



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

Wednesday, September 4, 2019
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD
CANONSBURG, PA 15317

Re: Permit approval for BLAKE N-10HU
47-051-02204-00-00

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. Marlin
Chief

Operator's Well Number: BLAKE N-10HU
Farm Name: RUSSELL BLAKE, ET AL
U.S. WELL NUMBER: 47-051-02204-00-00
Horizontal 6A New Drill
Date Issued: 9/4/2019

Promoting a healthy environment.

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

June 18, 2019

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

RE: Application for Deep Well Permit – API #47-051-02204

COMPANY: Tug Hill Operating, LLC

FARM: Russell Blake, et al Blake N-10HU

COUNTY: Marshall DISTRICT: Franklin QUAD: Powhatan Point

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? Yes; withdrawn prior to hearing
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; 47-051-02193; 47-051-02194, 47-051-01766, 47-051-02203, 47-051-02205, 47-051-01896, 47-051-01895, 47-051-01894, 47-051-02143, 47-051-02147
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

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 Franklin Powhatan Point 7
Operator ID County District Quadrangle

2) Operator's Well Number: Blake N-10HU Well Pad Name: Blake

3) Farm Name/Surface Owner: Russell Blaka, et ux; William Bungard, et ux Public Road Access: Burch Ridge Road - CR 29

4) Elevation, current ground: 1326.20' Elevation, proposed post-construction: 1326.20'

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

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No Yes

Handwritten signature and date: 3/27/19

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Point Pleasant is the target formation at a depth of 11,226' - 11,104' - thickness of 122' and anticipated pressure of approx. 9500 psi.

8) Proposed Total Vertical Depth: 11,376'

9) Formation at Total Vertical Depth: Trenton

10) Proposed Total Measured Depth: 21,871'

11) Proposed Horizontal Leg Length: 10,253.33'

12) Approximate Fresh Water Strata Depths: 70' ; 805'

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: 2,167'

15) Approximate Coal Seam Depths: Sewickley Coal - 816' ; Pittsburgh Coal - 916'

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. Blake N-10HU
Well Pad Name: Blake

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#	1020'	1020'	1,644FT^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2802'	2802'	1,976FT^3(CTS)
Intermediate	9 5/8"	NEW	HPP110	47#	10,052'	10,052'	3,287FT^3(CTS)
Production	5 1/2"	NEW	P110	23#	21,871'	21,871'	5,181FT^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		11,081'	
Liners							

Joe
3/27/19

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)

4705 902204
API NO. 47-051 -
OPERATOR WELL NO. Blake N-10HU
Well Pad Name: Blake

3/27/19

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 25,627,500 lb proppant and 396,220 bbl of water. Max rate = 80 bpm; max psi = 12,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 20.72 acres

22) Area to be disturbed for well pad only, less access road (acres): 5.94 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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*Note: Attach additional sheets as needed.

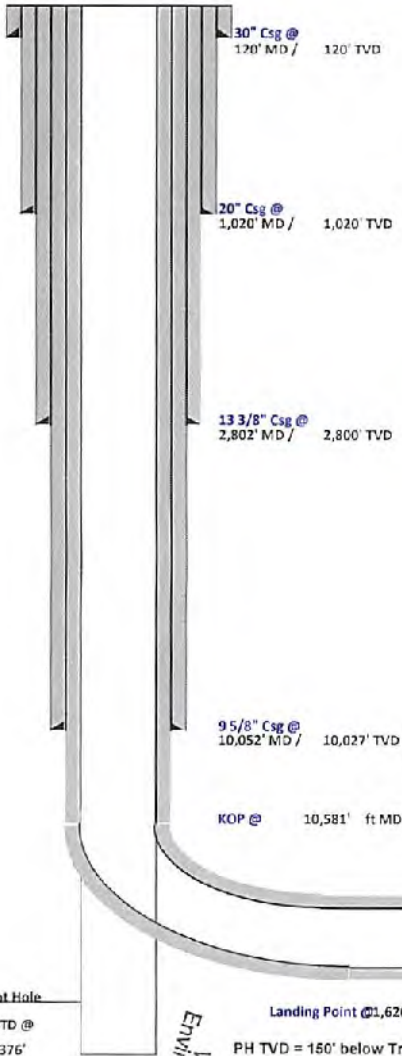


WELL NAME: Blake N-20HU
STATE: WV **COUNTY:** Marshall
DISTRICT: Franklin
DF Elev: 1,326' **GL Elev:** 1,326'
TD: 21,871'
TH Latitude: 39.76387872
TH Longitude: -80.80505472
BH Latitude: 39.7866149
BH Longitude: 80.822226

FORMATION TOPS	
Formation	Depth (TVD)
Deepest Fresh Water	922'
Sewickley Coal	816'
Pittsburgh Coal	916'
Big Lime	2,042'
Berea	2,585'
Tully	6,437'
Marcellus	6,496'
Onondaga	6,548'
Salina	7,209'
Lockport	8,231'
Utica	10,884'
Point Pleasant	11,104'
Landing Depth	11,154'
Trenton	11,226'
Pilot Hole TD	11,376'

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	26	20	1,020'	1,020'	106.5	J55	Surface
Intermediate 1	17 1/2	13 3/8	2,802'	2,800'	54.5	J55	Surface
Intermediate 2	12 1/4	9 5/8	10,052'	10,927'	47	HPP110	Surface
Production	8 1/2	5 1/2	21,871'	10,975'	23	HCP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,772	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	2,141	A	15	Air	1 Centralizer every other jt
Intermediate 2	2,706	A	14.5	Air	1 Centralizer every other jt
Production	4,472	A	15	Air / SOBIM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



JW
11/29/18

Pilot Hole
 PH TD @ 11,376'
 Landing Point @ 1,620' MD / 11,154' TVD
 PH TVD = 150' below Trenton Top

Lateral TD @ 21,871' ft MD
 10,975' ft TVD

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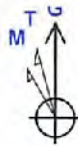
4705902204



Well: Blake 10 HU (slot N)
 Site: Blake Pad
 Project: Marshall County, West Virginia.
 Design: rev1

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1990
 Zone: Zone 17N (84 W to 78 W)
 System Datum: Mean Sea Level
 Depth Reference: GL @ 1326.06ft
 Northing: 14440813.54 Easting: 1695198.88 Latitude: 39.76387872 Longitude: -80.80505472

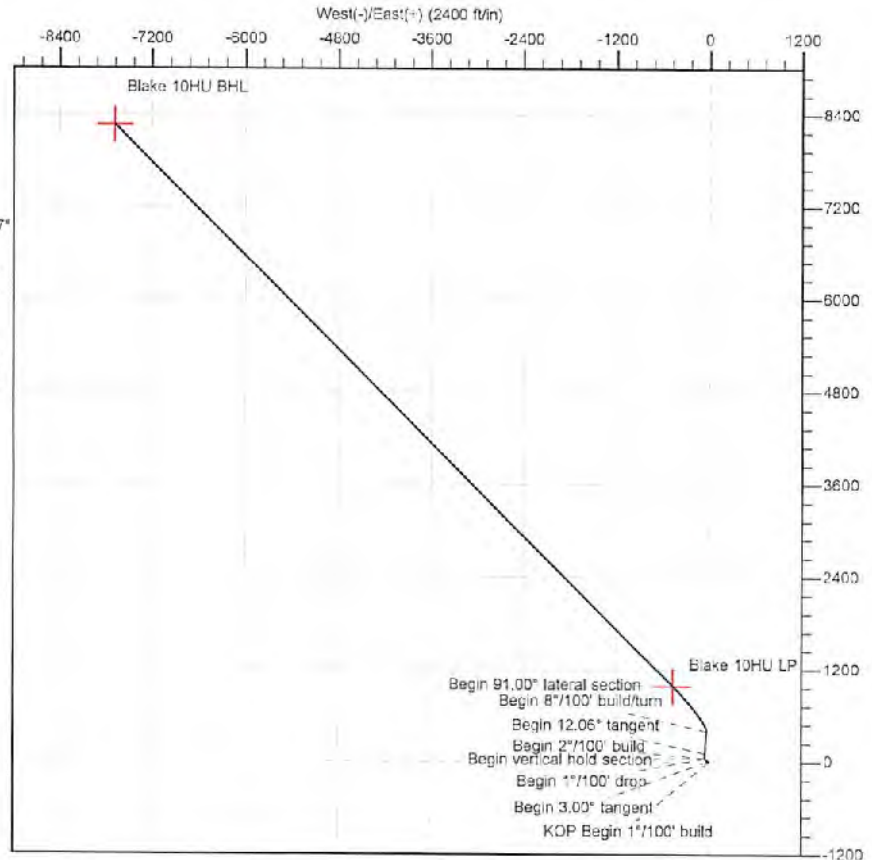
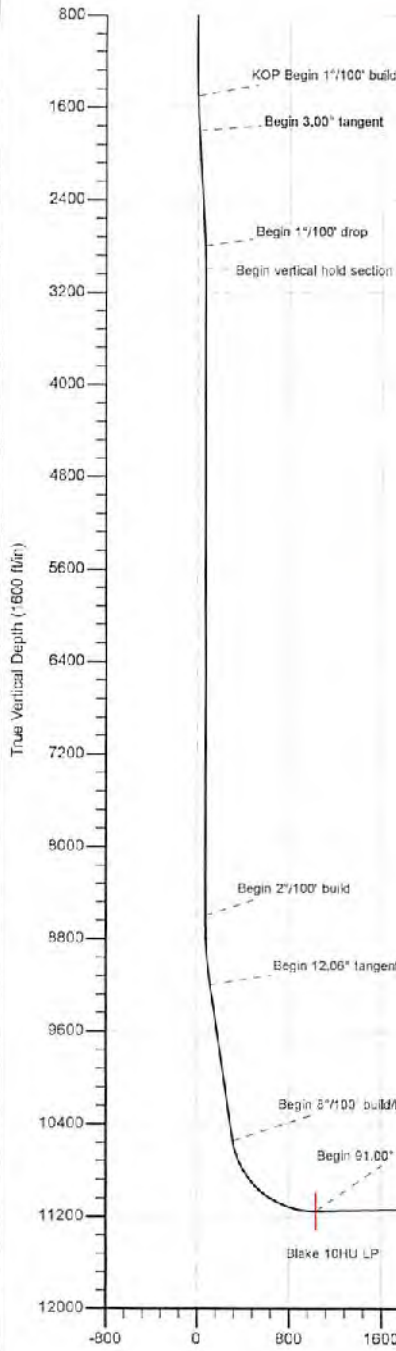
Total Corr. (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.77°



Azimuths to Grid North
 True North: -0.12°
 Magnetic North: -8.77°
 Magnetic Field:
 Strength: 52059.65nT
 Dip Angle: 66.87°
 Date: 6/8/2018
 Model: IGRF2015

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.00	0.00	
3	1600.00	3.00	315.00	1599.86	5.55	-5.55	1.00	315.00	7.85	
4	2700.00	3.00	315.00	2698.36	46.26	-46.26	0.00	0.00	65.38	
5	3000.00	0.00	315.00	2998.22	51.81	-51.81	1.00	180.00	73.23	Begin vertical hold section
6	8601.78	0.00	315.00	8600.00	51.81	-51.81	0.00	315.00	73.23	Begin 2°/100' build
7	9204.59	12.06	3.87	9198.37	114.86	-47.55	2.00	3.87	115.50	Begin 12.06° tangent
8	10591.44	12.06	3.87	10544.85	401.78	-28.15	0.00	0.00	313.44	Begin 8°/100' build/turn
9	11619.58	91.00	315.25	11154.00	984.28	-465.66	8.00	-49.09	1037.94	Begin 91.00° lateral section
10	21870.99	91.00	315.25	10975.00	8263.35	-7681.92	0.00	0.00	1282.50	PBHL/TD 21870.99 MD/10975.00 TVD



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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Blake 10 HU (slot N)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1326.00ft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1326.00ft
Site:	Blake Pad	North Reference:	Grid
Well:	Blake 10 HU (slot N)	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	Blake Pad				
Site Position:	Northing:	14,440,917.72 usft	Latitude:	39.76416471	
From:	Lat/Long	Easting:	1,695,217.29 usft	Longitude:	-80.80496839
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.12 °

Well	Blake 10 HU (slot N)					
Well Position	+N/-S	0.00 ft	Northing:	14,440,813.54 usft	Latitude:	39.76387872
	+E/-W	0.00 ft	Easting:	1,695,198.87 usft	Longitude:	-80.80505472
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	1,326.00 ft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	6/9/2018	-8.65	66.87	52,059,55254863

Design	rev1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	317.09

Plan Survey Tool Program	Date	6/16/2018		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	21,870.04 rev1 (Original Hole)	MWD	MWD - Standard

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Site:	Blake Pad	North Reference:	Grid
Well:	Blake 10 HU (slot N)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,600.00	3.00	315.00	1,599.86	5.55	-5.55	1.00	1.00	0.00	315.00	
2,700.00	3.00	315.00	2,698.36	46.26	-46.26	0.00	0.00	0.00	0.00	
3,000.00	0.00	315.00	2,998.22	51.81	-51.81	1.00	-1.00	0.00	180.00	
8,601.76	0.00	315.00	8,600.00	51.81	-51.81	0.00	0.00	0.00	315.00	
9,204.59	12.06	3.87	9,198.37	114.86	-47.55	2.00	2.00	8.11	3.87	
10,581.44	12.06	3.87	10,544.85	401.78	-28.15	0.00	0.00	0.00	0.00	
11,619.58	91.00	315.25	11,154.00	984.28	-485.66	8.00	7.60	-4.68	-49.09	Blake 10HU LP
21,871.00	91.00	315.25	10,975.00	8,263.35	-7,681.92	0.00	0.00	0.00	0.00	Blake 10HU BHL

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Planning Report - Geographic

4705102204

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Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1326.00ft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1326.00ft
Site:	Blake Pad	North Reference:	Grid
Well:	Blake 10 HU (slot N)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
100.00	0.00	0.00	100.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
200.00	0.00	0.00	200.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
300.00	0.00	0.00	300.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
400.00	0.00	0.00	400.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
500.00	0.00	0.00	500.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
600.00	0.00	0.00	600.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
700.00	0.00	0.00	700.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
800.00	0.00	0.00	800.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
900.00	0.00	0.00	900.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,440,813.54	1,695,198.87	39.76387872	-80.80505472
1,400.00	1.00	315.00	1,399.99	0.62	-0.62	14,440,814.16	1,695,198.26	39.76388042	-80.80505691
1,500.00	2.00	315.00	1,499.96	2.47	-2.47	14,440,816.01	1,695,198.41	39.76388551	-80.80508348
KOP Begin 1°/100' build									
1,600.00	3.00	315.00	1,599.86	5.55	-5.55	14,440,819.10	1,695,193.32	39.76389400	-80.80507444
1,700.00	3.00	315.00	1,699.73	9.25	-9.25	14,440,822.80	1,695,189.62	39.76390419	-80.80508758
1,800.00	3.00	315.00	1,799.59	12.95	-12.95	14,440,826.50	1,695,185.92	39.76391437	-80.80510072
Begin 3.00° tangent									
1,900.00	3.00	315.00	1,899.45	16.65	-16.65	14,440,830.20	1,695,182.22	39.76392456	-80.80511386
2,000.00	3.00	315.00	1,999.31	20.36	-20.36	14,440,833.90	1,695,178.52	39.76393474	-80.80512700
2,100.00	3.00	315.00	2,099.18	24.06	-24.06	14,440,837.60	1,695,174.82	39.76394493	-80.80514014
2,200.00	3.00	315.00	2,199.04	27.76	-27.76	14,440,841.30	1,695,171.12	39.76395512	-80.80515328
2,300.00	3.00	315.00	2,298.90	31.46	-31.46	14,440,845.00	1,695,167.42	39.76396530	-80.80516642
2,400.00	3.00	315.00	2,398.77	35.16	-35.16	14,440,848.70	1,695,163.72	39.76397549	-80.80517956
2,500.00	3.00	315.00	2,498.63	38.86	-38.86	14,440,852.40	1,695,160.01	39.76398568	-80.80519270
2,600.00	3.00	315.00	2,598.49	42.56	-42.56	14,440,856.10	1,695,156.31	39.76399586	-80.80520584
2,700.00	3.00	315.00	2,698.36	46.26	-46.26	14,440,859.81	1,695,152.61	39.76400604	-80.80521898
2,800.00	2.00	315.00	2,798.26	49.94	-49.94	14,440,862.89	1,695,149.53	39.76401453	-80.80522993
Begin 1°/100' drop									
2,900.00	1.00	315.00	2,898.22	51.20	-51.20	14,440,864.74	1,695,147.68	39.76401962	-80.80523851
3,000.00	0.00	315.00	2,898.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
Begin vertical hold section									
3,100.00	0.00	0.00	3,098.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
3,200.00	0.00	0.00	3,198.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
3,300.00	0.00	0.00	3,298.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
3,400.00	0.00	0.00	3,398.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
3,500.00	0.00	0.00	3,498.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
3,600.00	0.00	0.00	3,598.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
3,700.00	0.00	0.00	3,698.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
3,800.00	0.00	315.00	3,798.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
3,900.00	0.00	0.00	3,898.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
4,000.00	0.00	0.00	3,998.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
4,100.00	0.00	0.00	4,098.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
4,200.00	0.00	0.00	4,198.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
4,300.00	0.00	0.00	4,298.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
4,400.00	0.00	0.00	4,398.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
4,500.00	0.00	0.00	4,498.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
4,600.00	0.00	0.00	4,598.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
4,700.00	0.00	0.00	4,698.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
4,800.00	0.00	0.00	4,798.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
4,900.00	0.00	0.00	4,898.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870



