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west virginia department of environmental protection

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

Jim Justice , Governor  
Austin Caperton , Cabinet Secretary  
www.dep.wv.gov

Thursday, May 04, 2017  
WELL WORK PERMIT  
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC (A)  
1320 SOUTH UNIVERSITY DRIVE, SUITE 500

FORT WORTH , TX 76107

Re: Permit approval for HEAVEN HILL UNIT 2-1HM  
47-051-01918-00-00

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 UNIT 2-1HM  
Farm Name: CHARLES R. HAGEDORN, JR., ET UX  
U.S. WELL NUMBER: 47-051-01918-00-00  
Horizontal 6A / New Drill  
Date Issued: 5/4/2017

Promoting a healthy environment.

05/05/2017

# PERMIT CONDITIONS

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

## CONDITIONS

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

## PERMIT CONDITIONS

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



WW-6B  
(04/15)

4705101918

API NO. 47-051 -  
OPERATOR WELL NO. Heaven Hill Unit 2-1HM  
Well Pad Name: Heaven Hill Unit 2

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 Unit 2-1HM Well Pad Name: Heaven Hill Unit 2

3) Farm Name/Surface Owner: Charles R. Hagedorn, Jr., et ux Public Road Access: Blake Ridge Rd (Co. Rt. 21/3)

4) Elevation, current ground: 1350' Elevation, proposed post-construction: 1331'

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

(b) If Gas Shallow  Deep   
Horizontal

*ju 2/9/17*

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus is the target formation at a depth of 6727 - 6779' thickness of 52' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,879'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 16,507'

11) Proposed Horizontal Leg Length: 9,045'

12) Approximate Fresh Water Strata Depths: 70', 1066'

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: 2167'

15) Approximate Coal Seam Depths: Sewickly Coal - 969' and Pittsburgh Coal - 1059'

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: 1059' TVD and 300' subsea level  
Seam: Pittsburgh #8  
Owner: Murray Energy / Consolidated Coal Co.

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**FEB 13 2017**

4705101918

WW-6B  
(04/15)

API NO. 47- 051 -  
OPERATOR WELL NO. Heaven Hill Unit 2-1HM  
Well Pad Name: Heaven Hill Unit 2

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	125'	120'	338FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	48#	1,130'	1,120'	1142ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	1,130'	1,120'	1142ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,815'	2,805'	897ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	15,517'	16,507'	3717ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,662'	
Liners							

*ju* 2/19/17

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 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)

API NO. 47-051 -  
OPERATOR WELL NO. Heaven Hill Unit 2-1HM  
Well Pad Name: Heaven Hill Unit 2

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 22,612,500 lb proppant and 619,152 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 32.98

22) Area to be disturbed for well pad only, less access road (acres): 4.57

23) Describe centralizer placement for each casing string:

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

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

Sfc - Premium NE-1 + 2% CaCl; Int1 - Premium NE-1 + 1.5% CaCL + Flake; Int2 - Lead: Premium NE-1 +5% BA-90 + .85% R-3 + 3% KCl + .75 gals/100sk FP-13L + 1% MPA-170 Tail: Premium NE-1 + .1% R-3 + 5% KCl + 1% CD-32 + .4% FL-52 + .2% ASA-301 + .6% Sodium Metasilicate; Kick Plug - Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100 sk FP-13L; Prod - Lead: 50:50 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .75 gal/100sk FP-13L Tail: 25:75 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .375 gal/100sk FP-13L  
\*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.

**Conductor and Surface Casing Cement:**

*Premium NE-1 + 2% CaCl*

- Premium NE-1 – Class A Portland API Spec
- CaCl – Calcium Chloride

**Intermediate Casing:**

*Premium NE-1 + 1.5% CaCl + Flake*

- Premium NE-1 – Class A Portland API spec
- CaCl – Calcium Chloride
- CelloFlake

**Intermediate Casing 2:**

Lead: *Premium NE-1 + 5% BA-90 + .85% R-3 + 3% KCl + .75 gals/100sk FP-13L + 1% MPA-170*

Tail: *Premium NE-1 + .1% R-3 + 5% KCl + 1% CD-32 + .4% FL-52 + .2% ASA-301 + .6% Sodium Metasilicate*

- Premium NE-1 – Class A Portland API spec
- BA-90 – Gas Migration Mitigator
- R-3 – Cement Retarder
- KCl – Potassium Chloride
- FP-13L – Anti-Foaming Agent
- MPA-170 – Gelling Agent
- CD-32 – Dispersant
- FL-52 – Fluid Loss Agent
- ASA-301 – Free Water Control Agent
- Sodium Metasilicate – Extending Agent

**Kick Off Plug:**

*Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L*

- CD-32 – Dispersant
- Sodium Metasilicate – Extending Agent
- R-3 – Cement Retarder
- FP-13L – Anti-Foaming Agent

**Production Casing Cement:**

Lead: *50:50 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .75 gal/100sk FP-13L*

Tail: *25:75 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .375 gal/100sk FP-13L*

- R-3 – Cement Retarder
- MPA-250 – Gelling Agent
- FP-13L – Anti-Foaming Agent

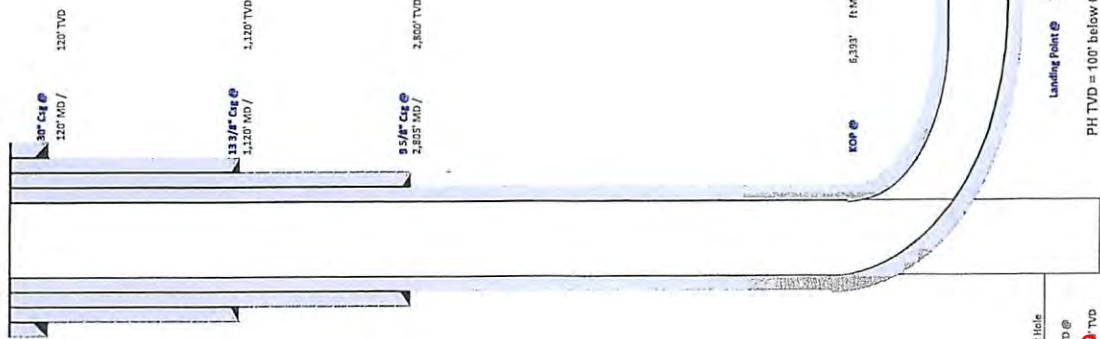
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WELL NAME: Heaven Hill 2-1HM  
 STATE: West Virginia COUNTY: Marshall  
 DISTRICT: Meade  
 DE Elev: 1,359' GL Elev: 1,331'  
 TD: 16,507'  
 TH Latitude: 39.8101215  
 TH Longitude: -80.7158414  
 BH Latitude: 39.79172  
 BH Longitude: -80.693316



Formation	Depth TVD
Deepest Fresh Water	1688
Sewickley Coal	959
Pittsburgh Coal	1059
Big Lime	2053
Weir	2489
Berea	2587
Gordon	2949
Rhinestreet	6071
Genesee/Burkett	6615
Tully	6920
Hemlock	8551
Marcellus	6727
Landing Depth	6750
Onondaga	6779
Photo Depth	6879

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	17.5	13 3/8	1,120'	1,120'	48	H40	Surface
Intermediate 1	22 1/4	9 5/8	2,805'	2,800'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	16,507'	6,908'	20	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Secks	Gras	Density	Fluid Type	Centralizer Notes	
Conductor	A	15.6	Alr	None	
Surface	A	15.6	Alr	3 Centralizers at equal distance	
Intermediate 1	A	15	Alr	1 Centralizer every other ft	
Production	A	14.5	Alr / 300M	1 every other joint in lateral; 1 per joint in curve; 1 every other ft to etc	

*Handwritten signature/initials*

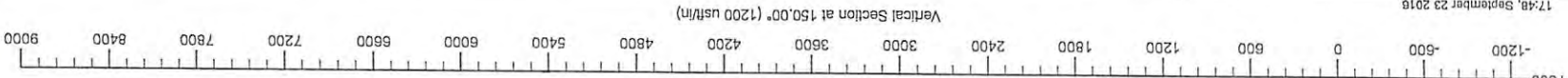
Lateral TD @ 15,507' ft MD  
6,808' ft TVD



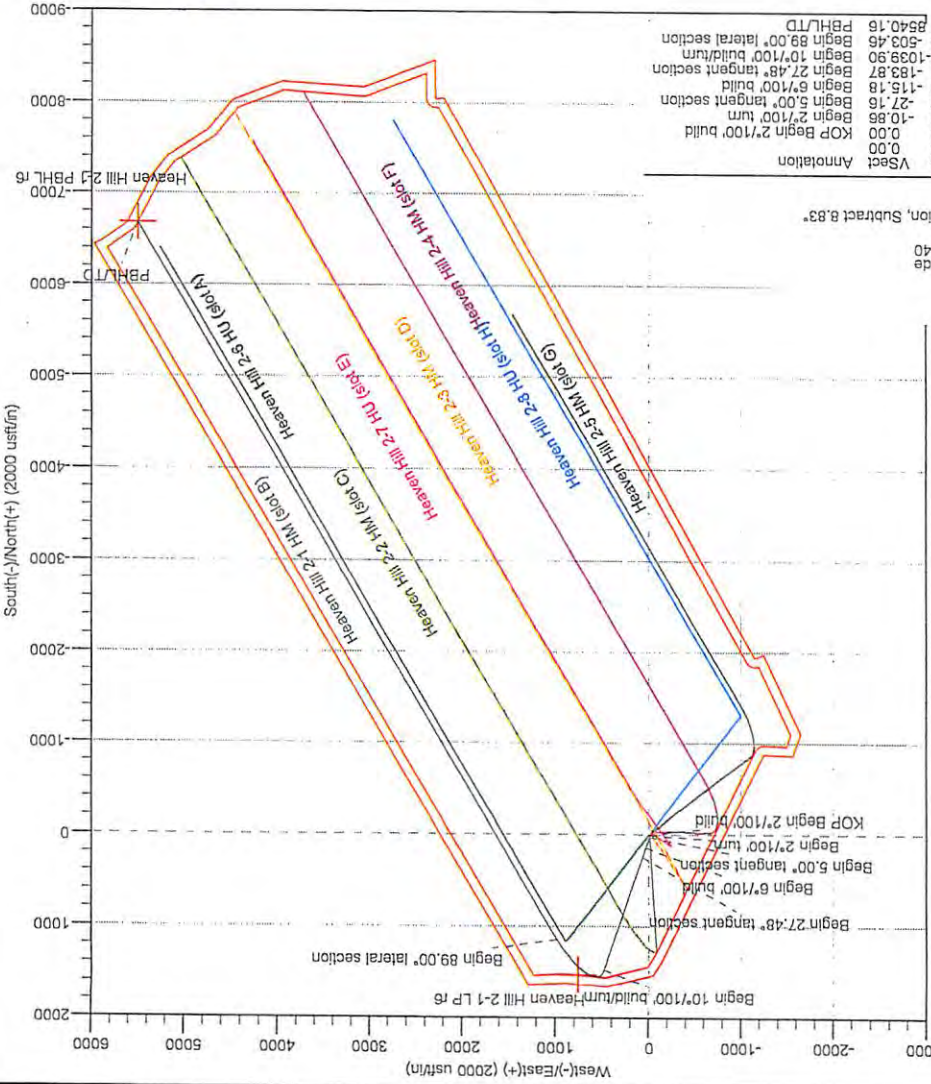
4705101918



Azimuths to Grid North  
 True North: -0.18°  
 Magnetic North: -8.83°  
 Magnetic Field  
 Strength: 52340.45nT  
 Dip Angle: 67.08°  
 Date: 1/18/2018  
 Model: IGRF2015



17:48, September 23 2018



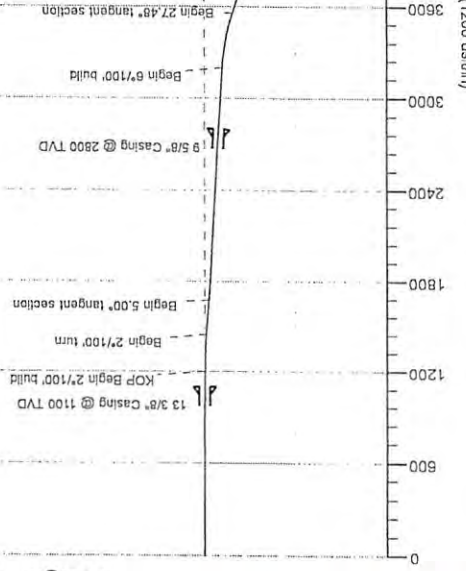
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dlog	TFace	Vsect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2'100" build
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	Begin 2'100" turn
3	1450.00	5.00	325.00	1449.58	8.83	-5.25	2.00	325.00	-10.85	Begin 5.00" tangent section
4	1675.72	5.00	18.73	1674.55	26.31	-8.74	2.00	115.18	-27.16	Begin 2'100" turn
5	3206.89	5.00	18.73	3200.00	152.69	34.11	0.00	115.18	-27.16	Begin 5.00" tangent section
6	3581.53	5.00	18.73	3557.48	251.32	67.56	6.00	0.01	-183.87	Begin 6'100" build
7	6393.95	27.48	18.73	6052.40	1480.46	484.44	0.00	0.00	-1039.90	Begin 10'100" build/turn
8	7481.85	89.00	150.00	6750.14	1149.68	984.38	10.00	128.28	-503.46	Begin 89.00" lateral section
9	16506.85	89.00	150.00	6908.00	-6882.32	5506.19	0.00	0.00	8540.16	PBHLTD

SECTION DETAILS  
 To convert a Magnetic Direction to a Grid Direction, Subtract 8.83°

Surface Location: RKB=133+28 @ 1359.00usft  
 Universal Transverse Mercator (US Survey Feet)  
 Zone 17N (84 W to 78 W)  
 Northing 14457721.56  
 Easting 1721058.07  
 Latitude 39.81012150  
 Longitude -80.71284140

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Tug Hill Operating LLC  
 Well: Heaven Hill 2-1 HM (slot B)  
 Site: Heaven Hill  
 Project: Marshall County, West Virginia  
 Design: rev7



True Vertical Depth (1200 usft/in)





Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2-1 HM (slot B)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Site:</b>	Heaven Hill	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2-1 HM (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev7		

<b>Project</b>	Marshall County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	Heaven Hill				
<b>Site Position:</b>		<b>Northing:</b>	14,457,660.30 usft	<b>Latitude:</b>	39.80995400
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,720,974.97 usft	<b>Longitude:</b>	-80.71313800
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.18 °

<b>Well</b>	Heaven Hill 2-1 HM (slot B)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,457,721.56 usft	<b>Latitude:</b>	39.81012150
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,721,058.07 usft	<b>Longitude:</b>	-80.71284140
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	1,331.00 usft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	1/18/2016	-8.64	67.09	52,348

<b>Design</b>	rev7			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	150.00

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	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,450.00	5.00	325.00	1,449.68	8.93	-6.25	2.00	2.00	0.00	325.00	
1,675.72	5.00	18.73	1,674.66	26.31	-8.74	2.00	0.00	23.80	116.78	
3,206.89	5.00	18.73	3,200.00	152.69	34.11	0.00	0.00	0.00	0.00	
3,581.63	27.48	18.73	3,557.48	251.32	67.56	6.00	6.00	0.00	0.01	
6,393.95	27.48	18.73	6,052.40	1,480.46	484.44	0.00	0.00	0.00	0.00	
7,461.85	89.00	150.00	6,750.14	1,149.68	984.38	10.00	5.76	12.29	128.28	
16,506.85	89.00	150.00	6,908.00	-6,682.32	5,506.19	0.00	0.00	0.00	0.00	Heaven Hill 2-1 PBHL

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Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2-1 HM (slot B)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Site:</b>	Heaven Hill	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2-1 HM (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev7		

