLWOOD	PENDING	PENDING
1076	10*26907	GG	9-17-7	CHARLES S TARR	1036	123
1077	10*47051.185.1	HH	9-17-39	HOMER L SIMMONS AND GLADYS R SIMMONS	885	68
1078	10*47051.185.2	HH	9-17-39	LUCINDA RAE ALLEN AND DAVID A ALLEN	894	482
1079	10*47051.185.3	HH	9-17-39	ANITA DIANE ANTILL AND TERRY ANTILL	885	71
1080	10*47051.185.1	II	9-17-38	HOMER L SIMMONS AND GLADYS R SIMMONS	885	68
1081	10*47051.185.2	II	9-17-38	LUCINDA RAE ALLEN AND DAVID A ALLEN	894	482
1082	10*47051.185.3	II	9-17-38	ANITA DIANE ANTILL AND TERRY ANTILL	885	71
1083	10*47051.185.1	JJ	9-17-38.1	HOMER L SIMMONS AND GLADYS R SIMMONS	885	68
1084	10*47051.185.2	JJ	9-17-38.1	LUCINDA RAE ALLEN AND DAVID A ALLEN	894	482
1085	10*47051.185.3	JJ	9-17-38.1	ANITA DIANE ANTILL AND TERRY ANTILL	885	71
1086	10*15802	KK	9-17-37	TOM GOULDSBERRY	683	640
1087	10*15803	KK	9-17-37	CHARLOTTE CROW	683	631
1088	10*15804	KK	9-17-37	JOE GOULDSBERRY	683	637
1089	10*15805	KK	9-17-37	MARY ELLEN CHAMBERS	694	82
1090	10*15806	KK	9-17-37	JOANNE FOX	683	634
1091	10*15807	KK	9-17-37	GLORIS VAN SCYOC	685	190
1092	10*15808	KK	9-17-37	ANGELA YOHO	685	193
1093	10*15809	KK	9-17-37	RYAN J AND MICHELE L RIDDLE	687	225
1094	10*15810	KK	9-17-37	FLOSSIE P RUTAN	690	266
1095	10*15811	KK	9-17-37	SANDRA M WINSLOW	719	51
1096	10*21969	KK	9-17-37	MARK WESLEY RICHARDSON	960	507

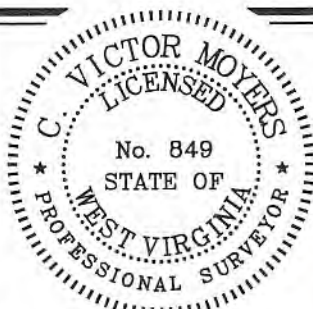
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KEITH STERN S-19HU-REV1