Planning Report - Geographic

4705102204

Database: DB_Jul2218dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Blake Pad
 Well: Blake 10 HU (slot N)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Blake 10 HU (slot N)
 TVD Reference: GL @ 1326.00ft
 MD Reference: GL @ 1326.00ft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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 APR 3 2019
 WV Department of
 Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,000.00	0.00	0.00	4,998.22	51.81	-51.81	14,440,865.35	1,695,147.06	39.76402132	-80.80523870
5,100.00	0.00	0.00	5,098.22	51.81	-51.81	14,440,865.35	1,695,147.06	39.76402132	-80.80523870
5,200.00	0.00	315.00	5,198.22	51.81	-51.81	14,440,865.35	1,695,147.06	39.76402132	-80.80523870
5,300.00	0.00	0.00	5,298.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
5,400.00	0.00	0.00	5,398.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
5,500.00	0.00	0.00	5,498.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
5,600.00	0.00	0.00	5,598.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
5,700.00	0.00	0.00	5,698.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
5,800.00	0.00	0.00	5,798.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
5,900.00	0.00	0.00	5,898.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
6,000.00	0.00	0.00	5,998.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
6,100.00	0.00	0.00	6,098.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
6,200.00	0.00	0.00	6,198.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
6,300.00	0.00	0.00	6,298.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
6,400.00	0.00	0.00	6,398.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
6,500.00	0.00	0.00	6,498.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
6,600.00	0.00	0.00	6,598.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
6,700.00	0.00	315.00	6,698.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
6,800.00	0.00	0.00	6,798.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
6,900.00	0.00	0.00	6,898.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
7,000.00	0.00	0.00	6,998.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
7,100.00	0.00	0.00	7,098.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
7,200.00	0.00	0.00	7,198.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
7,300.00	0.00	0.00	7,298.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
7,400.00	0.00	0.00	7,398.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
7,500.00	0.00	0.00	7,498.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
7,600.00	0.00	0.00	7,598.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
7,700.00	0.00	0.00	7,698.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
7,800.00	0.00	0.00	7,798.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
7,900.00	0.00	0.00	7,898.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
8,000.00	0.00	0.00	7,998.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
8,100.00	0.00	315.00	8,098.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
8,200.00	0.00	0.00	8,198.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
8,300.00	0.00	0.00	8,298.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
8,400.00	0.00	0.00	8,398.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
8,500.00	0.00	0.00	8,498.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
8,600.00	0.00	0.00	8,598.22	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
8,601.78	0.00	0.00	8,600.00	51.81	-51.81	14,440,865.36	1,695,147.06	39.76402132	-80.80523870
Begin 2°/100' build									
8,700.00	1.96	3.87	8,696.20	53.49	-51.70	14,440,867.04	1,695,147.17	39.76402594	-80.80523828
8,800.00	3.96	3.87	8,798.06	58.65	-51.35	14,440,872.20	1,695,147.52	39.76404010	-80.80523700
8,900.00	5.96	3.87	8,897.68	67.29	-50.77	14,440,880.83	1,695,148.11	39.76406381	-80.80523485
9,000.00	7.96	3.87	8,996.94	79.38	-49.95	14,440,892.93	1,695,148.92	39.76409703	-80.80523185
9,100.00	9.96	3.87	9,095.71	94.93	-48.90	14,440,908.47	1,695,149.98	39.76413971	-80.80522799
9,200.00	11.96	3.87	9,193.88	113.90	-47.62	14,440,927.45	1,695,151.26	39.76419182	-80.80522328
9,204.59	12.06	3.87	9,198.37	114.86	-47.55	14,440,928.40	1,695,151.32	39.76419443	-80.80522304
Begin 12.06° tangent									
9,300.00	12.06	3.87	9,291.58	134.74	-46.21	14,440,948.28	1,695,152.67	39.76424903	-80.80521811
9,400.00	12.06	3.87	9,389.47	155.58	-44.80	14,440,969.12	1,695,154.08	39.76430625	-80.80521293
9,500.00	12.06	3.87	9,487.26	176.42	-43.39	14,440,989.96	1,695,155.48	39.76436348	-80.80520776
9,600.00	12.06	3.87	9,585.06	197.26	-41.98	14,441,010.80	1,695,156.89	39.76442070	-80.80520258
9,700.00	12.06	3.87	9,682.85	218.10	-40.57	14,441,031.64	1,695,158.30	39.76447792	-80.80519741
9,800.00	12.06	3.87	9,780.65	238.94	-39.16	14,441,052.48	1,695,159.71	39.76453514	-80.80519223
9,900.00	12.06	3.87	9,878.44	259.78	-37.75	14,441,073.32	1,695,161.12	39.76459237	-80.80518706



Planning Report - Geographic

Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Blake Pad
 Well: Blake 10 HU (slot N)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Blake 10 HU (slot N)
 TVD Reference: GL @ 1326.00ft
 MD Reference: GL @ 1326.00ft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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WV Department of
 Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,000.00	12.06	3.87	9,976.24	280.62	-38.35	14,441,094.16	1,695,162.53	39.78464959	-80.80518188
10,100.00	12.06	3.87	10,074.03	301.45	-34.94	14,441,115.00	1,695,163.94	39.78470661	-80.80517671
10,200.00	12.06	3.87	10,171.82	322.29	-33.53	14,441,135.84	1,695,165.35	39.78478403	-80.80517154
10,300.00	12.06	3.87	10,269.62	343.13	-32.12	14,441,155.68	1,695,166.75	39.78482126	-80.80516636
10,400.00	12.06	3.87	10,367.41	363.97	-30.71	14,441,177.52	1,695,168.16	39.78487848	-80.80516119
10,500.00	12.06	3.87	10,465.21	384.81	-29.30	14,441,198.36	1,695,169.57	39.78493570	-80.80515601
10,581.44	12.06	3.87	10,544.85	401.78	-28.15	14,441,215.33	1,695,170.72	39.78498230	-80.80515180
Begin 8°/100' build/tum									
10,600.00	13.08	358.90	10,562.97	405.82	-28.06	14,441,219.36	1,695,170.81	39.78499338	-80.80515145
10,700.00	19.60	342.08	10,658.93	433.13	-33.45	14,441,246.66	1,695,165.42	39.78508843	-80.80517041
10,800.00	26.92	333.76	10,750.76	469.46	-48.65	14,441,283.00	1,695,150.23	39.78516827	-80.80522419
10,900.00	34.52	328.85	10,836.68	514.08	-73.35	14,441,327.62	1,685,125.52	39.78529097	-80.80531176
11,000.00	42.25	325.54	10,915.02	568.14	-107.08	14,441,379.66	1,695,091.79	39.78543413	-80.80543140
11,100.00	50.06	323.10	10,984.24	624.81	-149.19	14,441,438.15	1,695,049.68	39.78559496	-80.80558080
11,200.00	57.90	321.18	11,043.00	688.36	-198.85	14,441,501.91	1,695,000.02	39.78577035	-80.80575703
11,300.00	65.77	319.53	11,090.16	758.16	-255.10	14,441,569.70	1,684,943.78	39.78595686	-80.80595686
11,400.00	73.68	318.09	11,124.80	826.87	-316.84	14,441,640.21	1,694,882.04	39.78615088	-80.80617583
11,500.00	81.55	316.77	11,146.24	898.53	-382.87	14,441,712.07	1,694,816.01	39.78634882	-80.80641025
11,600.00	89.45	315.50	11,154.08	970.34	-451.90	14,441,783.88	1,694,746.97	39.78654624	-80.80665537
11,619.58	91.00	315.25	11,154.00	984.27	-465.66	14,441,797.82	1,694,733.22	39.78658459	-80.80670421
Begin 91.00° lateral section									
11,700.00	91.00	315.25	11,152.60	1,041.38	-522.27	14,441,854.92	1,694,676.61	39.78674174	-80.80680523
11,800.00	91.00	315.25	11,150.85	1,112.36	-592.66	14,441,925.92	1,694,606.21	39.78693716	-80.80715519
11,900.00	91.00	315.25	11,149.10	1,183.39	-663.05	14,441,996.93	1,694,535.82	39.78713258	-80.80740516
12,000.00	91.00	315.25	11,147.36	1,254.39	-733.45	14,442,067.93	1,694,465.43	39.78732799	-80.80765512
12,100.00	91.00	315.25	11,145.61	1,325.40	-803.84	14,442,138.94	1,694,395.04	39.78752341	-80.80790508
12,200.00	91.00	315.25	11,143.87	1,396.40	-874.23	14,442,209.95	1,694,324.64	39.78771883	-80.80815505
12,300.00	91.00	315.25	11,142.12	1,467.41	-944.62	14,442,280.95	1,694,254.25	39.78791424	-80.80840502
12,400.00	91.00	315.25	11,140.37	1,538.41	-1,015.02	14,442,351.96	1,694,183.86	39.78810966	-80.80865499
12,500.00	91.00	315.25	11,138.63	1,609.42	-1,085.41	14,442,422.96	1,694,113.47	39.78830507	-80.80890496
12,600.00	91.00	315.25	11,136.88	1,680.43	-1,155.80	14,442,493.97	1,694,043.07	39.78850048	-80.80915493
12,700.00	91.00	315.25	11,135.14	1,751.43	-1,226.20	14,442,564.97	1,693,972.68	39.78869590	-80.80940491
12,800.00	91.00	315.25	11,133.39	1,822.44	-1,296.59	14,442,635.98	1,693,902.29	39.78889131	-80.80965488
12,900.00	91.00	315.25	11,131.64	1,893.44	-1,366.98	14,442,706.98	1,693,831.89	39.78908672	-80.80990486
13,000.00	91.00	315.25	11,129.90	1,964.45	-1,437.37	14,442,777.99	1,693,761.50	39.78928213	-80.81015484
13,100.00	91.00	315.25	11,128.15	2,035.45	-1,507.77	14,442,848.99	1,693,691.11	39.78947754	-80.81040482
13,200.00	91.00	315.25	11,126.40	2,106.46	-1,578.16	14,442,920.00	1,693,620.72	39.78967295	-80.81065480
13,300.00	91.00	315.25	11,124.66	2,177.47	-1,648.55	14,442,991.01	1,693,550.32	39.78986836	-80.81090478
13,400.00	91.00	315.25	11,122.91	2,248.47	-1,718.95	14,443,062.01	1,693,479.93	39.79006377	-80.81115476
13,500.00	91.00	315.25	11,121.17	2,319.48	-1,789.34	14,443,133.02	1,693,409.54	39.79025918	-80.81140475
13,600.00	91.00	315.25	11,119.42	2,390.48	-1,859.73	14,443,204.02	1,693,339.15	39.79045459	-80.81165474
13,700.00	91.00	315.25	11,117.67	2,461.49	-1,930.12	14,443,275.03	1,693,268.75	39.79065000	-80.81190472
13,800.00	91.00	315.25	11,115.93	2,532.49	-2,000.52	14,443,346.03	1,693,198.36	39.79084540	-80.81215471
13,900.00	91.00	315.25	11,114.18	2,603.50	-2,070.91	14,443,417.04	1,693,127.97	39.79104081	-80.81240470
14,000.00	91.00	315.25	11,112.44	2,674.50	-2,141.30	14,443,488.04	1,693,057.57	39.79123622	-80.81265470
14,100.00	91.00	315.25	11,110.69	2,745.51	-2,211.70	14,443,559.05	1,692,987.18	39.79143162	-80.81290469
14,200.00	91.00	315.25	11,108.94	2,816.52	-2,282.09	14,443,630.05	1,692,916.79	39.79162703	-80.81315468
14,300.00	91.00	315.25	11,107.20	2,887.52	-2,352.48	14,443,701.06	1,692,846.40	39.79182243	-80.81340466
14,400.00	91.00	315.25	11,105.45	2,958.53	-2,422.87	14,443,772.07	1,692,776.00	39.79201783	-80.81365466
14,500.00	91.00	315.25	11,103.71	3,029.53	-2,493.27	14,443,843.07	1,692,705.61	39.79221324	-80.81390466
14,600.00	91.00	315.25	11,101.96	3,100.54	-2,563.66	14,443,914.08	1,692,635.22	39.79240864	-80.81415466
14,700.00	91.00	315.25	11,100.21	3,171.54	-2,634.05	14,443,985.08	1,692,564.83	39.79260404	-80.81440466
14,800.00	91.00	315.25	11,098.47	3,242.55	-2,704.45	14,444,056.09	1,692,494.43	39.79279944	-80.81465466
14,900.00	91.00	315.25	11,096.72	3,313.55	-2,774.84	14,444,127.09	1,692,424.04	39.79299485	-80.81490466



