



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

Monday, April 13, 2020
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit approval for HEAVEN HILL 3N-13HM
47-051-02323-00-00

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

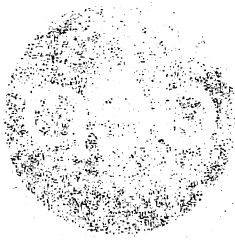
Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory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

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

James A. Martin
Chief

Operator's Well Number: HEAVEN HILL 3N-13HM
Farm Name: RICKY L. WHITLATCH
U.S. WELL NUMBER: 47-051-02323-00-00
Horizontal 6A New Drill
Date Issued: 4/13/2020

Promoting a healthy environment.



West Virginia Department of Environmental Protection

Office of Oil and Gas
601 5th Street, S.E.
Charleston, W.V. 25304
(606) 252-6100
Fax: (606) 252-6155

Environmental Protection Division

Monday, April 13, 2003
WELL WORK PERMIT
FARMERDALE A New Draft

HEAVEN HILL OPERATING, LLC
780 SOUTH THORNTON ROAD
CARONSBURG, VA 22017

Re: Permit approval for HEAVEN HILL OPERATING, LLC
47-071-0233-00-00

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 20 of the West Virginia Code of 1961, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Permission shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the commencement of well work, location and/or gas 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. If an emergency shut-in must be promptly reported by the operator to 1-800-642-3004 and to the Oil and Gas Inspector.

Please be advised that Form WR-25, Well Operator Report of Well Work is to be submitted to this office within 30 days of completion of permitted well work as shown on Form WR-24, Exchange Monitoring Report within 30 days of discharge of gas. It is the policy of this office, and regulatory provisions governing all mines and operations thereunder, may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties imposed upon the operators.

Per 20 CSR 4-2.2, 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 (606) 252-6450.

James A. Martin
Chief

Operator's Well Number: HEAVEN HILL 001-13810
Last Name: KIDNEY, L. WHITTAKER
U.S. WELL NUMBER: 47-071-0233-00-00
Location: Farmerdale A
New Draft
Date Issued: 4/11/2003

PERMIT CONDITIONS 4705102323

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

CONDITIONS

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

API Number: _____

PERMIT CONDITIONS 4705102323

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.

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Meade Glen Easton 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Heaven Hill 3N-13HM Well Pad Name: Heaven Hill 3

3) Farm Name/Surface Owner: Ricky L. Whitlatch Public Road Access: Yeater Lane CR 21/11

4) Elevation, current ground: 1326' Elevation, proposed post-construction: 1326'

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

(b) If Gas Shallow Deep _____
Horizontal _____

6) Existing Pad: Yes or No Yes yeater lane

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6817' - 6869' thickness of 52' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,969'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 15,113'

11) Proposed Horizontal Leg Length: 7,419.22'

12) Approximate Fresh Water Strata Depths: 70', 1038'

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: Sewickly Coal - 946' and Pittsburgh Coal - 1031'

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

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

(a) If Yes, provide Mine Info: Name: Marshall County Coal Co. / Marshall County Mine
Depth: 1031' TVD and 311' subsea level
Seam: Pittsburgh #8
Owner: Murray Energy / Consolidated Coal Co.

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18) **CASING AND TUBING PROGRAM**

TYPE	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	30"	NEW	BW	BW	100'	100'	216FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	48#	1,130'	1,130'	1077ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	1,130'	1,130'	1077ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,932'	2,932'	959ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	15,113'	15,113'	3860ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,810'	
Liners							

Joe
11/7/19

TYPE	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 1/2"	.33	1,730	1,384	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.33	1,730	1,384	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE#24	1.19
Production	5 1/2"	8 7/8_ 8 3/4	.361	12,640	10,112	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

PACKERS

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

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WW-6B
(10/14)

4705102323
API NO. 47-051

OPERATOR WELL NO. Heaven Hill 3N-13HM

Well Pad Name: Heaven Hill 3

Handwritten signature and date: 11/7/19

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

Drill through the Marcellus and TD Pilot Hole 100' into the Onondaga. Log vertical section and run a solid cement plug back to proposed KOP. Drill curve and lateral per proposed well plan, run and cement production casing. Perform CBL from 60 deg to surface, make cleanout run, and stimulate.

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

Well to be completed with approximately 18,545,000 lb prop and approximately 286,719 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 18.43

22) Area to be disturbed for well pad only, less access road (acres): 7.15

23) Describe centralizer placement for each casing string:

Will run 3 centralizers on surface casing at equal distance. Intermediate will have 1 centralizer every other joint. Production casing will have one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

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

*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.

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WELL NAME: Heaven Hill 3N-13HM COUNTY: Marshall
STATE: West Virginia DISTRICT: Meade
DE Elev: 1,326' GL Elev: 1,326'
TD: 15,113'
TH Latitude: 39.808615
TH Longitude: -80.693408
BH Latitude: 39.822762
BH Longitude: -80.709931

Formation	Depth TVD
Deepest Fresh Water	1038
Switching Coal	946
Pittsburgh Coal	1031
Big Lime	2153
Weir	2579
Bersa	2777
Gordon	3039
Rhinestreet	6161
Genevoo/Burkett	6679
Tully	6710
Hamilton	6743
Marcellus	6817
Landing Depth	6851
Onondaga	6869
Pilot Hole Depth	6969

13 3/8" Csg @
1,130' MD / 1,130' TVD

9 5/8" Csg @
2,932' MD / 2,850' TVD

KOP @ 6,310' ft MD

Landing Point @ 7,695' MD / 6,851' TVD

PH TVD = 100' below Onondaga Top

Pilot Hole
PH TD @
5,969' TVD

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Lateral TD @ 15,113' ft MD
6,721' ft TVD

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CASING SUMMARY

Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	100'	100'	BW	BW	Surface
Surface	17.5	13 3/8	1,130'	1,130'	48	H40	Surface
Intermediate 1	12 1/4	9 5/8	2,932'	2,850'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	15,113'	6,721'	20	P110	Surface

CEMENT SUMMARY

	Sacks	Class	Density	Fluid Type	DRILLING DETAILS	
					Centralizer	Notes
Conductor	291	A	15.6	Air		None
Surface	1,105	A	15.6	Air		3 Centralizers at equal distance
Intermediate 1	962	A	15	Air		1 Centralizer every other jt
Production	3,534	A	14.5	Air / SOBM		1 every other joint in lateral, 1 per joint in curve; 1 every other jt to stc

Handwritten signature/initials

4705102323



Tug Hill Operating, LLC Casing and Cement Program

Heaven Hill 3N-13HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	100'	CTS
Surface	13 3/8"	H40	17 1/2"	1,130'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,932'	CTS
Production	5 1/2"	P110	8 7/8 x 8 3/4"	15,113'	CTS

Cement

- Conductor: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2
- Surface: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
- Intermediate: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.19
- Kick Off Plug: Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug
- Production: 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.19

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Well: Heaven Hill 3N-13 HM (N)
Site: Heaven Hill 3
Project: Marshall County, West Virginia.
Design: rev2
Rig:

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

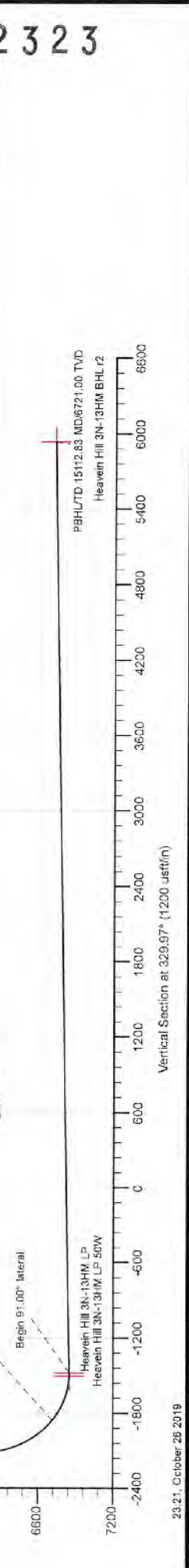
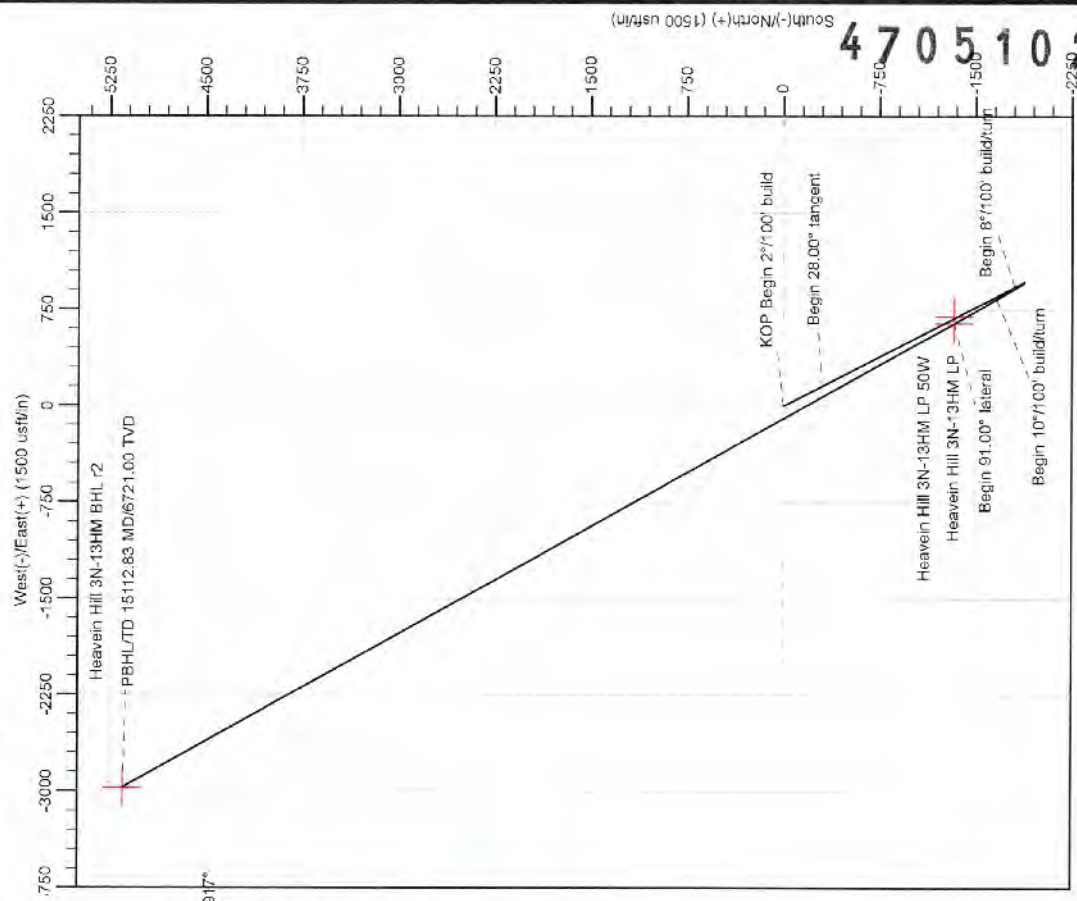
System Datum: Mean Sea Level
 Depth Reference: GL @ 1326.00usft
 Northing: 14457191.10
 Easting: 1726517.33
 Latitude: 39.80661500
 Longitude: -80.85340800

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.917°

Azimuths to Grid North
 True North: -0.20°
 Magnetic North: -8.92°
 Magnetic Field
 Strength: 52107.7sn
 Dip Angle: 66.92°
 Date: 2/9/2018
 Model: IGRF2015

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	Tface	Vsect	Annnotation
1	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
2	2700.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2 1/2' build
3	2700.00	28.00	152.72	2644.93	-298.03	153.70	2.00	152.719	334.84	Begin 28.00° tangent
4	5310.17	28.00	152.72	5832.53	-891.38	932.58	0.00	177.810	2027.65	Begin 8 1/2' build/turn
5	7284.66	50.00	326.92	6717.01	-1661.95	832.76	8.00	177.810	1655.82	Begin 10 1/2' build/turn
6	7694.98	91.00	330.80	6551.00	-1332.86	646.01	10.00	1.327	4077.23	Begin 91.00° lateral
7	15112.83	91.00	330.80	6721.00	5143.39	-2972.24	0.00	0.000	5868.73	PBHLTD 15112.83 MD/6721.00 TVD



4705102323



Database:	DB_Aug1919_v14	Local Co-ordinate Reference:	Well Heaven Hill 3N-13 HM (N)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1326.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3N-13 HM (N)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

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	Heaven Hill 3				
Site Position:		Northing:	14,457,178.77 usft	Latitude:	39.80858060
From:	Lat/Long	Easting:	1,726,571.98 usft	Longitude:	-80.69321360
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.196 °

Well	Heaven Hill 3N-13 HM (N)					
Well Position	+N/-S	0.00 usft	Northing:	14,457,191.11 usft	Latitude:	39.80861500
	+E/-W	0.00 usft	Easting:	1,726,517.35 usft	Longitude:	-80.69340800
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	1,326.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/9/2018	-8.721	66.918	52,107.74630093

Design	rev2				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	329.97	

Plan Survey Tool Program	Date	10/26/2019			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	15,112.83 rev2 (Original Hole)	MWD		
			MWD - Standard		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.000	
2,700.00	28.00	152.72	2,644.93	-298.03	153.70	2.00	2.00	0.00	152.719	
6,310.17	28.00	152.72	5,832.53	-1,804.38	930.55	0.00	0.00	0.00	0.000	
7,284.86	50.00	329.93	6,717.01	-1,661.95	832.78	8.00	2.26	18.18	177.816	
7,694.98	91.00	330.80	6,851.00	-1,332.86	646.01	10.00	10.00	0.21	1.327	
15,112.83	91.00	330.80	6,721.00	5,141.39	-2,972.24	0.00	0.00	0.00	0.000	Heavein Hill 3N-13HM