DATE MAY 1, 20 19

REVISED JUNE 11, 20 19

OPERATORS WELL NO. KEITH STERN S-19HU

API WELL NO. 47 — —
STATE COUNTY PERMIT



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



P.S. 849 *C. Victor Moyers*

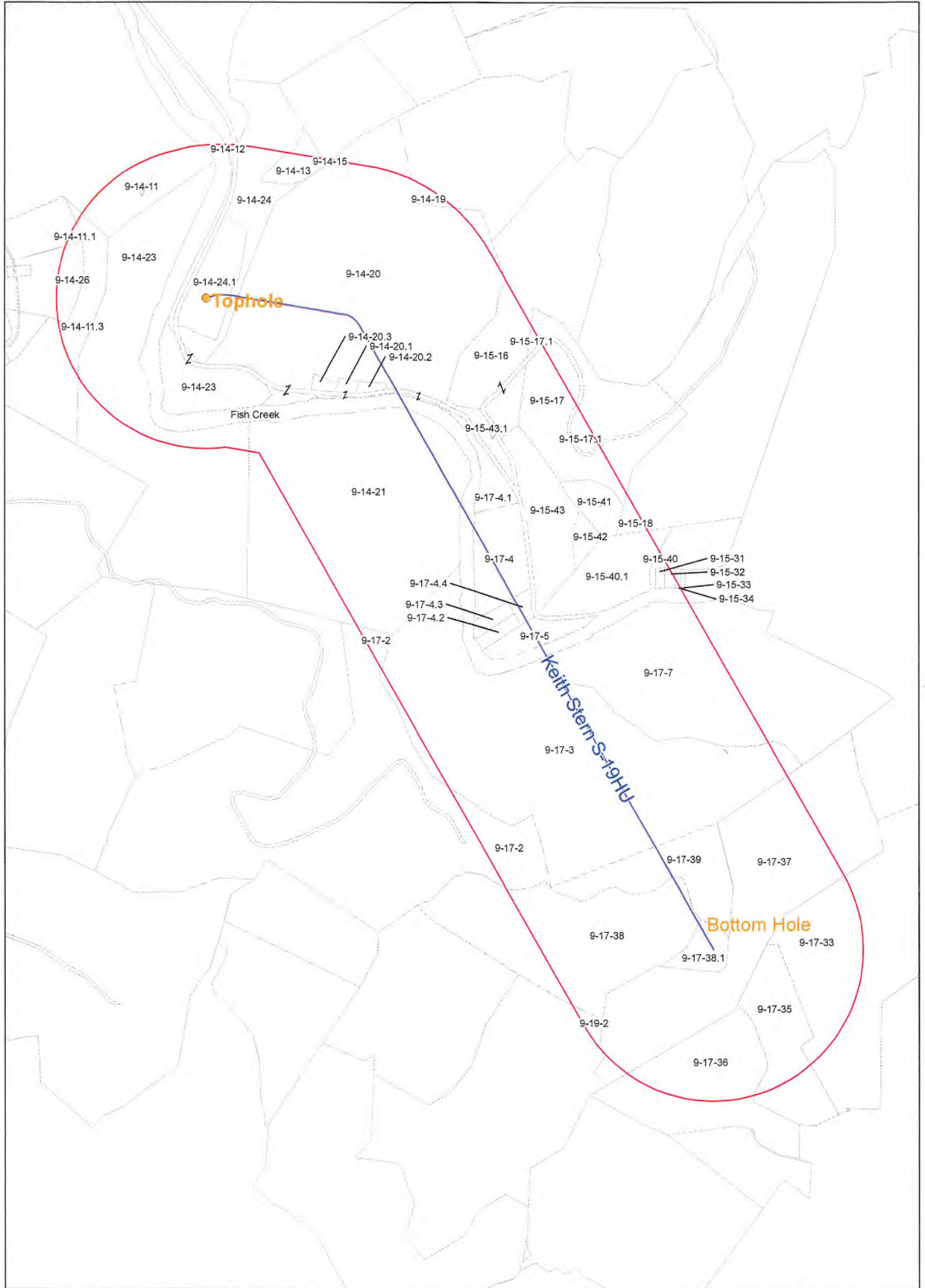
WELL OPERATOR TUG HILL OPERATING, LLC
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500
FORT WORTH, TX 76107

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

COUNTY NAME

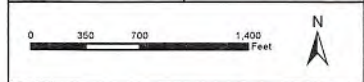
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Keith Stern S-19HU



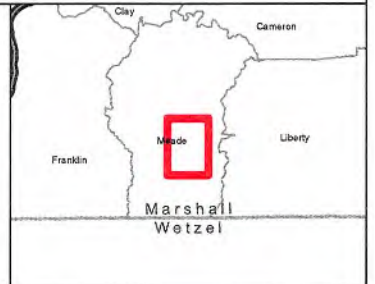
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 Central Meridian: -85.0000
 Scale Factor: 0.9999
 Units: Feet US

CONFIDENTIAL



— Utica Well
 □ 1500 Foot Buffer

Keith Stern S-19HU
 Operators within 1500 Feet of Well Borehole



Offset Operators within 1500'

Keith Stern S - 19HU

County	District	Parcel	Owner	Address
MARSHALL	MEADE	9-14-11	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-11.1	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-11.3	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-12	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-13	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-15	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-19	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-20	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-20	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-20.1	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-20.2	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-20.3	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-21	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-23	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317