Planning Report - Geographic

Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Blake Pad
 Well: Blake 10 HU (slot N)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Blake 10 HU (slot N)
 TVD Reference: GL @ 1326.00ft
 MD Reference: GL @ 1326.00ft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,000.00	91.00	315.25	11,094.97	3,384.56	-2,845.23	14,444,198.10	1,692,353.65	39.77319025	-80.81515409
15,100.00	91.00	315.25	11,093.23	3,455.57	-2,915.62	14,444,269.10	1,692,283.25	39.77336565	-80.81540470
15,200.00	91.00	315.25	11,091.48	3,526.57	-2,986.02	14,444,340.11	1,692,212.86	39.77358105	-80.81585471
15,300.00	91.00	315.25	11,089.74	3,597.58	-3,056.41	14,444,411.11	1,692,142.47	39.77377644	-80.81590472
15,400.00	91.00	315.25	11,087.99	3,666.58	-3,126.80	14,444,482.12	1,692,072.08	39.77397184	-80.81615474
15,500.00	91.00	315.25	11,086.24	3,736.59	-3,197.20	14,444,553.13	1,692,001.68	39.77416724	-80.81640475
15,600.00	91.00	315.25	11,084.50	3,810.59	-3,267.59	14,444,624.13	1,691,931.29	39.77436264	-80.81665477
15,700.00	91.00	315.25	11,082.75	3,881.60	-3,337.98	14,444,695.14	1,691,860.90	39.77455304	-80.81690478
15,800.00	91.00	315.25	11,081.01	3,952.60	-3,408.38	14,444,766.14	1,691,790.50	39.77474344	-80.81715480
15,900.00	91.00	315.25	11,079.26	4,023.61	-3,478.77	14,444,837.15	1,691,720.11	39.77493384	-80.81740482
16,000.00	91.00	315.25	11,077.51	4,094.62	-3,549.16	14,444,908.15	1,691,649.72	39.77512424	-80.81765484
16,100.00	91.00	315.25	11,075.77	4,165.62	-3,619.55	14,444,979.16	1,691,579.33	39.77531464	-80.81790486
16,200.00	91.00	315.25	11,074.02	4,236.63	-3,689.95	14,445,050.16	1,691,508.93	39.77550504	-80.81815488
16,300.00	91.00	315.25	11,072.28	4,307.63	-3,760.34	14,445,121.17	1,691,438.54	39.77569544	-80.81840491
16,400.00	91.00	315.25	11,070.53	4,378.64	-3,830.73	14,445,192.17	1,691,368.15	39.77588584	-80.81865494
16,500.00	91.00	315.25	11,068.78	4,449.64	-3,901.13	14,445,263.18	1,691,297.76	39.77607624	-80.81890496
16,600.00	91.00	315.25	11,067.04	4,520.65	-3,971.52	14,445,334.19	1,691,227.36	39.77626664	-80.81915499
16,700.00	91.00	315.25	11,065.29	4,591.65	-4,041.91	14,445,405.19	1,691,156.97	39.77645704	-80.81940502
16,800.00	91.00	315.25	11,063.54	4,662.66	-4,112.30	14,445,476.20	1,691,086.58	39.77664744	-80.81965505
16,900.00	91.00	315.25	11,061.80	4,733.67	-4,182.70	14,445,547.20	1,691,016.18	39.77683784	-80.81990509
17,000.00	91.00	315.25	11,060.05	4,804.67	-4,253.09	14,445,618.21	1,690,945.79	39.77702824	-80.82015512
17,100.00	91.00	315.25	11,058.31	4,875.68	-4,323.48	14,445,689.21	1,690,875.40	39.77721864	-80.82040516
17,200.00	91.00	315.25	11,056.56	4,946.68	-4,393.88	14,445,760.22	1,690,805.01	39.77740904	-80.82065520
17,300.00	91.00	315.25	11,054.81	5,017.69	-4,464.27	14,445,831.22	1,690,734.61	39.77759944	-80.82090523
17,400.00	91.00	315.25	11,053.07	5,088.69	-4,534.66	14,445,902.23	1,690,664.22	39.77778984	-80.82115527
17,500.00	91.00	315.25	11,051.32	5,159.70	-4,605.05	14,445,973.23	1,690,593.83	39.77798024	-80.82140532
17,600.00	91.00	315.25	11,049.58	5,230.71	-4,675.45	14,446,044.24	1,690,523.44	39.77817064	-80.82165536
17,700.00	91.00	315.25	11,047.83	5,301.71	-4,745.84	14,446,115.25	1,690,453.04	39.77836104	-80.82190540
17,800.00	91.00	315.25	11,046.08	5,372.72	-4,816.23	14,446,186.25	1,690,382.65	39.77855144	-80.82215545
17,900.00	91.00	315.25	11,044.34	5,443.72	-4,886.63	14,446,257.26	1,690,312.26	39.77874184	-80.82240550
18,000.00	91.00	315.25	11,042.59	5,514.73	-4,957.02	14,446,328.26	1,690,241.88	39.77893224	-80.82265555
18,100.00	91.00	315.25	11,040.85	5,585.73	-5,027.41	14,446,399.27	1,690,171.47	39.77912264	-80.82290560
18,200.00	91.00	315.25	11,039.10	5,656.74	-5,097.80	14,446,470.27	1,690,101.08	39.77931304	-80.82315565
18,300.00	91.00	315.25	11,037.35	5,727.74	-5,168.20	14,446,541.28	1,690,030.69	39.77950344	-80.82340570
18,400.00	91.00	315.25	11,035.61	5,798.75	-5,238.59	14,446,612.28	1,689,960.29	39.77969384	-80.82365575
18,500.00	91.00	315.25	11,033.86	5,869.76	-5,308.98	14,446,683.29	1,689,889.90	39.78000000	-80.82390581
18,600.00	91.00	315.25	11,032.12	5,940.76	-5,379.38	14,446,754.29	1,689,819.51	39.78022431	-80.82415587
18,700.00	91.00	315.25	11,030.37	6,011.77	-5,449.77	14,446,825.30	1,689,749.12	39.78044969	-80.82440593
18,800.00	91.00	315.25	11,028.62	6,082.77	-5,520.16	14,446,896.30	1,689,678.72	39.78067507	-80.82465599
18,900.00	91.00	315.25	11,026.88	6,153.78	-5,590.55	14,446,967.31	1,689,608.33	39.78090045	-80.82490605
19,000.00	91.00	315.25	11,025.13	6,224.78	-5,660.95	14,447,038.32	1,689,537.94	39.78112583	-80.82515611
19,100.00	91.00	315.25	11,023.38	6,295.79	-5,731.34	14,447,109.32	1,689,467.54	39.78135121	-80.82540617
19,200.00	91.00	315.25	11,021.64	6,366.79	-5,801.73	14,447,180.33	1,689,397.15	39.78157659	-80.82565624
19,300.00	91.00	315.25	11,019.89	6,437.80	-5,872.13	14,447,251.33	1,689,326.76	39.78180197	-80.82590631
19,400.00	91.00	315.25	11,018.15	6,508.81	-5,942.52	14,447,322.34	1,689,256.37	39.78202735	-80.82615638
19,500.00	91.00	315.25	11,016.40	6,579.81	-6,012.91	14,447,393.34	1,689,185.97	39.78225273	-80.82640645
19,600.00	91.00	315.25	11,014.65	6,650.82	-6,083.30	14,447,464.35	1,689,115.58	39.78247811	-80.82665652
19,700.00	91.00	315.25	11,012.91	6,721.82	-6,153.70	14,447,535.35	1,689,045.19	39.78270349	-80.82690659
19,800.00	91.00	315.25	11,011.16	6,792.83	-6,224.09	14,447,606.36	1,688,974.79	39.78292887	-80.82715667
19,900.00	91.00	315.25	11,009.42	6,863.83	-6,294.48	14,447,677.36	1,688,904.40	39.78315425	-80.82740674
20,000.00	91.00	315.25	11,007.67	6,934.84	-6,364.88	14,447,748.37	1,688,834.01	39.78337963	-80.82765682
20,100.00	91.00	315.25	11,005.92	7,005.84	-6,435.27	14,447,819.38	1,688,763.62	39.78360501	-80.82790690
20,200.00	91.00	315.25	11,004.18	7,076.85	-6,505.66	14,447,890.38	1,688,693.22	39.78383039	-80.82815698
20,300.00	91.00	315.25	11,002.43	7,147.86	-6,576.05	14,447,961.39	1,688,622.83	39.78405577	-80.82840706
20,400.00	91.00	315.25	11,000.69	7,218.86	-6,646.45	14,448,032.39	1,688,552.44	39.78428115	-80.82865714



Planning Report - Geographic

4705102204

Database: DB_Jul2216dt_V14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Blake Pad
 Well: Blake 10 HU (slot N)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Blake 10 HU (slot N)
 TVD Reference: GL @ 1326.00ft
 MD Reference: GL @ 1326.00ft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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Planned Survey

WV Department of Environmental Protection

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
20,500.00	91.00	315.25	10,998.94	7,289.87	-6,716.84	14,448,103.40	1,688,482.05	39.78393644	-80.82890723
20,600.00	91.00	315.25	10,997.19	7,360.87	-6,787.23	14,448,174.40	1,688,411.65	39.78413181	-80.82915731
20,700.00	91.00	315.25	10,995.45	7,431.88	-6,857.63	14,448,245.41	1,688,341.26	39.78432718	-80.82940740
20,800.00	91.00	315.25	10,993.70	7,502.88	-6,928.02	14,448,316.41	1,688,270.87	39.78452255	-80.82965749
20,900.00	91.00	315.25	10,991.95	7,573.89	-6,998.41	14,448,387.42	1,688,200.47	39.78471792	-80.82990758
21,000.00	91.00	315.25	10,990.21	7,644.90	-7,068.81	14,448,458.42	1,688,130.08	39.78491329	-80.83015767
21,100.00	91.00	315.25	10,988.46	7,715.90	-7,139.20	14,448,529.43	1,688,059.69	39.78510866	-80.83040776
21,200.00	91.00	315.25	10,986.72	7,786.91	-7,209.59	14,448,600.44	1,687,989.30	39.78530402	-80.83065786
21,300.00	91.00	315.25	10,984.97	7,857.91	-7,279.98	14,448,671.44	1,687,918.90	39.78549939	-80.83090795
21,400.00	91.00	315.25	10,983.22	7,928.92	-7,350.38	14,448,742.45	1,687,848.51	39.78569476	-80.83115805
21,500.00	91.00	315.25	10,981.48	7,999.92	-7,420.77	14,448,813.45	1,687,778.12	39.78589012	-80.83140815
21,600.00	91.00	315.25	10,979.73	8,070.93	-7,491.16	14,448,884.46	1,687,707.73	39.78608549	-80.83165825
21,700.00	91.00	315.25	10,977.99	8,141.93	-7,561.56	14,448,955.46	1,687,637.33	39.78628085	-80.83190835
21,800.00	91.00	315.25	10,976.24	8,212.94	-7,631.95	14,449,026.47	1,687,566.94	39.78647621	-80.83215845
21,870.99	91.00	315.25	10,975.00	8,283.35	-7,681.92	14,449,076.88	1,687,516.97	39.78661490	-80.83233600

PBHL/TD 21870.99 MD/10975.00 TVD

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Blake 10HU BHL - hit/miss target - Shape - Point	0.00	0.00	10,975.00	8,263.35	-7,681.92	14,449,076.88	1,687,516.96	39.78661491	-80.83233601
Blake 10HU LP - plan hits target center - Point	0.00	0.01	11,154.00	984.28	-465.66	14,441,797.82	1,694,733.22	39.76658459	-80.80670422

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,500.00	1,499.96	2.47	-2.47	KOP Begin 1°/100' build
1,800.00	1,799.59	12.95	-12.95	Begin 3.00° tangent
2,800.00	2,798.26	49.34	-49.34	Begin 1°/100' drop
3,000.00	2,998.22	51.81	-51.81	Begin vertical hold section
8,601.78	8,600.00	51.81	-51.81	Begin 2°/100' build
9,204.59	9,198.37	114.86	-47.55	Begin 12.06° tangent
10,581.44	10,544.85	401.78	-28.15	Begin 8°/100' build/turn
11,619.58	11,154.00	984.27	-465.66	Begin 91.00° lateral section
21,870.99	10,975.00	8,263.35	-7,681.92	PBHL/TD 21870.99 MD/10975.00 TVD



Tug Hill Operating, LLC Casing and Cement Program

Blake N-10HU

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	20"	J55	26"	1,020'	CTS
Intermediate 1	13 3/8"	J55	17 1/2"	2,802'	CTS
Intermediate 2	9 5/8"	HPP110	12 1/4"	10,052'	CTS
Production	5 1/2"	HCP110	8 1/2"	21,871'	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 (3/18/2019) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

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

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

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

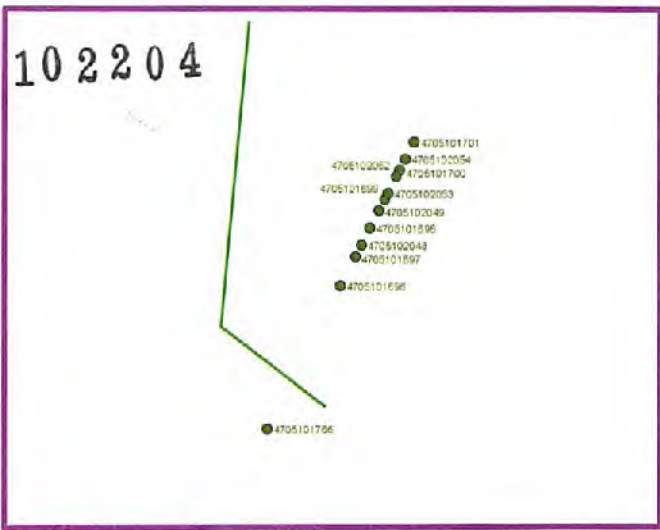
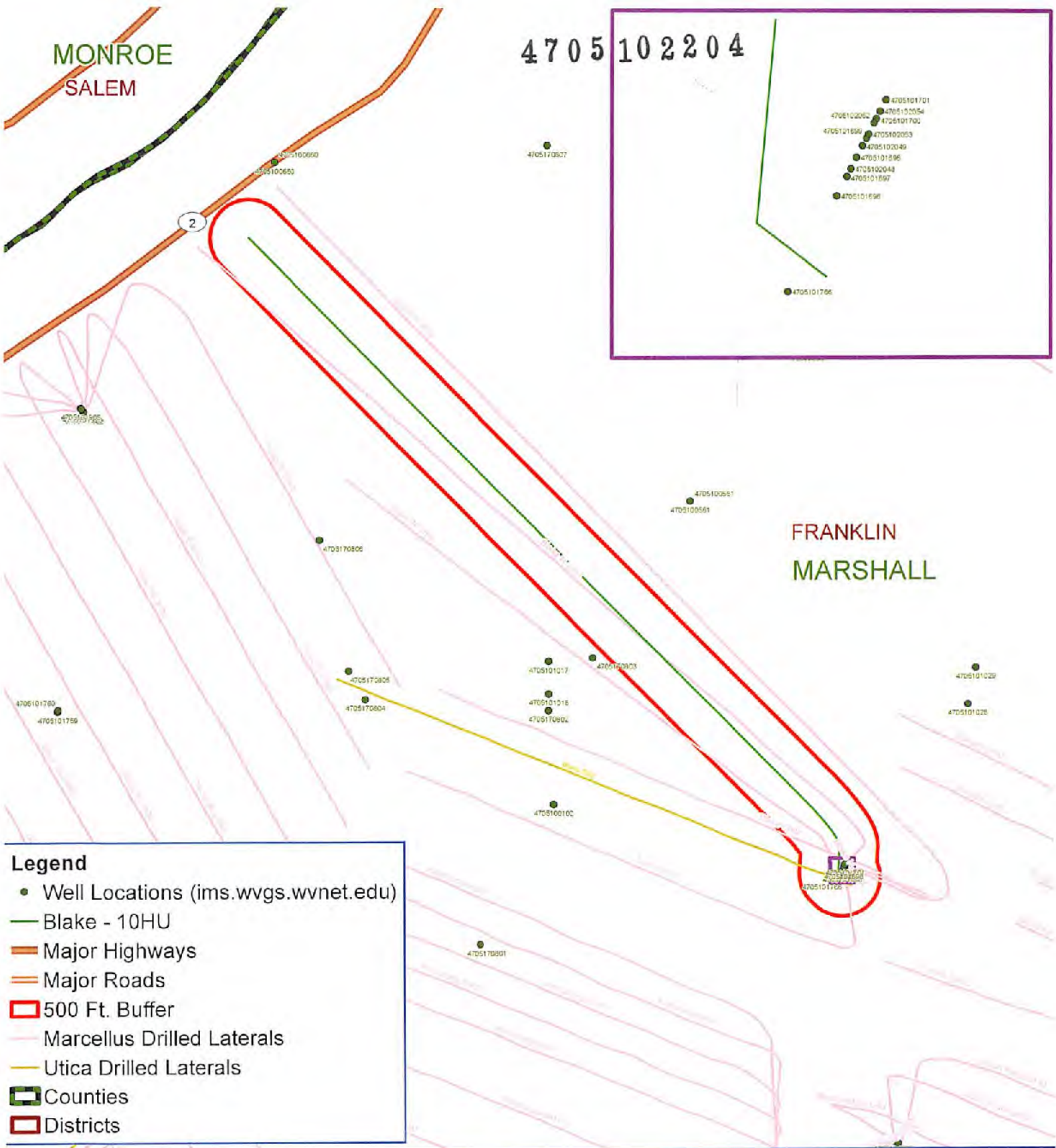
Permit well - Blake N-10HU

Wells within 500' Buffer

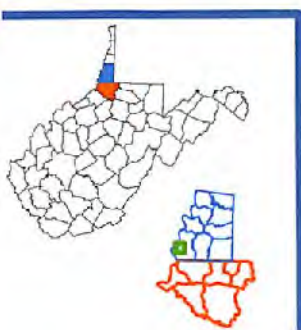
Note: Well spots depicted on Area of Review map (page 3) are derived from State held coordinates. The spots may differ from those depicted on the Well Plat because the Plat locations represent actual field

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
4705101701	Tug Hill Operating	13,355' TMD 6,572' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101698	Tug Hill Operating	12,573' TMD 6,562' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101766	Tug Hill Operating	18,102' TMD 11,131' TVD	Point Pleasant	None	Yes, existing Point Pleasant producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705170806	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 Marcellus well.	State records are incomplete
2405101018	CNX	N/A	N/A	N/A	No	Cancelled location
4705170803	Manufactures 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 Marcellus well.	State records are incomplete
4705102053	Tug Hill Operating	6,650' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705102048	Tug Hill Operating	6,643' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101539	Tug Hill Operating	11,480' TMD 6,488' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705102052	Tug Hill Operating	6,647' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705102054	Tug Hill Operating	6,647' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705102049	Tug Hill Operating	6,645' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101922	Tug Hill Operating	6,284' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101921	Tug Hill Operating	6,284' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101920	Tug Hill Operating	13,581' TMD 6,192' TVD	Marcellus	None	No, Marcellus producer > 1,000' above the Point Pleasant. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101017	CNX	N/A	N/A	N/A	No	Cancelled location

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- Legend**
- Well Locations (ims.wvgs.wvnet.edu)
 - Blake - 10HU
 - Major Highways
 - Major Roads
 - 500 Ft. Buffer
 - Marcellus Drilled Laterals
 - Utica Drilled Laterals
 - ▭ Counties
 - ▭ Districts



Blake - 10HU
Franklin District
Marshall County, WV



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

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WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Blake N-10HU

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 (IIUC 10) Fish Creek - Ohio River (Undefined) Quadrangle Powhatan Point 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1388426)

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

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

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

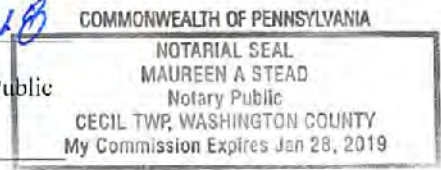
Company Official Signature James A. Pancake
Company Official (Typed Name) James Pancake
Company Official Title Vice President - Geoscience

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APR 8 2019

WV Department of Environmental Protection

Subscribed and sworn before me this 27 day of NOVEMBER, 20 18
Maureen A Stead Notary Public

My commission expires 1/26/19



Form WW-9

Operator's Well No. Blake N-10HU

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 20.72 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: *John Anderson*

Comments: _____

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WV Department of
Environmental Protection

Title: Oil and Gas Inspector

Date: 11/29/18

Field Reviewed? Yes No

WW-9

**PROPOSED BLAKE
N-10HU**

SUPPLEMENT PG 1

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.