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	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
100.00	0.00	0.00	100.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
200.00	0.00	0.00	200.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
300.00	0.00	0.00	300.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
400.00	0.00	0.00	400.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
500.00	0.00	0.00	500.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
600.00	0.00	0.00	600.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
700.00	0.00	0.00	700.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
800.00	0.00	0.00	800.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
900.00	0.00	0.00	900.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,457,721.56	1,721,058.07	39.81012150	-80.71284140
<b>KOP Begin 2°/100' build</b>									
1,300.00	2.00	325.00	1,299.98	1.43	-1.00	14,457,722.99	1,721,057.07	39.81012544	-80.71284495
1,400.00	4.00	325.00	1,399.84	5.72	-4.00	14,457,727.28	1,721,054.06	39.81013724	-80.71285559
1,450.00	5.00	325.00	1,449.68	8.93	-6.25	14,457,730.49	1,721,051.81	39.81014608	-80.71286356
<b>Begin 2°/100' turn</b>									
1,500.00	4.64	336.11	1,499.51	12.56	-8.32	14,457,734.12	1,721,049.75	39.81015607	-80.71287089
1,600.00	4.52	1.33	1,599.20	20.20	-9.87	14,457,741.76	1,721,048.20	39.81017707	-80.71287630
1,675.72	5.00	18.73	1,674.66	26.31	-8.74	14,457,747.87	1,721,049.33	39.81019384	-80.71287221
<b>Begin 5.00° tangent section</b>									
1,700.00	5.00	18.73	1,698.85	28.32	-8.06	14,457,749.88	1,721,050.01	39.81019934	-80.71286977
1,800.00	5.00	18.73	1,798.47	36.57	-5.26	14,457,758.13	1,721,052.81	39.81022198	-80.71285971
1,900.00	5.00	18.73	1,898.09	44.82	-2.46	14,457,766.39	1,721,055.61	39.81024462	-80.71284965
2,000.00	5.00	18.73	1,997.71	53.08	0.34	14,457,774.64	1,721,058.41	39.81026726	-80.71283959
2,100.00	5.00	18.73	2,097.33	61.33	3.14	14,457,782.89	1,721,061.20	39.81028991	-80.71282953
2,200.00	5.00	18.73	2,196.95	69.59	5.94	14,457,791.15	1,721,064.00	39.81031255	-80.71281947
2,300.00	5.00	18.73	2,296.56	77.84	8.73	14,457,799.40	1,721,066.80	39.81033519	-80.71280941
2,400.00	5.00	18.73	2,396.18	86.09	11.53	14,457,807.66	1,721,069.60	39.81035784	-80.71279935
2,500.00	5.00	18.73	2,495.80	94.35	14.33	14,457,815.91	1,721,072.40	39.81038048	-80.71278929
2,600.00	5.00	18.73	2,595.42	102.60	17.13	14,457,824.16	1,721,075.20	39.81040312	-80.71277923
2,700.00	5.00	18.73	2,695.04	110.86	19.93	14,457,832.42	1,721,078.00	39.81042576	-80.71276917
2,800.00	5.00	18.73	2,794.66	119.11	22.73	14,457,840.67	1,721,080.79	39.81044841	-80.71275911
2,900.00	5.00	18.73	2,894.28	127.36	25.53	14,457,848.93	1,721,083.59	39.81047105	-80.71274905
3,000.00	5.00	18.73	2,993.90	135.62	28.32	14,457,857.18	1,721,086.39	39.81049369	-80.71273899
3,100.00	5.00	18.73	3,093.52	143.87	31.12	14,457,865.43	1,721,089.19	39.81051634	-80.71272893
3,200.00	5.00	18.73	3,193.14	152.13	33.92	14,457,873.69	1,721,091.99	39.81053898	-80.71271887
3,206.89	5.00	18.73	3,200.00	152.69	34.11	14,457,874.26	1,721,092.18	39.81054054	-80.71271818
<b>Begin 6°/100' build</b>									
3,300.00	10.59	18.73	3,292.22	164.65	38.17	14,457,886.21	1,721,096.24	39.81057333	-80.71270361
3,400.00	16.59	18.73	3,389.37	186.88	45.71	14,457,908.45	1,721,103.78	39.81063433	-80.71267650
3,500.00	22.59	18.73	3,483.54	218.62	56.47	14,457,940.18	1,721,114.54	39.81072138	-80.71263781
3,581.63	27.48	18.73	3,557.48	251.32	67.56	14,457,972.88	1,721,125.63	39.81081109	-80.71259794
<b>Begin 27.48° tangent section</b>									
3,600.00	27.48	18.73	3,573.78	259.35	70.29	14,457,980.91	1,721,128.35	39.81083312	-80.71258815
3,700.00	27.48	18.73	3,662.49	303.06	85.11	14,458,024.62	1,721,143.18	39.81095302	-80.71253487
3,800.00	27.48	18.73	3,751.21	346.76	99.93	14,458,068.32	1,721,158.00	39.81107291	-80.71248159
3,900.00	27.48	18.73	3,839.92	390.47	114.76	14,458,112.03	1,721,172.82	39.81119281	-80.71242830
4,000.00	27.48	18.73	3,928.63	434.17	129.58	14,458,155.73	1,721,187.65	39.81131271	-80.71237502
4,100.00	27.48	18.73	4,017.35	477.88	144.40	14,458,199.44	1,721,202.47	39.81143260	-80.71232173
4,200.00	27.48	18.73	4,106.06	521.58	159.22	14,458,243.15	1,721,217.29	39.81155250	-80.71226845
4,300.00	27.48	18.73	4,194.77	565.29	174.05	14,458,286.85	1,721,232.11	39.81167239	-80.71221516
4,400.00	27.48	18.73	4,283.49	608.99	188.87	14,458,330.56	1,721,246.94	39.81179229	-80.71216188

Received  
Office of Oil & Gas  
FEB 13 2017



Database: DB Jul2216dt  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Heaven Hill  
 Well: Heaven Hill 2-1 HM (slot B)  
 Wellbore: Original Hole  
 Design: rev7

Local Co-ordinate Reference: Well Heaven Hill 2-1 HM (slot B)  
 TVD Reference: RKB=1331+28 @ 1359.00usft  
 MD Reference: RKB=1331+28 @ 1359.00usft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

Received  
 Office of Oil & Gas  
 FEB 13 2017

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,500.00	27.48	18.73	4,372.20	652.70	203.69	14,458,374.26	1,721,261.76	39.81191218	-80.71210859
4,600.00	27.48	18.73	4,460.92	696.41	218.52	14,458,417.97	1,721,276.58	39.81203208	-80.71205531
4,700.00	27.48	18.73	4,549.63	740.11	233.34	14,458,461.67	1,721,291.41	39.81215197	-80.71200202
4,800.00	27.48	18.73	4,638.34	783.82	248.16	14,458,505.38	1,721,306.23	39.81227187	-80.71194874
4,900.00	27.48	18.73	4,727.06	827.52	262.99	14,458,549.08	1,721,321.05	39.81239176	-80.71189545
5,000.00	27.48	18.73	4,815.77	871.23	277.81	14,458,592.79	1,721,335.88	39.81251166	-80.71184216
5,100.00	27.48	18.73	4,904.48	914.93	292.63	14,458,636.50	1,721,350.70	39.81263155	-80.71178888
5,200.00	27.48	18.73	4,993.20	958.64	307.45	14,458,680.20	1,721,365.52	39.81275145	-80.71173559
5,300.00	27.48	18.73	5,081.91	1,002.34	322.28	14,458,723.91	1,721,380.35	39.81287134	-80.71168230
5,400.00	27.48	18.73	5,170.62	1,046.05	337.10	14,458,767.61	1,721,395.17	39.81299124	-80.71162902
5,500.00	27.48	18.73	5,259.34	1,089.76	351.92	14,458,811.32	1,721,409.99	39.81311113	-80.71157573
5,600.00	27.48	18.73	5,348.05	1,133.46	366.75	14,458,855.02	1,721,424.81	39.81323103	-80.71152244
5,700.00	27.48	18.73	5,436.76	1,177.17	381.57	14,458,898.73	1,721,439.64	39.81335092	-80.71146916
5,800.00	27.48	18.73	5,525.48	1,220.87	396.39	14,458,942.43	1,721,454.46	39.81347082	-80.71141587
5,900.00	27.48	18.73	5,614.19	1,264.58	411.22	14,458,986.14	1,721,469.28	39.81359071	-80.71136258
6,000.00	27.48	18.73	5,702.91	1,308.28	426.04	14,459,029.85	1,721,484.11	39.81371061	-80.71130929
6,100.00	27.48	18.73	5,791.62	1,351.99	440.86	14,459,073.55	1,721,498.93	39.81383050	-80.71125600
6,200.00	27.48	18.73	5,880.33	1,395.69	455.69	14,459,117.26	1,721,513.75	39.81395040	-80.71120272
6,300.00	27.48	18.73	5,969.05	1,439.40	470.51	14,459,160.96	1,721,528.58	39.81407029	-80.71114943
6,393.95	27.48	18.73	6,052.40	1,480.46	484.44	14,459,202.03	1,721,542.50	39.81418294	-80.71109936
<b>Begin 10°/100' build/turn</b>									
6,400.00	27.11	19.78	6,057.77	1,483.08	485.35	14,459,204.64	1,721,543.42	39.81419012	-80.71109608
6,500.00	22.39	41.02	6,148.74	1,518.99	505.61	14,459,240.55	1,721,563.68	39.81428855	-80.71102350
6,600.00	21.41	67.92	6,241.75	1,540.27	535.10	14,459,261.83	1,721,593.17	39.81434674	-80.71091825
6,700.00	24.62	92.36	6,333.99	1,546.29	572.92	14,459,267.85	1,721,630.99	39.81436293	-80.71078350
6,800.00	30.73	109.55	6,422.65	1,536.86	617.92	14,459,258.42	1,721,675.99	39.81433663	-80.71062336
6,900.00	38.37	120.99	6,505.04	1,512.26	668.73	14,459,233.83	1,721,726.80	39.81426864	-80.71044270
7,000.00	46.80	128.98	6,578.65	1,473.25	723.81	14,459,194.81	1,721,781.88	39.81416101	-80.71024699
7,100.00	55.65	134.98	6,641.25	1,421.01	781.49	14,459,142.57	1,721,839.56	39.81401703	-80.71004220
7,200.00	64.73	139.82	6,690.93	1,357.13	840.01	14,459,088.69	1,721,898.08	39.81384106	-80.70983453
7,300.00	73.95	143.97	6,726.19	1,283.54	897.60	14,459,005.10	1,721,955.67	39.81363846	-80.70963031
7,400.00	83.24	147.75	6,745.96	1,202.48	952.50	14,458,924.05	1,722,010.57	39.81341538	-80.70943574
7,461.85	89.00	150.00	6,750.14	1,149.68	984.38	14,458,871.24	1,722,042.45	39.81327009	-80.70932282
<b>Begin 89.00° lateral section</b>									
7,500.00	89.00	150.00	6,750.81	1,116.65	1,003.46	14,458,838.21	1,722,061.52	39.81317920	-80.70925529
7,600.00	89.00	150.00	6,752.55	1,030.06	1,053.45	14,458,751.62	1,722,111.51	39.81294096	-80.70907827
7,700.00	89.00	150.00	6,754.30	943.47	1,103.44	14,458,665.03	1,722,161.51	39.81270272	-80.70890124
7,800.00	89.00	150.00	6,756.04	856.88	1,153.43	14,458,578.44	1,722,211.50	39.81246447	-80.70872422
7,900.00	89.00	150.00	6,757.79	770.29	1,203.42	14,458,491.85	1,722,261.49	39.81222623	-80.70854720
8,000.00	89.00	150.00	6,759.54	683.70	1,253.42	14,458,405.26	1,722,311.48	39.81198799	-80.70837019
8,100.00	89.00	150.00	6,761.28	597.11	1,303.41	14,458,318.67	1,722,361.48	39.81174974	-80.70819317
8,200.00	89.00	150.00	6,763.03	510.52	1,353.40	14,458,232.09	1,722,411.47	39.81151150	-80.70801615
8,300.00	89.00	150.00	6,764.77	423.93	1,403.39	14,458,145.50	1,722,461.46	39.81127326	-80.70783914
8,400.00	89.00	150.00	6,766.52	337.35	1,453.39	14,458,058.91	1,722,511.45	39.81103501	-80.70766213
8,500.00	89.00	150.00	6,768.26	250.76	1,503.38	14,457,972.32	1,722,561.45	39.81079677	-80.70748512
8,600.00	89.00	150.00	6,770.01	164.17	1,553.37	14,457,885.73	1,722,611.44	39.81055852	-80.70730810
8,700.00	89.00	150.00	6,771.75	77.58	1,603.36	14,457,799.14	1,722,661.43	39.81032028	-80.70713110
8,800.00	89.00	150.00	6,773.50	-9.01	1,653.36	14,457,712.55	1,722,711.42	39.81008203	-80.70695409
8,900.00	89.00	150.00	6,775.24	-95.60	1,703.35	14,457,625.96	1,722,761.42	39.80984379	-80.70677708
9,000.00	89.00	150.00	6,776.99	-182.19	1,753.34	14,457,539.37	1,722,811.41	39.80960554	-80.70660007
9,100.00	89.00	150.00	6,778.73	-268.78	1,803.33	14,457,452.78	1,722,861.40	39.80936730	-80.70642307
9,200.00	89.00	150.00	6,780.48	-355.37	1,853.33	14,457,366.19	1,722,911.39	39.80912905	-80.70624607
9,300.00	89.00	150.00	6,782.22	-441.96	1,903.32	14,457,279.60	1,722,961.39	39.80889080	-80.70606907
9,400.00	89.00	150.00	6,783.97	-528.55	1,953.31	14,457,193.01	1,723,011.38	39.80865256	-80.70589206





Planning Report - Geographic

Received  
Office of Oil & Gas  
FEB 13 2017

Database: DB Jul2216dt  
Company: Tug Hill Operating LLC  
Project: Marshall County, West Virginia  
Site: Heaven Hill  
Well: Heaven Hill 2-1 HM (slot B)  
Wellbore: Original Hole  
Design: rev7