MARSHALL	MEADE	9-14-24	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-24.1	TH EXPLORATION LLC	381 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-14-26	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-16	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-17	MASON ROBERT MATTHEW	5000 Nauvoo Ridge Rd, Glen Easton, WV 26039
MARSHALL	MEADE	9-15-17.1	MASON ROBERT MATTHEW	5000 Nauvoo Ridge Rd, Glen Easton, WV 26039
MARSHALL	MEADE	9-15-18	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-31	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-32	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-33	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-34	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-40	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-40.1	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-41	DURIG DELORIS R	339 Duerr St New Martinsville WB 26155
MARSHALL	MEADE	9-15-41	CLEGG LORNA MASON	512 Susan St New Martinsville, WV 26155
MARSHALL	MEADE	9-15-41	SMITH ELEANOR M	328 McEldowney Ave New Martinsville, WV 26155

MARSHALL	MEADE	9-15-42	MASON ROBERT MATTHEW	5000 Nauvoo Ridge Rd, Glen Easton, WV 26039
MARSHALL	MEADE	9-15-43	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-43	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389
MARSHALL	MEADE	9-15-43.1	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-15-43.1	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389
MARSHALL	MEADE	9-17-2	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-3	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-3	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389
MARSHALL	MEADE	9-17-33	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-33	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389
MARSHALL	MEADE	9-17-35	EQT CORPORATION	625 Liberty Ave. Suite 1700 Pittsburgh, PA 15222
MARSHALL	MEADE	9-17-35	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389
MARSHALL	MEADE	9-17-35	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-36	EQT CORPORATION	625 Liberty Ave. Suite 1700 Pittsburgh, PA 15222
MARSHALL	MEADE	9-17-36	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389
MARSHALL	MEADE	9-17-36	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-37	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-37	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389
MARSHALL	MEADE	9-17-38	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-38	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389

MARSHALL	MEADE	9-17-38.1	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-39	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-39	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389
MARSHALL	MEADE	9-17-2	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-3	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-4	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-4.1	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-4.2	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-4.3	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-4.4	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-5	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-5	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389
MARSHALL	MEADE	9-17-7	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	9-17-7	SWN PRODUCTION COMPANY LLC	10000 Energy Drive Spring, TX 77389
MARSHALL	MEADE	9-19-2	TH EXPLORATION LLC	380 Southpointe Blvd., Ste 200 Canonsburg, PA 15317
MARSHALL	MEADE	FISH CREEK	TH EXPLORATION LLC	381 Southpointe Blvd., Ste 200 Canonsburg, PA 15317

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

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

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

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

*See attached pages


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

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

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

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

Well Operator: Tug Hill Operating, LLC

By: Amy L. Miller 

Its: Permitting Specialist - Appalachia Region

ASSIGNMENT AND CONVEYANCE

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

ARTICLE 1
ASSIGNMENT OF ASSETS

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

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

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

ARTICLE 2
SPECIAL WARRANTY OF TITLE AND DISCLAIMERS

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

Section 2.2 Disclaimers of Warranties and Representations.

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

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*").

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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

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WV Department of
Environmental Protection

ASHLEY FAVINGER
AMERICAN PETROLEUM PARTNERS OPERATING LLC
4600 J BARRY COURT STE 310
CANONSBURG PA 15317-5854

BOOK 0042 PAGE 0109

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 THE 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

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WV Department of
Environmental Protection

WV-AGIR-0009

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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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.

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(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

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WV Department of
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August 3, 2018

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

RE: Keith Stern S-19HU

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Keith Stern S-19HU well plat.

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

Sincerely,

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

Amy L. Miller
Permitting Specialist – Appalachia Region

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WW-6AC
(1/12)

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

Date of Notice Certification: 06/07/2019

API No. 47- 051

Operator's Well No. Keith Stern S-19HU

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>526,370.07</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,811.38</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>			

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.