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Database: DB_Aug1919_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Heaven Hill 3
 Well: Heaven Hill 3N-13 HM (N)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Heaven Hill 3N-13 HM (N)
 TVD Reference: GL @ 1326.00usft
 MD Reference: GL @ 1326.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
100.00	0.00	0.00	100.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
200.00	0.00	0.00	200.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
300.00	0.00	0.00	300.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
400.00	0.00	0.00	400.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
500.00	0.00	0.00	500.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
600.00	0.00	0.00	600.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
700.00	0.00	0.00	700.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
800.00	0.00	0.00	800.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
900.00	0.00	0.00	900.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,457,191.11	1,726,517.35	39.80861500	-80.69340800
KOP Begin 2°/100' build									
1,400.00	2.00	152.72	1,399.98	-1.55	0.80	14,457,189.55	1,726,518.15	39.80861074	-80.69340517
1,500.00	4.00	152.72	1,499.83	-6.20	3.20	14,457,184.90	1,726,520.55	39.80859794	-80.69339669
1,600.00	6.00	152.72	1,599.45	-13.95	7.19	14,457,177.16	1,726,524.54	39.80857663	-80.69338256
1,700.00	8.00	152.72	1,698.70	-24.78	12.78	14,457,166.33	1,726,530.13	39.80854683	-80.69336280
1,800.00	10.00	152.72	1,797.46	-38.88	19.95	14,457,152.42	1,726,537.30	39.80850859	-80.69333744
1,900.00	12.00	152.72	1,895.62	-55.64	28.89	14,457,135.47	1,726,546.04	39.80846193	-80.69330651
2,000.00	14.00	152.72	1,993.05	-75.63	39.00	14,457,115.47	1,726,556.35	39.80840694	-80.69327004
2,100.00	16.00	152.72	2,089.64	-98.63	50.87	14,457,092.47	1,726,568.21	39.80834366	-80.69322808
2,200.00	18.00	152.72	2,185.26	-124.62	64.27	14,457,066.49	1,726,581.61	39.80827217	-80.69318068
2,300.00	20.00	152.72	2,279.81	-153.55	79.19	14,457,037.56	1,726,596.53	39.80819257	-80.69312790
2,400.00	22.00	152.72	2,373.16	-185.40	95.61	14,457,005.71	1,726,612.96	39.80810495	-80.69306981
2,500.00	24.00	152.72	2,465.21	-220.12	113.52	14,456,970.88	1,726,630.87	39.80800942	-80.69300646
2,599.99	26.00	152.72	2,555.84	-257.68	132.89	14,456,933.42	1,726,650.24	39.80790609	-80.69293795
2,700.00	28.00	152.72	2,644.94	-298.03	153.70	14,456,893.07	1,726,671.05	39.80779509	-80.69286435
Begin 28.00° tangent									
2,799.99	28.00	152.72	2,733.23	-339.75	175.22	14,456,851.35	1,726,692.56	39.80768030	-80.69278824
2,899.99	28.00	152.72	2,821.52	-381.48	196.73	14,456,809.63	1,726,714.08	39.80756551	-80.69271213
2,999.99	28.00	152.72	2,909.82	-423.20	218.25	14,456,767.90	1,726,735.60	39.80745072	-80.69263602
3,099.99	28.00	152.72	2,998.11	-464.93	239.77	14,456,726.18	1,726,757.12	39.80733593	-80.69255991
3,199.99	28.00	152.72	3,086.41	-506.65	261.29	14,456,684.45	1,726,778.64	39.80722114	-80.69248380
3,299.99	28.00	152.72	3,174.70	-548.38	282.81	14,456,642.73	1,726,800.15	39.80710635	-80.69240769
3,399.99	28.00	152.72	3,262.99	-590.10	304.33	14,456,601.00	1,726,821.67	39.80699156	-80.69233158
3,499.99	28.00	152.72	3,351.29	-631.83	325.84	14,456,559.28	1,726,843.19	39.80687677	-80.69225547
3,599.99	28.00	152.72	3,439.58	-673.55	347.36	14,456,517.55	1,726,864.71	39.80676198	-80.69217936
3,699.99	28.00	152.72	3,527.88	-715.28	368.88	14,456,475.83	1,726,886.23	39.80664719	-80.69210325
3,799.99	28.00	152.72	3,616.17	-757.01	390.40	14,456,434.10	1,726,907.75	39.80653240	-80.69202714
3,899.99	28.00	152.72	3,704.47	-798.73	411.92	14,456,392.38	1,726,929.26	39.80641761	-80.69195103
3,999.99	28.00	152.72	3,792.76	-840.46	433.44	14,456,350.65	1,726,950.78	39.80630282	-80.69187492
4,099.99	28.00	152.72	3,881.06	-882.18	454.95	14,456,308.92	1,726,972.30	39.80618803	-80.69179882
4,199.99	28.00	152.72	3,969.35	-923.91	476.47	14,456,267.20	1,726,993.82	39.80607324	-80.69172271
4,299.99	28.00	152.72	4,057.65	-965.63	497.99	14,456,225.47	1,727,015.34	39.80595845	-80.69164660
4,399.99	28.00	152.72	4,145.94	-1,007.36	519.51	14,456,183.75	1,727,036.86	39.80584366	-80.69157049
4,499.99	28.00	152.72	4,234.24	-1,049.08	541.03	14,456,142.02	1,727,058.37	39.80572886	-80.69149439
4,599.99	28.00	152.72	4,322.53	-1,090.81	562.55	14,456,100.30	1,727,079.89	39.80561407	-80.69141828
4,699.99	28.00	152.72	4,410.83	-1,132.53	584.06	14,456,058.57	1,727,101.41	39.80549928	-80.69134217
4,799.99	28.00	152.72	4,499.12	-1,174.26	605.58	14,456,016.85	1,727,122.93	39.80538449	-80.69126607
4,899.99	28.00	152.72	4,587.41	-1,215.98	627.10	14,455,975.12	1,727,144.45	39.80526970	-80.69118996
4,999.99	28.00	152.72	4,675.71	-1,257.71	648.62	14,455,933.40	1,727,165.96	39.80515491	-80.69111385
5,099.99	28.00	152.72	4,764.00	-1,299.43	670.14	14,455,891.67	1,727,187.48	39.80504012	-80.69103775

Database:	DB_Aug1919_v14	Local Co-ordinate Reference:	Well Heaven Hill 3N-13 HM (N)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3N-13 HM (N)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,199.99	28.00	152.72	4,852.30	-1,341.16	691.65	14,455,849.95	1,727,209.00	39.80492533	-80.69096164
5,299.99	28.00	152.72	4,940.59	-1,382.88	713.17	14,455,808.22	1,727,230.52	39.80481054	-80.69088554
5,399.99	28.00	152.72	5,028.89	-1,424.61	734.89	14,455,766.50	1,727,252.04	39.80469574	-80.69080943
5,499.99	28.00	152.72	5,117.18	-1,466.33	756.21	14,455,724.77	1,727,273.56	39.80458095	-80.69073333
5,599.99	28.00	152.72	5,205.48	-1,508.06	777.73	14,455,683.05	1,727,295.07	39.80446616	-80.69065722
5,699.99	28.00	152.72	5,293.77	-1,549.78	799.25	14,455,641.32	1,727,316.59	39.80435137	-80.69058112
5,799.99	28.00	152.72	5,382.07	-1,591.51	820.76	14,455,599.60	1,727,338.11	39.80423658	-80.69050502
5,899.99	28.00	152.72	5,470.36	-1,633.23	842.28	14,455,557.87	1,727,359.63	39.80412179	-80.69042691
5,999.99	28.00	152.72	5,558.66	-1,674.96	863.80	14,455,516.15	1,727,381.15	39.80400699	-80.69035281
6,099.99	28.00	152.72	5,646.95	-1,716.68	885.32	14,455,474.42	1,727,402.67	39.80389220	-80.69027671
6,199.99	28.00	152.72	5,735.25	-1,758.41	906.84	14,455,432.70	1,727,424.18	39.80377741	-80.69020060
6,299.99	28.00	152.72	5,823.54	-1,800.13	928.36	14,455,390.97	1,727,445.70	39.80366262	-80.69012450
6,310.17	28.00	152.72	5,832.53	-1,804.38	930.55	14,455,386.73	1,727,447.89	39.80365093	-80.69011675
Begin 8°/100' build/turn									
6,399.99	20.82	153.49	5,914.27	-1,837.45	947.36	14,455,353.66	1,727,464.70	39.80355996	-80.69005730
6,499.99	12.84	155.29	6,009.91	-1,863.48	959.96	14,455,327.62	1,727,477.30	39.80348833	-80.69001277
6,599.99	4.91	162.83	6,108.63	-1,877.69	965.87	14,455,313.42	1,727,483.22	39.80344928	-80.68999188
6,699.99	3.35	313.06	6,208.53	-1,879.77	964.99	14,455,311.33	1,727,482.34	39.80344356	-80.68999505
6,799.99	11.25	325.63	6,307.64	-1,869.70	957.33	14,455,321.40	1,727,474.67	39.80347128	-80.69002220
6,899.99	19.23	327.85	6,404.05	-1,847.67	943.04	14,455,343.43	1,727,460.38	39.80353191	-80.69007282
6,999.99	27.22	328.80	6,495.87	-1,814.12	922.39	14,455,376.99	1,727,439.74	39.80362427	-80.69014591
7,099.99	35.22	329.34	6,581.32	-1,769.68	895.79	14,455,421.42	1,727,413.14	39.80374655	-80.69024006
7,199.99	43.21	329.70	6,658.74	-1,715.23	863.77	14,455,475.87	1,727,381.11	39.80389639	-80.69035343
7,284.86	50.00	329.93	6,717.01	-1,661.95	832.78	14,455,529.16	1,727,350.13	39.80404301	-80.69046310
Begin 10°/100' build/turn									
7,299.99	51.51	329.97	6,726.58	-1,651.81	828.91	14,455,539.30	1,727,344.26	39.80407091	-80.69048386
7,399.99	61.51	330.23	6,781.69	-1,579.60	785.41	14,455,611.51	1,727,302.75	39.80426962	-80.69063076
7,499.99	71.51	330.44	6,821.50	-1,500.00	740.08	14,455,691.11	1,727,257.43	39.80448864	-80.69079117
7,599.98	81.51	330.63	6,844.80	-1,415.44	692.32	14,455,775.66	1,727,209.66	39.80472131	-80.69096020
7,694.98	91.00	330.80	6,851.00	-1,332.86	646.00	14,455,858.25	1,727,163.35	39.80494855	-80.69112409
Begin 91.00° lateral									
7,699.98	91.00	330.80	6,850.91	-1,328.49	643.56	14,455,862.62	1,727,160.91	39.80496057	-80.69113272
7,799.98	91.00	330.80	6,849.16	-1,241.21	594.79	14,455,949.89	1,727,112.13	39.80520072	-80.69130533
7,899.98	91.00	330.80	6,847.40	-1,153.93	546.01	14,456,037.17	1,727,063.35	39.80544087	-80.69147794
7,999.98	91.00	330.80	6,845.65	-1,066.65	497.23	14,456,124.45	1,727,014.58	39.80568102	-80.69165055
8,099.98	91.00	330.80	6,843.90	-979.37	448.45	14,456,211.73	1,726,965.80	39.80592117	-80.69182315
8,199.98	91.00	330.80	6,842.15	-892.09	399.68	14,456,299.01	1,726,917.02	39.80616132	-80.69199577
8,299.98	91.00	330.80	6,840.39	-804.81	350.90	14,456,386.29	1,726,868.24	39.80640148	-80.69216838
8,399.98	91.00	330.80	6,838.64	-717.54	302.12	14,456,473.57	1,726,819.47	39.80664163	-80.69234099
8,499.98	91.00	330.80	6,836.89	-630.26	253.34	14,456,560.85	1,726,770.69	39.80688178	-80.69251360
8,599.98	91.00	330.80	6,835.14	-542.98	204.57	14,456,648.13	1,726,721.91	39.80712193	-80.69268622
8,699.98	91.00	330.80	6,833.38	-455.70	155.79	14,456,735.41	1,726,673.14	39.80736208	-80.69285884
8,799.98	91.00	330.80	6,831.63	-368.42	107.01	14,456,822.69	1,726,624.36	39.80760223	-80.69303145
8,899.98	91.00	330.80	6,829.88	-281.14	58.23	14,456,909.97	1,726,575.58	39.80784238	-80.69320407
8,999.98	91.00	330.80	6,828.13	-193.86	9.46	14,456,997.24	1,726,526.80	39.80808252	-80.69337669
9,099.98	91.00	330.80	6,826.37	-106.58	-39.32	14,457,084.52	1,726,478.03	39.80832267	-80.69354932
9,199.98	91.00	330.80	6,824.62	-19.30	-88.10	14,457,171.80	1,726,429.25	39.80856282	-80.69372194
9,299.98	91.00	330.80	6,822.87	67.98	-136.88	14,457,259.08	1,726,380.47	39.80880297	-80.69389456
9,399.98	91.00	330.80	6,821.12	155.26	-185.65	14,457,346.36	1,726,331.69	39.80904312	-80.69406719
9,499.98	91.00	330.80	6,819.36	242.54	-234.43	14,457,433.64	1,726,282.92	39.80928327	-80.69423981
9,599.98	91.00	330.80	6,817.61	329.81	-283.21	14,457,520.92	1,726,234.14	39.80952341	-80.69441244
9,699.98	91.00	330.80	6,815.86	417.09	-331.99	14,457,608.20	1,726,185.36	39.80976356	-80.69458507
9,799.98	91.00	330.80	6,814.11	504.37	-380.76	14,457,695.48	1,726,136.58	39.81000371	-80.69475770
9,899.98	91.00	330.80	6,812.35	591.65	-429.54	14,457,782.76	1,726,087.81	39.81024385	-80.69493033