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED. TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.

ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.

WILBERT H
BUNGARD ET UX
T.M. 19/ 20
114.989 Acres

ERNIE L
ANDERSON
ET UX
T.M. 19/ 10
6.0125 Acres

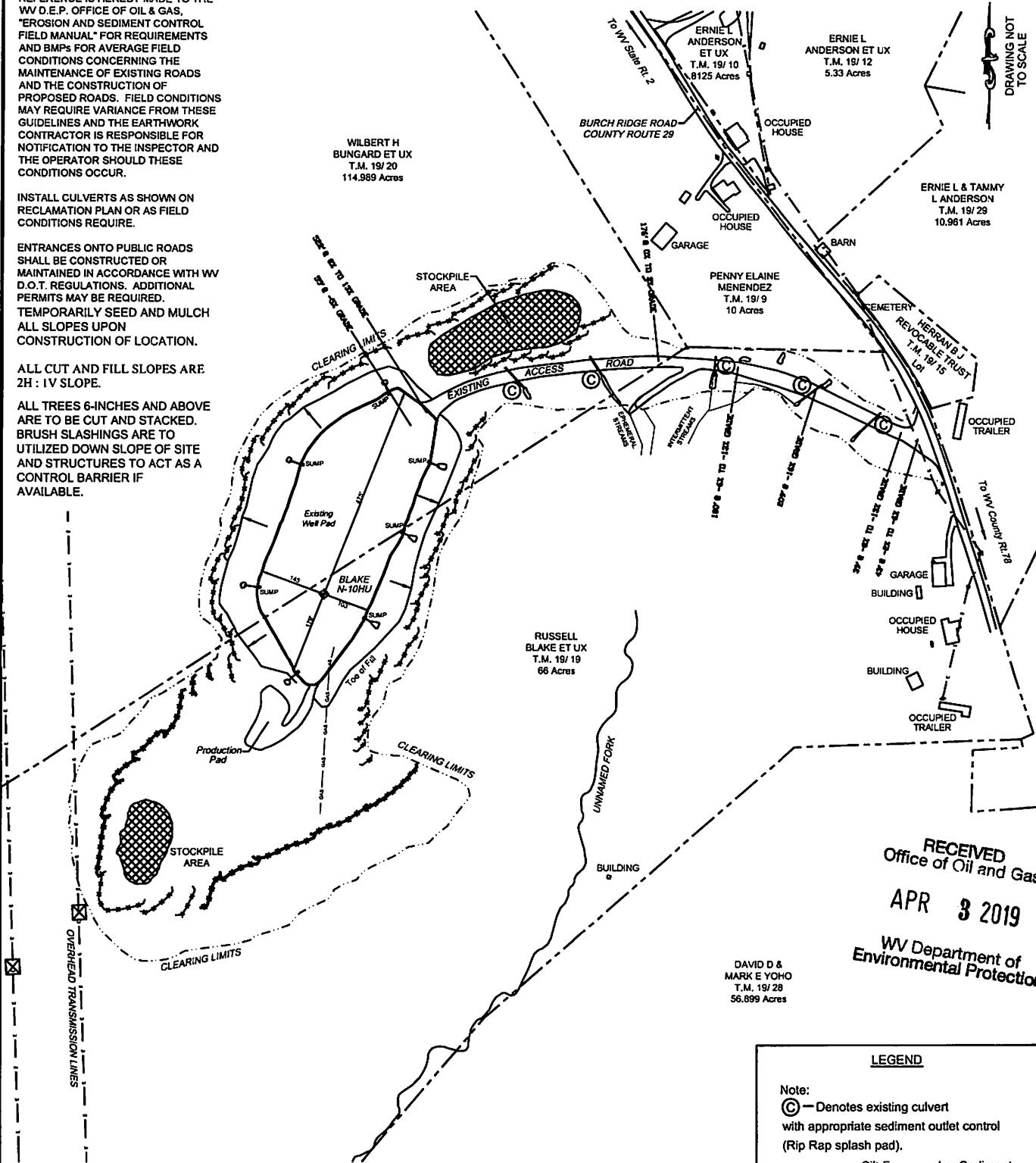
ERNIE L
ANDERSON ET UX
T.M. 19/ 12
5.33 Acres

ERNIE L & TAMMY
L ANDERSON
T.M. 19/ 29
10.961 Acres

PENNY ELAINE
MENEZDEZ
T.M. 19/ 9
10 Acres

RUSSELL
BLAKE ET UX
T.M. 19/ 19
66 Acres

DAVID D &
MARK E YOHO
T.M. 19/ 28
56.899 Acres



DRAWING NOT
TO SCALE

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Environmental Protection

LEGEND

Note:
 (C) — Denotes existing culvert with appropriate sediment outlet control (Rip Rap splash pad).
 - - - - - Silt Fence and or Sediment and Erosion Control Measure.
 - - - - - Surface Boundary



Well Site Safety Plan
Tug Hill Operating, LLC

ju
11/29/18

Well Name: Blake N-10HU

Pad Location: Blake

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

NORTHING - 4,401,565.37

EASTING - 516,697.65

November 2018

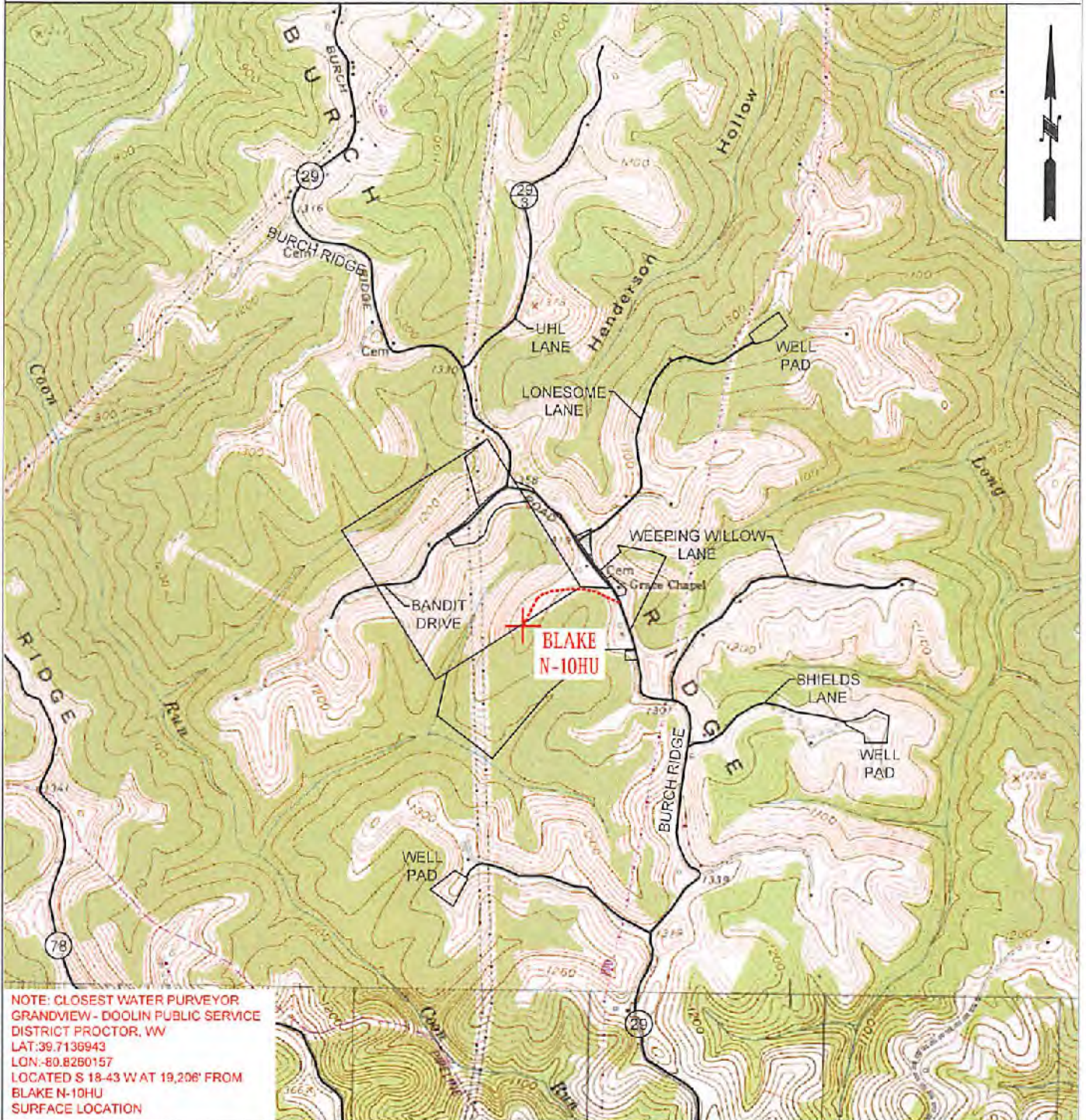
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WW-9

PROPOSED BLAKE N-10HU

SUPPLEMENT PG 2

4705 102204



NOTE: CLOSEST WATER PURVEYOR
 GRANDVIEW - DOOLIN PUBLIC SERVICE
 DISTRICT PROCTOR, WV
 LAT: 39.7136943
 LON: -80.8260157
 LOCATED S 18-43 W AT 19,206' FROM
 BLAKE N-10HU
 SURFACE LOCATION



TUG HILL
OPERATING

OPERATOR 494510851
 TUG HILL OPERATING, LLC
 380 SOUTHPOINTE BLVD
 SUITE 200
 CANONSBURG, PA 15317

TOPO SECTION
 POWHATAN POINT 75'
SCALE:
 1" = 2000'

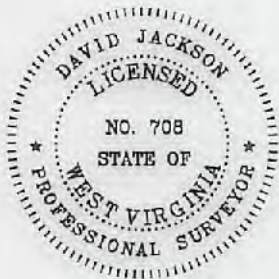
LEASE NAME
 BLAKE
DATE:
 DATE: 11-20-2018

**BLAKE LEASE
WELL N-10HU
400.4332± ACRES**

Number	TAX MAP -PARCEL	SURFACE OWNER	ACRES
S1	05-22-04	CONSOL RCPC, LLC	159.05
S2	B 05-19-20	WILBERT H. BUNGARD ET UX	114.989
S3	G 05-19-04	JUSTIN RINE	82.75
S4	05-14-02	JOHN B. WILLIAMS, ET AL	20.17
S5	05-13-41C	BENTON DARRAH, LILLIE MAY DUGAN, ALMA BITMER, ALBERTA PALMER & AUDREY HOWARD	1.0
S6	05-13-41B	LARRY & JUDY DARRAH	2.50
S7	05-13-41A	RODNEY & RHONDA JACKSON	17.05
S8	05-13-42	THOMAS & VICTORIA BOWMAN	45.0
S9	05-13-34	DAVID J. MAST	40.0
S10	05-13-35	DAVID J. MAST	24.90
S11	05-13-23	DAVID J. MAST	89.59
S12	05-13-33	NATHAN D. YODER	142.03
S13	05-13-25	AARON PAUL HOLDREN, ET UX	30.0
S14	05-13-27	AARON PAUL HOLDREN, ET UX	25.0
S15	05-13-28	AARON PAUL HOLDREN, ET UX	17.0
S16	P 05-13-30	CINDY D. ALIFF	3.0
S17	05-13-28.1	CINDY D. ALIFF	1.80
S18	05-13-29	W.V. DEPT. OF HIGHWAYS	1.0
S19	O 05-13-31	CNX LAND RESOURCES, INC.	31.723
S20	05-13-31.1	W.V. DEPT. OF HIGHWAYS	0.277
S21	05-13-31.2	CNX LAND RESOURCES, INC.	0.938
S22	05-12-27	CONSOL RCPC, LLC	0.87
S23	05-12-26	OHIO RIVER R.R. CO.	4.00
S24	05-12-28	W.V. DEPT. OF HIGHWAYS	1.1
S26	05-12-24.2	W.V. DEPT. OF HIGHWAYS	0.539
S27	05-12-25	OHIO RIVER R.R. CO.	12.8
S28	05-12-24	W.V. DEPT. OF HIGHWAYS	0.964
S29	05-12-24.3	CONSOL RCPC, LLC	18.523
S30	05-12-24.1	W.V. DEPT. OF HIGHWAYS	0.994
S31	05-12-23.2	CONSOLIDATION COAL COMPANY MURRAY ENERGY & CONSOL. RCPC, LLC	12.50
S32	05-12-22	CONSOL RCPC, LLC	0.944
S33	J 05-14-07	DONNA K. & LEROY ANDERSON	4.60
S34	05-14-16	GEORGE A. KNUTH	1.6386
S35	05-14-9.3	VERNIE A. RINE, ET UX	4.118
S36	05-14-9.4	VERNIE A. RINE, ET UX	3.404
S37	05-14-10.3	VERNIE A. & JODY K. RINE	1.54
S38	H 05-14-08	LAWRENCE EUGENE ANDERSON	18.29
S39	05-14-10.1	IDA BELLE RUTAN (LIFE), RALPH R. HOYT	0.50
S40	05-14-10.2	IDA BELLE RUTAN (LIFE), RALPH R. HOYT	0.495
S41	05-14-11	DALE R. GALLAHER, ET AL	12
S42	05-14-12	DALE R. GALLAHER, ET AL	135.100
S43	05-14-14	ROBERT L. SHIELDS ET AL	29.05
S44	05-19-06	BELINDA K. MEADOWS, REBECCA ANN SHEILDS & OLAN RUTAN	5.1099
S45	05-19-7.3	OLAN V. RUTAN, ET UX	0.341
S46	05-19-7.4	OLAN V. RUTAN, ET UX	1.787
S47	05-19-7.2	OLAN RUTAN	2.783
S48	05-19-7	OLAN V. RUTAN, ET UX	32.4801
S49	05-19-7.1	ROBERT L. SHIELDS, ET AL	3.399
S50	E 05-19-20.2	CASANDRA L. HARMON	7.448
S51	D 05-19-20.1	JOHN J. EBERT, LIFE	3.848
S52	C 05-19-20.3	SIDNEY HARMON	3.715
S53	05-19-7.5	ADAM T. & JESSE L. ROBINSON	2.640
S54	05-19-8	CONSOL RCPC, LLC	40
S55	05-19-11	ERNIE L. ANDERSON, ET UX	0.08
S56	05-19-10	ERNIE L. ANDERSON, ET UX	0.8125
S57	05-19-12	ERNIE L. ANDERSON, ET UX	5.33
S58	05-19-09	PENNY ELAINE MENENDEZ	10.44
S59	05-19-29	ERNIE L. & TAMMY L. ANDERSON	10.981
S60	05-19-15	B.J. HERRAN REVOCABLE TRUST	0.177
S61	05-19-30	ERNIE & TAMMY ANDERSON	19.037
S62	05-19-30.1	ERIC R.W. & ASHLEY A. HUGGINS	2.911
S63	05-19-31	CHARLES F. & DIANA L. HAYNES	8.779
S64	05-19-32	JASPER N. BURCH ET AL - TRUSTEES	0.397
S65	05-19-28	DAVID E. YOHO & MARK E. YOHO	56.899
S66	05-14-10.4	ADAM R. & JESSE L. ROBINSON	3.343

NOTES:

- 05-13-41A MAPPED AS PART OF 05-13-41
- 05-13-41B MAPPED AS PART OF 05-13-41, INCORRECTLY ASSESSED AS 05-25-22 #16 ACRES
- 05-13-41C MAPPED AS PART OF 05-13-41. NOT ASSESSED.



