



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
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Jim Justice, Governor
Austin Caperton, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
1320 SOUTH UNIVERSITY DRIVE, SUITE 500

FORT WORTH , TX 76107

Re: Permit Modification Approval for HEAVEN HILL UNIT 2-5 HM
47-051-01884-00-00

Extending lateral length and bottom hole location

TUG HILL OPERATING, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before 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 2-5 HM
Farm Name: CHARLES R. HAGEDORN, JR., ET AL
U.S. WELL NUMBER: 47-051-01884-00-00
Horizontal 6A / New Drill
Date Issued: 3/24/2017

Promoting a healthy environment.

03/24/2017

WW-6B
(04/15)

4705101884 *msk*

API NO. 47-051 - 01884
OPERATOR WELL NO. Heaven Hill Unit 2-5HM
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 2-5HM 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 _____

6) Existing Pad: Yes or No No

msk 3/10/17

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6699' - 6751', thickness of 52' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,851'

9) Formation at Total Vertical Depth: Onondoga

10) Proposed Total Measured Depth: 15,084'

11) Proposed Horizontal Leg Length: 7,745'

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.

WW-6B
(04/15)

4705101884 MoD
 API NO. 47- 051 - 01884
 OPERATOR WELL NO. Heaven Hill Unit 2-5HM
 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'	259FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	48#	1,130'	1,120'	1128ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	1,130'	1,120'	1128ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,815'	2,805'	919ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	15,084'	15,084'	3856ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,536'	
Liners	N/A						

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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	1.33
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	8960		
Liners	N/A						

PACKERS

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

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 Dept of Oil and Gas
 MAR 15 2017
 WW Department of
 Environmental Protection

WW-6B
(10/14)

4705101884 ^{Mod}
API NO. 47- 051 - 01884
OPERATOR WELL NO. Heaven Hill Unit 2-5HM
Well Pad Name: Heaven Hill Unit 2

see 3/10/17

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 19,362,500 lb proppant and 299,358 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

*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

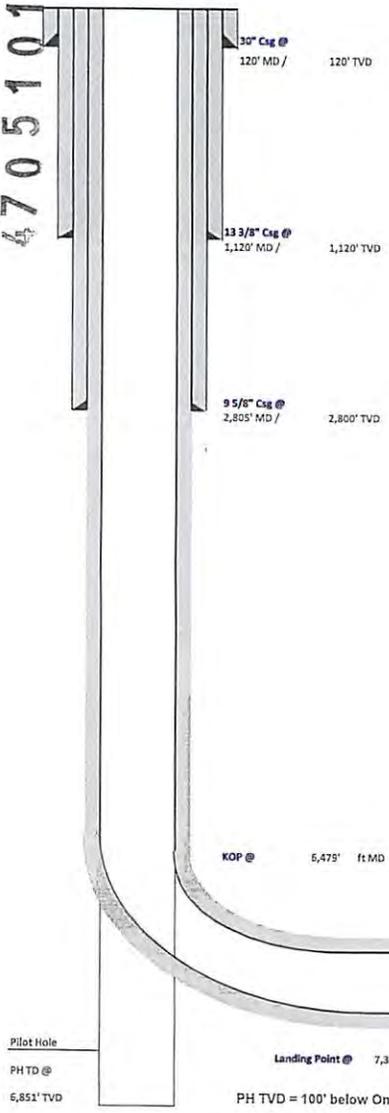
Production Casing Cement:

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

4705101 884 MD



WELL NAME:	Heaven Hill 2_5HM		
STATE:	West Virginia	COUNTY:	Marshall
DISTRICT:	Franklin		
DF Elev:	1,350'	GL Elev:	1,331'
TD:	15,084'		
TH Latitude:	39.809985		
TH Longitude:	-80.712976		
BH Latitude:	39.787743		
BH Longitude:	-80.70267		

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	1066
Sewickley Coal	941
Pittsburgh Coal	1031
Big Lime	2035
Weir	2461
Berea	2659
Gordon	2921
Rhinestreet	6043
Genesee/Burkett	6587
Tully	6592
Hamilton	6625
Marcellus	6699
Landing Depth	6755
Onondaga	6751
Pilot Hole Depth	6851