Local Co-ordinate Reference: Well Heaven Hill 2-1 HM (slot B)  
TVD Reference: RKB=1331+28 @ 1359.00usft  
MD Reference: RKB=1331+28 @ 1359.00usft  
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
9,500.00	89.00	150.00	6,785.71	-615.14	2,003.30	14,457,106.42	1,723,061.37	39.80841431	-80.70571506
9,600.00	89.00	150.00	6,787.46	-701.73	2,053.30	14,457,019.83	1,723,111.36	39.80817606	-80.70553807
9,700.00	89.00	150.00	6,789.20	-788.32	2,103.29	14,456,933.25	1,723,161.36	39.80793781	-80.70536107
9,800.00	89.00	150.00	6,790.95	-874.91	2,153.28	14,456,846.66	1,723,211.35	39.80769957	-80.70518407
9,900.00	89.00	150.00	6,792.69	-961.50	2,203.27	14,456,760.07	1,723,261.34	39.80746132	-80.70500708
10,000.00	89.00	150.00	6,794.44	-1,048.08	2,253.26	14,456,673.48	1,723,311.33	39.80722307	-80.70483008
10,100.00	89.00	150.00	6,796.19	-1,134.67	2,303.26	14,456,586.89	1,723,361.32	39.80698482	-80.70465309
10,200.00	89.00	150.00	6,797.93	-1,221.26	2,353.25	14,456,500.30	1,723,411.32	39.80674657	-80.70447610
10,300.00	89.00	150.00	6,799.68	-1,307.85	2,403.24	14,456,413.71	1,723,461.31	39.80650832	-80.70429911
10,400.00	89.00	150.00	6,801.42	-1,394.44	2,453.23	14,456,327.12	1,723,511.30	39.80627007	-80.70412212
10,500.00	89.00	150.00	6,803.17	-1,481.03	2,503.23	14,456,240.53	1,723,561.29	39.80603182	-80.70394514
10,600.00	89.00	150.00	6,804.91	-1,567.62	2,553.22	14,456,153.94	1,723,611.29	39.80579357	-80.70376815
10,700.00	89.00	150.00	6,806.66	-1,654.21	2,603.21	14,456,067.35	1,723,661.28	39.80555532	-80.70359116
10,800.00	89.00	150.00	6,808.40	-1,740.80	2,653.20	14,455,980.76	1,723,711.27	39.80531707	-80.70341418
10,900.00	89.00	150.00	6,810.15	-1,827.39	2,703.20	14,455,894.17	1,723,761.26	39.80507882	-80.70323720
11,000.00	89.00	150.00	6,811.89	-1,913.98	2,753.19	14,455,807.58	1,723,811.26	39.80484057	-80.70306022
11,100.00	89.00	150.00	6,813.64	-2,000.57	2,803.18	14,455,720.99	1,723,861.25	39.80460232	-80.70288324
11,200.00	89.00	150.00	6,815.38	-2,087.16	2,853.17	14,455,634.40	1,723,911.24	39.80436406	-80.70270626
11,300.00	89.00	150.00	6,817.13	-2,173.75	2,903.17	14,455,547.82	1,723,961.23	39.80412581	-80.70252928
11,400.00	89.00	150.00	6,818.87	-2,260.34	2,953.16	14,455,461.23	1,724,011.23	39.80388756	-80.70235230
11,500.00	89.00	150.00	6,820.62	-2,346.92	3,003.15	14,455,374.64	1,724,061.22	39.80364931	-80.70217533
11,600.00	89.00	150.00	6,822.36	-2,433.51	3,053.14	14,455,288.05	1,724,111.21	39.80341105	-80.70199835
11,700.00	89.00	150.00	6,824.11	-2,520.10	3,103.14	14,455,201.46	1,724,161.20	39.80317280	-80.70182138
11,800.00	89.00	150.00	6,825.85	-2,606.69	3,153.13	14,455,114.87	1,724,211.20	39.80293455	-80.70164441
11,900.00	89.00	150.00	6,827.60	-2,693.28	3,203.12	14,455,028.28	1,724,261.19	39.80269629	-80.70146744
12,000.00	89.00	150.00	6,829.34	-2,779.87	3,253.11	14,454,941.69	1,724,311.18	39.80245804	-80.70129047
12,100.00	89.00	150.00	6,831.09	-2,866.46	3,303.10	14,454,855.10	1,724,361.17	39.80221979	-80.70111350
12,200.00	89.00	150.00	6,832.84	-2,953.05	3,353.10	14,454,768.51	1,724,411.16	39.80198153	-80.70093654
12,300.00	89.00	150.00	6,834.58	-3,039.64	3,403.09	14,454,681.92	1,724,461.16	39.80174328	-80.70075957
12,400.00	89.00	150.00	6,836.33	-3,126.23	3,453.08	14,454,595.33	1,724,511.15	39.80150502	-80.70058261
12,500.00	89.00	150.00	6,838.07	-3,212.82	3,503.07	14,454,508.74	1,724,561.14	39.80126677	-80.70040564
12,600.00	89.00	150.00	6,839.82	-3,299.41	3,553.07	14,454,422.15	1,724,611.13	39.80102851	-80.70022868
12,700.00	89.00	150.00	6,841.56	-3,386.00	3,603.06	14,454,335.56	1,724,661.13	39.80079025	-80.70005172
12,800.00	89.00	150.00	6,843.31	-3,472.59	3,653.05	14,454,248.98	1,724,711.12	39.80055200	-80.69987476
12,900.00	89.00	150.00	6,845.05	-3,559.18	3,703.04	14,454,162.39	1,724,761.11	39.80031374	-80.69969780
13,000.00	89.00	150.00	6,846.80	-3,645.76	3,753.04	14,454,075.80	1,724,811.10	39.80007548	-80.69952085
13,100.00	89.00	150.00	6,848.54	-3,732.35	3,803.03	14,453,989.21	1,724,861.10	39.79983723	-80.69934389
13,200.00	89.00	150.00	6,850.29	-3,818.94	3,853.02	14,453,902.62	1,724,911.09	39.79959897	-80.69916694
13,300.00	89.00	150.00	6,852.03	-3,905.53	3,903.01	14,453,816.03	1,724,961.08	39.79936071	-80.69898998
13,400.00	89.00	150.00	6,853.78	-3,992.12	3,953.01	14,453,729.44	1,725,011.07	39.79912245	-80.69881303
13,500.00	89.00	150.00	6,855.52	-4,078.71	4,003.00	14,453,642.85	1,725,061.07	39.79888420	-80.69863608
13,600.00	89.00	150.00	6,857.27	-4,165.30	4,052.99	14,453,556.26	1,725,111.06	39.79864594	-80.69845913
13,700.00	89.00	150.00	6,859.01	-4,251.89	4,102.98	14,453,469.67	1,725,161.05	39.79840768	-80.69828218
13,800.00	89.00	150.00	6,860.76	-4,338.48	4,152.98	14,453,383.08	1,725,211.04	39.79816942	-80.69810523
13,900.00	89.00	150.00	6,862.50	-4,425.07	4,202.97	14,453,296.49	1,725,261.04	39.79793116	-80.69792829
14,000.00	89.00	150.00	6,864.25	-4,511.66	4,252.96	14,453,209.90	1,725,311.03	39.79769290	-80.69775134
14,100.00	89.00	150.00	6,865.99	-4,598.25	4,302.95	14,453,123.31	1,725,361.02	39.79745464	-80.69757440
14,200.00	89.00	150.00	6,867.74	-4,684.84	4,352.95	14,453,036.72	1,725,411.01	39.79721638	-80.69739746
14,300.00	89.00	150.00	6,869.49	-4,771.43	4,402.94	14,452,950.13	1,725,461.00	39.79697812	-80.69722052
14,400.00	89.00	150.00	6,871.23	-4,858.02	4,452.93	14,452,863.55	1,725,511.00	39.79673986	-80.69704358
14,500.00	89.00	150.00	6,872.98	-4,944.61	4,502.92	14,452,776.96	1,725,561.00	39.79650160	-80.69686664
14,600.00	89.00	150.00	6,874.72	-5,031.19	4,552.91	14,452,690.37	1,725,611.00	39.79626334	-80.69668970
14,700.00	89.00	150.00	6,876.47	-5,117.78	4,602.91	14,452,603.78	1,725,661.00	39.79602508	-80.69651276
14,800.00	89.00	150.00	6,878.21	-5,204.37	4,652.90	14,452,517.19	1,725,711.00	39.79578681	-80.69633583
14,900.00	89.00	150.00	6,879.96	-5,290.96	4,702.89	14,452,430.60	1,725,761.00	39.79554855	-80.69615889





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<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2-1 HM (slot B)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Site:</b>	Heaven Hill	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2-1 HM (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev7		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,000.00	89.00	150.00	6,881.70	-5,377.55	4,752.88	14,452,344.01	1,725,810.95	39.79531029	-80.69598196
15,100.00	89.00	150.00	6,883.45	-5,464.14	4,802.88	14,452,257.42	1,725,860.94	39.79507203	-80.69580503
15,200.00	89.00	150.00	6,885.19	-5,550.73	4,852.87	14,452,170.83	1,725,910.94	39.79483377	-80.69562810
15,300.00	89.00	150.00	6,886.94	-5,637.32	4,902.86	14,452,084.24	1,725,960.93	39.79459550	-80.69545117
15,400.00	89.00	150.00	6,888.68	-5,723.91	4,952.85	14,451,997.65	1,726,010.92	39.79435724	-80.69527424
15,500.00	89.00	150.00	6,890.43	-5,810.50	5,002.85	14,451,911.06	1,726,060.91	39.79411897	-80.69509732
15,600.00	89.00	150.00	6,892.17	-5,897.09	5,052.84	14,451,824.47	1,726,110.91	39.79388071	-80.69492039
15,700.00	89.00	150.00	6,893.92	-5,983.68	5,102.83	14,451,737.88	1,726,160.90	39.79364245	-80.69474347
15,800.00	89.00	150.00	6,895.66	-6,070.27	5,152.82	14,451,651.29	1,726,210.89	39.79340418	-80.69456654
15,900.00	89.00	150.00	6,897.41	-6,156.86	5,202.82	14,451,564.71	1,726,260.88	39.79316592	-80.69438962
16,000.00	89.00	150.00	6,899.15	-6,243.45	5,252.81	14,451,478.12	1,726,310.88	39.79292765	-80.69421270
16,100.00	89.00	150.00	6,900.90	-6,330.03	5,302.80	14,451,391.53	1,726,360.87	39.79268939	-80.69403578
16,200.00	89.00	150.00	6,902.64	-6,416.62	5,352.79	14,451,304.94	1,726,410.86	39.79245112	-80.69385887
16,300.00	89.00	150.00	6,904.39	-6,503.21	5,402.79	14,451,218.35	1,726,460.85	39.79221286	-80.69368195
16,400.00	89.00	150.00	6,906.14	-6,589.80	5,452.78	14,451,131.76	1,726,510.84	39.79197459	-80.69350503
16,500.00	89.00	150.00	6,907.88	-6,676.39	5,502.77	14,451,045.17	1,726,560.84	39.79173632	-80.69332812
16,506.85	89.00	150.00	6,908.00	-6,682.32	5,506.19	14,451,039.24	1,726,564.26	39.79172000	-80.69331600

PBHL/TD

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Heaven Hill 2-1 LP r6 - hit/miss target - Shape - Point	0.00	0.00	6,742.00	1,528.00	765.19	14,459,249.56	1,721,823.26	39.81431100	-80.71009900
- plan misses target center by 147.66usft at 7097.77usft MD (6639.99 TVD, 1422.31 N, 780.19 E)									
Heaven Hill 2-1 PBHL r6 - plan hits target center - Point	0.00	0.00	6,908.00	-6,682.32	5,506.19	14,451,039.24	1,726,564.26	39.79172000	-80.69331600

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,100.00	1,100.00	13 3/8" Casing @ 1100 TVD	13-3/8	17-1/2
2,805.36	2,800.00	9 5/8" Casing @ 2800 TVD	9-5/8	12-1/4

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
1,200.00	1,200.00	0.00	0.00	KOP Begin 2°/100' build
1,450.00	1,449.68	8.93	-6.25	Begin 2°/100' turn
1,675.72	1,674.66	26.31	-8.74	Begin 5.00° tangent section
3,206.89	3,200.00	152.69	34.11	Begin 6°/100' build
3,581.63	3,557.48	251.32	67.56	Begin 27.48° tangent section
6,393.95	6,052.40	1,480.46	484.44	Begin 10°/100' build/turn
7,461.85	6,750.14	1,149.68	984.38	Begin 89.00° lateral section
16,506.85	6,908.00	-6,682.32	5,506.19	PBHL/TD

**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](mailto:dducoeur@dpslandservices.com) DPS GIS (12/19/2016) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

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

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

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

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Page 1 of 3




Permit well - Heaven Hill Unit 2-1HM  
 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

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Comments
4705140021	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely, Appears to be CBM drill hole/sample hole. Old well, records are incomplete



**"Pipeline"**

Select County: (051) Marshall

Enter Permit #: 40021

Select datatypes:  (Check All)

Location  Production  Plugging

Owner/Completion  Stratigraphy  Sample

Pay/ShowWater  Logs  Btm Hole Loc

[Table Descriptions](#)

[County Code Translations](#)

[Permit Numbering Series](#)

[Usage Notes](#)

[Contact Information](#)

[Disclaimer](#)

[WVGES Main](#)

["Pipeline Plus" New](#)

WV Geological & Economic Survey:

Well: County = 51 Permit = 40021

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705140021	Marshall	40021	Meade	Glen Easton	Cameron	39.814125	-80.709634	524835.6	4407167.5

There is no Bottom Hole Location data for this well

There is no Owner/Completion data for this well

There is no Owner/Completion data for this well

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

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV	DATUM
4705140021	Original Loc	Pittsburgh coal	CBM: Drill Hole	840	Reasonable	7	Reasonable	1163	unknown

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

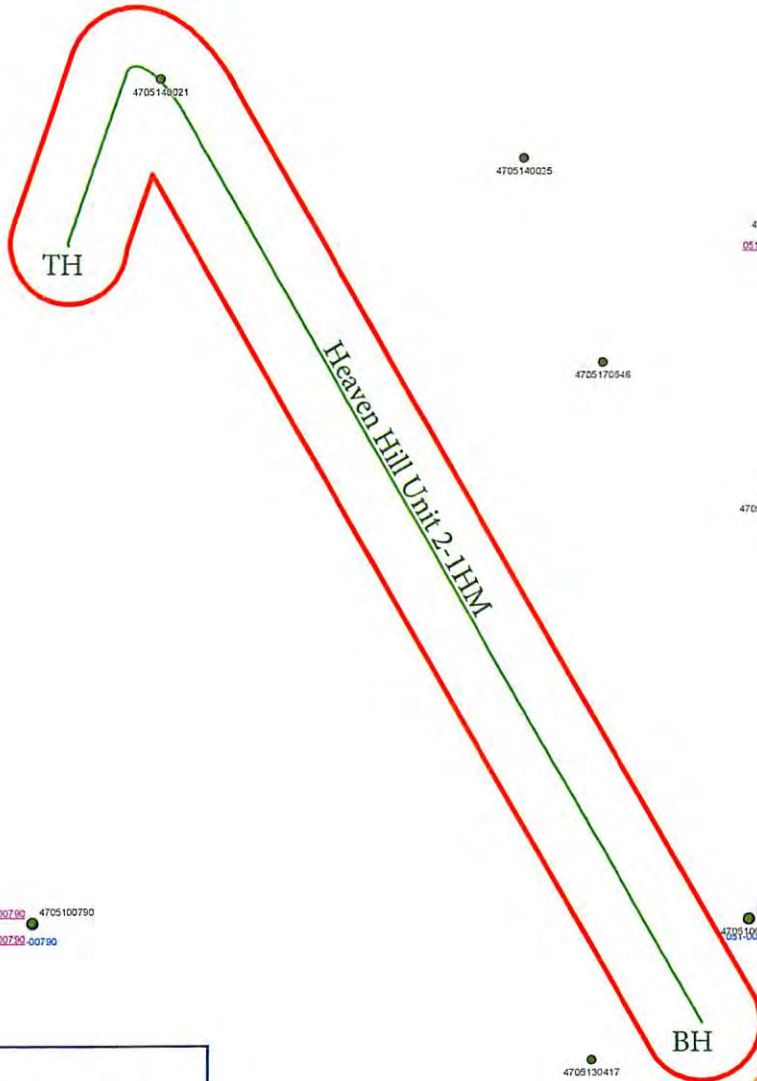
5.11. Area of Review-- The permittee shall review the area surrounding the proposed well pad so as to identify and evaluate potential conduits for unintended fracture propagation, a report of which the permittee shall provide to the Office with the application for well work. All existing active, plugged, abandoned, and undocumented wells within a five hundred feet (500') radius of the surface location of the well that is the subject of the new application and within a five hundred feet (500') radius of the lateral section of the wellbore shall be considered for the potential of unintended fracture propagation. The report shall detail those wells that are known or reasonably expected to penetrate a depth that could be within the range of the fracture propagation. The detail shall include at a minimum the API number, operator name, total depth, perforated formation(s) and producing zones not perforated.