David L Jackson

P.S.
708



**TUG HILL
OPERATING**

OPERATOR'S
WELL #: Blake N-10HU
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV

WELL PLAT
PAGE 2 OF 3
DATE: 04/01/2019
REVISED: 04/11/2019

**BLAKE LEASE
WELL N-10HU
400.4332± ACRES**

Lease No.	Tags	Parcel	Grantor, Lessor, etc.	Book	Pg
10*14634	A	5-19-19	RUSSELL BLAKE & MARY BLAKE	773	568
10*14141	B	5-19-20	DAVID TAKACH AND WIFE DEBORAH	720	233
10*14141	C	5-19-20.3	DAVID TAKACH AND WIFE DEBORAH	720	233
10*14141	D	5-19-20.1	DAVID TAKACH AND WIFE DEBORAH	720	233
10*14141	E	5-19-20.2	DAVID TAKACH AND WIFE DEBORAH	720	233
10*14925	F	5-19-5	MOUNTAIN TOP PRODUCTIONS LLC	840	444
10*14612	G	5-19-4	HAYHURST COMPANY ET AL LAWRENCE EUGENE ANDERSON AND NICOLE M ANDERSON	708	107
10*18121	H	5-14-8	M ANDERSON	927	68
10*14568	I	5-14-3	LEROY ANDERSON & DONNA K ANDERSON LEROY ANDERSON AND DONNA K ANDERSON	772	69
10*14945	J	5-14-7	LEROY ANDERSON & DONNA K ANDERSON ET AL	735	433
10*14568	K	5-14-5	LEROY ANDERSON & DONNA K ANDERSON ET AL	772	69
10*14568	L	5-14-4	LEROY ANDERSON & DONNA K ANDERSON	772	69
041111	M	5-12-23	EDWARD DOUGLAS GUIRE ET AL	663	91
10*16609	N	5-13-32	C PATRICIA WOBIG ET AL	916	118
10*14688	O	5-13-31	DEBBIE RICHMOND ET AL	786	398
10*14636	P	5-13-30	WANDA RIDING ET AL	794	503



P.S.
708

David L Jackson



TUG HILL
OPERATING

OPERATOR'S

WELL #: Blake N-10HU

DISTRICT: Franklin

COUNTY: Marshall

STATE: WV

WELL PLAT

PAGE 3 OF 3

DATE: 04/01/2019

REVISED: 04/11/2019

WW-6A1
(5/13)

Operator's Well No. Blake N-10HM

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

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

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

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

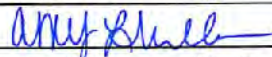
*See attached pages

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

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

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

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

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

Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*14634	A	5-19-19	RUSSELL BLAKE & MARY BLAKE	GASTAR EXPLORATION USA, INC	1/8+	773	568	NA	NA	NA	28/499 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14141	B	5-19-20	DAVID TAKACH AND WIFE DEBORAH	GASTAR EXPLORATION USA, INC	1/8+	720	233	NA	NA	NA	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14141	C	5-19-20.3	DAVID TAKACH AND WIFE DEBORAH	GASTAR EXPLORATION USA, INC	1/8+	720	233	NA	NA	NA	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14141	D	5-19-20.1	DAVID TAKACH AND WIFE DEBORAH	GASTAR EXPLORATION USA, INC	^F 1/8+	720	233	NA	NA	NA	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14141	E	5-19-20.2	DAVID TAKACH AND WIFE DEBORAH	GASTAR EXPLORATION USA, INC	1/8+	720	233	NA	NA	NA	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14925	F	5-19-5	MOUNTAIN TOP PRODUCTIONS LLC	GASTAR EXPLORATION INC	1/8+	840	444	NA	NA	NA	NA	33/308 Gastar Exploration Inc to Atinum Marcellus I Inc	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14612	G	5-19-4	HAYHURST COMPANY	CHESAPEAKE APPALACHIA, LLC	1/8+	708	107	NA	NA	NA	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties, Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14613	G	5-19-4	CHESTNUT HOLDINGS INC	GASTAR EXPLORATION INC	1/8+	827	556	NA	NA	NA	NA	32/428 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*18121	H	5-14-8	LAWRENCE EUGENE ANDERSON AND NICOLE M ANDERSON	TH EXPLORATION, LLC	1/8+	927	68	NA	NA	NA	NA	NA	NA
10*14568	I	5-14-3	LEROY ANDERSON & DONNA K ANDERSON	GASTAR EXPLORATION USA, INC	1/8+	772	69	NA	NA	NA	27/639 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14945	J	5-14-7	LEROY ANDERSON AND DONNA K ANDERSON	TRIENERGY HOLDINGS, LLC	1/8+	735	433	NA	25/449 TriEnergy Holdings, LLC to NPAR, LLC	756/332 NPAR, LLC to Chevron USA Inc	32/355 Chevron USA Inc to Gastar Exploration Inc and Atinum Marcellus I LLC	32/370 Chevron USA Inc to Gastar Exploration Inc and Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14568	K	5-14-5	LEROY ANDERSON & DONNA K ANDERSON	GASTAR EXPLORATION USA, INC	1/8+	772	69	NA	NA	NA	27/639 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC

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10*14619	K	5-14-5	SHIRLEY R MILLER	CHESAPEAKE APPALACHIA, LLC	1/8+	715	414	NA	NA	NA	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14620	K	5-14-5	ANITA R MILLER	CHESAPEAKE APPALACHIA, LLC	1/8+	715	416	NA	NA	NA	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14621	K	5-14-5	WILLIAM DALE AND NOREEN G MILLER	CHESAPEAKE APPALACHIA, LLC	1/8+	715	415	NA	NA	NA	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14622	K	5-14-5	KELLY D MILLER	CHESAPEAKE APPALACHIA, LLC	1/8+	713	606	NA	NA	NA	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14623	K	5-14-5	DUANE D MILLER	CHESAPEAKE APPALACHIA, LLC	1/8+	717	149	NA	NA	NA	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14624	K	5-14-5	DOUGLAS E MILLER	CHESAPEAKE APPALACHIA, LLC	1/8+	725	559	NA	NA	25/582 Chesapeake Appalachia, LLC to Statoil USA Onshore Properties Inc	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14625	K	5-14-5	JACQUELYN J JOHNSON	CHESAPEAKE APPALACHIA, LLC	1/8+	715	616	NA	NA	24/204 Chesapeake Appalachia, LLC to Statoil USA Onshore Properties Inc	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14626	K	5-14-5	STEVEN POND	CHESAPEAKE APPALACHIA, LLC	1/8+	715	622	NA	NA	24/204 Chesapeake Appalachia, LLC to Statoil USA Onshore Properties Inc	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC

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10*14627	K	5-14-5	BRIAN AND LENA POND	CHESAPEAKE APPALACHIA, LLC	1/8+	717	51	NA	NA	NA	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14628	K	5-14-5	TEXYN L AND GEORGIA A MILLER	CHESAPEAKE APPALACHIA, LLC	1/8+	715	514	NA	NA	NA	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14629	K	5-14-5	GERALD R AND LEE A MILLER	CHESAPEAKE APPALACHIA, LLC	1/8+	717	1	NA	NA	24/204 Chesapeake Appalachia, LLC to Statoil USA Onshore Properties Inc	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14630	K	5-14-5	BARBARA K BURLEY	CHESAPEAKE APPALACHIA, LLC	1/8+	716	637	NA	NA	24/204 Chesapeake Appalachia, LLC to Statoil USA Onshore Properties Inc	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14631	K	5-14-5	LISA ANN MILLER	CHESAPEAKE APPALACHIA, LLC	1/8+	715	520	NA	NA	24/204 Chesapeake Appalachia, LLC to Statoil USA Onshore Properties Inc	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc to Gastar Exploration USA, Inc and Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14898	K	5-14-5	SHERLEY RAY STOWE	GASTAR EXPLORATION USA, INC	1/8+	813	444	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	31/184 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14899	K	5-14-5	SANDRA J HARMON AND WALTER D HARMON	GASTAR EXPLORATION USA, INC	1/8+	813	442	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	31/184 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14900	K	5-14-5	STANLEY EUGENE STOWE	GASTAR EXPLORATION USA, INC	1/8+	813	440	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	31/184 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14901	K	5-14-5	MARGARET CLICKNER	GASTAR EXPLORATION USA, INC	1/8+	815	244	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	31/184 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14902	K	5-14-5	BENNY MILLER	GASTAR EXPLORATION INC	1/8+	836	98	NA	NA	NA	NA	NA	36/9 Gastar Exploration Inc to TH Exploration II, LLC

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10*14903	K	5-14-5	SUE PRUITT	GASTAR EXPLORATION INC	1/8+	836	100	NA	NA	NA	NA	32/428 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14904	K	5-14-5	LEROY MILLER	GASTAR EXPLORATION INC	1/8+	846	398	NA	NA	NA	NA	34/302 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14905	K	5-14-5	JAMES K MILLER	GASTAR EXPLORATION INC	1/8+	854	610	NA	NA	NA	NA	35/119 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14906	K	5-14-5	MARY LOU MILLER-HORTON	GASTAR EXPLORATION INC	1/8+	862	417	NA	NA	NA	NA	35/119 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*17547	K	5-14-5	JAMES CONTRERAS AND CATHERINE CONTRERAS	TH EXPLORATION, LLC	1/8+	942	400	NA	NA	NA	NA	NA	NA
10*17548	K	5-14-5	RICHARD ARTHUR VAN GROL AND JEANNE MARIE VAN GROL	TH EXPLORATION, LLC	1/8+	942	398	NA	NA	NA	NA	NA	NA
10*17718	K	5-14-5	MARY ELLEN & THOMAS C DAVIS	TH EXPLORATION, LLC	1/8+	929	92	NA	NA	NA	NA	NA	NA
10*18202	K	5-14-5	TERRANCE V POWDERLY SR	TH EXPLORATION, LLC	1/8+	929	85	NA	NA	NA	NA	NA	NA
10*18209	K	5-14-5	CORRINE E VERNA & JONATHAN C VERNA	TH EXPLORATION, LLC	1/8+	929	82	NA	NA	NA	NA	NA	NA
10*18210	K	5-14-5	DAVID F POWDERLY JR AND NANCY A POWDERLY	TH EXPLORATION, LLC	1/8+	929	87	NA	NA	NA	NA	NA	NA
10*18211	K	5-14-5	REBECCA LYNN KIER AND ERIC JAMES KIER	TH EXPLORATION, LLC	1/8+	929	90	NA	NA	NA	NA	NA	NA
10*18212	K	5-14-5	THOMAS C DAVIS AND MARY ELLEN DAVIS	TH EXPLORATION, LLC	1/8+	929	92	NA	NA	NA	NA	NA	NA
10*18213	K	5-14-5	THOMAS A POWDERLY	TH EXPLORATION, LLC	1/8+	929	94	NA	NA	NA	NA	NA	NA

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10*18214	K	5-14-5	ANNE M AND JOHN LEACH	TH EXPLORATION, LLC	1/8+	929	96	NA	NA	NA	NA	NA	NA
10*18215	K	5-14-5	MARGARET J WHITFORD AND LANCE W WHITFORD	TH EXPLORATION, LLC	1/8+	929	103	NA	NA	NA	NA	NA	NA
10*18218	K	5-14-5	ERIN E SCHOLL	TH EXPLORATION, LLC	1/8+	929	106	NA	NA	NA	NA	NA	NA
10*18806	K	5-14-5	E SHEILA PAVLOVICH	TH EXPLORATION, LLC	1/8+	929	576	NA	NA	NA	NA	NA	NA
10*19787	K	5-14-5	JOSEPH N POWDERLY III	TH EXPLORATION, LLC	1/8+	935	47	NA	NA	NA	NA	NA	NA
10*21223	K	5-14-5	EUGENE C GRIEB AND SHIRLEY K GRIEB	TH EXPLORATION, LLC	1/8+	961	468	NA	NA	NA	NA	NA	NA
10*21924	K	5-14-5	BEVERLY A MILLER	TH EXPLORATION, LLC	1/8+	953	533	NA	NA	NA	NA	NA	NA
10*21926	K	5-14-5	VIOLA JANE BREON AND JAMES RONALD BREON	TH EXPLORATION, LLC	1/8+	953	360	NA	NA	NA	NA	NA	NA
10*21930	K	5-14-5	JAMES A GRENOBLE AND MARY JANE GRENOBLE	TH EXPLORATION, LLC	1/8+	953	263	NA	NA	NA	NA	NA	NA
10*21938	K	5-14-5	SEAN M GRENOBLE AND CHERYL A GRENOBLE	TH EXPLORATION, LLC	1/8+	960	91	NA	NA	NA	NA	NA	NA
10*22292	K	5-14-5	JACQUELYN J JOHNSON AND SAMMY R JOHNSON	TH EXPLORATION, LLC	1/8+	957	113	NA	NA	NA	NA	NA	NA
10*22442	K	5-14-5	SANDRA J HARMON AND WALTER D HARMON	TH EXPLORATION, LLC	1/8+	966	106	NA	NA	NA	NA	NA	NA
10*22449	K	5-14-5	MARGARET CLICKNER	TH EXPLORATION, LLC	1/8+	963	644	NA	NA	NA	NA	NA	NA

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10*22511	K	5-14-5	SHERLEY R STOWE & KAREN M STOWE	TH EXPLORATION, LLC	1/8+	966	104	NA	NA	NA	NA	NA	NA
10*22645	K	5-14-5	STANLEY EUGENE STOWE	TH EXPLORATION, LLC	1/8+	968	204	NA	NA	NA	NA	NA	NA
10*22744	K	5-14-5	BRIDGET A POWDERLY	TH EXPLORATION, LLC	1/8+	968	206	NA	NA	NA	NA	NA	NA
10*23896	K	5-14-5	MOLLY AND JOHN D MCMAHON	TH EXPLORATION, LLC	1/8+	1017	489	NA	NA	NA	NA	NA	NA
10*23969	K	5-14-5	MARK A JOHNSON ET AL JONATHAN E TURAK, SPECIAL COMMISSIONER	TH EXPLORATION, LLC	1/8+	1020	195	NA	NA	NA	NA	NA	NA
10*14568	L	5-14-4	LEROY ANDERSON & DONNA K ANDERSON	GASTAR EXPLORATION USA, INC	1/8+	772	69	NA	NA	NA	27/639 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
041111	M	5-12-23	EDWARD DOUGLAS GUIRE ET AL	CNX LAND RESOURCES	1/8+	663	91	NA	745/117 CNX Land Resources Inc to CNX Gas Company LLC	752/66 CNX Gas Company LLC to Noble Energy Inc	909/94 CNX Gas Company LLC to Noble Energy Inc	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
10*16609	N	5-13-32	C PATRICIA WOBIG	TH EXPLORATION, LLC	1/8+	916	118	NA	NA	NA	NA	NA	NA
10*16610	N	5-13-32	RICHARD B SMITH SR AND EVELYN MARIE SMITH	TH EXPLORATION, LLC	1/8+	916	120	NA	NA	NA	NA	NA	NA
10*14688	O	5-13-31	DEBBIE RICHMOND	GASTAR EXPLORATION USA, INC	1/8+	786	398	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	29/157 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14690	O	5-13-31	DANA HAMBEL	GASTAR EXPLORATION USA, INC	1/8+	789	289	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	29/157 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14692	O	5-13-31	BARBARA ANN DEEM	GASTAR EXPLORATION USA, INC	1/8+	804	247	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	31/184 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC

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10*14693	O	5-13-31	CHARLES DOWNS	GASTAR EXPLORATION USA, INC	1/8+	809	501	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	31/184 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14694	O	5-13-31	MARY FUNK	GASTAR EXPLORATION USA, INC	1/8+	821	36	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	32/428 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14695	O	5-13-31	KATHY MITCHELL	GASTAR EXPLORATION USA, INC	1/8+	822	258	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	32/428 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14696	O	5-13-31	MCKENZIE ANN ADAMS	GASTAR EXPLORATION USA, INC	1/8+	827	224	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	32/428 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14697	O	5-13-31	ANGELA ADAMS WILHITE	GASTAR EXPLORATION USA, INC	1/8+	839	533	NA	NA	NA	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	33/308 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14698	O	5-13-31	JASON ADAMS	GASTAR EXPLORATION INC	1/8+	842	372	NA	NA	NA	NA	33/308 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
041112	O	5-13-31	COLUMBIAN CHEMICAL COMPANY	CNX LAND RESOURCES	1/8+	691	363	NA	745/117 CNX Land Resources Inc to CNX Gas Company LLC	752/66 CNX Gas Company LLC to Noble Energy Inc	909/94 CNX Gas Company LLC to Noble Energy Inc	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II
10*16873	O	5-13-31	LUCILLE R YOUNG	TH EXPLORATION, LLC	1/8+	917	93	NA	NA	NA	NA	NA	NA
10*16875	O	5-13-31	CHRISTOPHER M EARICH AND BREA D EARICH	TH EXPLORATION, LLC	1/8+	917	99	NA	NA	NA	NA	NA	NA
10*16877	O	5-13-31	RENEE E CAIN AND GERALD D CAIN JR	TH EXPLORATION, LLC	1/8+	917	89	NA	NA	NA	NA	NA	NA
10*16878	O	5-13-31	DIANE L GOODE	TH EXPLORATION, LLC	1/8+	917	91	NA	NA	NA	NA	NA	NA
10*16940	O	5-13-31	PATRICIA A RICHMOND	TH EXPLORATION, LLC	1/8+	915	127	NA	NA	NA	NA	NA	NA
10*18571	O	5-13-31	JUDITH R GADE AND WILLIAM S GADE	TH EXPLORATION, LLC	1/8+	935	72	NA	NA	NA	NA	NA	NA