Database: DB_Aug1919_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Heaven Hill 3
 Well: Heaven Hill 3N-13 HM (N)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Heaven Hill 3N-13 HM (N)
 TVD Reference: GL @ 1326.00usft
 MD Reference: GL @ 1326.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,999.98	91.00	330.80	6,810.60	678.93	-478.32	14,457,870.04	1,726,039.03	39.81048400	-80.69510296
10,099.98	91.00	330.80	6,808.85	766.21	-527.10	14,457,957.32	1,725,990.25	39.81072415	-80.69527560
10,199.98	91.00	330.80	6,807.10	853.49	-575.87	14,458,044.59	1,725,941.47	39.81098429	-80.69544823
10,299.98	91.00	330.80	6,805.34	940.77	-624.65	14,458,131.87	1,725,892.70	39.81120444	-80.69562087
10,399.98	91.00	330.80	6,803.59	1,028.05	-673.43	14,458,219.15	1,725,843.92	39.81144458	-80.69579350
10,499.98	91.00	330.80	6,801.84	1,115.33	-722.21	14,458,306.43	1,725,795.14	39.81168473	-80.69596614
10,599.98	91.00	330.80	6,800.09	1,202.61	-770.98	14,458,393.71	1,725,746.36	39.81192487	-80.69613878
10,699.98	91.00	330.80	6,798.33	1,289.89	-819.76	14,458,480.99	1,725,697.59	39.81216502	-80.69631142
10,799.98	91.00	330.80	6,796.58	1,377.16	-868.54	14,458,568.27	1,725,648.81	39.81240516	-80.69648406
10,899.98	91.00	330.80	6,794.83	1,464.44	-917.31	14,458,655.55	1,725,600.03	39.81264531	-80.69665671
10,999.98	91.00	330.80	6,793.08	1,551.72	-966.09	14,458,742.83	1,725,551.25	39.81288545	-80.69682935
11,099.98	91.00	330.80	6,791.32	1,639.00	-1,014.87	14,458,830.11	1,725,502.48	39.81312559	-80.69700200
11,199.98	91.00	330.80	6,789.57	1,726.28	-1,063.65	14,458,917.39	1,725,453.70	39.81336574	-80.69717464
11,299.98	91.00	330.80	6,787.82	1,813.56	-1,112.42	14,459,004.67	1,725,404.92	39.81360588	-80.69734729
11,399.98	91.00	330.80	6,786.07	1,900.84	-1,161.20	14,459,091.94	1,725,356.14	39.81384602	-80.69751994
11,499.98	91.00	330.80	6,784.31	1,988.12	-1,209.98	14,459,179.22	1,725,307.37	39.81408617	-80.69769259
11,599.98	91.00	330.80	6,782.56	2,075.40	-1,258.76	14,459,266.50	1,725,258.59	39.81432631	-80.69786524
11,699.98	91.00	330.80	6,780.81	2,162.68	-1,307.53	14,459,353.78	1,725,209.81	39.81456645	-80.69803789
11,799.98	91.00	330.80	6,779.06	2,249.96	-1,356.31	14,459,441.06	1,725,161.04	39.81480659	-80.69821055
11,899.98	91.00	330.80	6,777.30	2,337.24	-1,405.09	14,459,528.34	1,725,112.26	39.81504673	-80.69838320
11,999.98	91.00	330.80	6,775.55	2,424.51	-1,453.87	14,459,615.62	1,725,063.48	39.81528687	-80.69855586
12,099.98	91.00	330.80	6,773.80	2,511.79	-1,502.64	14,459,702.90	1,725,014.70	39.81552702	-80.69872851
12,199.98	91.00	330.80	6,772.05	2,599.07	-1,551.42	14,459,790.18	1,724,965.93	39.81576716	-80.69890117
12,299.98	91.00	330.80	6,770.29	2,686.35	-1,600.20	14,459,877.46	1,724,917.15	39.81600730	-80.69907383
12,399.98	91.00	330.80	6,768.54	2,773.63	-1,648.98	14,459,964.74	1,724,868.37	39.81624744	-80.69924649
12,499.98	91.00	330.80	6,766.79	2,860.91	-1,697.75	14,460,052.02	1,724,819.59	39.81648758	-80.69941916
12,599.98	91.00	330.80	6,765.04	2,948.19	-1,746.53	14,460,139.29	1,724,770.82	39.81672772	-80.69959182
12,699.97	91.00	330.80	6,763.28	3,035.47	-1,795.31	14,460,226.57	1,724,722.04	39.81696786	-80.69976448
12,799.97	91.00	330.80	6,761.53	3,122.75	-1,844.09	14,460,313.85	1,724,673.26	39.81720799	-80.69993715
12,899.97	91.00	330.80	6,759.78	3,210.03	-1,892.86	14,460,401.13	1,724,624.48	39.81744813	-80.70010982
12,999.97	91.00	330.80	6,758.03	3,297.31	-1,941.64	14,460,488.41	1,724,575.71	39.81768827	-80.70028248
13,099.97	91.00	330.80	6,756.27	3,384.59	-1,990.42	14,460,575.69	1,724,526.93	39.81792841	-80.70045515
13,199.97	91.00	330.80	6,754.52	3,471.86	-2,039.20	14,460,662.97	1,724,478.15	39.81816855	-80.70062782
13,299.97	91.00	330.80	6,752.77	3,559.14	-2,087.97	14,460,750.25	1,724,429.37	39.81840869	-80.70080050
13,399.97	91.00	330.80	6,751.02	3,646.42	-2,136.75	14,460,837.53	1,724,380.60	39.81864882	-80.70097317
13,499.97	91.00	330.80	6,749.27	3,733.70	-2,185.53	14,460,924.81	1,724,331.82	39.81888896	-80.70114584
13,599.97	91.00	330.80	6,747.51	3,820.98	-2,234.31	14,461,012.09	1,724,283.04	39.81912910	-80.70131852
13,699.97	91.00	330.80	6,745.76	3,908.26	-2,283.08	14,461,099.37	1,724,234.26	39.81936923	-80.70149120
13,799.97	91.00	330.80	6,744.01	3,995.54	-2,331.86	14,461,186.64	1,724,185.48	39.81960937	-80.70166387
13,899.97	91.00	330.80	6,742.26	4,082.82	-2,380.64	14,461,273.92	1,724,136.71	39.81984951	-80.70183655
13,999.97	91.00	330.80	6,740.50	4,170.10	-2,429.41	14,461,361.20	1,724,087.93	39.82008964	-80.70200923
14,099.97	91.00	330.80	6,738.75	4,257.38	-2,478.19	14,461,448.48	1,724,039.15	39.82032978	-80.70218191
14,199.97	91.00	330.80	6,737.00	4,344.66	-2,526.97	14,461,535.76	1,723,990.38	39.82056991	-80.70235460
14,299.97	91.00	330.80	6,735.25	4,431.94	-2,575.75	14,461,623.04	1,723,941.60	39.82081005	-80.70252728
14,399.97	91.00	330.80	6,733.49	4,519.21	-2,624.52	14,461,710.32	1,723,892.82	39.82105018	-80.70269996
14,499.97	91.00	330.80	6,731.74	4,606.49	-2,673.30	14,461,797.60	1,723,844.04	39.82129032	-80.70287265
14,599.97	91.00	330.80	6,729.99	4,693.77	-2,722.08	14,461,884.88	1,723,795.27	39.82153045	-80.70304534
14,699.97	91.00	330.80	6,728.24	4,781.05	-2,770.86	14,461,972.16	1,723,746.49	39.82177059	-80.70321803
14,799.97	91.00	330.80	6,726.48	4,868.33	-2,819.63	14,462,059.44	1,723,697.71	39.82201072	-80.70339072
14,899.97	91.00	330.80	6,724.73	4,955.61	-2,868.41	14,462,146.72	1,723,648.93	39.82225086	-80.70356341
14,999.97	91.00	330.80	6,722.98	5,042.89	-2,917.19	14,462,233.99	1,723,600.16	39.82249099	-80.70373610
15,099.97	91.00	330.80	6,721.23	5,130.17	-2,965.97	14,462,321.27	1,723,551.38	39.82273112	-80.70390879
15,112.83	91.00	330.80	6,721.00	5,141.39	-2,972.24	14,462,332.50	1,723,545.11	39.82276200	-80.70393100

PBHL/TD 15112.83 MD/6721.00 TVD



Database:	DB_Aug1919_v14	Local Co-ordinate Reference:	Well Heaven Hill 3N-13 HM (N)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1326.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3N-13 HM (N)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Heavein Hill 3N-13HM B - plan hits target center - Point	0.00	0.00	6,721.00	5,141.39	-2,972.24	14,462,332.50	1,723,545.11	39.82276200	-80.70393100
Heavein Hill 3N-13HM L - plan hits target center - Point	0.00	0.00	6,851.00	-1,332.88	646.02	14,455,858.22	1,727,163.37	39.80494848	-80.69112403
Heavein Hill 3N-13HM L - plan misses target center by 43.64usft at 7670.52usft MD (6850.90 TVD, -1354.21 N, 657.94 E) - Point	0.00	0.00	6,851.00	-1,332.88	696.02	14,455,858.22	1,727,213.37	39.80494800	-80.69094600

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,300.00	1,300.00	0.00	0.00	KOP Begin 2°/100' build
2,700.00	2,644.94	-298.03	153.70	Begin 28.00° tangent
6,310.17	5,832.53	-1,804.38	930.55	Begin 8°/100' build/turn
7,284.86	6,717.01	-1,661.95	832.78	Begin 10°/100' build/turn
7,694.98	6,851.00	-1,332.86	646.00	Begin 91.00° lateral
15,112.83	6,721.00	5,141.39	-2,972.24	PBHL/TD 15112.83 MD/6721.00 TVD

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Operator's Well No. Heaven Hill 3N-13HM**Area of Review****Sources of information to Support 35CSR8 - 5.11: 9.3 et seq.**

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

Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (08/15/2019) 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

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Permit well - Heaven Hill 3N-13HM

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 surveyed locations. Please refer to the Plat for surveyed well spots

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
4705101935	Tug Hill	6,876' TVD	No	No	Yes, existing Marcellus drilled well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	Drilled not completed
4705101947	Tug Hill	6,876' TVD	No	No	Yes, existing Marcellus drilled well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	Drilled not completed
4705101948	Tug Hill	6,876' TVD	No	No	Yes, existing Marcellus drilled well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	Drilled not completed
4705101962	Tug Hill	6,876' TVD	No	No	Yes, existing Marcellus drilled well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	Drilled not completed
4705101963	Tug Hill	6,876' TVD	No	No	Yes, existing Marcellus drilled well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	Drilled not completed
4705101967	Tug Hill	11,829' TVD	No	No	No, existing Point Pleasant drilled well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	Drilled not completed
4705101968	Tug Hill	11,829' TVD	No	No	No, existing Point Pleasant drilled well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	Drilled not completed
4705101969	Tug Hill	11,829' TVD	No	No	No, existing Point Pleasant drilled well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	Drilled not completed
4705102015	Tug Hill	6,876' TVD	No	No	Yes, existing Marcellus drilled well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	Drilled not completed
4705102016	Tug Hill	11,898' TVD	No	No	No, existing Point Pleasant drilled well. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore.	Drilled not completed
4705170645	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

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WV Geological & Economic Survey Well: County = 61 Permit = 01838

Location Information: [View Map](#)
 6176101848 COUNTY PERMIT TAL DISTRICT QUAD_7N QUAD_7S LAY_00 LAY_01 UTIME UTIME
 6176101848 Monroe 1988 Meigs Gas Basin Central 38.82677 -80.65181 520593.8 450594.2

Bottom Hole Location Information:
 6176101848 EP FLGS UTIME UTIME LON_DD LAT_DD
 6176101848 1 Aa Prosser 528328.8 4505332.8 80.77981 38.77981

Owner Information:
 6176101848 COMP_ID SUPPL STATUS SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_CTY_COMPLETION_PROD_VID PROP_TYD_PFM_TYD_LET_PFM
 6176101848 D&L Coal Loc Partner Subj L Volsen 5-12-81 186468100 Rudy L. Volson et al. The HSE Company LLC 0178 Monaca Pm

Completion Information:
 6176101848 COMP_ID EPUC_ID ELEV DAYUM FIELD DEEPREST_FH DEEPREST_FH1 INITIAL_CLASS FINAL_CLASS TYPE NSD COMP_WTRD TVD TVD_NEW_PTD ROD O_BEF O_AFT O_BEF O_AFT NSD_BEF
 6176101848 1229 Gas Oil Lease

There is no Pay data for this well
 There is no Production Gas data for this well
 There is no Production Oil data for this well ** some operators may have reported NGL under Oil
 There is no Production NGL data for this well ** some operators may have reported NGL under Oil
 There is no Production Water data for this well
 There is no Stratigraphy data for this well
 There is no Wireline (E-Log) data for this well
 There is no Plugging data for this well
 There is no Sample data for this well

WV Geological & Economic Survey Well: County = 61 Permit = 01847

Location Information: [View Map](#)
 6176101847 COUNTY PERMIT TAL DISTRICT QUAD_7N QUAD_7S LAY_00 LAY_01 UTIME UTIME
 6176101847 Monroe 1987 Meigs Gas Basin Central 38.82677 -80.65181 520593.8 450594.2

Bottom Hole Location Information:
 6176101847 EP FLGS UTIME UTIME LON_DD LAT_DD
 6176101847 1 Aa Prosser 528187.7 4505372.8 80.77981 38.77981

Owner Information:
 6176101847 COMP_ID SUPPL STATUS SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_CTY_COMPLETION_PROD_VID PROP_TYD_PFM_TYD_LET_PFM
 6176101847 D&L Coal Loc Partner Subj L Volsen 5-12-81 186468100 Rudy L. Volson et al. The HSE Company LLC 0178 Monaca Pm

Completion Information:
 6176101847 COMP_ID EPUC_ID ELEV DAYUM FIELD DEEPREST_FH DEEPREST_FH1 INITIAL_CLASS FINAL_CLASS TYPE NSD COMP_WTRD TVD TVD_NEW_PTD ROD O_BEF O_AFT O_BEF O_AFT NSD_BEF
 6176101847 1255 Gas Oil Lease
 Comment: -- Plst Missing data

There is no Pay data for this well
 There is no Production Gas data for this well
 There is no Production Oil data for this well ** some operators may have reported NGL under Oil
 There is no Production NGL data for this well ** some operators may have reported NGL under Oil
 There is no Production Water data for this well
 There is no Stratigraphy data for this well
 There is no Wireline (E-Log) data for this well
 There is no Plugging data for this well
 There is no Sample data for this well

WV Geological & Economic Survey Well: County = 61 Permit = 01848

Location Information: [View Map](#)
 6176101848 COUNTY PERMIT TAL DISTRICT QUAD_7N QUAD_7S LAY_00 LAY_01 UTIME UTIME
 6176101848 Monroe 1988 Meigs Gas Basin Central 38.82677 -80.65181 520593.8 450594.2

Bottom Hole Location Information:
 6176101848 EP FLGS UTIME UTIME LON_DD LAT_DD
 6176101848 1 Aa Prosser 528328.8 4505332.8 80.77981 38.77981

Owner Information:
 6176101848 COMP_ID SUPPL STATUS SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_CTY_COMPLETION_PROD_VID PROP_TYD_PFM_TYD_LET_PFM
 6176101848 D&L Coal Loc Partner Subj L Volsen 5-12-81 186468100 Rudy L. Volson et al. The HSE Company LLC 0178 Monaca Pm

Completion Information:
 6176101848 COMP_ID EPUC_ID ELEV DAYUM FIELD DEEPREST_FH DEEPREST_FH1 INITIAL_CLASS FINAL_CLASS TYPE NSD COMP_WTRD TVD TVD_NEW_PTD ROD O_BEF O_AFT O_BEF O_AFT NSD_BEF
 6176101848 1250 Gas Oil Lease