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:

OOG OFFICE USE ONLY

*PLEASE CHECK ALL THAT APPLY

1. NOTICE OF SEISMIC ACTIVITY or NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED
2. NOTICE OF ENTRY FOR PLAT SURVEY or NO PLAT SURVEY WAS CONDUCTED
3. NOTICE OF INTENT TO DRILL or NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or
- WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)
4. NOTICE OF PLANNED OPERATION
5. PUBLIC NOTICE
6. NOTICE OF APPLICATION

RECEIVED/
NOT REQUIRED

RECEIVED

RECEIVED/
NOT REQUIRED

RECEIVED

RECEIVED
Office of Oil and Gas

RECEIVED
JUN 13 2019

Required Attachments:

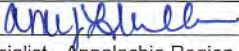
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication 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.

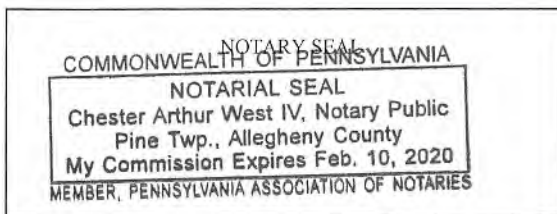
WV Department of
Environmental Protection

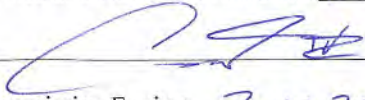
WW-6AC
(1/12)

Certification of Notice is hereby given:

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

Well Operator:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Boulevard, Plaza II, Suite 200</u>
By:	<u>Amy L. Miller </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>amiller@tug-hillop.com</u>



Subscribed and sworn before me this 7th day of JUNE 2019.

 _____ Notary Public
 My Commission Expires 2-10-2020

Oil and Gas Privacy Notice:

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

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WW-6A
(9-13)

API NO. 47- 051 -
OPERATOR WELL NO. Keith Stern S-19HU
Well Pad Name: Keith Stern

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: 5/2/2019 **Date Permit Application Filed:** 5/3/2019

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

RECEIVED
 Office of Oil and Gas
 JUN 13 2019
 WV Department of Environmental Protection

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

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Well Location Restrictions

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within one 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

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(8-13)

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API NO. 47-051 -
OPERATOR WELL NO. Keith Stern S-19HU
Well Pad Name: Keith Stern

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

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JUN 13 2019
WV Department of
Environmental Protection

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. 47-⁰⁵¹4705102244
OPERATOR WELL NO. Keith Stern S-19HU
Well Pad Name: Keith Stern

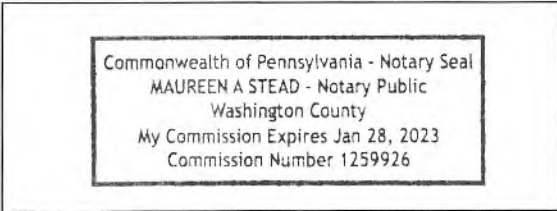
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 2 day of MAY 2019.
Maureen A Stead Notary Public
My Commission Expires 1/28/23

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')