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10*18760	O	5-13-31	DAVID HAMBEL	TH EXPLORATION, LLC	1/8+	938	452	NA	NA	NA	NA	NA	NA
10*19420	O	5-13-31	REBECCA L RICHMOND	TH EXPLORATION, LLC	1/8+	940	264	NA	NA	NA	NA	NA	NA
10*19916	O	5-13-31	RALPH M RICHMOND & WENDY L RICHMOND	TH EXPLORATION, LLC	1/8+	948	595	NA	NA	NA	NA	NA	NA
10*14636	P	5-13-30	WANDA RIDING	GASTAR EXPLORATION USA, INC	1/8+	794	503	NA	NA	806/1 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	30/136 Gastar Exploration USA, Inc to Atinum Marcellus LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14637	P	5-13-30	KIMBERLY S. DENNY	GASTAR EXPLORATION USA, INC	1/8+	794	511	NA	NA	806/1 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	30/136 Gastar Exploration USA, Inc to Atinum Marcellus LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14638	P	5-13-30	HUGH YOHO	GASTAR EXPLORATION USA, INC	1/8+	794	478	NA	NA	806/1 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	30/136 Gastar Exploration USA, Inc to Atinum Marcellus LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14639	P	5-13-30	GARY PARSONS	GASTAR EXPLORATION USA, INC	1/8+	794	521	NA	NA	806/1 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	30/136 Gastar Exploration USA, Inc to Atinum Marcellus LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14640	P	5-13-30	SHERRI SNYDER	GASTAR EXPLORATION USA, INC	1/8+	799	545	NA	NA	806/1 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	30/136 Gastar Exploration USA, Inc to Atinum Marcellus LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14641	P	5-13-30	LORA LANGLEY	GASTAR EXPLORATION USA, INC	1/8+	800	621	NA	NA	806/1 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	30/136 Gastar Exploration USA, Inc to Atinum Marcellus LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14642	P	5-13-30	MARY B. FERRIS BY AIF REBECCA R. FERRIS SULLIVAN	GASTAR EXPLORATION USA, INC	1/8+	808	457	NA	NA	NA	31/184 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14643	P	5-13-30	MARTHA RENEE ROBINSON	GASTAR EXPLORATION USA, INC	1/8+	809	541	NA	NA	NA	31/184 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14644	P	5-13-30	CHERYL HILL	GASTAR EXPLORATION USA, INC	1/8+	809	517	NA	NA	NA	31/184 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14645	P	5-13-30	RANDY BERISFORD	GASTAR EXPLORATION USA, INC	1/8+	810	328	NA	NA	NA	31/184 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	21/41 Gastar Exploration USA, Inc and Gastar Exploration Inc merger	36/9 Gastar Exploration Inc to TH Exploration II, LLC

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10*14647	P	5-13-30	JAMES W ROBINSON III	GASTAR EXPLORATION INC	1/8+	836	102	NA	NA	NA	NA	32/428 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14648	P	5-13-30	LORI ANN ROBINSON	GASTAR EXPLORATION INC	1/8+	836	104	NA	NA	NA	NA	32/428 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14649	P	5-13-30	DONALD GARY GROVES II	GASTAR EXPLORATION INC	1/8+	842	382	NA	NA	NA	NA	33/308 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14650	P	5-13-30	TIMOTHY DWIGHT GROVES	GASTAR EXPLORATION INC	1/8+	842	384	NA	NA	NA	NA	33/308 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14651	P	5-13-30	DAVID V CALDWELL	GASTAR EXPLORATION INC	1/8+	842	386	NA	NA	NA	NA	33/308 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14652	P	5-13-30	CANDICE GUTIERREZ	GASTAR EXPLORATION INC	1/8+	842	388	NA	NA	NA	NA	33/308 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14653	P	5-13-30	KRISTIN DOUGLAS	GASTAR EXPLORATION INC	1/8+	842	390	NA	NA	NA	NA	33/308 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14654	P	5-13-30	KATHY JO RUNYON AND ROBERT PAT	GASTAR EXPLORATION INC	1/8+	854	607	NA	NA	NA	NA	35/119 Gastar Exploration Inc to Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*14655	P	5-13-30	RONALD R JOHNSON	TRIENERGY HOLDINGS, LLC	1/8+	737	483	25/449 TriEnergy Holdings, LLC to NPAR, LLC	756/332 NPAR, LLC to Chevron USA Inc	28/356 TriEnergy Holdings, LLC and TriEnergy, Inc to Chevron USA Inc	32/355 Chevron USA Inc to Gastar Exploration Inc and Atinum Marcellus I LLC	32/370 Chevron USA Inc to Gastar Exploration Inc and Atinum Marcellus I LLC	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*18373	P	5-13-30	SARAH K SCHNEIDER AND DANIEL K SCHNEIDER	TH EXPLORATION, LLC	1/8+	931	391	NA	NA	NA	NA	NA	NA
10*18375	P	5-13-30	DENNIS D CALDWELL AND APRIL N CALDWELL	TH EXPLORATION, LLC	1/8+	931	394	NA	NA	NA	NA	NA	NA
Q083768116	K	5-14-5	Susanne S. Quarterman, single	Noble Energy, Inc.	1/8+	890	606	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC

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Q083768098	K	5-14-5	Rodney F. Peterson, widower	Noble Energy, Inc.	1/8+	870	380	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768112	K	5-14-5	Nora K. Powderly, single	Noble Energy, Inc.	1/8+	881	32	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768103	K	5-14-5	Nora C. Powderly, single	Noble Energy, Inc.	1/8+	873	83	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768094	K	5-14-5	Muriel Anne Miller and Alan Powell, wife and husband	Noble Energy, Inc.	1/8+	860	541	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768114	K	5-14-5	Mary S. Scholl, single	Noble Energy, Inc.	1/8+	890	572	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768105	K	5-14-5	Mary F. Weiland, widow	Noble Energy, Inc.	1/8+	873	126	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768113	K	5-14-5	Kevin M. Powderly, a married man dealing in his sole and separate property	Noble Energy, Inc.	1/8+	890	515	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768095	K	5-14-5	Kathleen A. Sullivan and Thomas Sullivan, wife and husband	Noble Energy, Inc.	1/8+	870	364	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768106	K	5-14-5	Jane H. Barnsteiner and Joanne M. Disch, her spouse	Noble Energy, Inc.	1/8+	873	132	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC

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Q083768108	K	5-14-5	James T. Scholl, single	Noble Energy, Inc.	1/8+	878	365	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768101	K	5-14-5	James E. Herman, a married man dealing in his sole and separate property	Noble Energy, Inc.	1/8+	873	130	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768091	K	5-14-5	Harriet C. Ventura and Rocco Ventura, wife and husband	Noble Energy, Inc.	1/8+	894	541	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768100	K	5-14-5	Harriet C. Herman and Joseph H. Wilkinson, a wife and husband	Noble Energy, Inc.	1/8+	873	122	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768096	K	5-14-5	Francis F. Fischer and Jacqueline Fischer, husband and wife	Noble Energy, Inc.	1/8+	870	366	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768104	K	5-14-5	Eugenia A. Kerr, widow	Noble Energy, Inc.	1/8+	873	120	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768099	K	5-14-5	Eileen T. Powderly, single	Noble Energy, Inc.	1/8+	873	81	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768102	K	5-14-5	Edward P. Powderly and Marilyn Powderly, husband and wife	Noble Energy, Inc.	1/8+	873	85	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768097	K	5-14-5	Dennis Fischer and Sharron A. Fischer, husband and wife	Noble Energy, Inc.	1/8+	870	358	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC

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Q083768093	K	5-14-5	David Lee Evans, Jr. and Novella Evans, husband and wife	Noble Energy, Inc.	1/8+	864	180	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768111	K	5-14-5	Bridget A. Powderly, single	Noble Energy, Inc.	1/8+	881	26	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768115	K	5-14-5	Brian P. Powderly and Anita Powderly, h/w	Noble Energy, Inc.	1/8+	890	566	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768080	K	5-14-5	Anthony T. Powderly and Barbara M. Powderly, husband and wife	Noble Energy, Inc.	1/8+	878	363	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC
Q083768107	K	5-14-5	Anne Galbally and James F. Galbally, h/w	Noble Energy, Inc.	1/8+	878	373	NA	NA	NA	NA	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/286 Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC

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COPY

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

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On this 18th day of October, 2016, before me, the undersigned authority, personally appeared David D. Kalish ("Affiant") who being first duly sworn under oath, deposes and saith:

1. TH Exploration, LLC, TH Exploration II, LLC and TH Exploration III, LLC are wholly owned subsidiaries of THQ Appalachia I, LLC.
2. Tug Hill Operating, LLC provides oil and gas operations services to THQ Appalachia I, LLC under an Operating Services Agreement dated July 23, 2014.
3. David D. Kalish, the Affiant, is the Vice President of Tug Hill Operating, LLC, THQ Appalachia I, LLC, TH Exploration, LLC, TH Exploration II, LLC and TH Exploration III, LLC, and;
3. Tug Hill Operating, LLC is authorized to operate and maintain the assets owned by THQ Appalachia I, LLC, including, as referenced above, TH Exploration, LLC, TH Exploration II, LLC, and TH Exploration III, LLC, including oil and gas leases, wells, pipelines, surface facilities, and other all other assets that support the business of THQ Appalachia I, LLC, and;
4. Specifically, Tug Hill Operating, LLC is authorized to submit and obtain well work permits and carry out all activities pursuant to such work permits for assets owned by TH Exploration, LLC, TH Exploration II, LLC, TH Exploration III, LLC.

FURTHER, AFFIANT SAITH NOT.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this 18th day of October, 2016.

David D. Kalish
Affiant: David D. Kalish

Jan Pest
MARSHALL County 03:44:28 PM
Instrument No 1416299
Date Recorded 10/19/2016
Document Type HIS
Pages Recorded 1
Book-Page 28-62
Recording Fee \$5.00
Additional \$5.00

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STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

Sworn and subscribed to (or affirmed) before me on this, the 18th day of October, 2016, by David D. Kalish

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

My Commission Expires: 10-05-2020

Signature/Notary Public: Robin Bock

Name/Notary Public (Print): Robin Bock



RECEIVED
Office of Oil and Gas
APR 3 2019
WV Department of
Environmental Protection

Jay Pest
 MARSHALL County 01:22:38 PM
 Instrument No 1403489
 Date Recorded 04/27/2016
 Document Type ASB
 Pages Recorded 77
 Book-Page 36-9
 Recording Fee \$77.00
 Additional \$13.00

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WHEN RECORDED RETURN TO:
 TH Exploration II, LLC
 1320 South University Drive, Suite 500
 Fort Worth, Texas 76107
 Attn: David Kalish

Execution Version

ASSIGNMENT AND BILL OF SALE

STATE OF WV §
 §
 COUNTY OF MARSHALL § KNOW ALL MEN BY THESE PRESENTS:

THIS ASSIGNMENT AND BILL OF SALE (this "*Assignment*"), dated April 7, 2016, but effective as of 7:00 A.M. Houston time on January 1, 2016 (the "*Effective Time*"), is between Gasbar Exploration Inc, a Delaware corporation, whose address is 1331 Lamar Street, Suite 630 Houston, Texas 77010 ("*Assignor*"), and TH Exploration II, LLC, a Texas limited liability company, whose address is 1320 South University Drive, Suite 500, Fort Worth, Texas 76107 ("*Assignee*"). Assignor and Assignee are each, individually, referred to herein as a "*Party*" and, collectively, as the "*Parties*".

Capitalized terms used but not defined herein shall have the respective meanings set forth in that certain Purchase and Sale Agreement (the "*Purchase Agreement*"), dated as of February 19, 2016, by and between Assignor and Assignee (as Successor-in-interest).

Section 1. Assignment. The conveyance and assignment herein shall be deemed effective as of the *Effective Time*.

For Ten Dollars (\$10.00) and other good and valuable consideration (the receipt and sufficiency of which are hereby acknowledged), Assignor does hereby forever GRANT, BARGAIN, SELL, CONVEY, ASSIGN, TRANSFER, SET OVER AND DELIVER unto Assignee, all of Assignor's right, title and interest in and to the following interests and properties (such right, title and interest described in *subsections (a) through (b)* of this Section 1, less and except the Excluded Assets, collectively, the "*Conveyed Interests*"):

(a) all oil, gas and/or mineral leases of Assignor, together with any and all other right, title and interest of Assignor in and to the leasehold estates created thereby, including subleases, royalties, overriding royalties, net profits interest, carried interests or similar rights or interests in such leases, and together with all rights, privileges, benefits and powers conferred upon Assignor with respect to the use and occupation of the lands covered thereby that may be necessary, convenient or incidental to the possession and enjoyment of such leases, located in Marshall, Wetzel, Doddridge, Harrison, Lewis, Marion, and Mingo Counties, West Virginia and Greene, Butler, Fayette, Somerset, and Clearfield Counties, Pennsylvania, including those described on Exhibit A—Part 1 attached hereto (subject to any reservations, limitations or depth restrictions described on Exhibit A—Part 1), (Assignor's interest in such leases and other right, title and interest as so limited, the "*Leases*");

(b) all rights and interests in, under or derived from all unitization agreements in effect with respect to any of the Leases and the units created thereby, including those described

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MEMORANDUM OF OPERATING AGREEMENT AND FINANCING STATEMENT

This Memorandum of Operating Agreement and Financing Statement (hereinafter referred to as "Memorandum") is executed to be effective concurrently with that certain Operating Agreement (the "Operating Agreement") by and between TH Exploration, LLC, as Operator, and HG Energy II Appalachia, LLC and TH Exploration II, LLC, as Non-Operators, covering, among other things, the development and production of crude oil, natural gas and associated substances from the leases (hereinafter called the "Contract Area") described on Exhibit "A-1" and Exhibit "A-2" attached hereto and owned by Operator and Non-Operator in the respective percentages of shares indicated on Exhibit "A" to the Operating Agreement.

The Operating Agreement contains an Accounting Procedure, along with provisions giving the parties hereto mutual liens and security interests where one or more parties hereto are or may become Debtors to one or more other parties hereto. This Memorandum incorporates by reference all of the terms and conditions of the Operating Agreement, including but not limited to the lien and security interest provisions.

The purpose of this Memorandum is to place third parties on notice of the Operating Agreement, and to secure and perfect the mutual liens and security interests of the parties hereto.

The Operating Agreement specifically provides and the parties do hereby confirm and agree that:

1. The Operator shall conduct and direct and have full control of all operations on the Contract Area as permitted and required by, and within the limits of, the Operating Agreement.

2. The liability of the parties under the Operating Agreement shall be several, not joint or collective. Each party shall be responsible only for its obligations and shall be liable only for its proportionate share of costs.

3. Each Non-Operator grants to Operator a lien upon its oil and gas rights, oil and gas leases and mineral interests in the Contract Area, and a security interest in its share of oil and/or gas when extracted and its interest in all fixtures, inventory, personal property and equipment located on or used on the Contract Area and in all its contract rights and receivables related thereto and arising therefrom to secure payment of its present and future share of costs and expenses, together with interest thereon at the rate provided in the Accounting Procedure referred to above. To the extent that Operator has a security interest under the Uniform Commercial Code ("Code") of the state or states in which the Contract Area is located, Operator without prejudice and in addition to all other legal, equitable and contractual remedies which are expressly reserved, shall be entitled to exercise the rights and remedies of a secured party under the Code. The bringing of a suit and the obtaining of judgment by Operator for the secured indebtedness shall not be deemed an election of remedies or otherwise affect the rights or security interests for the payment thereof.

4. The Operator grants to Non-Operator a lien and security interest equivalent to that granted to Operator as described in Paragraph 3 above, to secure payment by Operator of its own share of costs and expenses when due.