There is no Pay data for this well
 There is no Production Gas data for this well
 There is no Production Oil data for this well ** some operators may have reported NGL under Oil
 There is no Production NGL data for this well ** some operators may have reported NGL under Oil
 There is no Production Water data for this well
 There is no Stratigraphy data for this well
 There is no Wireline (E-Log) data for this well
 There is no Plugging data for this well
 There is no Sample data for this well

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WV Geological & Economic Survey

Well: County = 51 Permit = 01982

Location Information: View Map

AP# COUNTY PERMIT TAX DISTRICT QUAD_78 QUAD_78 LAY_00 LAY_00 UTIME UTIME
470510192 Meigs 129 Meigs Gas Easton Carbon 30.80854 -92.60378 60926.7 440998.4

Bottom Hole Location Information:

AP# SP FLAG UTIME UTIME LAY_00 LAY_00
470510192 1 A# Process 52787.4 440281.1 30.97492 30.77492

Owner Information:

AP# CMP_ID# SURFAC SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_CAT_COMPLETION PROP_VD PROP_TYPT_FW_TYR_CRT_FW
470510192 ... Dual Coal Les. Permited. Rivy. V. Watson 5284 Meigs Co Rivy. V. Watson et al. The H.G. Osborne, LLC 873 Meigs Co

Completion Information:

AP# CMP_ID# SPUD_DT ELEV DATUM FIELD DEEPSPT_FW DEEPSPT_FHT INITIAL_CLASS FINAL_CLASS TYPE NSG CMP_INTD YTD YTD NEW_FTO ROD O_BEF O_AFT O_BEF O_AFT NSG_BEF

470510192 ... 1341 Ground Level

- There is no Pay data for this well
There is no Production Gas data for this well
There is no Production Oil data for this well ** some operators may have reported NGL under Oil
There is no Production NGL data for this well ** some operators may have reported NGL under Oil
There is no Production Water data for this well
There is no Stratigraphy data for this well
There is no Wireline (E-Log) data for this well
There is no Plugging data for this well
There is no Sample data for this well

WV Geological & Economic Survey

Well: County = 51 Permit = 01983

Location Information: View Map

AP# COUNTY PERMIT TAX DISTRICT QUAD_78 QUAD_78 LAY_00 LAY_00 UTIME UTIME
470510193 Meigs 193 Meigs Gas Easton Carbon 30.80854 -92.60378 60926.4 440997.7

Bottom Hole Location Information:

AP# SP FLAG UTIME UTIME LAY_00 LAY_00
470510193 1 A# Process 52727.4 440278.2 30.97391 30.77391

Owner Information:

AP# CMP_ID# SURFAC SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_CAT_COMPLETION PROP_VD PROP_TYPT_FW_TYR_CRT_FW
470510193 ... Dual Coal Les. Permited. Rivy. V. Watson 5284 Meigs Co Rivy. V. Watson et al. The H.G. Osborne, LLC 873 Meigs Co

Completion Information:

AP# CMP_ID# SPUD_DT ELEV DATUM FIELD DEEPSPT_FW DEEPSPT_FHT INITIAL_CLASS FINAL_CLASS TYPE NSG CMP_INTD YTD YTD NEW_FTO ROD O_BEF O_AFT O_BEF O_AFT NSG_BEF

470510193 ... 1343 Ground Level

- There is no Pay data for this well
There is no Production Gas data for this well
There is no Production Oil data for this well ** some operators may have reported NGL under Oil
There is no Production NGL data for this well ** some operators may have reported NGL under Oil
There is no Production Water data for this well
There is no Stratigraphy data for this well
There is no Wireline (E-Log) data for this well
There is no Plugging data for this well
There is no Sample data for this well

WV Geological & Economic Survey

Well: County = 51 Permit = 01987

Location Information: View Map

AP# COUNTY PERMIT TAX DISTRICT QUAD_78 QUAD_78 LAY_00 LAY_00 UTIME UTIME
470510197 Meigs 197 Meigs Gas Easton Carbon 30.80854 -92.60378 60926.4 440998.4

Bottom Hole Location Information:

AP# SP FLAG UTIME UTIME LAY_00 LAY_00
470510197 1 A# Process 52728.2 440278.2 30.97391 30.77391

Owner Information:

AP# CMP_ID# SURFAC SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_CAT_COMPLETION PROP_VD PROP_TYPT_FW_TYR_CRT_FW
470510197 ... Dual Coal Les. Permited. Rivy. V. Watson 5284 Meigs Co Rivy. V. Watson et al. The H.G. Osborne, LLC 11828 Pt Pleasant Co

Completion Information:

AP# CMP_ID# SPUD_DT ELEV DATUM FIELD DEEPSPT_FW DEEPSPT_FHT INITIAL_CLASS FINAL_CLASS TYPE NSG CMP_INTD YTD YTD NEW_FTO ROD O_BEF O_AFT O_BEF O_AFT NSG_BEF

470510197 ... 1345 Ground Level

- There is no Pay data for this well
There is no Production Gas data for this well
There is no Production Oil data for this well ** some operators may have reported NGL under Oil
There is no Production NGL data for this well ** some operators may have reported NGL under Oil
There is no Production Water data for this well
There is no Stratigraphy data for this well
There is no Wireline (E-Log) data for this well
There is no Plugging data for this well
There is no Sample data for this well

WV Geological & Economic Survey

Well: County = 51 Permit = 01988

Location Information: View Map

AP# COUNTY PERMIT TAX DISTRICT QUAD_78 QUAD_78 LAY_00 LAY_00 UTIME UTIME
470510198 Meigs 198 Meigs Gas Easton Carbon 30.80854 -92.60378 60926.4 440998.4

Bottom Hole Location Information:

AP# SP FLAG UTIME UTIME LAY_00 LAY_00
470510198 1 A# Process 52720.4 440287.4 30.97399 30.78398

Owner Information:

AP# CMP_ID# SURFAC SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_CAT_COMPLETION PROP_VD PROP_TYPT_FW_TYR_CRT_FW
470510198 ... Dual Coal Les. Permited. Rivy. V. Watson 5284 Meigs Co Rivy. V. Watson et al. The H.G. Osborne, LLC 11828 Pt Pleasant Co

Completion Information:

AP# CMP_ID# SPUD_DT ELEV DATUM FIELD DEEPSPT_FW DEEPSPT_FHT INITIAL_CLASS FINAL_CLASS TYPE NSG CMP_INTD YTD YTD NEW_FTO ROD O_BEF O_AFT O_BEF O_AFT NSG_BEF

470510198 ... 1349 Ground Level

- There is no Pay data for this well
There is no Production Gas data for this well
There is no Production Oil data for this well ** some operators may have reported NGL under Oil
There is no Production NGL data for this well ** some operators may have reported NGL under Oil
There is no Production Water data for this well
There is no Stratigraphy data for this well
There is no Wireline (E-Log) data for this well
There is no Plugging data for this well
There is no Sample data for this well

WV Geological & Economic Survey

Well: County = 51 Permit = 01989

Location Information: View Map

AP# COUNTY PERMIT TAX DISTRICT QUAD_78 QUAD_78 LAY_00 LAY_00 UTIME UTIME
470510199 Meigs 199 Meigs Gas Easton Carbon 30.80854 -92.60378 60926.4 440998.4

Bottom Hole Location Information:

AP# SP FLAG UTIME UTIME LAY_00 LAY_00
470510199 1 A# Process 52720.4 440287.4 30.97399 30.78398

Owner Information:

AP# CMP_ID# SURFAC SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_CAT_COMPLETION PROP_VD PROP_TYPT_FW_TYR_CRT_FW
470510199 ... Dual Coal Les. Permited. Rivy. V. Watson 5284 Meigs Co Rivy. V. Watson et al. The H.G. Osborne, LLC 11828 Pt Pleasant Co

Completion Information:

AP# CMP_ID# SPUD_DT ELEV DATUM FIELD DEEPSPT_FW DEEPSPT_FHT INITIAL_CLASS FINAL_CLASS TYPE NSG CMP_INTD YTD YTD NEW_FTO ROD O_BEF O_AFT O_BEF O_AFT NSG_BEF

470510199 ... 1355 Ground Level

- There is no Pay data for this well
There is no Production Gas data for this well
There is no Production Oil data for this well ** some operators may have reported NGL under Oil
There is no Production NGL data for this well ** some operators may have reported NGL under Oil
There is no Production Water data for this well
There is no Stratigraphy data for this well
There is no Wireline (E-Log) data for this well
There is no Plugging data for this well
There is no Sample data for this well

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WV Geological & Economic Survey Well: County = 61 Permit = 62018

Location Information: View Map

WELL	COUNTY	PERMIT	TAL	DISTRICT	QUAD_75	QUAD_16	LAT_DD	LONG_DD	UTM_E	UTM_N
620180218	Marion	2218	18000	Gas	Easton	Carleton	39.506677	-80.601364	426247.3	4462980.8

Bottom Hole Location Information:

WELL	UTM_E	UTM_N	LOW_DD	LAT_DD
620180218	426247.3	4462980.8	-90.719104	39.417716

Owner Information:

WELL	CMP_ID	SURFAC	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWNER	OPERATOR	AT_COMPLETION	PROP_VO	PROP_TENET	THU_EST	THU
620180218

Completion Information:

WELL	CMP_ID	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FT	DEEPEST_FT	INITIAL_CLASS	FINAL_CLASS	TYPE	WIG	CMP_WIND	TWO	TWO	NEW_FTG	ROD	O_BEP	O_APT	O_BEP	O_APT	NOI_BEP	
620180218

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

There is no Plugging data for this well

There is no Sample data for this well

WV Geological & Economic Survey Well: County = 61 Permit = 62018

Location Information: View Map

WELL	COUNTY	PERMIT	TAL	DISTRICT	QUAD_75	QUAD_16	LAT_DD	LONG_DD	UTM_E	UTM_N
620180218	Marion	2218	18000	Gas	Easton	Carleton	39.506654	-80.593358	426248.7	4462986.1

Bottom Hole Location Information:

WELL	UTM_E	UTM_N	LOW_DD	LAT_DD
620180218	426248.7	4462986.1	-90.709104	39.417716

Owner Information:

WELL	CMP_ID	SURFAC	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWNER	OPERATOR	AT_COMPLETION	PROP_VO	PROP_TENET	THU_EST	THU
620180218

Completion Information:

WELL	CMP_ID	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FT	DEEPEST_FT	INITIAL_CLASS	FINAL_CLASS	TYPE	WIG	CMP_WIND	TWO	TWO	NEW_FTG	ROD	O_BEP	O_APT	O_BEP	O_APT	NOI_BEP
620180218

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

There is no Plugging data for this well

There is no Sample data for this well

WV Geological & Economic Survey Well: County = 61 Permit = 70646

Location Information: View Map

WELL	COUNTY	PERMIT	TAL	DISTRICT	QUAD_75	QUAD_16	LAT_DD	LONG_DD	UTM_E	UTM_N
620170646	Marion	70646	18000	Gas	Easton	Carleton	39.505038	-80.591104	426245.8	4462976.4

Bottom Hole Location Information:

There is no Bottom Hole Location data for this well

Owner Information:

WELL	CMP_ID	SURFAC	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWNER	OPERATOR	AT_COMPLETION	PROP_VO	PROP_TENET	THU_EST	THU
620170646

Completion Information:

WELL	CMP_ID	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FT	DEEPEST_FT	INITIAL_CLASS	FINAL_CLASS	TYPE	WIG	CMP_WIND	TWO	TWO	NEW_FTG	ROD	O_BEP	O_APT	O_BEP	O_APT	NOI_BEP
620170646

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

There is no Plugging data for this well

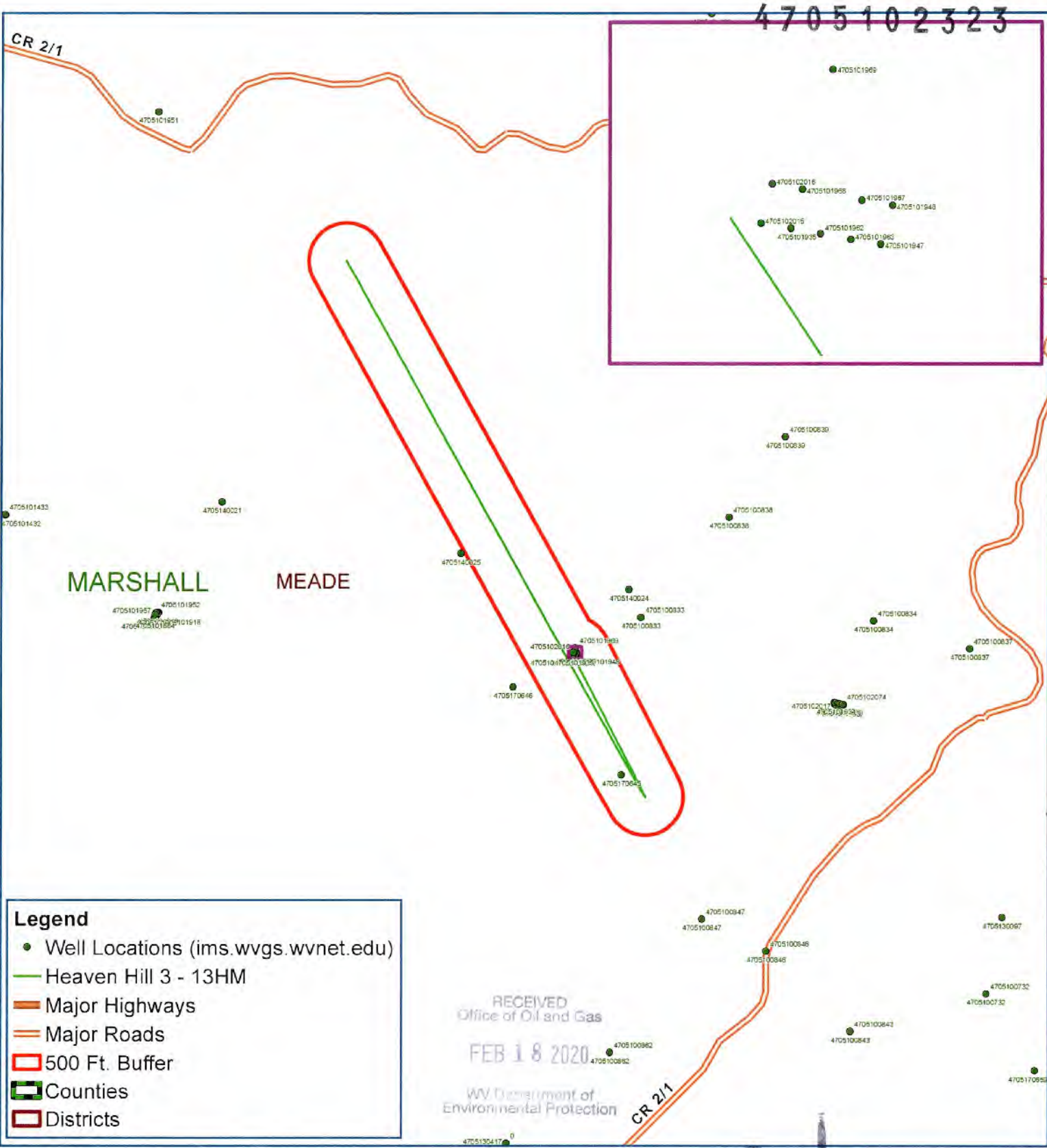
There is no Sample data for this well

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- Legend**
- Well Locations (ims.wvgs.wvnet.edu)
 - Heaven Hill 3 - 13HM
 - Major Highways
 - Major Roads
 - 500 Ft. Buffer
 - ▭ Counties
 - ▭ Districts