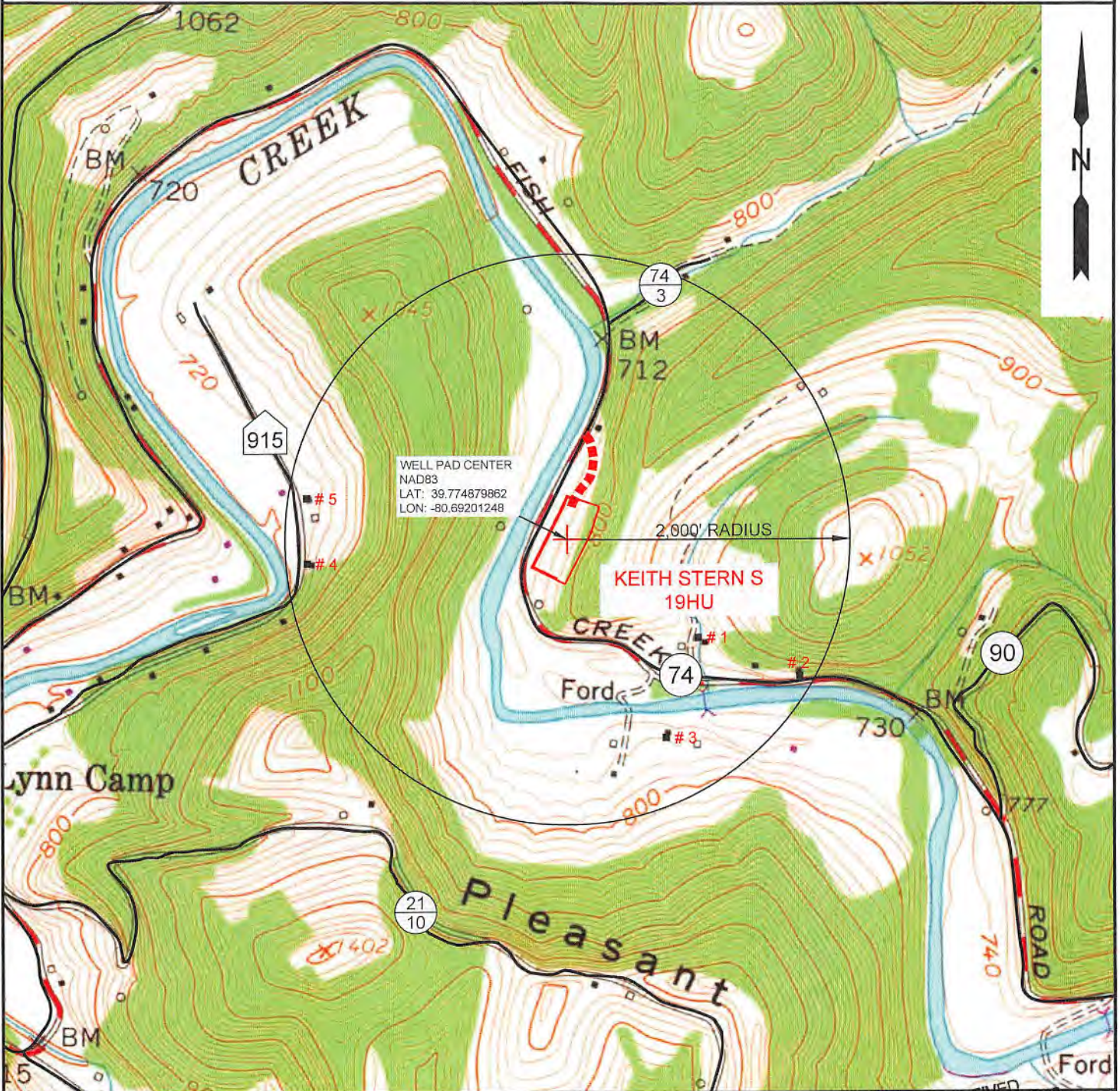
Well: KEITH STERN S – 19HU
 District: Meade (House #'s 1-5)
 State: WV

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



PROPOSED KEITH STERN S - 19HU



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

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 <p>SLS Land & Energy Development <i>Solutions from the ground up.</i> P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 462-6934 www.slssurveys.com</p>	TOPO SECTION: GLEN EASTON 7.5'		OPERATOR: PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		 <p>WV Department of Environmental Protection TUG HILL OPERATING</p>		
	COUNTY MARSHALL	DISTRICT MEADE	DRAWN BY K.G.M.	JOB NO. 8811		DATE 05/01/2019	SCALE 1" = 1000'

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

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: Tug Hill Operating, LLC

Telephone: 724-749-8388

Email: amiller@tug-hill.com

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317

Facsimile: 724-338-2030

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Office of Oil and Gas

JUN 13 2019

WV Department of
Environmental Protection

Oil and Gas Privacy Notice:

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

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: 05/02/2019 **Date Permit Application Filed:** 05/03/2019

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

CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

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

Notice is hereby provided to the SURFACE OWNER(s)

(at the address listed in the records of the sheriff at the time of notice):

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

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>526,370.07</u>
County: <u>Marshall</u>		Northing: <u>4,402,811.38</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-hill.com

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

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Office of Oil and Gas

JUN 13 2019

WV Department of
Environmental Protection

Oil and Gas Privacy Notice:

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



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

June 11, 2019

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 S-19HU 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 of 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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 Office of Oil and Gas

JUN 13 2019

WV Department of
 Environmental Protection

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



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Keith Stern S-19HU

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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APPROVED WVDEP OOG
7/30/2018

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: 304-845-1920
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

Year	Acres	WV Parcel	WV Parcel	Assess Year	Construction	Assess Year	Parcel	Parcel
2018	11.24	13	13	2017	13	13	13	13
2017	11.24	13	13	2016	13	13	13	13

Exhibit A: Final Design: Issue for Permitting



WV State Plane Coordinate System
North Zone, NAD 83
Elevation based on NAVD83
Established by Survey Grade GPS
and used for final permitting.