RECEIVED
Office of Oil and Gas
APR 3 2019
WV Department of
Environmental Protection



TUG HILL

March 29, 2019

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

RE: Blake N-10HU

Subject: Marshall County Route 29 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 29 in the area reflected on the Blake N-10HU well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

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

Sincerely,

Amy Miller
Permit Specialist – Appalachia Region
Cell 304-376-0111
Email: amiller@tug-hilop.com

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Office of Oil and Gas
APR 3 2019
WV Department of
Environmental Protection

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

Date of Notice Certification: 03/29/2019

API No. 47- 051 - _____
Operator's Well No. Blake N-10HU
Well Pad Name: Blake

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>516,697.65</u>
County: <u>Marshall</u>		Northing: <u>4,401,568.77</u>
District: <u>Franklin</u>	Public Road Access: <u>Burch Ridge Road - County Route 29</u>	
Quadrangle: <u>Powhatan Point 7.5'</u>	Generally used farm name: <u>Wibert H. Bungard, et ux</u>	
Watershed: <u>French Creek - Ohio River (HUC 10)</u>		

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

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

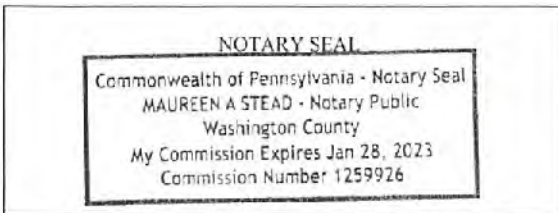
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

4705102204

Certification of Notice is hereby given:

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

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



Subscribed and sworn before me this 29 day of MARCH.
Maureen A Stead Notary Public
 My Commission Expires 1/28/23

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.

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Office of Oil and Gas
APR 3 2019
WV Department of
Environmental Protection

WW-6A
(9-13)

API NO. 47- 051 -
OPERATOR WELL NO. Blake N-10HU
Well Pad Name: Blake

**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: 3/26/2019 **Date Permit Application Filed:** 3/29/2019

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: Wilbert H. and Pamela June Bungard (access road and well pad)
 Address: 243 Bandit Drive
Proctor, WV 26055

Name: Russell and Mary Blake (access road and well pad)
 Address: 3343 Burch Ridge Road
Proctor, WV 26055

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: CNX Land Resources, Attn: Casey Saunders
 Address: 1000 Consol Energy Drive
Canonsburg, PA 15318

COAL OPERATOR
 Name: _____
 Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
 Name: Wilbert H. Bungard and Pamela June Bungard (*See attached list)
 Address: 243 Bandit Drive
Proctor, WV 26055

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

*Please attach additional forms if necessary

RECEIVED
Office of Oil and Gas
APR 3 2019
WV Department of Environmental Protection

WW-6A
(8-13)

API NO. 47-051
OPERATOR WELL NO. Blake N-10HU
Well Pad Name: Blake

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

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4705102204
API NO. 47-051
OPERATOR WELL NO. Blake N-10HU
Well Pad Name: Blake

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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API NO. 47- 051 -
OPERATOR WELL NO. Blake N-10HU
Well Pad Name: Blake

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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(8-13)

API NO. 47-051 -
OPERATOR WELL NO. Blake N-10HU
Well Pad Name: Blake

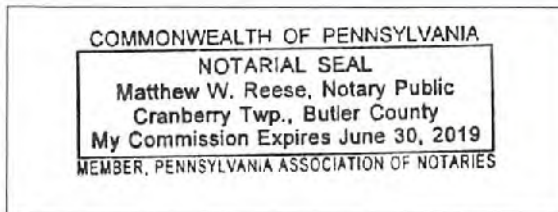
Notice is hereby given by:

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

Address: 360 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 26 day of marc, 2019.
[Signature] Notary Public
My Commission Expires 6-30-2019

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Supplement Pg. 1A

Tug Hill Operating, LLC
 380 Southpointe BLVD, Suite 200
 Canonsburg, PA 15317

WATER WELL REPORT

Well: BLAKE N -10HU
 District: Franklin
 County: Marshall
 State: WV

There appears to be Sixteen (16) possible water sources within 2,000 feet of the above referenced well location.

Topo Spot # 1 (House) TM 19 Par. 20 Wilbert H. Bungard, et ux 304-476-6494 243 Bandit Drive Proctor, WV 26055	Topo Spot #2 (Abandoned House) TM 19 Par. 20 Wilbert H. Bungard, et ux 304-476-6494 243 Bandit Drive Proctor, WV 26055	Topo Spot # 3 (House) TM 19 Par. 20.2 Casandra L. Harmon 304-639-9837 37 Bandit Drive Proctor, WV 26055
Topo Spot # 4 (House) TM 19 Par. 20.1 John J. Ebert (Life) 304-455-3967 26 Bandit Drive Proctor, WV 26055	Topo Spot # 5 (House) TM 19 Par. 7.1 Robert L. Shields, et ux 304-455-5387 2756 Burch Ridge Rd. Proctor, WV 26055	Topo Spot # 6 (House) TM 19 Par. 7.5 Adam & Jesse Robinson 304-280-9745 2932 Burch Ridge Rd. Proctor, WV 26055
Topo Spot # 7 (House-New) TM 19 Par. 10 Ernie L. Anderson, et ux 304-455-3818 3156 Burch Ridge Rd. Proctor, WV 26055	Topo Spot # 8 (House) TM 19 Par. 10 Ernie L. Anderson, et ux 304-455-3818 3156 Burch Ridge Rd. Proctor, WV 26055	Topo Spot # 9 (House) TM 19 Par. 9 Penny E. Menendez 304-455-5338 3171 Burch Ridge Rd. Proctor, WV 26055
Topo Spot # 10 (Trailer) TM 19 Par. 29 Ernie L. & Tammy L. Anderson 304-455-3818 3156 Burch Ridge Rd. (3298 Burch Ridge Rd.) Proctor, WV 26055	Topo Spot # 11 (House) TM 19 Par. 19 Russell Blake, et al 304-455-1158 3343 Burch Ridge Rd. Proctor, WV 26055	Topo Spot # 12 (Trailer) TM 19 Par. 19 Russell Blake, et al 304-455-1158 3343 Burch Ridge Rd. (3435 Burch Ridge Rd.) Proctor, WV 26055

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<p>Topo Spot # 13 (House) TM 19 Par. 30 Ernie & Tammy Anderson 304-455-3818 3156 Burch Ridge Rd. (3486 Burch Ridge Rd.) Proctor, WV 26055</p>	<p>Topo Spot # 14 (House) TM 19 Par. 31 Charles F. & Diana L. Haynes 304-312-5210 3508 Burch Ridge Rd. Proctor, WV 26055</p>	<p>Topo Spot # 15 (House) TM 19 Par. 28 David D. Yoho & Mark E. Yoho 304-455-3176 3555 Burch Ridge Rd. Proctor, WV 26055</p>
<p>Topo Spot # 16 (House) TM 19 Par. 28 David D. Yoho & Mark E. Yoho 304-455-3176 3555 Burch Ridge Rd. Proctor, WV 26055</p>		

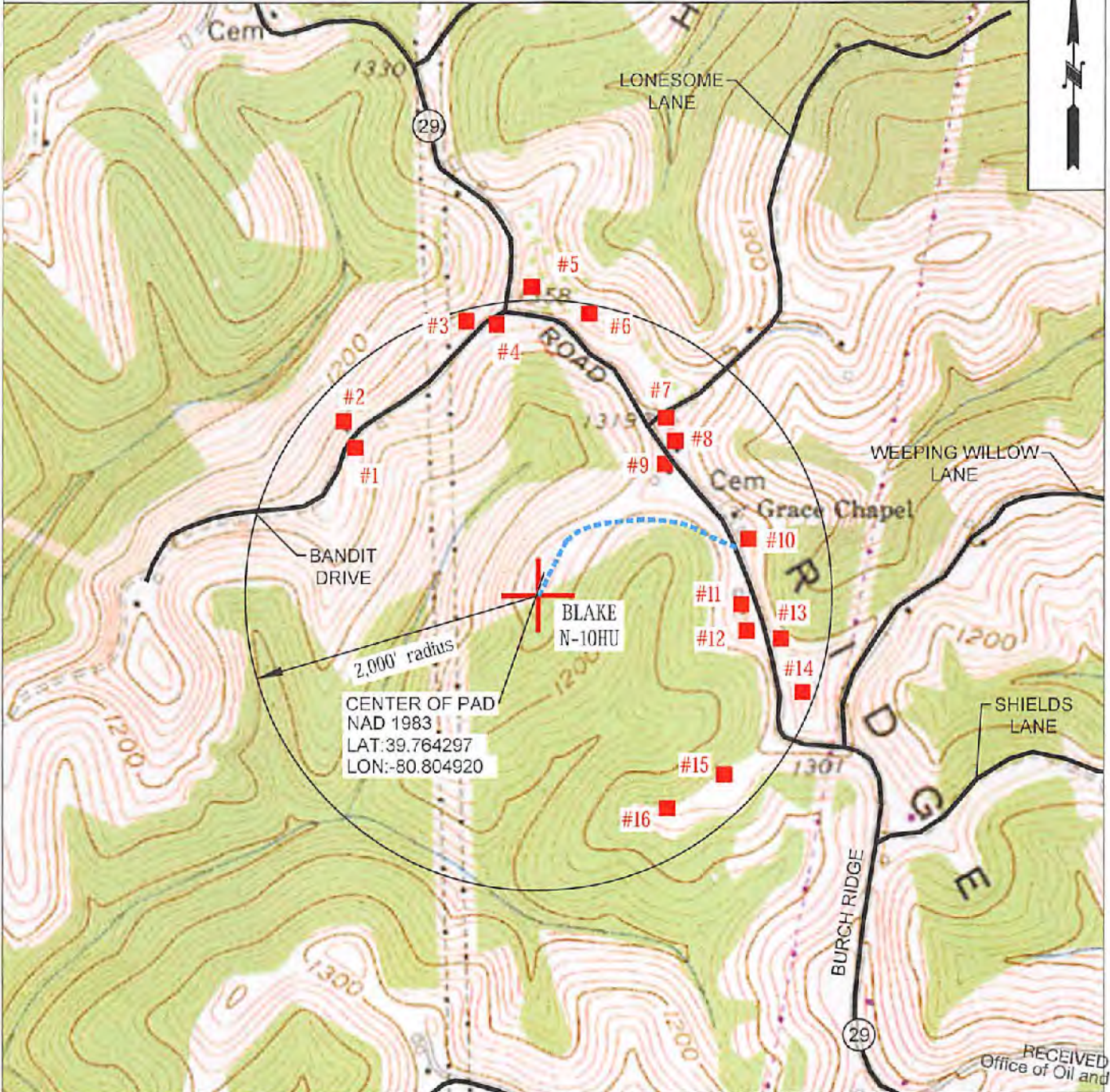
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PROPOSED BLAKE N-10HU

SUPPLEMENT PG 1

There appears to be Sixteen (16) possible water sources within 2,000'.



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OPERATOR	494510851	TOPO SECTION	LEASE NAME
TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	BLAKE
		SCALE:	DATE:
		1" = 1000'	DATE: 11-20-2018

WV Department of
Environmental Protection

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

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

Date of Notice: 10/22/2018 **Date of Planned Entry:** 10/29/2018

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

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

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

Notice is hereby provided to:

SURFACE OWNER(s)

Name: Wilbert H. and Pamela June Bungard (access road and well pad)

Address: 243 Bandit Drive
Proctor, WV 26055

Name: Russell and Mary Blake (access road and well pad)

Address: 3343 Burch Ridge Road
Proctor, WV 26055

Name: _____

Address: _____

COAL OWNER OR LESSEE

Name: GNX Land Resources

Address: 1000 Consol Energy Drive
Canonsburg, PA 15318

MINERAL OWNER(s)

Name: David A. and Deborah Takach (*See Attached List)

Address: 14 Zitko Terrace
Glen Dale, WV 26038

*please attach additional forms if necessary

Notice is hereby given:

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

State: West Virginia

County: Marshall

District: Franklin

Quadrangle: Powhatan Point 7.5'

Approx. Latitude & Longitude: 39.75422598, - 80.80495697

Public Road Access: Burch Ridge Road - CR 29

Watershed: huc-10: FRENCH CREEK - OHIO RIVER (UNDEFINED)

Generally used farm name: Blake, Russell Et Al

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-op.com

Address: 380 Southpointe Boulevard, Plaza II, Suite 200

Canonsburg, PA 15317

Facsimile: 724-338-2030

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Oil and Gas Privacy Notice:

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

**WW-6A3 Notice Attachment
Blake N-10HU**

Mineral Owners

Russell and Mary Blake
3343 Burch Ridge Road
Proctor, WV 26055

Gary L. and Pamela S. Witschey
2645 Paden Fork Road
New Martinsville, WV 26155

Gordon L. Witschey
160 E. Thistle Drive
New Martinsville, WV 26155

Carl Coffield
970 Allendale Avenue
Akron, OH 44306

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

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

June 19, 2018

Jill M. Newman
Deputy Commissioner

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

Subject: DOH Permits for the Blake Well Pad, Marshall County

Blake N-10HU

Dear Mr. Martin,

This well site will be accessed from Permit #06-2013-0426 transferred to Tug Hill Operating for access to the State Road for a well site located off of Marshall County Route 29 SLS.

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

Very Truly Yours,

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

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

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PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Blake N-10HU

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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**WVDEP OOG
ACCEPTED AS-BUILT**

WV 8/14/2018

Blake Well Site
Site Design, Construction Plan, &
Erosion and Sediment Control Plans
Tug Hill Operating
Marshall County
Franklin District
Latitude 39.76429745°
Longitude -80.80492031°
Stillhouse Run - Ohio River Watershed

Pertinent Site Information
Blake Well Site
Emergency Number: 304-845-1920
Franklin District, Marshall County, WV
Watershed: Stillhouse Run - Ohio River Watershed
Site 911 Address:
Tug Hill Contact Number: 1-817-632-1400

Property Owner Information - Blake Well Site

Owner	TM (Easting)	NAD (Northing)	TM (Easting)	NAD (Northing)	Area (Sq. Feet)	Area (Acres)	Permit Number
Franklin District	1525	425	1525	425	1.13	0.026	1717
William H. H. H. H.	1525	425	1525	425	1.13	0.026	1717

Exhibit A: Final Design: Issue for Permitting

Site Location

Corner	Coordinates
Corner of West Side	TM 1525.000, NAD 425.000
Corner of East Side	TM 1525.000, NAD 425.000
Corner of North Side	TM 1525.000, NAD 425.000
Corner of South Side	TM 1525.000, NAD 425.000

Well Table

Well ID	Well Name	Well Type	Well Depth
WV-1001	Blake Well	Production	100 ft
WV-1002	Blake Well	Production	100 ft
WV-1003	Blake Well	Production	100 ft
WV-1004	Blake Well	Production	100 ft
WV-1005	Blake Well	Production	100 ft
WV-1006	Blake Well	Production	100 ft
WV-1007	Blake Well	Production	100 ft
WV-1008	Blake Well	Production	100 ft
WV-1009	Blake Well	Production	100 ft
WV-1010	Blake Well	Production	100 ft



Access Road

Location	TM (Easting)	NAD (Northing)	Area (Sq. Feet)	Area (Acres)
Access Road	1525	425	1.13	0.026

Disturbed Area

Category	Area (Sq. Feet)	Area (Acres)
Disturbed Area	1.13	0.026

Blake Well Site Quantities

Category	Quantity	Unit
Well Pad	1.13	Sq. Feet
Access Road	1.13	Sq. Feet
Disturbed Area	1.13	Sq. Feet
Total	3.39	Sq. Feet

Project Contacts

Tug Hill Operating
Tug Hill Operating, Inc.
1000 1st St.
Martinsburg, WV 26151

WVDEP
West Virginia Department of Environmental Protection
1900 Kanawha Blvd. S.
Martinsburg, WV 26151

MISS UTILITY OF WEST VIRGINIA
1000 1st St.
Martinsburg, WV 26151

Approach Route

From the intersection of WV Rt 2 and OH Rt 7 turn North on WV Rt 2 for 1.5 mi. Turn Right onto CR 2 (P.O. Hill Rd). Follow CR 2 for 2.4 mi. Turn Right onto CR 78 (Waynes Ridge). Follow CR 78 for 0.5 mi. Turn Left onto CR 25 (Thompson Ridge Rd). Follow CR 25 for 0.5 mi. The site entrance will be on the Left (West) side of the road.

Flowline Condition

The flowline condition is shown on the site plan. The flowline is shown as a dashed line with arrows indicating the direction of flow. The flowline is shown to be in good condition and is not expected to be affected by the proposed construction.

Site Locations (NAD 83)

Location	TM (Easting)	NAD (Northing)
Well Pad	1525.000	425.000
Access Road	1525.000	425.000

Site Locations (NAD 83)

Location	TM (Easting)	NAD (Northing)
Well Pad	1525.000	425.000
Access Road	1525.000	425.000



Well Location Restrictions

All well locations shall comply with the following restrictions:

- All well locations shall be located a minimum of 100 feet from any water body.
- All well locations shall be located a minimum of 100 feet from any road.
- All well locations shall be located a minimum of 100 feet from any structure.
- All well locations shall be located a minimum of 100 feet from any power line.
- All well locations shall be located a minimum of 100 feet from any other well.