Heaven Hill 3 - 13HM
 Meade District
 Marshall County, WV



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



Map Created: October 8, 2018
 Map Current As Of: October 8, 2018

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Map Prepared by:
PS
 LAND SERVICES

WW-9
(4/16)

API Number 47 - 051 - 4705102323
Operator's Well No. Heaven Hill 3N-13HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

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

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386429)

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 Jim Pancake

Company Official (Typed Name) Jim Pancake

Company Official Title Vice President, Geoscience

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JAN 14 2020

Subscribed and sworn before me this 9 day of OCTOBER, 2019

Maureen A Stead
Notary Public

My commission expires 1/28/23

WV Department of Environmental Protection
Commonwealth of Pennsylvania - Notary Seal
MAUREEN A STEAD - Notary Public
Washington County
My Commission Expires Jan 28, 2023
Commission Number 1259926

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4705102323

Form WW-9

Operator's Well No. Heaven Hill 3N-13HM

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 18.43 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: Jain Anubaker

Comments: _____

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Environmental Protection

Title: Oil + Gas Inspect

Date: 9/12/17

Field Reviewed? Yes No

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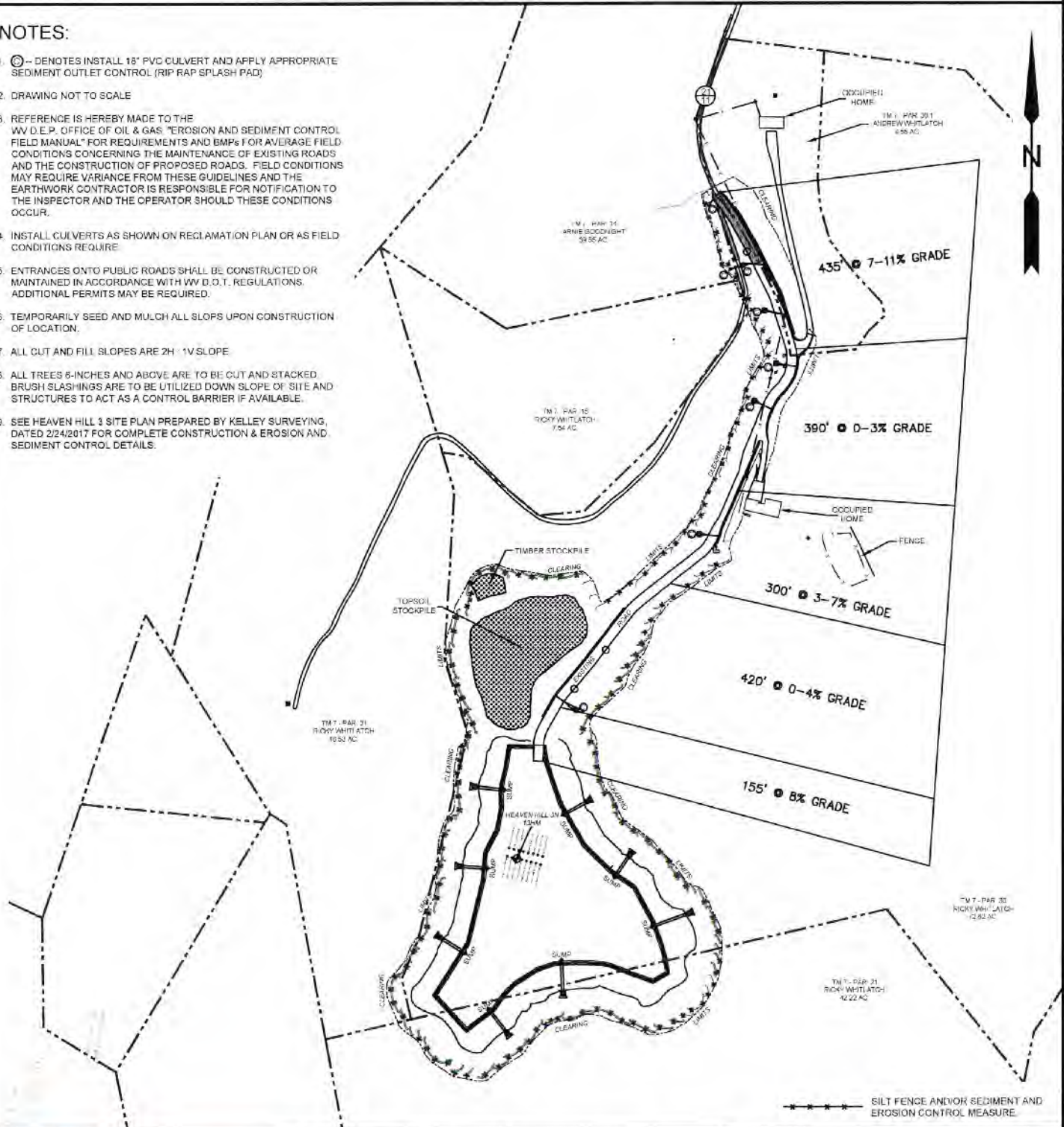
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WV Department of
Environmental Protection

PROPOSED HEAVEN HILL 3N - 13HM

NOTES:

1. -- DENOTES INSTALL 18" PVC CULVERT AND APPLY APPROPRIATE SEDIMENT OUTLET CONTROL (RIP RAP SPLASH PAD)
2. DRAWING NOT TO SCALE
3. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
4. INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.
5. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
6. TEMPORARILY SEED AND MULCH ALL SLOPS UPON CONSTRUCTION OF LOCATION.
7. ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE
8. ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO BE UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.
9. SEE HEAVEN HILL 3 SITE PLAN PREPARED BY KELLEY SURVEYING, DATED 2/24/2017 FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.



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www.slsurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	MEADE		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8654	06/21/2019	NONE

TUG HILL
OPERATING

4705102323



Well Site Safety Plan

Tug Hill Operating, LLC

9/12/19

Well Name: Heaven Hill 3N-13HM

Pad Location: Heaven Hill 3

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:
Northing-4,406,560.66
Easting -526,243.54

September 2019

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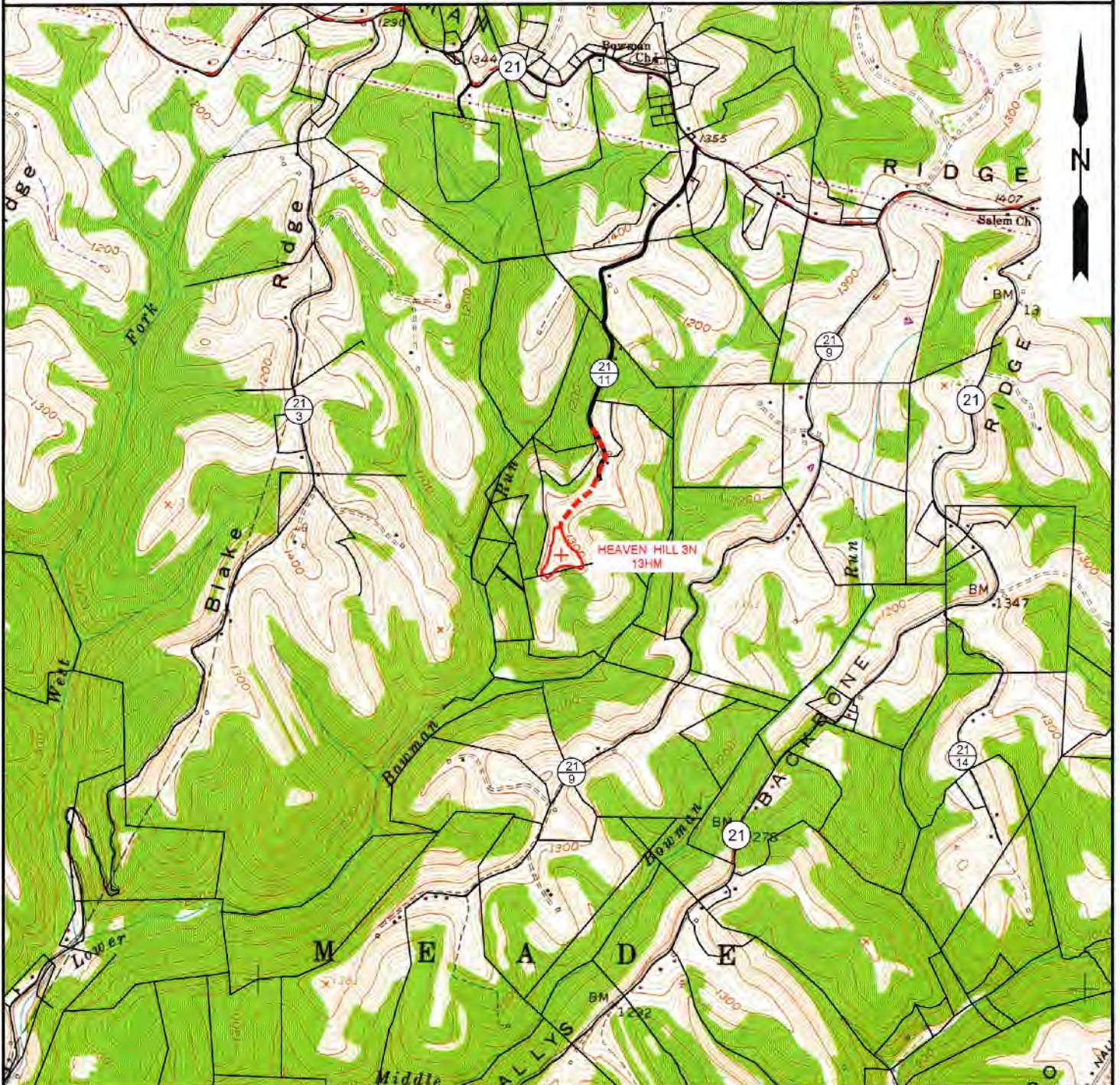
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WV Department of
Environmental Protection

4705102323

WW-9

PROPOSED HEAVEN HILL 3N - 13HM

SUPPLEMENT PG. 2



NOTE: CLOSEST WATER PURVEYOR
CITY OF CAMERON - FRANK WALKER RESERVOIR
CAMDEN, WV

LAT: 39.829865
LON: -80.573724
LOCATED: N 77°44'18" E AT 34,474.56' FROM THE CENTER OF HEAVEN HILL 3N WELL PAD LOCATION.

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www.slsurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8654	06/21/2019	1" = 2000'

TUG HILL
OPERATING

10,466' B.H.

7,512' T.H.

HEAVEN HILL 3N
WELL 13HM
TUG HILL OPERATING

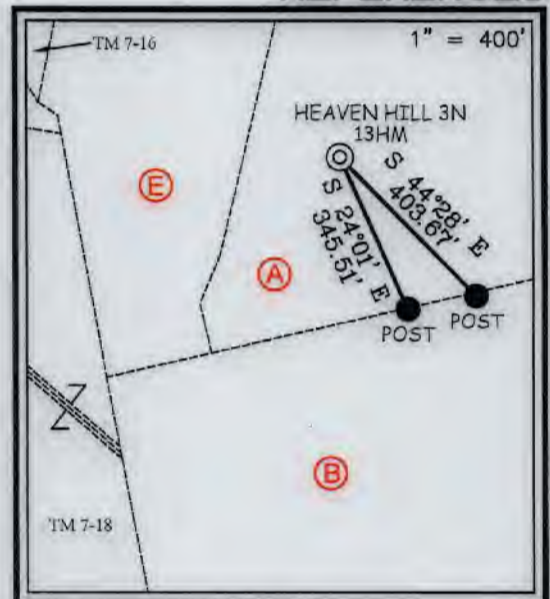
T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°50'00"

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)		
NAD'83 S.P.C.(FT)	N. 478,865.60	E. 1,633,247.69
NAD'83 GEO.	LAT-(N) 39.808615	LONG-(W) 80.693408
NAD'83 UTM (M)	N. 4,406,580.66	E. 526,243.54
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 477,521.7	E. 1,633,871.5
NAD'83 GEO.	LAT-(N) 39.804949	LONG-(W) 80.691124
NAD'83 UTM (M)	N. 4,406,154.4	E. 526,440.4
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 484,057.7	E. 1,630,360.8
NAD'83 GEO.	LAT-(N) 39.822762	LONG-(W) 80.703931
NAD'83 UTM (M)	N. 4,406,127.8	E. 525,337.6

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



REFERENCES



NOTES ON SURVEY

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'

P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26031 • (304) 482-9634
www.slsww.com

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 849

C. Victor Moyers



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE AUGUST 30, 20 19
 REVISED NOVEMBER 5, 20 19
 OPERATORS WELL NO. HEAVEN HILL 3N-13HM
 API WELL NO. 47 - 051 - 02323 **HGA**
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8654P13HMR.dwg
HEAVEN HILL 3-13HM REV2
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

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

LOCATION: ELEVATION GROUND = 1,335.60' PROPOSED = 1,326.35' WATERSHED LOWER BOWMAN RUN OF FISH CREEK (HUC 10)
 DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER RICKY L. WHITLATCH ACREAGE 72.82±
 ROYALTY OWNER RICKY L. WHITLATCH, ET AL ACREAGE 72.82±
 PROPOSED WORK: LEASE NO. SEE WW-6A1

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS
 ESTIMATED DEPTH TVD: 6,969' / TMD: 15,113'

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

COUNTY NAME
PERMIT

10,466' B.H.