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	8W	BW	Surface
Surface	17.5	13 3/8	1,120'	1,120'	48	H40	Surface
Intermediate 1	12 1/4	9 5/8	2,805'	2,800'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	15,084'	6,893'	20	P110	Surface

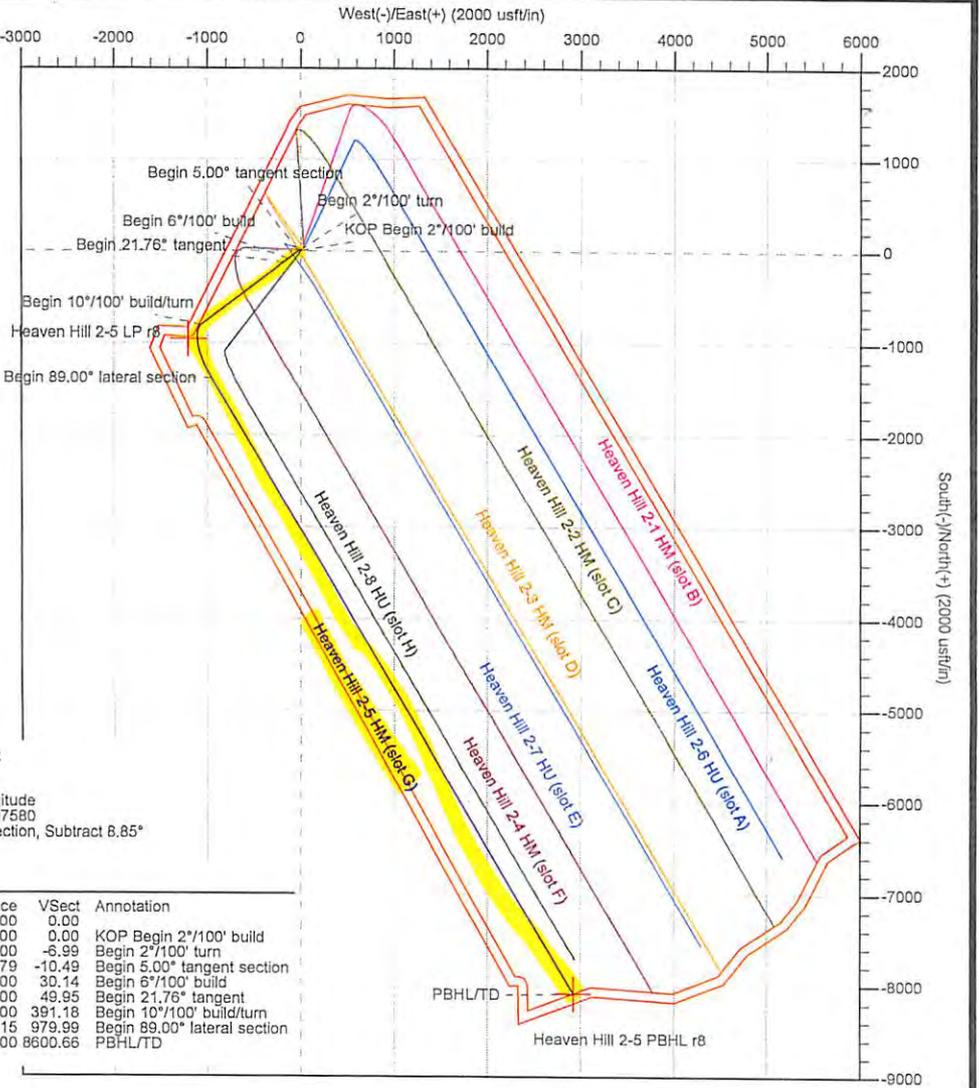