Well Location Restrictions of WV Code 22-2-11

All well locations shall comply with the following restrictions:

- All well locations shall be located a minimum of 100 feet from any water body.
- All well locations shall be located a minimum of 100 feet from any road.
- All well locations shall be located a minimum of 100 feet from any structure.
- All well locations shall be located a minimum of 100 feet from any power line.
- All well locations shall be located a minimum of 100 feet from any other well.

Sheet

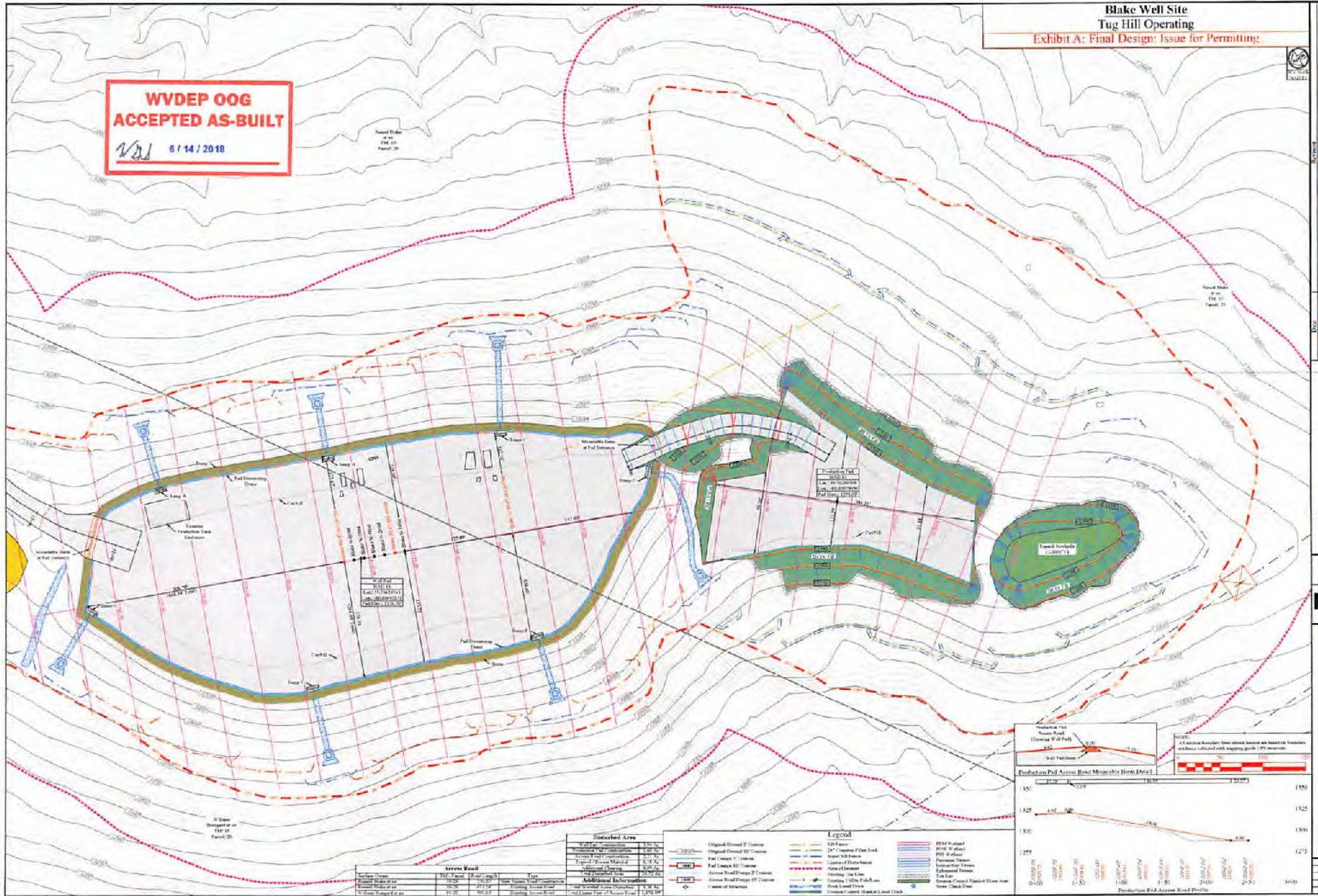
Sheet	Description
1	Cover Sheet
2	Schedule of Quantities
3	Site Notes
4	Pre-Construction Site Conditions
5	Site Soil Maps
6	Clearing Exhibit
7	Overall Plan View
8	EAS Plan View
9	The Key Exhibit
10	Plan View
11	Cross Sections - Well Pad
12	Cross Sections - Access Road
13	Cross Sections - Production Pad
14	Cross Sections - Access Road
15	Landowner Disturbed Area Exhibit
16	Site Reclamation
17	Production Exhibit
18	Erosion and Sediment Control Details
19	Access Road Details
20	Well Details



The undersigned, under the authority of the State of West Virginia, hereby certifies that the information contained herein is true and correct to the best of my knowledge and belief.

Gregory C. Sullivan
Professional Engineer
License No. 2214

**WVDEP OOG
ACCEPTED AS-BUILT**
6/14/2018

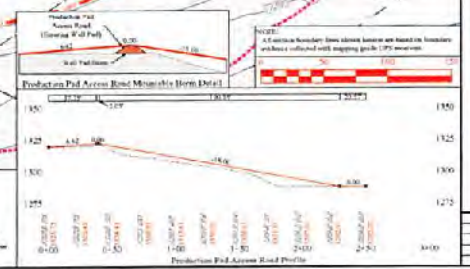


Station	Width	Depth	Material	Notes
1+00	12.50	1.00	Gravel	Access Road
1+25	12.50	1.00	Gravel	Access Road
1+50	12.50	1.00	Gravel	Access Road
1+75	12.50	1.00	Gravel	Access Road
2+00	12.50	1.00	Gravel	Access Road

Item	Description	Quantity
1	Gravel	12,500
2	Crusher Run	12,500
3	Asphalt	12,500

Symbol	Description
(Solid Green)	Original Ground 2" Contour
(Dashed Green)	Original Ground 10" Contour
(Dotted Green)	Final Elevation 2" Contour
(Dashed Blue)	Final Elevation 10" Contour
(Dotted Blue)	Access Road Design 2" Contour
(Dashed Blue)	Access Road Design 10" Contour
(Dotted Yellow)	Proposed 1/2" to 1/4" Asph
(Dashed Yellow)	Proposed 1/4" to 1/2" Asph
(Dotted Red)	Proposed 1/2" to 1" Asph
(Dashed Red)	Proposed 1" to 2" Asph
(Dotted Purple)	Proposed 2" to 4" Asph
(Dashed Purple)	Proposed 4" to 6" Asph
(Dotted Orange)	Proposed 6" to 8" Asph
(Dashed Orange)	Proposed 8" to 12" Asph
(Dotted Brown)	Proposed 12" to 18" Asph
(Dashed Brown)	Proposed 18" to 24" Asph
(Dotted Black)	Proposed 24" to 36" Asph
(Dashed Black)	Proposed 36" to 48" Asph
(Dotted Grey)	Proposed 48" to 60" Asph
(Dashed Grey)	Proposed 60" to 72" Asph
(Dotted White)	Proposed 72" to 84" Asph
(Dashed White)	Proposed 84" to 96" Asph
(Dotted Yellow-Orange)	Proposed 96" to 108" Asph
(Dashed Yellow-Orange)	Proposed 108" to 120" Asph
(Dotted Red-Orange)	Proposed 120" to 132" Asph
(Dashed Red-Orange)	Proposed 132" to 144" Asph
(Dotted Orange-Red)	Proposed 144" to 156" Asph
(Dashed Orange-Red)	Proposed 156" to 168" Asph
(Dotted Red)	Proposed 168" to 180" Asph
(Dashed Red)	Proposed 180" to 192" Asph
(Dotted Orange)	Proposed 192" to 204" Asph
(Dashed Orange)	Proposed 204" to 216" Asph
(Dotted Yellow)	Proposed 216" to 228" Asph
(Dashed Yellow)	Proposed 228" to 240" Asph
(Dotted Green)	Proposed 240" to 252" Asph
(Dashed Green)	Proposed 252" to 264" Asph
(Dotted Blue)	Proposed 264" to 276" Asph
(Dashed Blue)	Proposed 276" to 288" Asph
(Dotted Purple)	Proposed 288" to 300" Asph
(Dashed Purple)	Proposed 300" to 312" Asph
(Dotted Brown)	Proposed 312" to 324" Asph
(Dashed Brown)	Proposed 324" to 336" Asph
(Dotted Grey)	Proposed 336" to 348" Asph
(Dashed Grey)	Proposed 348" to 360" Asph
(Dotted White)	Proposed 360" to 372" Asph
(Dashed White)	Proposed 372" to 384" Asph
(Dotted Yellow-Orange)	Proposed 384" to 396" Asph
(Dashed Yellow-Orange)	Proposed 396" to 408" Asph
(Dotted Red-Orange)	Proposed 408" to 420" Asph
(Dashed Red-Orange)	Proposed 420" to 432" Asph
(Dotted Orange-Red)	Proposed 432" to 444" Asph
(Dashed Orange-Red)	Proposed 444" to 456" Asph
(Dotted Red)	Proposed 456" to 468" Asph
(Dashed Red)	Proposed 468" to 480" Asph
(Dotted Orange)	Proposed 480" to 492" Asph
(Dashed Orange)	Proposed 492" to 504" Asph
(Dotted Yellow)	Proposed 504" to 516" Asph
(Dashed Yellow)	Proposed 516" to 528" Asph
(Dotted Green)	Proposed 528" to 540" Asph
(Dashed Green)	Proposed 540" to 552" Asph
(Dotted Blue)	Proposed 552" to 564" Asph
(Dashed Blue)	Proposed 564" to 576" Asph
(Dotted Purple)	Proposed 576" to 588" Asph
(Dashed Purple)	Proposed 588" to 600" Asph
(Dotted Brown)	Proposed 600" to 612" Asph
(Dashed Brown)	Proposed 612" to 624" Asph
(Dotted Grey)	Proposed 624" to 636" Asph
(Dashed Grey)	Proposed 636" to 648" Asph
(Dotted White)	Proposed 648" to 660" Asph
(Dashed White)	Proposed 660" to 672" Asph
(Dotted Yellow-Orange)	Proposed 672" to 684" Asph
(Dashed Yellow-Orange)	Proposed 684" to 696" Asph
(Dotted Red-Orange)	Proposed 696" to 708" Asph
(Dashed Red-Orange)	Proposed 708" to 720" Asph
(Dotted Orange-Red)	Proposed 720" to 732" Asph
(Dashed Orange-Red)	Proposed 732" to 744" Asph
(Dotted Red)	Proposed 744" to 756" Asph
(Dashed Red)	Proposed 756" to 768" Asph
(Dotted Orange)	Proposed 768" to 780" Asph
(Dashed Orange)	Proposed 780" to 792" Asph
(Dotted Yellow)	Proposed 792" to 804" Asph
(Dashed Yellow)	Proposed 804" to 816" Asph
(Dotted Green)	Proposed 816" to 828" Asph
(Dashed Green)	Proposed 828" to 840" Asph
(Dotted Blue)	Proposed 840" to 852" Asph
(Dashed Blue)	Proposed 852" to 864" Asph
(Dotted Purple)	Proposed 864" to 876" Asph
(Dashed Purple)	Proposed 876" to 888" Asph
(Dotted Brown)	Proposed 888" to 900" Asph
(Dashed Brown)	Proposed 900" to 912" Asph
(Dotted Grey)	Proposed 912" to 924" Asph
(Dashed Grey)	Proposed 924" to 936" Asph
(Dotted White)	Proposed 936" to 948" Asph
(Dashed White)	Proposed 948" to 960" Asph
(Dotted Yellow-Orange)	Proposed 960" to 972" Asph
(Dashed Yellow-Orange)	Proposed 972" to 984" Asph
(Dotted Red-Orange)	Proposed 984" to 996" Asph
(Dashed Red-Orange)	Proposed 996" to 1008" Asph
(Dotted Orange-Red)	Proposed 1008" to 1020" Asph
(Dashed Orange-Red)	Proposed 1020" to 1032" Asph
(Dotted Red)	Proposed 1032" to 1044" Asph
(Dashed Red)	Proposed 1044" to 1056" Asph
(Dotted Orange)	Proposed 1056" to 1068" Asph
(Dashed Orange)	Proposed 1068" to 1080" Asph
(Dotted Yellow)	Proposed 1080" to 1092" Asph
(Dashed Yellow)	Proposed 1092" to 1104" Asph
(Dotted Green)	Proposed 1104" to 1116" Asph
(Dashed Green)	Proposed 1116" to 1128" Asph
(Dotted Blue)	Proposed 1128" to 1140" Asph
(Dashed Blue)	Proposed 1140" to 1152" Asph
(Dotted Purple)	Proposed 1152" to 1164" Asph
(Dashed Purple)	Proposed 1164" to 1176" Asph
(Dotted Brown)	Proposed 1176" to 1188" Asph
(Dashed Brown)	Proposed 1188" to 1200" Asph
(Dotted Grey)	Proposed 1200" to 1212" Asph
(Dashed Grey)	Proposed 1212" to 1224" Asph
(Dotted White)	Proposed 1224" to 1236" Asph
(Dashed White)	Proposed 1236" to 1248" Asph
(Dotted Yellow-Orange)	Proposed 1248" to 1260" Asph
(Dashed Yellow-Orange)	Proposed 1260" to 1272" Asph
(Dotted Red-Orange)	Proposed 1272" to 1284" Asph
(Dashed Red-Orange)	Proposed 1284" to 1296" Asph
(Dotted Orange-Red)	Proposed 1296" to 1308" Asph
(Dashed Orange-Red)	Proposed 1308" to 1320" Asph
(Dotted Red)	Proposed 1320" to 1332" Asph
(Dashed Red)	Proposed 1332" to 1344" Asph
(Dotted Orange)	Proposed 1344" to 1356" Asph
(Dashed Orange)	Proposed 1356" to 1368" Asph
(Dotted Yellow)	Proposed 1368" to 1380" Asph
(Dashed Yellow)	Proposed 1380" to 1392" Asph
(Dotted Green)	Proposed 1392" to 1404" Asph
(Dashed Green)	Proposed 1404" to 1416" Asph
(Dotted Blue)	Proposed 1416" to 1428" Asph
(Dashed Blue)	Proposed 1428" to 1440" Asph
(Dotted Purple)	Proposed 1440" to 1452" Asph
(Dashed Purple)	Proposed 1452" to 1464" Asph
(Dotted Brown)	Proposed 1464" to 1476" Asph
(Dashed Brown)	Proposed 1476" to 1488" Asph
(Dotted Grey)	Proposed 1488" to 1500" Asph

Symbol	Description
(Blue Line)	24" Crown Pipe Trench
(Red Line)	Water Trench
(Green Line)	Line of Distribution
(Yellow Line)	Area of Interest
(Dashed Blue)	Proposed 1/2" to 1/4" Asph
(Dashed Yellow)	Proposed 1/4" to 1/2" Asph
(Dashed Red)	Proposed 1/2" to 1" Asph
(Dashed Orange)	Proposed 1" to 2" Asph
(Dashed Purple)	Proposed 2" to 4" Asph
(Dashed Brown)	Proposed 4" to 6" Asph
(Dashed Grey)	Proposed 6" to 8" Asph
(Dashed White)	Proposed 8" to 12" Asph
(Dashed Yellow-Orange)	Proposed 12" to 18" Asph
(Dashed Red-Orange)	Proposed 18" to 24" Asph
(Dashed Orange-Red)	Proposed 24" to 36" Asph
(Dashed Red)	Proposed 36" to 48" Asph
(Dashed Orange)	Proposed 48" to 60" Asph
(Dashed Yellow)	Proposed 60" to 72" Asph
(Dashed Green)	Proposed 72" to 84" Asph
(Dashed Blue)	Proposed 84" to 96" Asph
(Dashed Purple)	Proposed 96" to 108" Asph
(Dashed Brown)	Proposed 108" to 120" Asph
(Dashed Grey)	Proposed 120" to 132" Asph
(Dashed White)	Proposed 132" to 144" Asph
(Dashed Yellow-Orange)	Proposed 144" to 156" Asph
(Dashed Red-Orange)	Proposed 156" to 168" Asph
(Dashed Orange-Red)	Proposed 168" to 180" Asph
(Dashed Red)	Proposed 180" to 192" Asph
(Dashed Orange)	Proposed 192" to 204" Asph
(Dashed Yellow)	Proposed 204" to 216" Asph
(Dashed Green)	Proposed 216" to 228" Asph
(Dashed Blue)	Proposed 228" to 240" Asph
(Dashed Purple)	Proposed 240" to 252" Asph
(Dashed Brown)	Proposed 252" to 264" Asph
(Dashed Grey)	Proposed 264" to 276" Asph



Scale: 1" = 100'