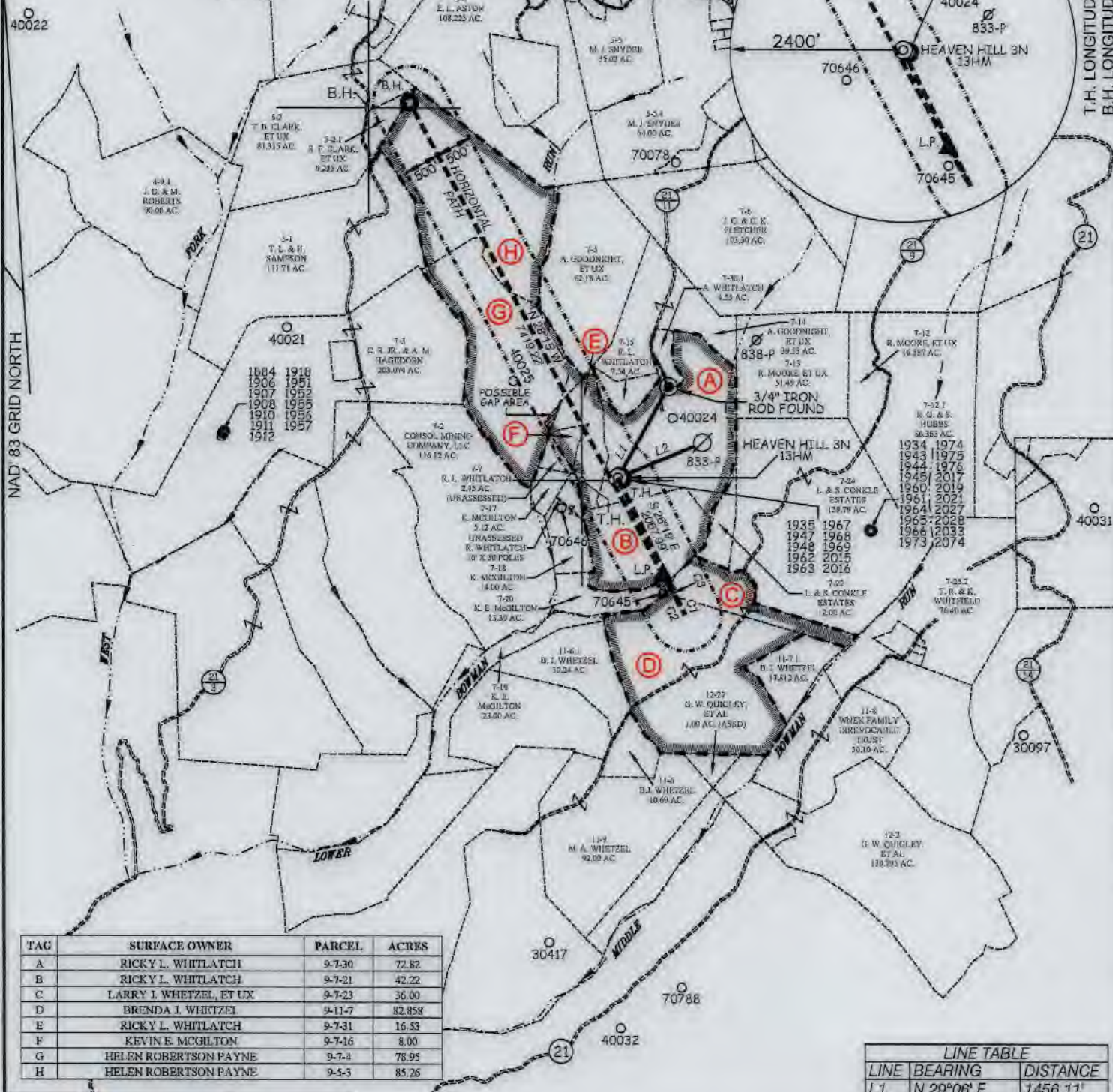
7,512' T.H.

**HEAVEN HILL 3N
WELL 13HM
TUG HILL OPERATING**

T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°50'00"

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

NAD 83 GRID NORTH



TAG	SURFACE OWNER	PARCEL	ACRES
A	RICKY L. WHITLATCH	9-7-30	72.82
B	RICKY L. WHITLATCH	9-7-21	42.22
C	LARRY J. WHETZEL, ET UX	9-7-23	36.00
D	BRENDA J. WHITZEL	9-11-7	82.858
E	RICKY L. WHITLATCH	9-7-31	16.53
F	KEVIN E. MCGILTON	9-7-16	8.00
G	HELEN ROBERTSON PAYNE	9-7-4	78.95
H	HELEN ROBERTSON PAYNE	9-5-3	85.26

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 29°08' E	1456.11'
L2	N 67°14' E	1274.38'

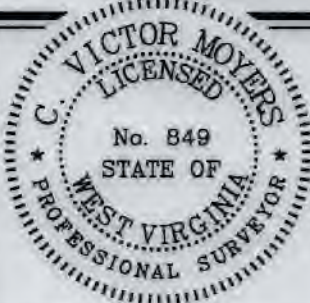
CURVE TABLE				
CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	46.85'	321.75'	S 22°54' E	46.81'
C2	58.18'	386.96'	N 33°25' W	58.12'
C3	576.48'	18225.13'	N 28°58' W	576.45'

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(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
NAD 83 S.P.C. (FT) N. 478,066.80 E. 1,839,247.89
NAD 83 GEO. LAT-(N) 39.803615 LONG-(W) 80.893408
NAD 83 UTM (M) N. 4,406,560.66 E. 526,243.54

LANDING POINT
NAD 83 S.P.C. (FT) N. 477,521.7 E. 1,839,871.5
NAD 83 GEO. LAT-(N) 39.804948 LONG-(W) 80.691124
NAD 83 UTM (M) N. 4,406,154.4 E. 526,440.4

BOTTOM HOLE
NAD 83 S.P.C. (FT) N. 484,057.7 E. 1,630,360.8
NAD 83 GEO. LAT-(N) 39.822782 LONG-(W) 80.703931
NAD 83 UTM (M) N. 4,408,127.8 E. 525,337.6



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

P.S. 849 *C. Victor Moyers*

LEGEND

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

SCALE 1" = 2000' FILE NO. 8654P13HMR.dwg
HEAVEN HILL 3-13HM REV2
DATE AUGUST 30, 2019
REVISED NOVEMBER 5, 2019
OPERATORS WELL NO. HEAVEN HILL 3N-13HM
API WELL NO. 47-051-02323 H&A
NO. STATE COUNTY PERMIT

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



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

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

COUNTY NAME
PERMIT

WW-6A1
(5/13)

Operator's Well No. Heaven Hill 3N-13HM

**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 *Amy Miller*
 Its: Permitting Specialist - Appalachia Region

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WV Department of
Environmental Protection

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment
10*15557	9-7-30	A	RICKY L WHITLATCH ET AL	CHEVRON USA INC	1/8+	780	N/A	N/A	Chevron USA Inc to Tug Hill Exploration LLC: 36/148
10*15557	9-7-21	B	RICKY L WHITLATCH ET AL	CHEVRON USA INC	1/8+	780	N/A	N/A	Chevron USA Inc to Tug Hill Exploration LLC: 36/148
10*15746	9-7-23	C	BRUCE D SCHURR	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16021	9-7-23	C	TOMMY BONAR AND TANYA S BONAR	TH EXPLORATION LLC	1/8+	925	N/A	N/A	N/A
10*16115	9-7-23	C	EARL W HARRIS	TH EXPLORATION LLC	1/8+	925	N/A	N/A	N/A
10*16121	9-7-23	C	ISAIAH BENNETT	TH EXPLORATION LLC	1/8+	933	N/A	N/A	N/A
10*16247	9-7-23	C	CAROL RIGGLE PARSLEY AND JAMES DENNIS PARSLEY	TH EXPLORATION LLC	1/8+	925	N/A	N/A	N/A
10*17415	9-7-23	C	DILLON PITSENBARGER	TH EXPLORATION LLC	1/8+	919	N/A	N/A	N/A
10*17506	9-7-23	C	CHASKIA F HARRIS AND JAMES M HARRIS	TH EXPLORATION LLC	1/8+	919	N/A	N/A	N/A
10*17507	9-7-23	C	DEZRAY METCALF	TH EXPLORATION LLC	1/8+	919	N/A	N/A	N/A
10*47051.256.1	9-7-23	C	BRENDA J WHEITZEL	TH EXPLORATION LLC	1/8+	881	N/A	N/A	N/A
10*47051.256.7	9-7-23	C	MARILYN SUE BUMER	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*47051.256.8	9-7-23	C	PAMELA ANN MASON	TH EXPLORATION LLC	1/8+	31	N/A	N/A	N/A
10*47051.256.9	9-7-23	C	WANDA MASON SUNSHINE	TH EXPLORATION LLC	1/8+	33	N/A	N/A	N/A
10*47051.256.10	9-7-23	C	GRACE LAURA BONAR	TH EXPLORATION LLC	1/8+	35	N/A	N/A	N/A
10*47051.256.11	9-7-23	C	JOHN L MASON	TH EXPLORATION LLC	1/8+	37	N/A	N/A	N/A
10*47051.256.12	9-7-23	C	STEVEN A BOHRER	TH EXPLORATION LLC	1/8+	39	N/A	N/A	N/A
10*47051.256.13	9-7-23	C	WILLIAM W CRAIG	TH EXPLORATION LLC	1/8+	41	N/A	N/A	N/A
10*47051.256.14	9-7-23	C	HUGH R BUZZARD	TH EXPLORATION LLC	1/8+	43	N/A	N/A	N/A
10*47051.256.15	9-7-23	C	ROY E AND CHARLOTTE J BONAR YOHO	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*47051.256.16	9-7-23	C	CHARLOTTE B HUMMELL	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*47051.256.17	9-7-23	C	MAXINE G JOHNSON	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*47051.256.18	9-7-23	C	JOHN WILLIAM BONAR AND SHIRLEY BONAR	TH EXPLORATION LLC	1/8+	913	N/A	N/A	N/A
10*47051.256.19	9-7-23	C	MICHAEL DAVID PYLES AND CYNTHIA A PYLES	TH EXPLORATION LLC	1/8+	907	N/A	N/A	N/A
10*47051.256.20	9-7-23	C	JEFFREY THOMAS PYLES AND TERESA A PYLES	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*47051.256.21	9-7-23	C	JACK L MASON AND JEAN M MASON	TH EXPLORATION LLC	1/8+	913	N/A	N/A	N/A
10*47051.256.22	9-7-23	C	BEVERLY J HOPSON	TH EXPLORATION LLC	1/8+	581	N/A	N/A	N/A
10*47051.256.23	9-7-23	C	ROBERT L BONAR	TH EXPLORATION LLC	1/8+	556	N/A	N/A	N/A
10*47051.256.24	9-7-23	C	CATHERINE BONAR PETTIT BILLIE	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*15746	9-11-7	D	BRUCE D SCHURR	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16021	9-11-7	D	TOMMY BONAR AND TANYA S BONAR	TH EXPLORATION LLC	1/8+	925	N/A	N/A	N/A
10*16115	9-11-7	D	EARL W HARRIS	TH EXPLORATION LLC	1/8+	329	N/A	N/A	N/A
10*16121	9-11-7	D	ISAIAH BENNETT	TH EXPLORATION LLC	1/8+	329	N/A	N/A	N/A
10*16247	9-11-7	D	CAROL RIGGLE PARSLEY AND JAMES DENNIS PARSLEY	TH EXPLORATION LLC	1/8+	933	N/A	N/A	N/A
10*17415	9-11-7	D	DILLON PITSENBARGER	TH EXPLORATION LLC	1/8+	925	N/A	N/A	N/A
10*17506	9-11-7	D	CHASKIA F HARRIS AND JAMES M HARRIS	TH EXPLORATION LLC	1/8+	919	N/A	N/A	N/A
10*17507	9-11-7	D	DEZRAY METCALF	TH EXPLORATION LLC	1/8+	919	N/A	N/A	N/A
10*47051.256.1	9-11-7	D	BRENDA J WHEITZEL	TH EXPLORATION LLC	1/8+	881	N/A	N/A	N/A
10*47051.256.7	9-11-7	D	MARILYN SUE BUMER	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*47051.256.8	9-11-7	D	PAMELA ANN MASON	TH EXPLORATION LLC	1/8+	31	N/A	N/A	N/A
10*47051.256.9	9-11-7	D	WANDA MASON SUNSHINE	TH EXPLORATION LLC	1/8+	33	N/A	N/A	N/A
10*47051.256.10	9-11-7	D	GRACE LAURA BONAR	TH EXPLORATION LLC	1/8+	35	N/A	N/A	N/A
10*47051.256.11	9-11-7	D	JOHN L MASON	TH EXPLORATION LLC	1/8+	37	N/A	N/A	N/A

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WV Department of Environmental Protection

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Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment
10*47051.256.12	9-11-7	D	STEVEN A BOHRER	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A	N/A
10*47051.256.13	9-11-7	D	WILLIAM W CRAIG	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A	N/A
10*47051.256.14	9-11-7	D	HUGH R BUZZARD	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A	N/A
10*47051.256.15	9-11-7	D	ROY E AND CHARLOTTE J BONAR YOHO	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A	N/A
10*47051.256.16	9-11-7	D	CHARLOTTE B HUMMELL	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A	N/A
10*47051.256.17	9-11-7	D	MAXINE G JOHNSON	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A	N/A
10*47051.256.18	9-11-7	D	JOHN WILLIAM BONAR AND SHIRLEY BONAR	TH EXPLORATION LLC	1/8+	913	N/A	N/A	N/A	N/A
10*47051.256.19	9-11-7	D	MICHAEL DAVID PYLES AND CYNTHIA A PYLES	TH EXPLORATION LLC	1/8+	907	N/A	N/A	N/A	N/A
10*47051.256.20	9-11-7	D	JEFFREY THOMAS PYLES AND TERESA A PYLES	TH EXPLORATION LLC	1/8+	907	N/A	N/A	N/A	N/A
10*47051.256.21	9-11-7	D	JACK L MASON AND JEAN M MASON	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A	N/A
10*47051.256.22	9-11-7	D	BEVERLY J HOPSON	TH EXPLORATION LLC	1/8+	913	N/A	N/A	N/A	N/A
10*47051.256.23	9-11-7	D	ROBERT L BONAR	TH EXPLORATION LLC	1/8+	913	N/A	N/A	N/A	N/A
10*47051.256.24	9-11-7	D	CATHERINE BONAR PETTIT BILLIE	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A	N/A
10*15557	9-7-31	E	RICKY L WHITLATCH ET AL	CHEVRON USA INC	1/8+	780	N/A	N/A	N/A	Chevron USA Inc to Tug Hill Exploration LLC: 36/148
10*15667	9-7-16	F	KEVIN E MCGILTON AND TERESA E MCGILTON	CHEVRON USA INC	1/8+	850	N/A	N/A	N/A	Chevron USA Inc to Tug Hill Exploration LLC: 36/148
10*21593	9-7-4	G	HELEN R. PAYNE	CHEVRON USA INC	1/8+	791	N/A	N/A	N/A	Chevron USA Inc to TH Exploration LLC: 42/435
10*21588	9-5-3	H	LAWRENCE ALLEN WAYT	CHESAPEAKE APPALACHIA LLC	1/8+	687	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 22/646	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 22/646	Statoil USA Onshore Properties Inc to Chevron USA Inc: 30/427	Chesapeake Appalachia LLC to Chevron USA Inc: 30/461
10*21591	9-5-3	H	BEATRICE ANN KIDD	CHESAPEAKE APPALACHIA LLC	1/8+	687	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 22/646	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 22/646	Statoil USA Onshore Properties Inc to Chevron USA Inc: 30/427	Chesapeake Appalachia LLC to Chevron USA Inc: 30/461

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STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

Jan Pest
MARSHALL County 12:43:01 PM
Instrument No 1404876
Date Recorded 05/20/2016
Document Type ASN
Pages Recorded 20
Book-Page 36-148
Recording Fee \$20.00
Additional \$9.00

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "**Assignment**") is made and entered into this 17th day of May, 2016 (the "**Effective Date**"), by and between **CHEVRON U.S.A. INC.** (hereinafter "**Assignor**") and **TH EXPLORATION, LLC** (hereinafter "**Assignee**") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated May 2, 2016 (the "**Acreage Trade Agreement**"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit "A", and as depicted in Exhibits "A-1" and "A-2", attached hereto and made a part hereof (hereinafter the "**Leases**"); and

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

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

1. **Assignment.** Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon, except that Assignor accepts and reserves from this Assignment the Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia.