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4705101918

MEADE  
MARSHALL



**Legend**

- Well Locations (ims.wvgs.wvnet.edu)
- Well Locations (www.dep.wv.gov)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Heaven Hill 2-1 HM
- 500 Ft Buffer
- COUNTIES
- DISTRICTS

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Heaven Hill Unit 2-1HM  
Meade District  
Marshall County, WV



Map Created: December 19, 2016  
Map Current As Of: December 19, 2016

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



WW-9  
(4/16)

API Number 47 - \_\_\_\_\_  
Operator's Well No. Heaven Hill Unit 2-114M

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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 casing

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 Wetzel County Sanitary Landfill

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WW0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1986426)

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

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

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

Company Official Signature [Signature]

Company Official (Typed Name) David Patterson

Company Official Title Senior Vice President, Operations

Subscribed and sworn before me this 3rd day of February, 20 17

[Signature]  
Sara Beth Benavidez

My commission expires 2-4-18

Notary Public



Sara Beth Benavidez  
Notary Public  
State of Texas  
My Comm. Exp. 02-04-2018

05/05/2017



Form WW-9

Operator's Well No. Heaven Hill Unit 2-1HM

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 32.98 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

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Seed Mixtures

Temporary

Permanent

Seed Type	lbs/acre
Annual Ryegrass	40

Seed Type	lbs/acre
Orchard Grass	10
Ladino Clover	3

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Jim Nicholas

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

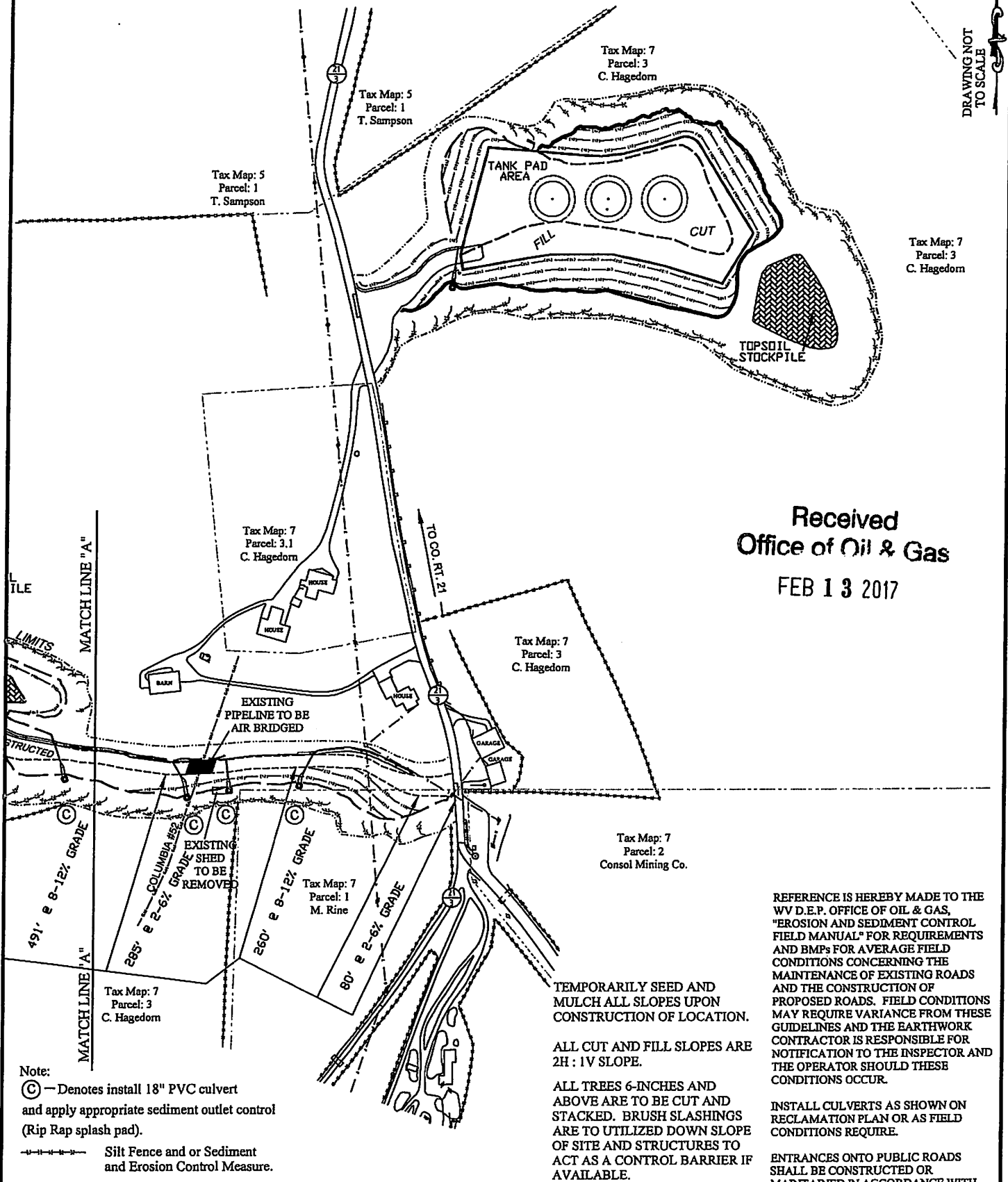
Title: Oil & Gas Inspector Date: 2/9/17

Field Reviewed? (  ) Yes (  ) No

WW-9

**PROPOSED  
HEAVEN HILL UNIT 2-1HM**

SUPPLEMENT PG 1-A



DRAWING NOT TO SCALE

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Note:  
 (C) — Denotes install 18" PVC culvert and apply appropriate sediment outlet control (Rip Rap splash pad).  
 - - - - - Silt Fence and or Sediment and Erosion Control Measure.

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.  
 ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.  
 ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.

REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.  
 ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

DATE: 12/13/16	PROJECT NO: W0160328	DRAWN BY: J.N.W.
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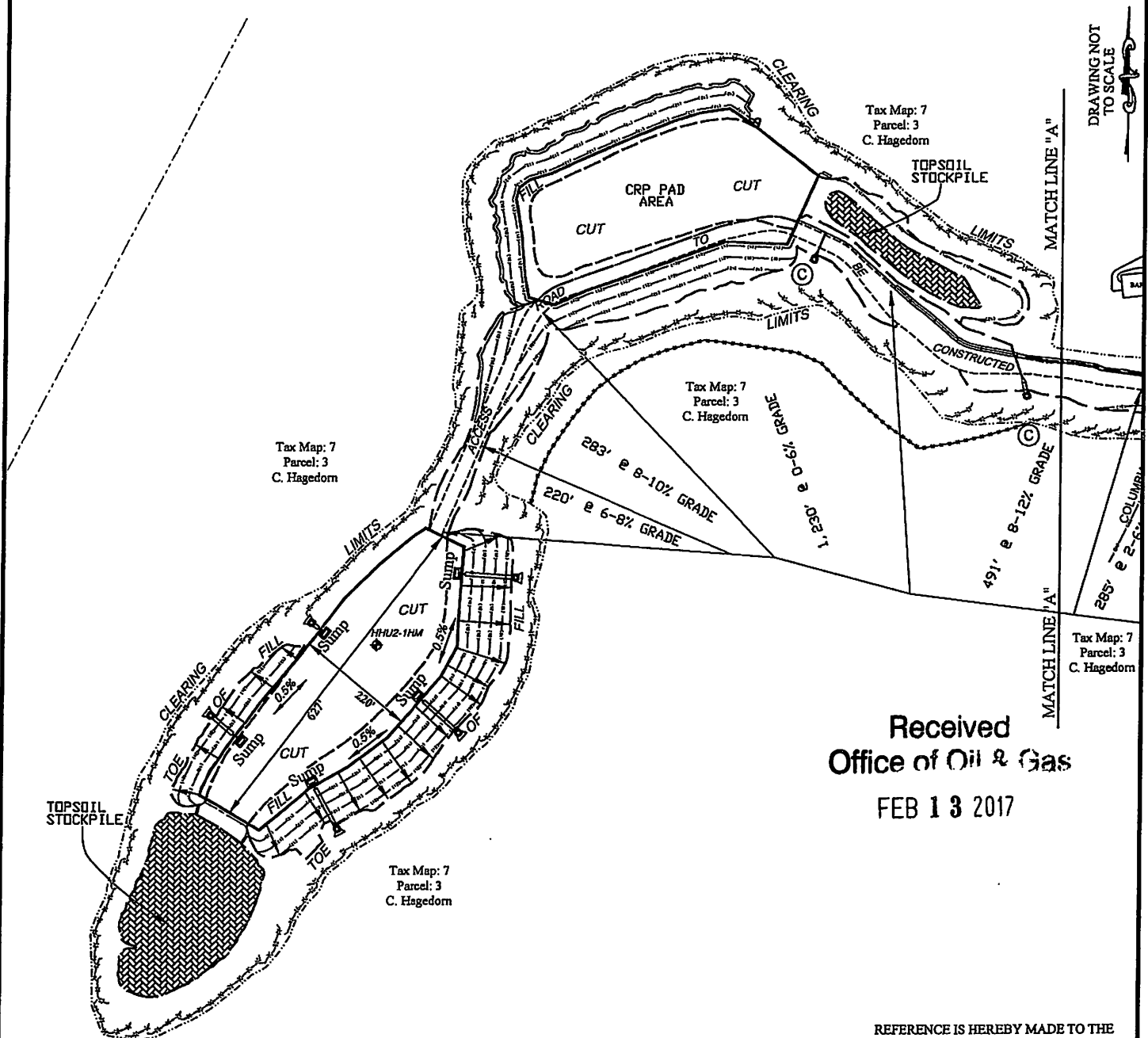
05/05/2017



WW-9

**PROPOSED  
HEAVEN HILL UNIT 2-1 HM**

SUPPLEMENT PG 1-B



DRAWING NOT TO SCALE

MATCH LINE "A"

Received  
Office of Oil & Gas

FEB 13 2017

Note:  
 (C) — Denotes install 18" PVC culvert and apply appropriate sediment outlet control (Rip Rap splash pad).  
 - - - - - Silt Fence and or Sediment and Erosion Control Measure.

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

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

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

REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

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

ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

DATE: 12/13//16

PROJECT NO: W0160328

DRAWN BY: J.N.W.

05/05/2017

4705101918



# Well Site Safety Plan

## Tug Hill Operating, LLC

*ju*  
2/9/17

Well Name: Heaven Hill Unit 2-1HM

Pad Name: Heaven Hill Unit 2

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:  
Northing: 4,406,722.35  
Easting: 524,579.55

January 2017

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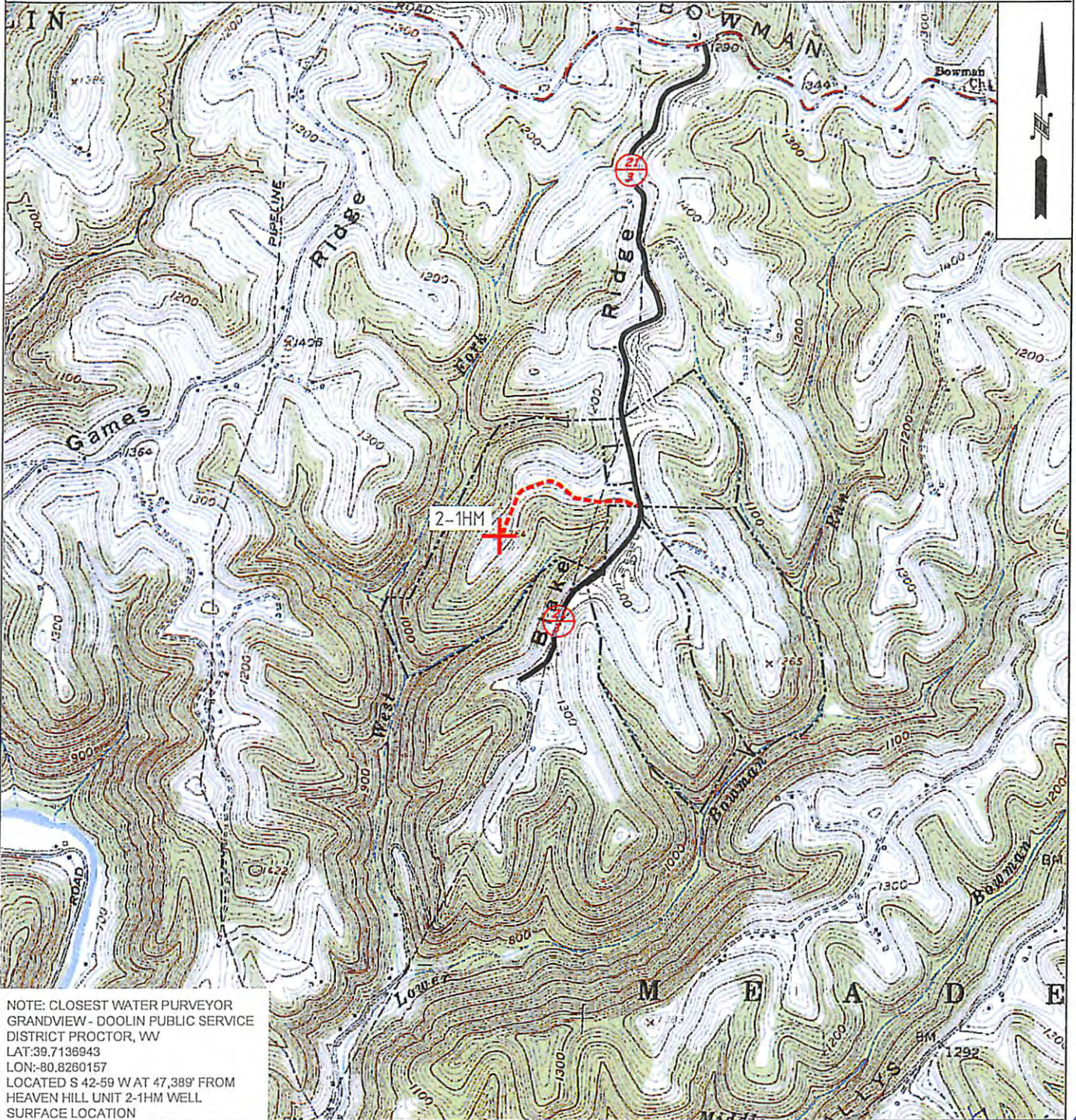
05/05/2017



FEB 13 2017

PROPOSED  
HEAVEN HILL UNIT 2-1HM

4705101918



NOTE: CLOSEST WATER PURVEYOR  
GRANDVIEW - DOOLIN PUBLIC SERVICE  
DISTRICT PROCTOR, WV  
LAT:39.7136943  
LON:-80.8260157  
LOCATED S 42-59 W AT 47,389' FROM  
HEAVEN HILL UNIT 2-1HM WELL  
SURFACE LOCATION



**TUG HILL**  
OPERATING

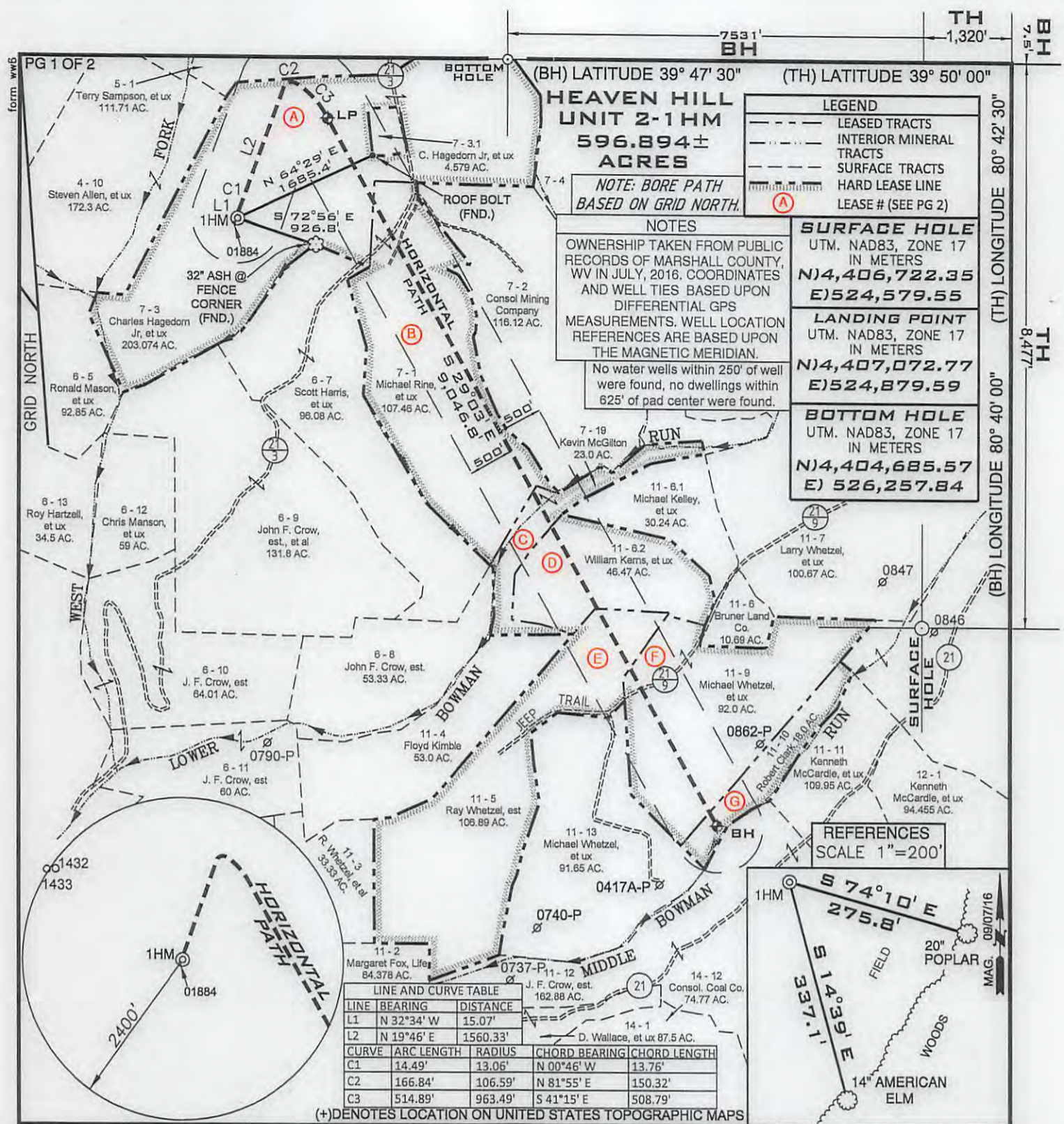
OPERATOR 163-697(CEC)  
TUG HILL OPERATING, LLC  
380 SOUTHPOINTE BLVD  
SUITE 200  
CANONSBURG, PA 15317