Access Road

Station	Station	Station	Station
1+00.00	2+00.00	3+00.00	4+00.00

Disturbed Area

Category	Area (Ac)
Well Pad Construction	0.25
Access Road Construction	0.10
Clearing	0.10
Excavation	0.10
Additional Information	
Non-Setback Area	0.10
Total Disturbed Area	0.65

Keith Stern Well Site Quantities

Item	Quantity	Unit	Notes
Well Pad	0.25	Acres	
Access Road	0.10	Acres	
Clearing	0.10	Acres	
Excavation	0.10	Acres	
Total	0.65	Acres	

Site Location (NAD 27)

Station	Latitude (N)	Longitude (W)
Center of Well Pad	39.77487986	-80.69201248
Well Pad	39.77487986	-80.69201248
Access Road	39.77487986	-80.69201248

Project Contacts

The Well Operator:
Location: Meade District, Marshall County
304-845-1920
304-845-1920

The Well Owner:
Tug Hill Operating, LLC
180 Sandstone Blvd
Sandstone, PA 15146

Contractor:
K&S Engineering, Inc.
1000 West 10th Street
Martinsburg, WV 26150

Miss Utility of West Virginia:
1-800-245-4242

Know what's below. Call before you dig.

Site Locations (NAD 83)

Station	Latitude (N)	Longitude (W)
Center of Well Pad	39.77487986	-80.69201248
Well Pad	39.77487986	-80.69201248
Access Road	39.77487986	-80.69201248

Approach Route:
From the intersection of CR 74 and WV Rt. 2 near New Martinsville, WV. Travel North on WV Rt. 2 for 1.5 miles. Turn Right onto CR 74 (Fish Creek Rd). Follow CR 74 for 1.2 miles. Turn Right onto Site Rd 2 (Continuation of CR 74). Follow Site Rd 2 for 0.2 miles. Turn sharp Left onto CR 74 (Fish Creek Rd). Follow CR 74 for 2.0 miles. The site entrance will be on the left (eastward) side of the road.

Well Location Description:
All Well locations comply with the following restrictions:
- 250' from an existing well or developed ground for human or domestic use.
- 25' from an existing building or structure.
- 100' from the edge of disturbance or newly exposed bare earth.
- 100' of a surface or ground water table on a well water supply.
(WV Code, Subchapter 20 of Title 22, Chapter 22)

Well Location Map:
The drawings, construction plans and other documents have been prepared in accordance with the West Virginia Code, Title 22, Chapter 22, Subchapter 20 of the Code of West Virginia.

Professional Engineer:
K&S Engineering, Inc.
1000 West 10th Street
Martinsburg, WV 26150
Professional Engineer
No. 12345
Date: 7/30/2018

Project Contacts

The Well Operator:
Location: Meade District, Marshall County
304-845-1920
304-845-1920

The Well Owner:
Tug Hill Operating, LLC
180 Sandstone Blvd
Sandstone, PA 15146

Contractor:
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Well Location Map

The drawings, construction plans and other documents have been prepared in accordance with the West Virginia Code, Title 22, Chapter 22, Subchapter 20 of the Code of West Virginia.

All Well Sites and Access Road Locations have been prepared in accordance with the West Virginia Code, Title 22, Chapter 22, Subchapter 20 of the Code of West Virginia.

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1000 West 10th Street
Martinsburg, WV 26150
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Know what's below. Call before you dig.

TUG HILL OPERATIONS

Keith Stern Well Site
Meade District, Marshall County, WV

Sheet 02 of 02
Scale: As Shown
Designed by ZS
Date: 7/30/2018
Sheet 1 of 11