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

2. **Special Warranty.** Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the Conveyed Interests since the time that Assignor obtained its interests in the Leases. Assignor does covenant, promise and agree, to and with the Assignee, its respective successors and assigns, to forever specially warrant and defend the title to the Leases or portions thereof included under this Assignment, unto the Assignee and its respective successors and assigns, against the lawful claims of Assignor, and all persons claiming, or to claim, the same or any part thereof, by, through or under Assignor.

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STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

Jan Pest
MARSHALL County 12:43:01 PM
Instrument No 1404876
Date Recorded 05/20/2016
Document Type ASK
Pages Recorded 20
Book-Page 36-148
Recording Fee \$20.00
Additional \$8.00

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WITNESSETH:

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

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

1. **Assignment.** Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon, except that Assignor accepts and reserves from this Assignment the Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia.

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TUG HILL

4705102323

January 7, 2020

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

RE: Heaven Hill 3N-13HM

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Heaven Hill 3N-13HM well plat.

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

Sincerely,

Amy L. Miller
Permitting Specialist – Appalachia Region

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

Date of Notice Certification: 01/07/2020

API No. 47- 051 -

Operator's Well No. Heaven Hill 3N-13HM

Well Pad Name: Heaven Hill 3

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:	West Virginia	UTM NAD 83	Easting:	526,243.54
County:	Marshall		Northing:	4,406,560.66
District:	Meade	Public Road Access:	Yeater Lane (Co. Rt. 21/11)	
Quadrangle:	Glen Easton 7.5'	Generally used farm name:	Ricky L. Whittlatch	
Watershed:	(HUC 10) Fish Creek			

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

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

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FEB 18 2020

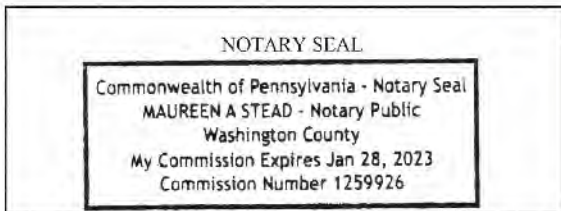
WV Department of
Environmental Protection

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: Tug Hill Operating, LLC
By: Amy L. Miller *Amy Miller*
Its: Regulatory Analyst - Appalachia
Telephone: 724-749-8388

Address: 380 Southpointe Blvd, Southeppointe Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030
Email: amiller@tug-hillop.com



Subscribed and sworn before me this 7 day of JANUARY 2020
Maureen 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 depprivacyofficer@wv.gov.

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WW-6A
(9-13)

API NO. 47- 051 -
OPERATOR WELL NO. Heaven Hill 3N-15HM
Well Pad Name: Heaven Hill 3

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: 1/7/2020 **Date Permit Application Filed:** 1/8/2020

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: Ricky L. Whittatch
 Address: 1044 Yeater Lane
Glen Easton, WV 26039
 Name: None
 Address: _____

COAL OWNER OR LESSEE ✓
 Name: Murray Energy Corporation
 Address: 46226 National Road
St. Clairsville, OH 43950

COAL OPERATOR
 Name: Same as above coal owner
 Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
 Name: Andrew Whittatch
 Address: 942 Yeater Lane
Glen Easton, WV 26039
 Name: Arnie Goodnight, et ux
 Address: 102 Goodnight Lane
Moundsville, WV 26041

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
 Name: *See supplement page 1A attached
 Address: _____

SURFACE OWNER(s) (Impoundments or Pits)
 Name: None
 Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
 Name: None
 Address: _____

*Please attach additional forms if necessary

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WW-6A
(8-13)

API NO. 47-051 - _____
 OPERATOR WELL NO. Heaven Hill 3N-13HM
 Well Pad Name: Heaven Hill 3

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

WW-6A
(8-13)

API NO. 47-051 -
OPERATOR WELL NO. Heaven Hill 3N-13HM
Well Pad Name: Heaven Hill 3

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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WW-6A
(8-13)

API NO. 47-051 -
OPERATOR WELL NO. Heaven Hill 3N-13HM
Well Pad Name: Heaven Hill 3

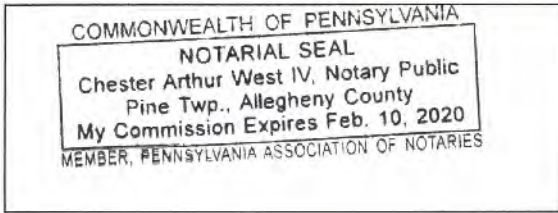
Notice is hereby given by:

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

Address: 380 Southeppointe Blvd, Southpointe 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 31 day of Dec, 2019.

[Signature]

Notary Public

My Commission Expires 2-10-2020

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Exhibit WW-6A

Supplement Pg. 1A

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

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

Well: Heaven Hill 3N – 13HM
District: Meade (Residence #1)
State: WV

There is one (1) residence, no business or commercial sites, no churches, no schools or emergency facilities within two-thousand feet (2,000') of the above referenced well location.

Residence (#1)
TM 7 Pcl. 30
Ricky L. Whitlatch
Phone: 304-843-1168
Physical Address:
1044 Yeater Ln.
Glen Easton, WV 26039
Tax Address:
Same

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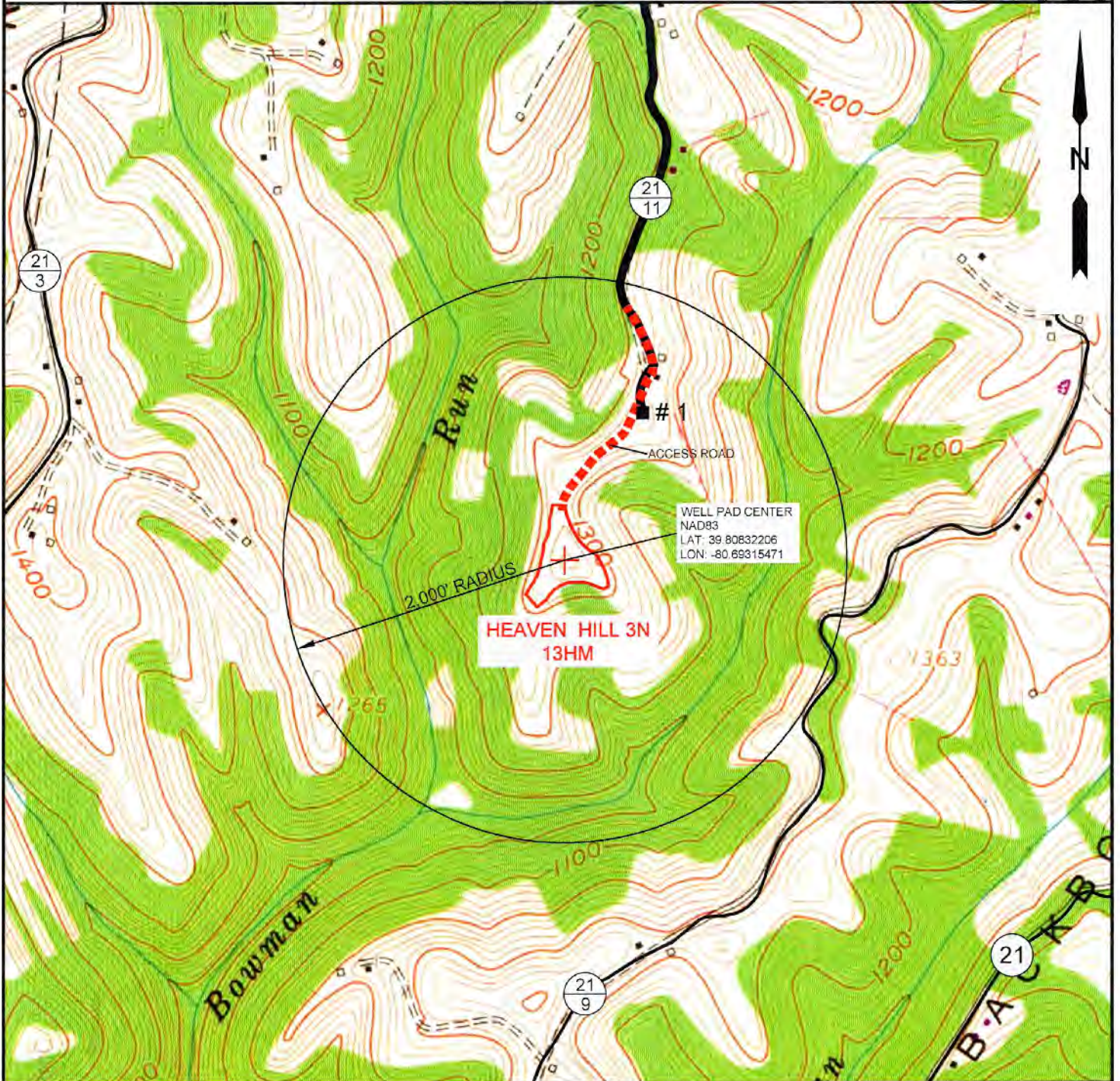
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PROPOSED HEAVEN HILL 3N - 13HM

4705102323



NOTE: THERE APPEARS TO BE ONE (1) POSSIBLE WATER SOURCE WITHIN TWO THOUSAND FEET (2,000').

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

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8654	06/21/2019	1" = 1000'

TUG HILL
OPERATING

4705102323

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: 5/13/2019 **Date of Planned Entry:** 5/20/2019

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: Ricky L. Whitlatch ✓
Address: 1044 Yeater Lane ✓
Glen Easton, WV 26039

Name: Andrew Whitlatch ✓
Address: 982 Yeater Lane ✓
Glen Easton, WV 26039

Name: Arnie Goodnight ET UX ✓
Address: 102 Goodnight Lane ✓
Moundsville, WV 26041

COAL OWNER OR LESSEE

Name: Murray Energy Corp. ✓
Address: 46226 National Road ✓
St. Clairsville, OH 43950

MINERAL OWNER(s)

Name: Ricky L. Whitlatch ✓
Address: 1044 Yeater Lane ✓
Glen Easton, WV 26039 **SEE SUPPLEMENT PAGE**
*please attach additional forms if necessary

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MAY 14 2019
WV Department of Environmental Protection

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	Approx. Latitude & Longitude: Lat: 39.8083194, Long: -80.6931660
County: Marshall	Public Road Access: Yeater Lane (CO. Rt. 21/11)
District: Meade	Watershed: HUC-10 Fish Creek
Quadrangle: Glen Easton 7.5'	Generally used farm name: Ricky L. Whitlatch

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	Address: 380 Southpointe Blvd., Scoutpointe Plaza II, Suite 200
Telephone: 724-0749-8388	Canonsburg, PA 15317
Email: amiller@tug-hillop.com	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.

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Operator Well No. Heaven Hill Unit 3N-13HM

WW-6A3 Notice of Entry for Plat Survey Attachment 1 of 1

Mineral Owner(s):

Name: Arnie Goodnight ET UX ✓
Address: 102 Goodnight Lane
Moundsville, WV 26041

Bounty Minerals III Acquisitions, LLC ✓
777 Main Street – Suite 850
Ft. Worth, TX 76102

Andrew Whitlatch ✓
982 Yeater Lane
Glen Easton, WV 26039

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WW-6A5
(1/12)

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

Notice Time Requirement: notice shall be provided no later than the **filing date of permit application.**
Date of Notice: 01/07/2020 **Date Permit Application Filed:** 01/06/2020

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

- CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

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

Notice is hereby provided to the SURFACE OWNER(s)

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

Name: Ricky L. Whitlatch
Address: 1044 Yeater Lane
Glen Easton, WV 26039

Name: Andrew Whitlatch
Address: 942 Yeater Lane
Glen Easton, WV 26039 ****See Attached****

Notice is hereby given:

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

State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>526,243.54</u>
County: <u>Marshall</u>	Northing: <u>4,406,580.66</u>
District: <u>Meade</u>	Public Road Access: <u>Yeater Lane (Co. Rt. 21/11)</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Ricky L. Whitlatch</u>
Watershed: <u>(HUC 10) Fish Creek</u>	

This Notice Shall Include:

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

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

Address: 380 Southpointe Blvd, Southpointe 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.