TOPO SECTION  
GLEN EASTON 7.5'  
SCALE:  
1" = 2000'

LEASE NAME  
HEAVEN HILL UNIT 2  
DATE:  
DATE: 12/13/16

*Handwritten signature and date: 2/19/17*





FILE NUMBER 163-697  
 DRAWING NUMBER HHU2\_WP\_1HM  
 SCALE 1" = 1500'  
 MINIMUM DEGREE OF ACCURACY 1/2500  
 PROVEN SOURCE OF ELEVATION SUBMETER MAPPING  
GRADE GPS

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

P.S. 2122 *Jonathan N. White*



WVDEP  
 OFFICE OF OIL & GAS  
 601 57TH STREET, SE  
 CHARLESTON, WV 25304



DATE: February 08, 2017  
 OPERATORS WELL NO. Heaven Hill Unit 2-1HM  
 API WELL NO. 47-051-01918  
 STATE WV COUNTY MARSHALL PERMIT 01918

LOCATION ELEVATION 1331' WATERSHED (HUC 10) FISH CREEK  
 DISTRICT MEADE COUNTY MARSHALL  
 QUADRANGLE GLEN EASTON 7.5' LEASE NUMBER SEE ATTACHED PG 2 OF 2

SURFACE OWNER CHARLES R. HAGEDORN, JR., ET UX ACREAGE 203.074  
 OIL & GAS ROYALTY OWNER CHARLES R. HAGEDORN, JR., ET AL LEASE ACREAGE 596.894  
 PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION   
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_\_\_

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 6,879' TMD:16,507'  
 WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER  
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

05/05/2017

COPY NAME PERMIT



**HEAVEN HILL UNIT 2-1HM  
WELL PLAT LEASE INFORMATION**

Lease No.	Tag	Parcel	Oil & Gas Royalty Owner	Deed	
				Book/Pg	
10*15505	A	9-7-3	RALPH E. WELLMAN	686	412
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	722	281
10*15608	A	9-7-3	CHARLES R HAGEDORN JR	816	423
10*47051.073.1	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	888	618
10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	908	541
10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	878	330
10*15665	B	9-7-1	MICHAEL J RINE ET UX	668	147
10*15667	C	9-7-19	KEVIN E MCGILTON ET UX	850	351
10*15560	D	9-11-6.2	WILLIAM F KERNS ET UX	677	561
10*15669	D	9-11-6.2	EMMA ANDERSON	861	586
10*15670	D	9-11-6.2	GARY M BONAR	861	577
10*15671	D	9-11-6.2	JUDALENE K COLLUMS	861	571
10*15672	D	9-11-6.2	NAOMI HUPP	861	604
10*47051.256.2	D	9-11-6.2	CAROL JEAN ANDERSON	879	299
10*47051.256.3	D	9-11-6.2	BRENDA S DYKHOUSE	881	148
10*47051.256.4	D	9-11-6.2	GLEN A BONAR	881	151
10*47051.256.5	D	9-11-6.2	JERRY W ZIEN AND KATHLEEN E ZIEN	882	530
10*15560	D	9-11-6.2	WILLIAM F KERNS ET UX	677	561
10*15669	D	9-11-6.2	EMMA ANDERSON	861	586
10*15670	D	9-11-6.2	GARY M BONAR	861	577
10*15671	D	9-11-6.2	JUDALENE K COLLUMS	861	571
10*15672	D	9-11-6.2	NAOMI HUPP	861	604
10*47051.256.2	D	9-11-6.2	CAROL JEAN ANDERSON	879	299
10*47051.256.3	D	9-11-6.2	BRENDA S DYKHOUSE	881	148
10*47051.256.4	D	9-11-6.2	GLEN A BONAR	881	151
10*47051.256.5	D	9-11-6.2	JERRY W ZIEN AND KATHLEEN E ZIEN	882	530
10*15584	E	9-11-5	VICKIE MASON	686	239
10*15585	E	9-11-5	SHARON L WHETZEL	687	147
10*15586	E	9-11-5	MARY A SOUTH	690	615
10*15587	E	9-11-5	ROBERT L WHETZEL	690	559
10*15588	E	9-11-5	RAY A WHETZEL JR	693	571
10*15589	E	9-11-5	MARK L WHETZEL	693	576
10*47051.108.1	E	9-11-5	MICHAEL A WHETZEL	885	51
10*47051.108.5	E	9-11-5	BRENDA J WHETZEL	885	55
10*47051.108.1	F	9-11-9	MICHAEL A WHETZEL	885	51
10*15582	G	9-11-10	ROBERT L CLARK	685	239

05/05/2017

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

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

WW-6A1  
(5/13)

Operator's Well No. Heaven Hill Unit 2-1HM

**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

**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: Jonathan White  
 Its: Regulatory Analyst - Appalachia Region

Received  
Office of Oil & Gas  
FEB 13 2017



4705101918

Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	bed	Book/	Assignment	Assignment	Assignment
10*15505	A	9-7-3	RALPH E. WELLMAN	TH EXPLORATION LLC	1/8+	686	412	N/A	N/A	N/A
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	TRIENERGY HOLDINGS, LLC	1/8+	722	281	Tri Energy to NPAR: 24/196	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15608	A	9-7-3	CHARLES R HAGEDORN JR	CHEVRON USA INC	1/8+	816	423	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.073.1	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	TH EXPLORATION LLC	1/8+	888	618	N/A	N/A	N/A
10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	TH EXPLORATION LLC	1/8+	908	541	N/A	N/A	N/A
10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	TH EXPLORATION LLC	1/8+	878	330	N/A	N/A	N/A
10*15665	B	9-7-1	MICHAEL J RINE ET UX	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	668	147	CME to Stone Energy: 21/288	Stone Energy to Chevron: 33/276	Chevron to Tug Hill: 36/148
10*15667	C	9-7-19	KEVIN E MCGILTON ET UX	CHEVRON USA INC	1/8+	850	351	N/A	N/A	Chevron to Tug Hill: 36/148
10*15560	D	9-11-6.2	WILLIAM F KERNS ET UX	CHESAPEAKE APPALACHIA LLC	1/8+	677	561	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15669	D	9-11-6.2	EMMA ANDERSON	CHEVRON USA INC	1/8+	861	586	N/A	N/A	Chevron to Tug Hill: 36/148
10*15670	D	9-11-6.2	GARY M BONAR	CHEVRON USA INC	1/8+	861	577	N/A	N/A	Chevron to Tug Hill: 36/148
10*15671	D	9-11-6.2	JUDALENE K COLLUMS	CHEVRON USA INC	1/8+	861	571	N/A	N/A	Chevron to Tug Hill: 36/148
10*15672	D	9-11-6.2	NAOMI HUPP	CHEVRON USA INC	1/8+	861	604	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.256.2	D	9-11-6.2	CAROL JEAN ANDERSON	TH EXPLORATION LLC	1/8+	879	299	N/A	N/A	N/A
10*47051.256.3	D	9-11-6.2	BRENDA S DYKHOUSE	TH EXPLORATION LLC	1/8+	881	148	N/A	N/A	N/A
10*47051.256.4	D	9-11-6.2	GLEN A BONAR	TH EXPLORATION LLC	1/8+	881	151	N/A	N/A	N/A
10*47051.256.5	D	9-11-6.2	JERRY W ZIEN AND KATHLEEN E ZIEN	TH EXPLORATION LLC	1/8+	882	530	N/A	N/A	N/A
10*15560	D	9-11-6.2	WILLIAM F KERNS ET UX	CHESAPEAKE APPALACHIA LLC	1/8+	677	561	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15669	D	9-11-6.2	EMMA ANDERSON	CHEVRON USA INC	1/8+	861	586	N/A	N/A	Chevron to Tug Hill: 36/148
10*15670	D	9-11-6.2	GARY M BONAR	CHEVRON USA INC	1/8+	861	577	N/A	N/A	Chevron to Tug Hill: 36/148
10*15671	D	9-11-6.2	JUDALENE K COLLUMS	CHEVRON USA INC	1/8+	861	571	N/A	N/A	Chevron to Tug Hill: 36/148
10*15672	D	9-11-6.2	NAOMI HUPP	CHEVRON USA INC	1/8+	861	604	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.256.2	D	9-11-6.2	CAROL JEAN ANDERSON	TH EXPLORATION LLC	1/8+	879	299	N/A	N/A	N/A
10*47051.256.3	D	9-11-6.2	BRENDA S DYKHOUSE	TH EXPLORATION LLC	1/8+	881	148	N/A	N/A	N/A
10*47051.256.4	D	9-11-6.2	GLEN A BONAR	TH EXPLORATION LLC	1/8+	881	151	N/A	N/A	N/A
10*47051.256.5	D	9-11-6.2	JERRY W ZIEN AND KATHLEEN E ZIEN	TH EXPLORATION LLC	1/8+	882	530	N/A	N/A	N/A
10*15584	E	9-11-5	VICKIE MASON	CHESAPEAKE APPALACHIA LLC	1/8+	686	239	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15585	E	9-11-5	SHARON L WHETZEL	CHESAPEAKE APPALACHIA LLC	1/8+	687	147	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15586	E	9-11-5	MARY A SOUTH	CHESAPEAKE APPALACHIA LLC	1/8+	690	615	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15587	E	9-11-5	ROBERT L WHETZEL	CHESAPEAKE APPALACHIA LLC	1/8+	690	559	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15588	E	9-11-5	RAY A WHETZEL JR	CHESAPEAKE APPALACHIA LLC	1/8+	693	571	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15589	E	9-11-5	MARK L WHETZEL	CHESAPEAKE APPALACHIA LLC	1/8+	693	576	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*47051.108.1	E	9-11-5	MICHAEL A WHETZEL	TH EXPLORATION LLC	1/8+	885	51	N/A	N/A	N/A
10*47051.108.5	E	9-11-5	BRENDA J WHETZEL	TH EXPLORATION LLC	1/8+	885	55	N/A	N/A	N/A
10*47051.108.1	F	9-11-9	MICHAEL A WHETZEL	TH EXPLORATION LLC	1/8+	885	51	N/A	N/A	N/A
10*15582	G	9-11-10	ROBERT L CLARK	CHESAPEAKE APPALACHIA LLC	1/8+	685	239	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148

Received  
Office of Oil & Gas  
FEB 18 2017

AFFIDAVIT

STATE OF TEXAS §
COUNTY OF TARRANT § SS

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

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

FURTHER, AFFIANT SAITH NOT.

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

David D. Kalish
Affiant: David D. Kalish

JURAT

Carroll S Haupt
WETZEL County 10:29:27 AM
Instrument No 212093
Date Recorded 10/20/2016
Document Type AFFID
Pages Recorded 1
Book-Page 119-291
Recording Fee \$5.00
Additional \$6.00

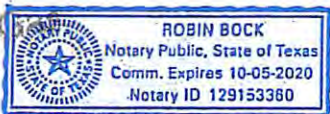
STATE OF TEXAS §
COUNTY OF TARRANT § SS

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

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

My Commission Expires: 10-05-2020
Signature/Notary Public: Robin Bock
Name/Notary Public (Print): Robin Bock

Received
Office of Oil & Gas
FEB 13 2017





4705101918  
AB 24/196

Image Print

Page 2 of 2

INT0024 REC0196

STATE OF WEST VIRGINIA :  
COUNTY OF MARSHALL :

ASSIGNMENT OF  
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

TRIENERGY HOLDINGS, LLC  
412 Beaver Street, 2<sup>nd</sup> floor  
Sowlekey, PA 15143  
("Assignor")

for and in consideration of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby sell, assign, convey, transfer and set over unto:

NPAR, LLC  
6802 W. Snowville Rd., Suite B  
Brooksville, OH 44141  
("Assignee")

A 100% WORKING INTEREST IN AND TO THOSE CERTAIN OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA SET FORTH ON EXHIBIT "A", ATTACHED HERETO AND MADE A PART HEREOF (EACH INDIVIDUALLY A "LEASE" AND COLLECTIVELY THE "LEASES"); BUT EXCEPTING AND RESERVING INTO ASSIGNOR IN AND TO EACH LEASE AN OVERRIDING ROYALTY EQUAL TO THE DIFFERENCE BETWEEN 20% AND THE LESSOR'S ROYALTY PROVIDED IN EACH LEASE, ON A LEASE BY LEASE BASIS IN ALL OIL, GAS, COALBED METHANE GAS AND ASSOCIATED HYDROCARBONS PRODUCED, SAVED AND SOLD FROM THE LEASES, SUBJECT TO A PROPORTIONATE REDUCTION BASED ON PARTIAL LEASEHOLD INTEREST, AS DESCRIBED BELOW.

Assignor's overriding royalty interest reserved hereunder shall be calculated and paid in the same manner as the Lessor's royalty provided for in the subject LEASE. Furthermore, if any LEASE covers less than a full mineral interest in the lands described therein or if Assignor owns less than a full interest in a given LEASE, then Assignor's overriding royalty related thereto shall be proportionately reduced accordingly.

Assignor covenants with and warrants to Assignee, its successors and assigns, that Assignor is the lawful owner of the interests in each LEASE, that Assignor has good and right authority to sell and convey the same, and that the LEASES are free and clear of all encumbrances by, through or under Assignor.

Assignee, by the acceptance of this Assignment, hereby agrees to be bound by and fulfill all of the terms, conditions, limitations and covenants of the each LEASE. Assignor's overriding royalty reserved interest hereunder shall extend to any and all extensions or renewals of each LEASE that may be acquired by Assignee, its successors and assigns.

This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND MADE DULY EFFECTIVE THIS INSTRUMENT THIS 24<sup>th</sup> DAY OF MARCH, 2011.

Witness:

ASSIGNOR  
TRIENERGY HOLDINGS, LLC

Joseph E. Bojalec  
President and Managing Partner

ASSIGNEE

Witness:

*[Handwritten signature]*

AB  
LEGAL  
C-3

NPAR, LLC

Gordon O. Yonck  
Chief Executive Officer

Received  
Office of Oil & Gas  
FEB 13 2017

Pages Omitted

REC-0000000000

ASN 24/430

AP 24/15

BOOK 0024 PAGE 0430  
STATE OF WEST VIRGINIA :  
COUNTY OF MARSHALL :

ASSIGNMENT OF  
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

**TRIENERGY HOLDINGS, LLC**  
412 Beaver Street, 2<sup>nd</sup> floor  
Sewickley, PA 15143  
("Assignor")

for and in consideration of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby sell, assign, convey, transfer and set over unto:

**NPAR, LLC**  
6802 W. Snowville Rd., Suite E  
Brecksville, OH 44141  
("Assignee")

Return

A 100% WORKING INTEREST IN AND TO THOSE CERTAIN OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA SET FORTH ON EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF (EACH INDIVIDUALLY A "LEASE" AND COLLECTIVELY THE "LEASES"); BUT EXCEPTING AND RESERVING UNTO ASSIGNOR IN AND TO EACH LEASE AN OVERRIDING ROYALTY EQUAL TO THE DIFFERENCE BETWEEN 20% AND THE LESSOR'S ROYALTY PROVIDED IN EACH LEASE, ON A LEASE BY LEASE BASIS BUT IN NO EVENT SHALL ASSIGNOR'S OVERRIDING ROYALTY BE GREATER THAN FOUR PERCENT (4% OF 8/8<sup>TH</sup>) OR LESS THAN TWO PERCENT (2% OF 8/8<sup>TH</sup>) IN ALL OIL, GAS, COALBED METHANE GAS AND ASSOCIATED HYDROCARBONS PRODUCED, SAVED AND SOLD FROM THE LEASES, SUBJECT TO A PROPORTIONATE REDUCTION BASED ON PARTIAL LEASEHOLD INTEREST, AS DESCRIBED BELOW.