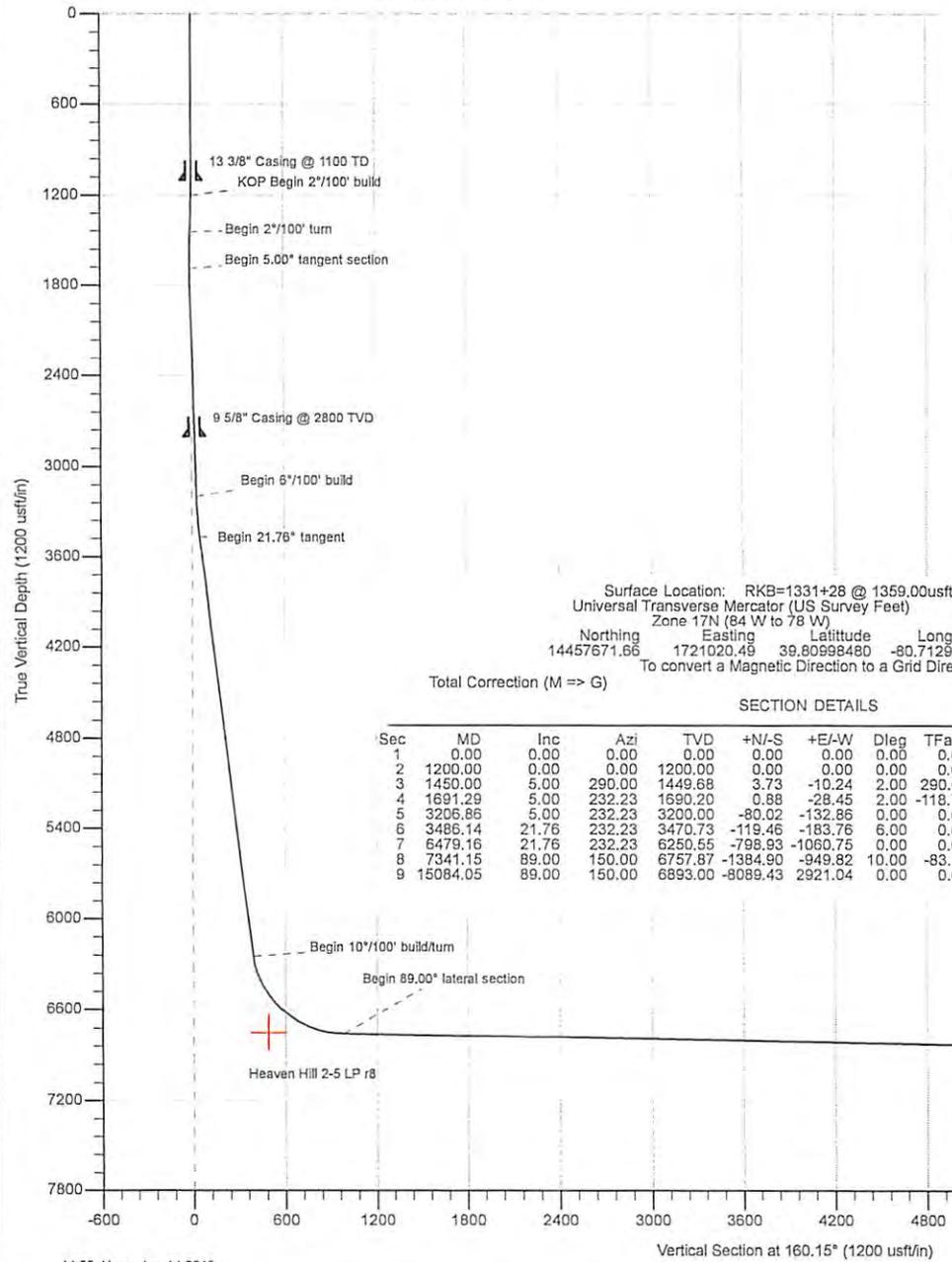
CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,142	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	897	A	15	Air	1 Centralizer every other j
Production	3,402	A	14.5	Air / SOBIM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc