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Operator Well No. Heaven Hill Unit 3N-13HM

WW-6A5 Notice of Entry for Plat Survey Attachment 1 of 1

Notice is hereby provided to the SURFACE OWNER(s):

Name: Arnie Goodnight, et ux
Address: 102 Goodnight Lane
Moundsville, WV 26041

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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

Byrd E. White, III
 Secretary of Transportation/
 Commissioner of Highways

January 7, 2020

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

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

Subject: DOH Permit for the Heaven Hill Unit 3 Pad, Marshal County

Heaven Hill 3N-13HM Well Site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2016-0126 which has been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off Marshall County Route 21/11 SLS.

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

Very Truly Yours,

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

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

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PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Heaven Hill 3N-13HM

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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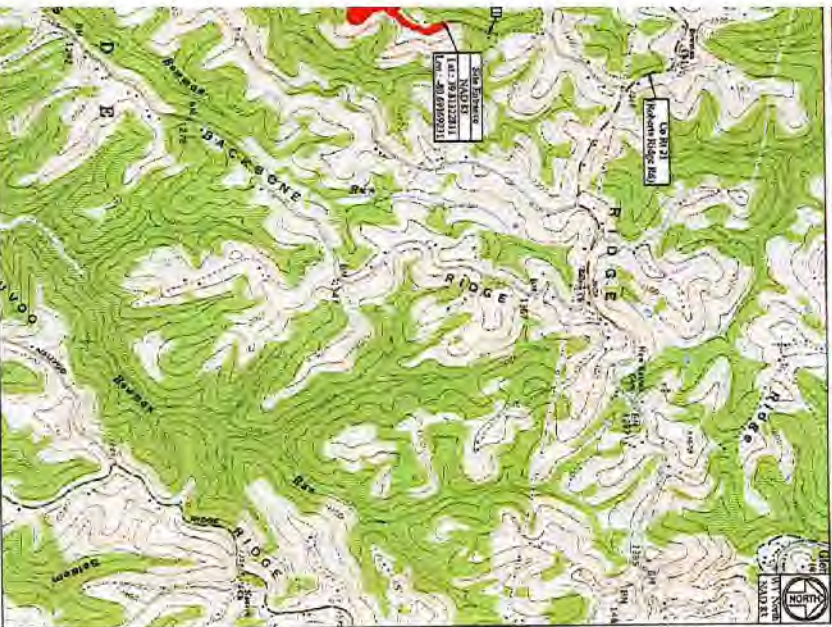
WV Department of
Environmental Protection

Hill 3 Site

struction Plan, &
 nent Control Plans
 Operating
 I County
 District
 9.80832206°
 80.69315471°
 reek Watershed

As-Built

Pertinent Site Information
 Heaven Hill 3 Site
 Emergency Number: 304-845-1920
 Meade District, Marshall County, WV
 Watershed: Middle Fish Creek Watershed
 Tug Hill Contact Number: 1-817-632-3400



WV State River Conditions System
 Elevation Based on NAVD83
 Established by Survey Order: OPS
 and OPS Post Processing

Property Owner Information - Heaven Hill 3 Site
 Meade District - Marshall County

Owner	Map Reference	Width (Feet)	Depth (Feet)	Area (Sq. Feet)	ADL (Linear)	Total District
Meade District	7-30	6.26	1.36	8.51	3.33	14.99
Meade District	7-13	0.00	0.01	0.00	0.14	0.15
Meade District	7-15	0.00	0.00	0.00	0.00	0.00
Meade District	7-21	0.00	0.00	0.00	0.00	0.00
Meade District	7-21	0.00	0.00	0.00	1.43	2.53
Total	Map Reference	Width	Depth	Area	ADL	Total
	7-13, 7-15, 7-21	6.26	1.37	8.51	3.47	15.14

Access Road

Right-of-Way	Width	Depth	Type
Meade District	7-30	1.11	New Access Road Construction
Meade District	7-30	1.05	New Access Road Construction

Disturbed Area

Well Pad	7.15 AC
Access Road Construction	2.01 AC
Impervious / Access Material	1.24 AC
Additional Clearing	1.83 AC
Total Disturbed Area	12.23 AC

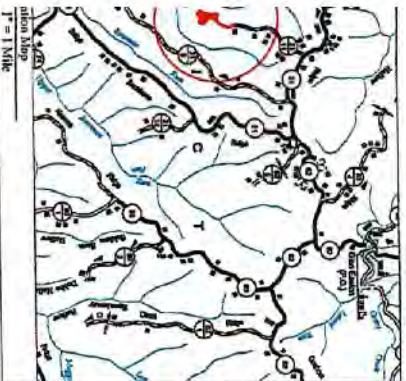
Heaven Hill 3 Site Quantities

Description	Category	Quantity	Item	Unit	Length of Slope
Well Pad	7.15 AC	12,697.75		Sq. Ft.	18,375'
Well Pad Access Road	2.01 AC	2,610.00		Sq. Ft.	5,414'
Impervious / Access Material	1.24 AC	1,650.00		Sq. Ft.	3,414'
Additional Clearing	1.83 AC	2,380.00		Sq. Ft.	5,114'
Drainage for 13	21.29	31.98		Lineal Ft.	3,114'
Drainage for 15	0.21	0.30		Lineal Ft.	3,114'
Drainage for 21	0.21	0.30		Lineal Ft.	3,114'
Gravel Spill (Material Spill)	31.11	51,538.83		Cu. Yd.	5,114'
Gravel Spill (CIV)	2.16	3,160.26		Cu. Yd.	3,114'

Drill 2/14/18

Site Locations (NAVD 83)

Station	Latitude (D/M)	Longitude (D/M)
Station 1	38° 00' 00" N	-80° 00' 00" W
Station 2	38° 00' 00" N	-80° 00' 00" W
Station 3	38° 00' 00" N	-80° 00' 00" W



Well Location Restrictions
 All Well construction overlaps with the following restrictions:

- *250' from an existing well or developed (piped) well for human or domestic animals
- *25' from an occupied building or from greater than 2,100 SF used for parking or dairy purposes
- *100' from the edge of discharge to wetland, perennial stream, natural or artificial lake, pond or reservoir
- *50' from the edge of discharge to a sanitary repository (well stream)
- *1,000' of a surface or ground water table to a public water supply

(Well Location Restrictions of WV Code 22-6A-13)



The job and conditions under the signature of the engineer are as stated in the contract documents and the drawings. It is recommended that the engineer be held responsible for the design and construction of the project. The engineer is not responsible for the design and construction of the project.

Robert C. Smead
 Professional Engineer
 State of West Virginia
 License No. 22214

Sheet	Description
1	Cover Sheet
VI	Schedule of Quantities
N1-N3	Site Notes
2	Site Construction Site Conditions
3	Site Soil Map
4	General Notes
2-7	EAS Plan View
8	Top Key Exhibit
9-10	Plan Views
11-12	Cross Sections - Well Pad
13	Cross Sections - Access Road
14	Cross Sections - Additional Access Roads
G1-G3	Geotechnical Exhibit
L1	Landscape Design Plan Exhibit
L2	Site Reclamation Exhibit
SI1-M2	Erosion and Sediment Control Details
DI-1D2	Access Road Details
P1	Pad Details

Cover Sheet
 Heaven Hill 3 Site
 Meade District
 Marshall County, WV

Date: 07/3/2015
 Scale: As Shown
 Drawn By: ZS
 File No.
 Sheet 1 of 14



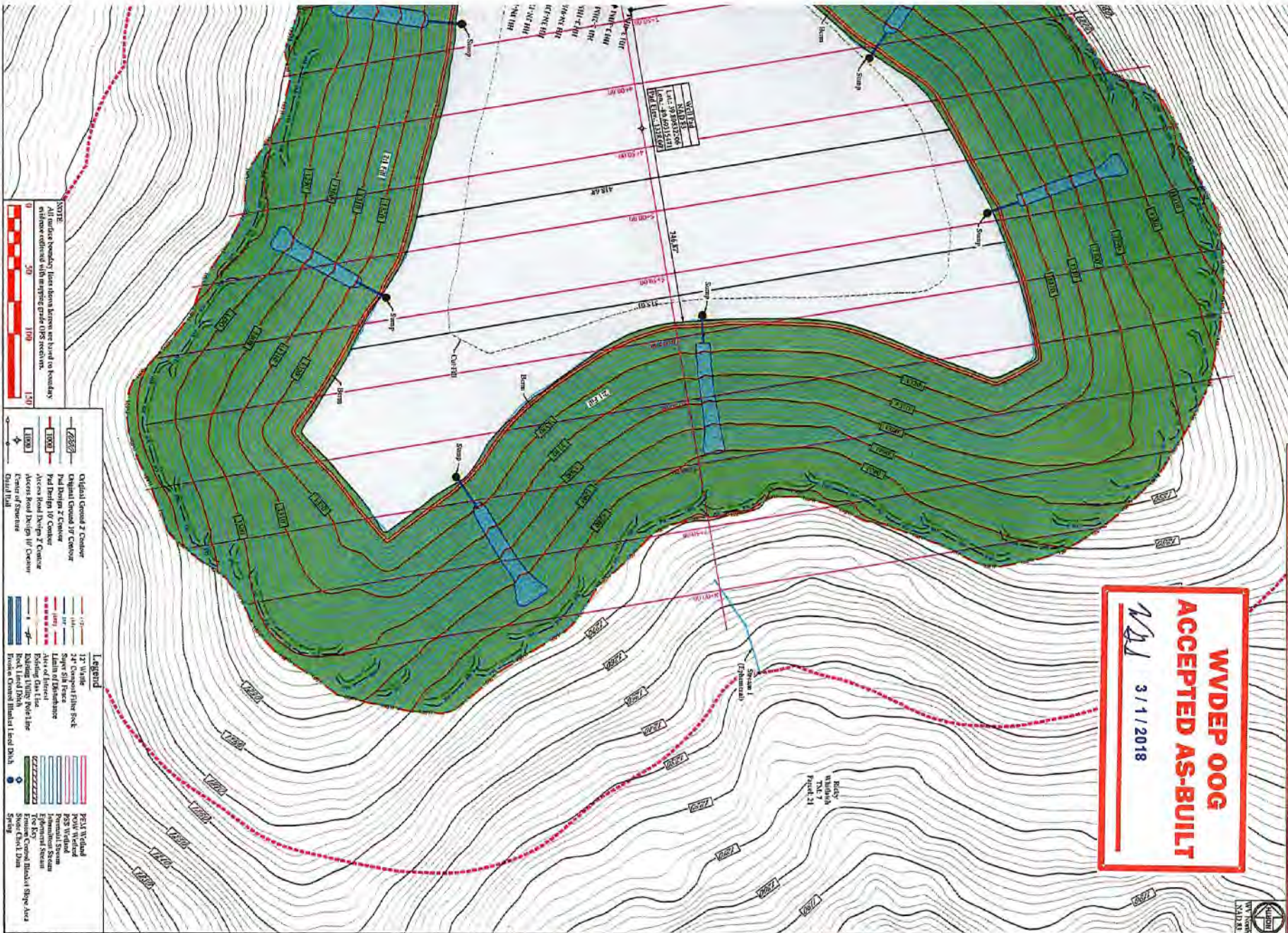
Kyle Smead
 Professional Engineer
 State of West Virginia
 License No. 22214

THIS DOCUMENT
 PREPARED FOR
 TUG HILL
 OPERATING

Date	Revision
02-24-2017	Design
03-24-2017	Design: Access Road Modification
02-13-2018	As-Built

Heaven Hill 3 Site
Tug Hill Operating
Exhibit A: As-Built

WVDEP 00G
ACCEPTED AS-BUILT
3/1/2018



NSR
All feature boundary lines shown herein are based on boundary evidence reflected with an existing grade (1/25 feet).

- Older Road 3 Center
- Older Road 2 Center
- Older Road 1 Center
- Proposed Road 3 Center
- Proposed Road 2 Center
- Proposed Road 1 Center
- Proposed Road 4 Center
- Proposed Road 5 Center
- Proposed Road 6 Center
- Proposed Road 7 Center
- Proposed Road 8 Center
- Proposed Road 9 Center
- Proposed Road 10 Center
- Proposed Road 11 Center
- Proposed Road 12 Center
- Proposed Road 13 Center
- Proposed Road 14 Center
- Proposed Road 15 Center
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- Proposed Road 100 Center

- 1" Water
- 2" Concrete Pipe Rock
- 3" Concrete Pipe
- 4" Concrete Pipe
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- 12" Concrete Pipe
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- 978" Concrete Pipe
- 984" Concrete Pipe
- 990" Concrete Pipe
- 996" Concrete Pipe
- 1002" Concrete Pipe

Site Plan
Heaven Hill 3 Site
Meade District
Marshall County, WV

Kelly Surveying
Professional Surveyors
1000 1/2 West 10th Street
Martinsburg, WV 26150
304-263-1111

THIS DOCUMENT
PREPARED FOR
TUG HILL
OPERATING



TUG HILL
OPERATING

Date	Revision
02-24-2017	Design
03-24-2017	Design: Access Road Modification
02-13-2018	As-Built

Date: 02/13/2018
Scale: As Shown
Designed By: JS
File No:
Sheet 10 of 14

WW-6A7
(6-12)

OPERATOR: Tug Hill Operating, LLC WELL NO: Heaven Hill 3N-13HM

PAD NAME: Heaven Hill 3

REVIEWED BY: Amy L. Miller SIGNATURE: *Amy Miller*

WELL RESTRICTIONS CHECKLIST

HORIZONTAL 6A WELL

Well Restrictions

- At Least 100 Feet from Pad and LOD (including any E&S Control Feature) to any Perennial Stream, Lake, Pond, Reservoir or Wetland; OR
 DEP Waiver and Permit Conditions
- At Least 300 Feet from Pad and LOD (including any E&S Control Feature) to any Naturally Producing Trout Stream; OR
 DEP Waiver and Permit Conditions
- At Least 1000 Feet from Pad and LOD (including any E&S Control Feature) to any Groundwater Intake or Public Water Supply; OR
 DEP Waiver and Permit Conditions
- At Least 250 Feet from an Existing Water Well or Developed Spring to Well Being Drilled; OR
 Surface Owner Waiver and Recorded with County Clerk, OR
 DEP Variance and Permit Conditions
- At Least 625 Feet from an Occupied Dwelling Structure to Center of the Pad; OR
 Surface Owner Waiver and Recorded with County Clerk, OR
 DEP Variance and Permit Conditions
- At Least 625 Feet from Agricultural Buildings Larger than 2500 Square Feet to the Center of the Pad; OR
 Surface Owner Waiver and Recorded with County Clerk, OR
 DEP Variance and Permit Conditions

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Office of Oil and Gas
FEB 18 2020

WV Department of
Environmental Protection

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FEB 14 2020

WV Department of
Environmental Protection