Assignor's overriding royalty interest reserved hereunder shall be calculated and paid in the same manner as the Lessor's royalty provided for in the subject LEASE. Furthermore, if any LEASE covers less than a full mineral interest in the lands described therein or if Assignor owns less than a full interest in a given LEASE, then Assignor's overriding royalty related thereto shall be proportionately reduced accordingly.

Assignor covenants with and warrants to Assignee, its successors and assigns, that Assignor is the lawful owner of the interests in each LEASE, that Assignor has good and right authority to sell and convey the same, and that the LEASES are free and clear of all encumbrances by, through or under Assignor.

Assignee, by the acceptance of this Assignment, hereby agrees to be bound by and fulfill all of the terms, conditions, limitations and covenants of the each LEASE. Assignor's overriding royalty reserved interest hereunder shall extend to any and all extensions or renewals of each LEASE that may be acquired by Assignee, its successors and assigns.

This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND MADE DULY EFFECTIVE THIS INSTRUMENT THIS 25<sup>TH</sup> DAY OF MAY, 2011.

Witness: 

ASSIGNOR  
  
**TRIENERGY HOLDINGS, LLC**

Joseph E. Bojalad  
President and Managing Partner

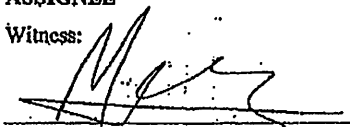
Jan Pest  
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Date Recorded 06/13/2011  
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Book-Page 24-430  
Recording Fee \$25.00  
Additional \$0

Received  
Office of Oil & Gas

FEB 13 2017

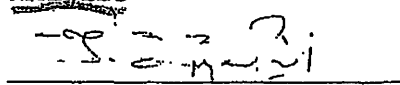
ASSIGNEE

Witness:



ASSIGNEE

**NPAR, LLC**





ASN 25/463  
BOOK 0025 PAGE 0463

STATE OF WEST VIRGINIA :  
:  
COUNTY OF MARSHALL :

ASSIGNMENT OF  
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

TRIENERGY HOLDINGS, LLC  
412 Beaver Street, 2<sup>nd</sup> floor  
Sewickley, PA 15143  
("Assignor")

for and in consideration of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby sell, assign, convey, transfer and set over unto:

NPAR, LLC  
6802 W. Snowville Rd., Suite E  
Brecksville, OH 44141  
("Assignee")

A 100% WORKING INTEREST IN AND TO THOSE CERTAIN OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA SET FORTH ON EXHIBIT "A", ATTACHED HERETO AND MADE A PART HEREOF (EACH INDIVIDUALLY A "LEASE" AND COLLECTIVELY THE "LEASES"); BUT EXCEPTING AND RESERVING UNTO ASSIGNOR IN AND TO EACH LEASE AN OVERRIDING ROYALTY EQUAL TO THE DIFFERENCE BETWEEN 20% AND THE LESSOR'S ROYALTY PROVIDED IN EACH LEASE ON A LEASE BY LEASE BASIS; BUT IN NO EVENT SHALL ASSIGNOR'S OVERRIDING ROYALTY BE GREATER THAN FOUR PERCENT OF 8/8THS (4% OF 8/8<sup>TH</sup>) OR LESS THAN TWO PERCENT OF 8/8THS (2% OF 8/8<sup>TH</sup>) IN ALL OIL, GAS, COALBED METHANE GAS AND ASSOCIATED HYDROCARBONS PRODUCED, SAVED AND SOLD FROM THE LEASES, SUBJECT TO A PROPORTIONATE REDUCTION BASED ON PARTIAL LEASEHOLD INTEREST, AS DESCRIBED BELOW.

Assignor's overriding royalty interest reserved hereunder shall be calculated and paid in the same manner as the Lessor's royalty provided for in the subject LEASE. Furthermore, if any LEASE covers less than a full mineral interest in the lands described therein or if Assignor owns less than a full interest in a given LEASE, then Assignor's overriding royalty related thereto shall be proportionately reduced accordingly.

Assignor covenants with and warrants to Assignee, its successors and assigns, that Assignor is the lawful owner of the interests in each LEASE, that Assignor has good and right authority to sell and convey the same, and that the LEASES are free and clear of all encumbrances by, through or under Assignor.

Assignee, by the acceptance of this Assignment, hereby agrees to be bound by and fulfill all of the terms, conditions, limitations and covenants of the each LEASE. Assignor's overriding royalty interest reserved hereunder shall extend to any and all extensions or renewals of each LEASE that may be acquired by Assignee, its successors and assigns.

This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND MADE DULY EFFECTIVE THIS INSTRUMENT THIS 3rd DAY OF August, 2011.

Witness:

Debra Reed

ASSIGNOR  
TRIENERGY HOLDINGS, LLC

Joseph E. Bojalad  
President and Managing Partner

ASSIGNEE

Witness:

James A. Kei

Jan Post  
MARSHALL County 12:50:36 PM  
Instrument No 1308986  
Date Recorded 08/04/2011  
Document Type ASH  
Pages Recorded 10  
Book-Page 25-463  
Recording Fee \$10.00  
Additional \$7.00

NPAR, LLC

Gordon O. Yonel  
Chief Executive Officer

8/5/2011

TRIENERGY HOLDINGS, LLC  
PO BOX 89  
SEWICKLEY, PA 15143-0089

Received  
Office of Oil & Gas  
FEB 13 2017

★ Pages Omitted

AS/N 25/449

BOOK 0025 PAGE 0449

STATE OF WEST VIRGINIA :  
COUNTY OF MARSHALL :

ASSIGNMENT OF OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

TRIENERGY HOLDINGS, LLC  
412 Beaver Street, 2<sup>nd</sup> floor  
Sewickley, PA 15143  
("Assignor")

for and in consideration of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby sell, assign, convey, transfer and set over unto:

NPAR, LLC  
6802 W. Snowville Rd., Suite E  
Brecksville, OH 44141  
("Assignee")

A 100% WORKING INTEREST IN AND TO THOSE CERTAIN OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA SET FORTH ON EXHIBIT "A," ATTACHED HERETO AND MADE A PART HEREOF (EACH INDIVIDUALLY A "LEASE" AND COLLECTIVELY THE "LEASES"); BUT EXCEPTING AND RESERVING UNTO ASSIGNOR IN AND TO EACH LEASE AN OVERRIDING ROYALTY EQUAL TO THE DIFFERENCE BETWEEN 20% AND THE LESSOR'S ROYALTY PROVIDED IN EACH LEASE ON A LEASE BY LEASE BASIS; BUT IN NO EVENT SHALL ASSIGNOR'S OVERRIDING ROYALTY BE GREATER THAN FOUR PERCENT OF 8/8THS (4% of 8/8<sup>th</sup>) OR LESS THAN TWO PERCENT OF 8/8THS (2% of 8/8<sup>th</sup>) IN ALL OIL, GAS, COALBED METHANE GAS AND ASSOCIATED HYDROCARBONS PRODUCED, SAVED AND SOLD FROM THE LEASES, SUBJECT TO A PROPORTIONATE REDUCTION BASED ON PARTIAL LEASEHOLD INTEREST, AS DESCRIBED BELOW.

Assignor's overriding royalty interest reserved hereunder shall be calculated and paid in the same manner as the Lessor's royalty provided for in the subject LEASE. Furthermore, if any LEASE covers less than a full mineral interest in the lands described therein or if Assignor owns less than a full interest in a given LEASE, then Assignor's overriding royalty related thereto shall be proportionately reduced accordingly.

Assignor covenants with and warrants to Assignee, its successors and assigns, that Assignor is the lawful owner of the interests in each LEASE, that Assignor has good and right authority to sell and convey the same, and that the LEASES are free and clear of all encumbrances by, through or under Assignor.

Assignee, by the acceptance of this Assignment, hereby agrees to be bound by and fulfill all of the terms, conditions, limitations and covenants of the each LEASE. Assignor's overriding royalty interest reserved hereunder shall extend to any and all extensions or renewals of each LEASE that may be acquired by Assignee, its successors and assigns.

This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND MADE DULY EFFECTIVE THIS INSTRUMENT THIS 3rd DAY OF August, 2011.

Witness:

Debra Reid

ASSIGNOR  
TRIENERGY HOLDINGS, LLC

Joseph E. Bojalad  
President and Managing Partner

ASSIGNEE

Witness:

Patricia A. Dier

Jan Pest  
MARSHALL County 12:48:53 PM  
Instrument No 1308985  
Date Recorded 08/04/2011  
Document Type ASN  
Pages Recorded 14  
Book-Page 25-449  
Recording Fee \$16.00  
Additional \$7.00

NPAR, LLC

Gordon O. Yoncl  
Chief Executive Officer

8/3/2011

TRIENERGY HOLDINGS, LLC  
PO BOX 89  
SEWICKLEY, PA 15143-0089

Received  
Office of Oil & Gas  
FEB 13 2017



\* Pages Omitted

BOOK 0756 PAGE 0332

JIM BOURGEOIS LAND SERVICE INC  
11106 BY HAY RD  
CONNEAUT LAKE, PA 16316-3620

Jan, Past  
MARSHALL County 10:52:20 AM  
Instrument No 1317416  
Date Recorded 01/26/2012  
Document Type O&G  
Pages Recorded 65  
Book-Page 756-332  
Recording Fee \$65.00  
Additional \$12.00

MARSHALL COUNTY, WEST VIRGINIA

CONVEYANCE

This Conveyance (this "Conveyance") is dated as of August 5, 2011 (the "Execution Date"), by and between NPAR, LLC, a Delaware limited liability company ("Grantor"), on the one part, and Chevron U.S.A. Inc., a Pennsylvania corporation ("Grantee"), on the other part. Each of Grantor and Grantee are sometimes referred to herein individually as a "Party" and collectively as the "Parties."

Capitalized terms used but not defined herein shall have the respective meanings set forth in that certain Purchase and Sale Agreement (the "PSA"), dated as of July 6, 2011, by and between Grantor and Grantee.

ARTICLE I  
CONVEYANCE

Section 1.1 Conveyance. Subject to the terms and conditions hereof, with effect as of 7:00 a.m., Eastern Time, on April 1, 2011 (the "Effective Date"), Grantor, for and in consideration of the sum of Ten Dollars (\$10.00) cash and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, hereby sells, transfers and conveys unto Grantee, and Grantee hereby accepts from Grantor, all of Grantor's right, title and interest in and to the following (collectively the "Assets"; but excepting and excluding, in all such instances, the Excluded Assets):

(a) All oil and gas leases, oil, gas and mineral leases, subleases and other leaseholds, royalties, overriding royalties, net profits interests, mineral fee interests, carried interests and other rights to Hydrocarbons in place owned by Grantor in the Asset Areas, including those that are identified on Exhibit A-1 (collectively, the "Leases"), subject to the depth limitations and other restrictions that may be set forth in the Leases;

(b) All pooled, communitized or unitized acreage which includes all or a part of any Lease (the "Units"), and all covenants, hereditaments and appurtenances belonging to the Leases and Units;

(c) All oil, gas, water, carbon dioxide or injection wells located on the Leases or Units, whether producing, shut-in or temporarily abandoned, including the interests in the wells shown on Exhibit A-2 (the "Wells");

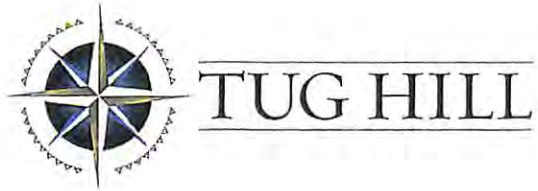
(d) All flowlines, pipelines, gathering systems and appurtenances thereto located on the Leases or Units or used, or held for use, in connection with the operation of the

JIN865779.1

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Office of Oil & Gas

FEB 13 2017

05/05/2017



January 26, 2017

WV Department of Environmental Protection  
Office of Oil & Gas  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304  
Attention: Laura Cooper

RE: Heaven Hill Unit 2-1HM

Subject: County Route 21/3 and County Route 21/9 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 21/3 and County Route 21/9 in the area reflected on the Heaven Hill Unit 2-1HM well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Route and is not currently aware of any recorded document that would suggest an ownership other than THO.

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 304-689-7676, or by email at [Jwhite@tug-hilop.com](mailto:Jwhite@tug-hilop.com).

Sincerely,

A handwritten signature in blue ink that reads "Jonathan White".

Jonathan White  
Regulatory Analyst – Appalachia Region  
Cell 304-689-7676  
Email: [jwhite@tug-hilop.com](mailto:jwhite@tug-hilop.com)

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Office of Oil & Gas  
FEB 13 2017



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

Date of Notice Certification: 02/10/2017

API No. 47- 051 -  
Operator's Well No. Heaven Hill Unit 2-1HM  
Well Pad Name: Heaven Hill Unit 2

**Notice has been given:**

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

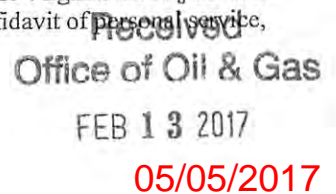
State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>524,579.55</u>
County: <u>Marshall</u>	Northing: <u>4,406,722.35</u>
District: <u>Meade</u>	Public Road Access: <u>Blake Ridge Road (Co. Rt. 21/3)</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Charles R. Hagedorn, Jr., et ux</u>
Watershed: <u>(HUC 10) Fish Creek</u>	

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

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 100px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p><b>OOG OFFICE USE ONLY</b></p> <p><input checked="" type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p>
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**Required Attachments:**

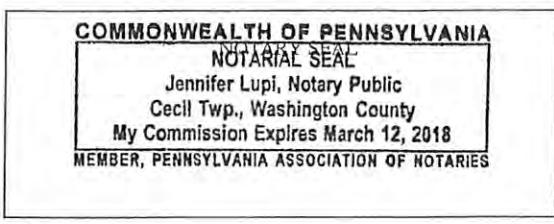
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

  
**Office of Oil & Gas**  
 FEB 13 2017  
 05/05/2017

**Certification of Notice is hereby given:**

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

Well Operator:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Blvd, Southpointe Plaza II, Suite 200</u>
By:	<u>Jonathan White <i>Jonathan White</i></u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Regulatory Analyst - Appalachia</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>724-338-2026</u>	Email:	<u>jwhite tug-hillop.com</u>



Subscribed and sworn before me this 9 day of Feb. 2017.

*Jennifer Lupi* Notary Public

My Commission Expires March 12, 2018

**Oil and Gas Privacy Notice:**

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

Received  
Office of Oil & Gas  
FEB 13 2017



WW-6A  
(9-13)

4705101918

API NO. 47- 051  
OPERATOR WELL NO. Heaven Hill Unit 2-1HM  
Well Pad Name: Heaven Hill Unit 2

**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:** 02/10/2017 **Date Permit Application Filed:** 02/13/2017

**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: Charles R. Hagedorn, Jr., ex ux  
 Address: 78 Hagedorn Drive  
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: Michael J. Rlne, et ux  
 Address: 1466 Blake Ridge Road  
Glen Easton, WV 26039  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
 Name: None  
 Address: \_\_\_\_\_

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

\*Please attach additional forms if necessary

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Office of Oil & Gas

CCD 13 2017

05/05/2017

**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 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

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Office of Oil & Gas

**Well Location Restrictions**

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



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

**Water Well Testing:**

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

**Water Testing Laboratories:**

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

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

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

**Written Comment:**

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

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

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**Office of Oil & Gas**  
**FEB 13 2017**

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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**Notice is hereby given by:**

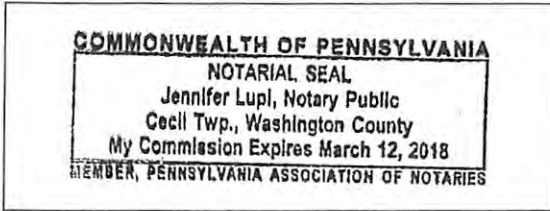
Well Operator: Tug Hill Operating, LLC  
Telephone: 724-338-2026  
Email: jwhite tug-hillop.com

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

**Oil and Gas Privacy Notice:**

*Jonathan White*

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](mailto:depprivacyofficer@wv.gov).



Subscribed and sworn before me this 9<sup>th</sup> day of Feb, 2017.  
Jennifer Lupi Notary Public  
My Commission Expires March 12, 2018

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WW-6A

Supplement Pg. 1A

January 26, 2017  
 Tug Hill Operating, LLC  
 380 Southpointe BLVD  
 Suite 200  
 Canonsburg, PA 15317

## WATER WELL REPORT

Well: Heaven Hill Unit 2-1HM  
 District: Meade  
 County: Marshall  
 State: WV

There appears to be No ( 6 ) possible water sources within 2,000 feet of the above referenced well location.

House 1 TM 07 Par. 3.1 Charles R. Hagedorn Jr., et ux Phone 304-845-7332 78 Hagedorn Rd. Glen Easton, WV 26039	House 2 TM 07 Par. 3.1 Charles R. Hagedorn Jr., et ux Phone 304-845-7332 78 Hagedorn Rd. Glen Easton, WV 26039	House 3 TM 07 Par. 3 Charles R. Hagedorn Jr., et ux Phone 304-845-7332 78 Hagedorn Rd. Glen Easton, WV 26039
House 4 TM 07 Par. 1 Michael Rine, et ux Phone 304-845-4437 1466 Blake Ridge Road Glen Easton, WV 26039	Spring with House 4 TM 07 Par. 1 Michael Rine, et ux Phone 304-845-4437 1466 Blake Ridge Road Glen Easton, WV 26039	House 5 TM 06 Par. 07 Scott & Carolyn Harris Phone 304-845-0747 1944 Blake Ridge Road Glen Easton, WV 26039

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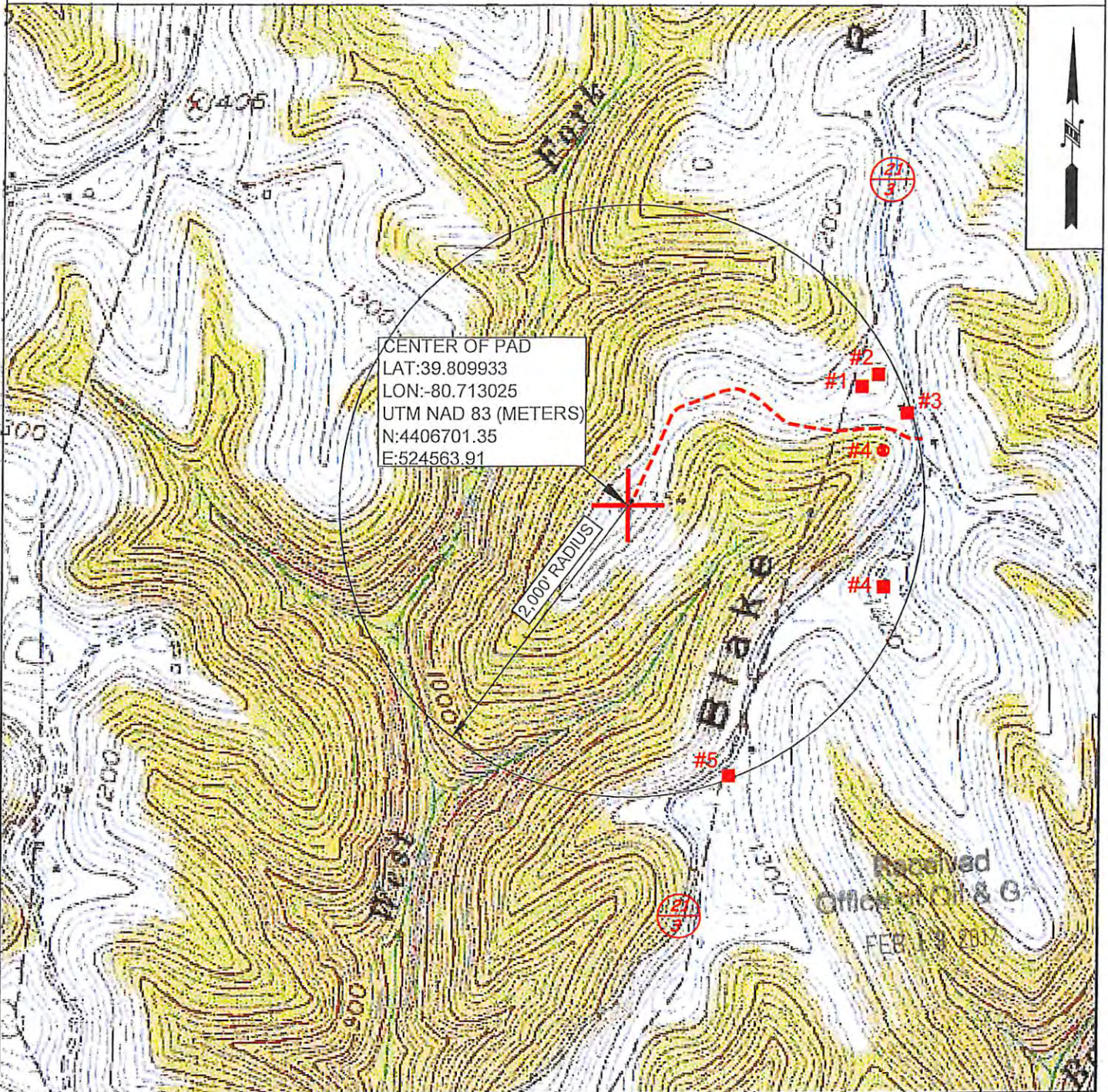



WW-6A

# PROPOSED HEAVEN HILL UNIT 2-1HM

SUPPLEMENT PG 1B

There appear to be ( 6 ) possible water sources within 2,000'.



 <b>TUG HILL OPERATING</b>	OPERATOR	TOPO SECTION	UNIT NAME
	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	GLEN EASTON 7.5'	HEAVEN HILL UNIT 2
	SCALE: 1" = 1000'	DATE: DATE: 12/13/16	



**AGREEMENT**  
**FOR**  
**COAL WAIVER AND CONDITIONAL DRILLING ACTIVITY**

This Agreement, effective this 29<sup>th</sup> day of July, 2016, by and between, CONSOLIDATION COAL COMPANY, a Delaware Corporation, and Murray American Energy, Inc., a Delaware Corporation, both of whose mailing address is 46226 National Road, St. Clairsville, OH 43905, hereinafter collectively referred to as "COMPANY,"

A N D

Tug Hill Operating, a Texas limited liability company, having a place of business at 1320 S. University Drive, Suite 500, Fort Worth, Texas 76107, hereinafter referred to as "TUG HILL." Company and Tug Hill are sometimes referred to herein, collectively, as the "Parties" and, individually, as a "Party."

**PREAMBLE**

WHEREAS, TUG HILL intends to apply to the West Virginia Department of Environmental Protection for a permit to drill gas wells listed in Table 1 on the pad known as the HEAVEN HILL UNIT 2 wells at a location in Meade District, Marshall County, West Virginia; and

WHEREAS, COMPANY through itself and/or any one or more of its affiliates, owns or controls the Pittsburgh #8 seam of coal at the proposed location of the proposed HEAVEN HILL UNIT 2 wells and said wells when drilled will penetrate the Pittsburgh #8 seam of coal; and

WHEREAS, TUG HILL has a regulatory obligation and responsibility to notify coal seam owners of its intent to drill and develop oil/gas wells through such coal seams; and

WHEREAS, TUG HILL has requested COMPANY to sign a WW-6AW Voluntary Statement of No Objection form, which COMPANY is willing to sign subject to the conditions set forth in this Agreement.

NOW, THEREFORE, in consideration of the commitments set forth herein and intending to be legally bound hereby the Parties do hereby agree as follows:

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1. The approved surface locations of the proposed HEAVEN HILL UNIT 2 wells are listed in Table 1 in WV State Plane North NAD 27 coordinate system. The HEAVEN HILL UNIT 2 wells shall only be drilled at these surface locations.

Table 1: Well Locations

Well Name	Northing	Easting
Heaven Hill Unit 2-1HM	479450.81	1659233.08
Heaven Hill Unit 2-2HM	479440.96	1659225.39
Heaven Hill Unit 2-3HM	479431.10	1659217.70
Heaven Hill Unit 2-4HM	479411.39	1659202.33
Heaven Hill Unit 2-5HM	479401.53	1659194.64
Heaven Hill Unit 2-6HU	479460.67	1659240.76
Heaven Hill Unit 2-7HU	479421.25	1659210.01
Heaven Hill Unit 2-8HU	479391.68	1659186.95

2. The proposed HEAVEN HILL UNIT 2 wells are located in an existing interior barrier of the active Marshall County Mine. Hence, the drilling of the proposed HEAVEN HILL UNIT 2 wells shall strictly follow the procedures set forth in the Agreement.
3. COMPANY shall develop procedures and submit well protection pillar permit applications to the applicable coal mining regulatory authorities to secure approval to drill the proposed HEAVEN HILL UNIT 2 near, around, or adjacent to existing mine workings. COMPANY will design the protection pillar to provide a minimum coal barrier of fifty feet (50') from its existing underground mining activities to the location of the active HEAVEN HILL UNIT 2 wells within the Pittsburgh #8 coal seam.
4. COMPANY shall provide TUG HILL with a copy of the procedures and well protection pillar permit applications for TUG HILL's review prior to submittal to the applicable coal mining regulatory agencies.
5. Once all the required approvals are received to drill the proposed HEAVEN HILL UNIT 2 wells near, around, or adjacent to the existing mine workings, TUG HILL may proceed with the drilling of HEAVEN HILL UNIT 2 wells in accordance to the procedures and requirements of this Agreement, provided that TUG HILL shall also comply with any and all requirements applicable to TUG HILL imposed by the coal mining regulatory agencies within the approvals, which procedures and requirements are articulated and contained herein.

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6. TUG HILL agrees that if a coal mining regulatory agency does not approve the proposed well protection pillar permit or the procedures and plans to drill the proposed HEAVEN HILL UNIT 2 wells near, around or adjacent to the existing mine workings, then the Parties will work together to determine an alternative protection pillar permit that meets the coal mining regulatory agency's approval. If the coal mining regulatory agency's approval is not thereafter acquired, then this Agreement is voided and is no longer in effect and COMPANY rescinds its consent to drill the HEAVEN HILL UNIT 2 wells.
7. TUG HILL shall provide COMPANY with written notification at least two (2) weeks prior to the commencement of well drilling activities to provide sufficient time for COMPANY to verify and approve the surveyed location of the proposed wells. TUG HILL and COMPANY shall maintain continued communication during the well drilling process.
8. Once the surveyed surface location is verified, TUG HILL may drill from the surface pad to a depth no closer than twenty feet (20') from the top of the Pittsburgh #8 coal seam.
9. TUG HILL shall then, at its expense, have a well deviation survey conducted in the well boring from the surface to the drilled depth approximately twenty feet (20') above the Pittsburgh #8 coal seam and shall promptly provide the certified results of the deviation survey to COMPANY. The well shall be limited to a total deviation not to exceed one percent (1%) to assure the well boring will penetrate through the Pittsburgh #8 coal seam within the area approved by the coal mining regulatory agencies.
10. TUG HILL shall use water, water sprays, drilling soap or other approved drilling fluids while drilling after the surface casing is installed through the Pittsburgh #8 coal seam and continue drilling with fluids until the steel coal protection casing is effectively installed and cemented in place below the Pittsburgh #8 coal seam in accordance with all rules, regulations, and approvals for the drilling operation.
11. If the drilled well boring is less than or equal to the required one percent (1%) maximum deviation, TUG HILL may proceed with its planned drilling activities in accordance to all applicable laws and regulations. TUG HILL and COMPANY shall continue to maintain communication through the completion of the well drilling and installation processes.
12. If the well boring deviation exceeds one percent (1%), TUG HILL may elect to take measures within the well boring above the coal seam to correct the well drilling deviation to assure the well boring will penetrate through the Pittsburgh #8 coal seam within the required one percent (1%) deviation area. If TUG HILL is unable to make the necessary corrections to limit the well deviation to one percent (1%), TUG HILL shall cease

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drilling activities and, at its expense, grout the well boring completely from the bottom of the well boring to the surface using approved procedures to assure a uniform and complete sealing of the drilled well boring.

13. TUG HILL shall immediately provide all records and certified results of the deviation surveys to COMPANY.
14. COMPANY plans to mine its coal reserve utilizing full extraction techniques to fully mine and remove the entire coal seam in those areas where such mining is planned and COMPANY has acquired the legal property rights and regulatory permits to conduct such mining activities. Full extraction mining causes surface subsidence that may affect surface structures. The mining subsidence may also create lateral stresses within the geologic overburden above the coal seam.
  - a. TUG HILL accepts all responsibility to monitor, maintain, mitigate, and repair all of its facilities including wells, pipelines, compressor stations, all surface facilities, and appurtenant facilities from the effects of subsidence from the underground mining activities of COMPANY.
  - b. TUG HILL shall be solely responsible for all costs and expenses to monitor, maintain, mitigate and repair any and all of its facilities that are constructed and installed after the effective date of this Agreement from the effects of subsidence from the underground mining activities of COMPANY.
  - c. COMPANY and TUG HILL agree to employ the principals of common law property rights (the Party that does not have superior property rights is responsible) for all subsidence related costs and expenses relating to Tug Hill surface facilities that are in place and operational on the effective date of this Agreement. Tug Hill is not responsible for other subsidence related costs.
15. COMPANY and TUG HILL agree to fully cooperate and support each other's permitting and regulatory approval activity. Each Party agrees that it will not object to any permit submittal nor will it appeal any permit approval provided that the terms and conditions of this Agreement are followed.
16. This Agreement shall extend to and be binding upon the heirs, successors, assigns, legal representatives, affiliates and joint venture partners of the Parties hereto. This Agreement and the rights agreed and granted herein are assignable or transferable, in whole or in part by the Parties.

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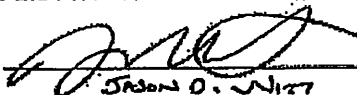
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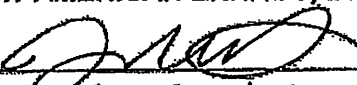
- 17. This Agreement represents the entire understanding of the Parties with respect to the matters referred to herein and supersedes all other understandings, written or oral, between the Parties with respect thereto.
- 18. No amendment, modification, or waiver of any provision of the Agreement shall be valid, unless in writing signed by both Parties.

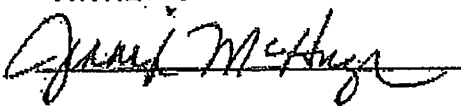
In WITNESS WHEREOF, each of CONSOLIDATION COAL COMPANY, MURRAY AMERICAN ENERGY, INC. and TUG HILL OPERATING has executed this Agreement intending to be legally bound hereby.

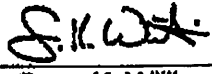
WITNESS:  
  
 \_\_\_\_\_

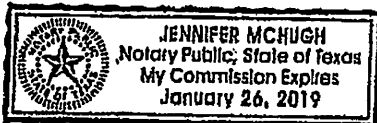
CONSOLIDATION COAL COMPANY  
 By:   
 Name: Jason D. Witt  
 Title: SECRETARY

WITNESS:  
  
 \_\_\_\_\_

MURRAY AMERICAN ENERGY, INC.  
 By:   
 Name: Jason D. Witt  
 Title: SECRETARY

WITNESS:  
  
 \_\_\_\_\_

TUG HILL OPERATING  
 By:   
 Name: Sean K. Willis  
 Title: Vice President



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**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:** April 14, 2016      **Date of Planned Entry:** April 25, 2016

**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: Charles R. Hagedorn  
Address: 78 Hagedorn Drive  
Glen Easton, WV 26039

Name: Michael J. Rine  
Address: 1466 Blake Ridge Road  
Glen Easton, WV 26039

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

COAL OWNER OR LESSEE

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

MINERAL OWNER(s)

Name: JMK Irrevocable Trust  
Address: 600 Texas Street, Suite 101  
Fort Worth, TX 76102

\*please attach additional forms if necessary

**Notice is hereby given:**

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

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>Lat: 39.8099255, Long: -80.7131595</u>
County: <u>Marshall</u>	Public Road Access: <u>Blake Ridge Road (Co. Rt. 21/3)</u>
District: <u>Meade</u>	Watershed: <u>West Fork / HUC-10 Fish Creek</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Charles R. Hagedorn</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> 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](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

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**Notice is hereby given by:**

Well Operator: Tug Hill Operating, LLC

Telephone: 724-338-2026

Email: jwhite@tug-hilltop.com

Address: 380 Southpointe Blvd, 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](mailto:depprivacyofficer@wv.gov).

Operator Well No. Heaven Hill Unit 2-1HM**WW-6A3 Notice of Entry for Plat Survey****Attachment 1 of 1****Mineral Owner(s):**

**Name:** Marcellus TX Minerals Partners, LTD ✓  
**Address:** 5111 Broadway Street  
San Antonio, TX 78209

**Name:** Purpleburgh Ventures, LLC ✓  
**Address:** 600 Texas Street, Suite 101  
Fort Worth, TX 76102

**Name:** Charles R. Hagedorn ✕ ✓  
**Address:** 78 Hagedorn Drive  
Glen Easton, WV 26039

**Name:** Venango 21st Century ✓  
**Address:** 301 Moon Clinton Road  
Moon Township, PA 15108

**Name:** TriEnergy Holdings, LLC ✓  
**Address:** 412 Beaver Street, 2nd Floor  
Sewickley, PA 15143

**Name:** Patriot Restoration ✓  
**Address:** 713 Sycamore Road Extension  
Sewickley, PA 15143

**Name:** Ralph E. Wellman ✓  
**Address:** 1824 4th Street  
Moundsville, WV 26041

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**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:** April 25, 2016      **Date of Planned Entry:** May 04, 2016

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

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

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**Notice is hereby provided to:**

SURFACE OWNER(s)

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Address: 78 Hagedorn Drive  
Glen Easton, WV 26039

Name: Michael J. Rine  
Address: 1466 Blake Ridge Road  
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Name: \_\_\_\_\_  
Address: \_\_\_\_\_

COAL OWNER OR LESSEE

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District: <u>Meade</u>	Watershed: <u>West Fork / HUC-10 Fish Creek</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Charles R. Hagedorn</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> 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](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Notice is hereby given by:**

Well Operator: Tug Hill Operating, LLC  
Telephone: 724-338-2026  
Email: jwhite@tug-hillop.com

Address: 380 Southpointe Blvd, Suite 200  
Canonsburg, PA 15317  
Facsimile: 724-338-2030

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**Oil and Gas Privacy Notice:**

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

Operator Well No. Heaven Hill Unit 2-1HM**WW-6A3 Notice of Entry for Plat Survey****Attachment 1 of 1****Mineral Owner(s):**

**Name:** Marcellus TX Minerals Partners, LTD  
**Address:** 307 W 7<sup>th</sup> St.  
Fort Worth, TX 76102

**Name:** Purpleburgh Ventures, LLC  
**Address:** 306 W 7<sup>th</sup> St.  
Fort Worth, TX 76102

**Name:** Charles R. Hagedorn  
**Address:** 78 Hagedorn Drive  
Glen Easton, WV 26039

**Name:** Venango 21st Century  
**Address:** 301 Moon Clinton Road  
Moon Township, PA 15108

**Name:** TriEnergy Holdings, LLC  
**Address:** 412 Beaver Street, 2nd Floor  
Sewickley, PA 15143

**Name:** Patriot Restoration  
**Address:** 713 Sycamore Road Extension  
Sewickley, PA 15143

**Name:** Ralph E. Wellman  
**Address:** 2209 Bowman Ridge Rd.  
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: 02/10/2017 Date Permit Application Filed: 02/13/2017

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

- CERTIFIED MAIL RETURN RECEIPT REQUESTED
- HAND DELIVERY

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

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: Charles R. Hagedorn, Jr., et ux	Name: Michael J. Rine, et ux
Address: 78 Hagedorn Drive Glen Easton, WV 26039	Address: 1468 Blake Ridge Road Glen Easton, WV 26039

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: West Virginia	UTM NAD 83 Easting: 524,579.55
County: Marshall	Northing: 4,408,722.35
District: Meade	Public Road Access: Blake Ridge Road (Co. Rt. 21/3)
Quadrangle: Glen Easton 7.5'	Generally used farm name: Charles R. Hagedorn, Jr., et ux
Watershed: (HUC 10) Fish Creek	

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 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

Well Operator: Tug Hill Operating, LLC	Address: 380 Southpointe Blvd, Southpointe Plaza II, Suite 200
Telephone: 724-338-2028	Canonsburg, PA 15317
Email: jwhite@tug-hilltop.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](mailto:depprivacyofficer@wv.gov).

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WW-6AW  
(1-12)

API NO. \_\_\_\_\_  
OPERATOR WELL NO. HEAVEN HILLS  
UNIT 2 - IHM  
Well Pad Name: Heaven Hills Unit 2

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
**VOLUNTARY STATEMENT OF NO OBJECTION**

**Instructions to Persons Named on Page WW-6A**

The well operator named on page WW-6A is applying for a permit from the State of West Virginia to conduct oil or gas well work. Well work permits are valid for twenty-four (24) months. Please contact the listed well operator and the Office of Oil and Gas if you do not own any interest in the listed surface tract.

**Comment and Waiver Provisions**

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.

Pursuant to West Virginia Code § 22-6A-8(b) No permit may be issued less than thirty days after the filing date of the application for any well work except plugging or replugging; and no permit for plugging or replugging may be issued less than five days after the filing date of the application except a permit for plugging or replugging a dry hole: *Provided*, That if the applicant certifies that all persons entitled to notice of the application under the provisions of subsection (b), section ten of this article have been served in person or by certified mail, return receipt requested, with a copy of the well work application, including the erosion and sediment control plan, if required, and the well plat, and further files written statements of no objection by all such persons, the secretary may issue the well work permit at any time.

**VOLUNTARY STATEMENT OF NO OBJECTION**

I, Alex O'Neill, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through \_\_\_\_\_, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State: West Virginia East: 1,659,233.08 ft  
County: Marshall North State Plane North: 479,450.81 ft  
District: Meade NAD 27  
Quadrangle: Glen Easton 7.5' Public Road Access: Blake Ridge Road (Co. Rt. 21/3)  
Watershed: (HUC) Fish Creek Generally used farm name: Charles R. Hagedorn, Jr. et ux

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials, **provided that Tug Hill Operating drills the well on West Virginia North State Plane NAD 27 coordinates of North 479,450.81 ft, East 1,659,233.08 ft in accordance with the Agreement between Consolidation Coal Company, Murray American Energy and Tug Hill Operating dated 7/29/16.**

\*Please check the box that applies

- SURFACE OWNER
- SURFACE OWNER (Road and/or Other Disturbance)
- SURFACE OWNER (Impoundments/Pits)
- COAL OWNER OR LESSEE
- COAL OPERATOR
- WATER PURVEYOR
- OPERATOR OF ANY NATURAL GAS STORAGE FIELD

**FOR EXECUTION BY A NATURAL PERSON**

Signature: \_\_\_\_\_  
Print Name: \_\_\_\_\_  
Date: \_\_\_\_\_

**FOR EXECUTION BY A CORPORATION, ETC.**

Company: Consolidation Coal Company  
By: Alex O'Neill  
Its: Coal, Oil & Gas Relations Manager  
Signature: \_\_\_\_\_  
Date: 1/4/2017

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**Oil and Gas Privacy Notice:**

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

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05/05/2017





## WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## Division of Highways

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

Earl Ray Tomblin  
 Governor

Paul A. Mattox, Jr., P. E.  
 Secretary of Transportation/  
 Commissioner of Highways

November 2, 2016

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

Subject: DOH Permit for the Heaven Hills Unit 2 Pad, Marshall County  
 Heaven Hills Unit 2-1HM Well site 47-051-01918

Dear Mr. Martin,

This well site will be accessed from a DOH permits #06-2016-0284 & 0287 which have been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off of Marshall County Route 21/3 SLS.

The 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 January 3, 2012.

Very Truly Yours,

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

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

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# TUG HILL

## PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

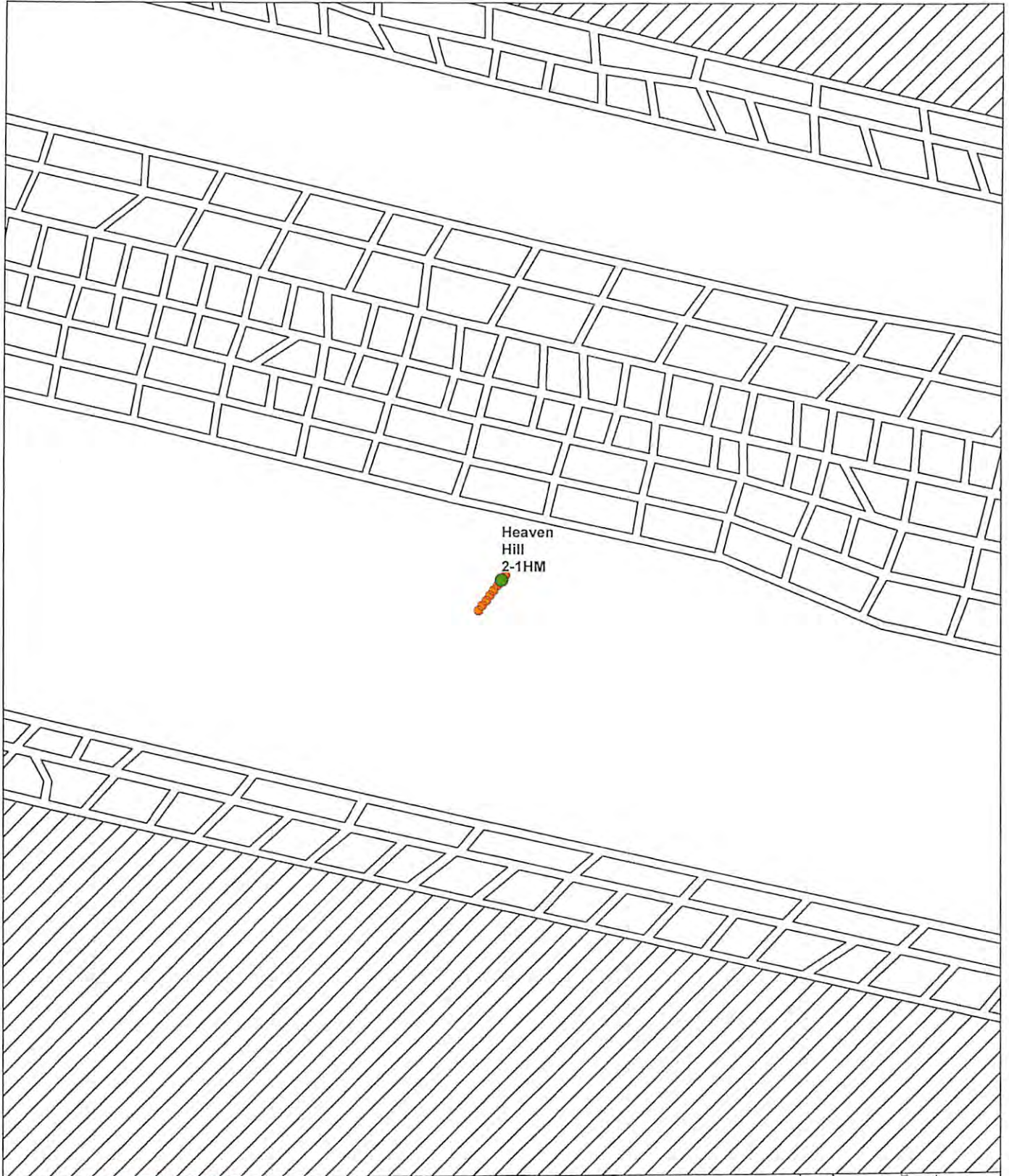
Well No. Heaven Hill Unit 2-1HM

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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Heaven Hill  
2-1HM

**CONFIDENTIAL**

0 0.001 0.01 0.02 0.03 0.04 Miles

**Heaven Hill Unit 2 Pad**  
**Heaven Hill Unit 2-1HM Well Location**  
Received  
Office of Oil & Gas  
FEB 13 2017

Category

- Surface Location
- Murray Mines





4705101918



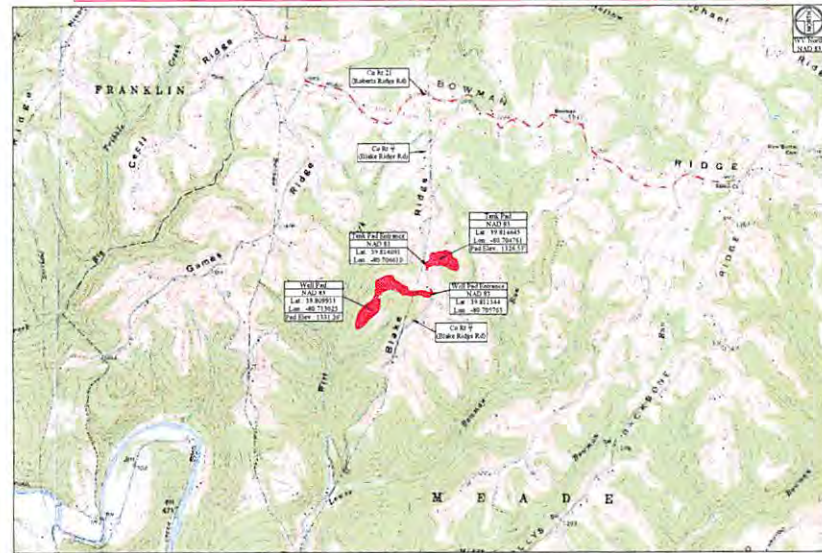
APPROVED WVDEP OOG 11/2/2016

Heaven Hill 2 Site Site Design, Construction Plan, & Erosion and Sediment Control Plans Tug Hill Operating Marshall County Meade District Latitude 39.809933° Longitude -80.713025° Middle Fish Creek Watershed

Pertinent Site Information Heaven Hill 2 Site Emergency Number 304-845-1920 Marshall County Emergency 911 (Moundsville, WV) Meade District, Marshall County, WV Watershed: Middle Fish Creek

Exhibit A: Final Design: Issue for Permitting

Table with columns for Well Pad Site, Center of CRP Pad, Center of Well Pad, and Center of Tank Pad, listing coordinates and elevations for various well pads and tanks.

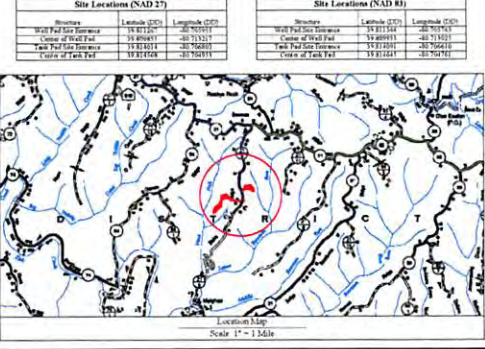


Property Owner Information - Heaven Hill 2 Site. Includes tables for Acres Road, Disturbed Area, and Heaven Hill 2 Site Quantities.

Project Contacts: The Hill Operating, LLC; 182 Sandhollow Blvd; Sandhollow, WV 26041-9917. Also lists environmental and geotechnical consultants.

From Moundsville, WV Head South on State Rt 2 Turn Left onto State Rt 2 Alt (Round Bottom Hill Road) approximately 4 miles south of Moundsville, WV Follow State Rt 2 Alt for 1.5 mi. Turn Right onto Co R 21 (Lansley Lane) Follow Co R 21 for 1.8 mi Turn Right onto Co R 21 (Roberts Ridge Rd) Follow Co R 21 for 1.4 mi. Co R 21 (Roberts Ridge Rd) becomes Co R 21 (Roberts Ridge St Joseph Rd) Follow Co R 21 for 4 mi Turn Left onto Co R 21 (Roberts Ridge Rd) Follow Co R 21 for 1.1 mi. Turn Right onto Co R 21 (Blaker Ridge Rd) Follow Co R 21 for 1.4 mi. The site entrance will be on the Right (West) side of the road.

Site Locations (NAD 27) and Site Locations (NAD 83) tables listing latitude, longitude, and elevation for various well pads and tanks.



Well Location Restrictions: All Pad construction complies with the following restrictions: \*20' from an existing well or developed spring... \*25' from an occupied dwelling... \*100' from the edge of disturbance... \*1000' of a surface or ground water table to a public water supply.

Vertical sidebar containing 'TUG HILL OPERATING' logo, 'THIS DOCUMENT PREPARED FOR TUG HILL OPERATING', 'K&S SURVEYING' logo, and 'Cover Sheet Heaven Hill 2 Site Meade District, Marshall County, WV'.