JK
3/10/17

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Office of Oil and Gas
Mar 13 2017
WV Department of Environmental Protection



Tug Hill Operating LLC
 Well: Heaven Hill 2-5 HM (slot G)
 Site: Heaven Hill
 Project: Marshall County, West Virginia
 Design: rev8



Surface Location: RKB=1331+28 @ 1359.00ustf
 Universal Transverse Mercator (US Survey Feet)
 Zone 17N (84 W to 78 W)
 Northing Easting Latitude Longitude
 14457671.66 1721020.49 39.80998480 -80.71297580
 To convert a Magnetic Direction to a Grid Direction, Subtract 8.85°
 Total Correction (M => G)

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1450.00	5.00	290.00	1449.68	3.73	-10.24	2.00	290.00	-6.99	Begin 2°/100' turn
4	1691.29	5.00	232.23	1690.20	0.88	-28.45	2.00	-118.79	-10.49	Begin 5.00° tangent section
5	3206.86	5.00	232.23	3200.00	-80.02	-132.86	0.00	0.00	30.14	Begin 6°/100' build
6	3486.14	21.76	232.23	3470.73	-119.46	-183.76	6.00	0.00	49.95	Begin 21.76° tangent
7	6479.16	21.76	232.23	6250.55	-796.93	-1060.75	0.00	0.00	391.18	Begin 10°/100' build/turn
8	7341.15	89.00	150.00	6757.87	-1384.90	-949.82	10.00	-83.15	979.99	Begin 89.00° lateral section
9	15084.05	89.00	150.00	6893.00	-8089.43	2921.04	0.00	0.00	8600.66	PBHLTD

Azimuths to Grid North
 True North: -0.18°
 Magnetic North: -8.85°
 Magnetic Field
 Strength: 52277.3snT
 Dip Angle: 67.04°
 Date: 8/30/2016
 Model: IGRF2015



4705101884 MOD



Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Heaven Hill 2-5 HM (slot G)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1331+28 @ 1359.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1331+28 @ 1359.00usft
Site:	Heaven Hill	North Reference:	Grid
Well:	Heaven Hill 2-5 HM (slot G)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev8		

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

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

Well	Heaven Hill 2-5 HM (slot G)					
Well Position	+N/-S	0.00 usft	Northing:	14,457,671.66 usft	Latitude:	39.80998480
	+E/-W	0.00 usft	Easting:	1,721,020.48 usft	Longitude:	-80.71297580
Position Uncertainty	0.00 usft		Wellhead Elevation:		Ground Level:	1,331.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/30/2016	-8.66	67.04	52,277

Design	rev8			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	160.15

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	290.00	1,449.68	3.73	-10.24	2.00	2.00	0.00	290.00		
1,691.29	5.00	232.23	1,690.20	0.88	-28.45	2.00	0.00	-23.94	-118.79		
3,206.86	5.00	232.23	3,200.00	-80.02	-132.86	0.00	0.00	0.00	0.00		
3,486.14	21.76	232.23	3,470.73	-119.46	-183.76	6.00	6.00	0.00	0.00		
6,479.17	21.76	232.23	6,250.55	-798.93	-1,060.75	0.00	0.00	0.00	0.00		
7,341.15	89.00	150.00	6,757.87	-1,384.90	-949.82	10.00	7.80	-9.54	-83.15		
15,084.05	89.00	150.00	6,893.00	-8,089.43	2,921.04	0.00	0.00	0.00	0.00	Heaven Hill 2-5 PBHL	



Planning Report - Geographic

4705101884 MOD

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Heaven Hill 2-5 HM (slot G)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1331+28 @ 1359.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1331+28 @ 1359.00usft
Site:	Heaven Hill	North Reference:	Grid
Well:	Heaven Hill 2-5 HM (slot G)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev8		

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	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
100.00	0.00	0.00	100.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
200.00	0.00	0.00	200.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
300.00	0.00	0.00	300.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
400.00	0.00	0.00	400.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
500.00	0.00	0.00	500.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
600.00	0.00	0.00	600.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
700.00	0.00	0.00	700.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
800.00	0.00	0.00	800.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
900.00	0.00	0.00	900.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,457,671.66	1,721,020.48	39.80998480	-80.71297580	
KOP Begin 2°/100' build										
1,300.00	2.00	290.00	1,299.98	0.60	-1.64	14,457,672.26	1,721,018.84	39.80998646	-80.71298163	
1,400.00	4.00	290.00	1,399.84	2.39	-6.56	14,457,674.05	1,721,013.93	39.80999141	-80.71299912	
1,450.00	5.00	290.00	1,449.68	3.73	-10.24	14,457,675.39	1,721,010.24	39.80999513	-80.71301224	
Begin 2°/100' turn										
1,500.00	4.60	279.01	1,499.51	4.79	-14.27	14,457,676.45	1,721,006.21	39.80999808	-80.71302657	
1,600.00	4.42	253.47	1,599.21	4.32	-21.93	14,457,675.98	1,720,998.55	39.80999686	-80.71305384	
1,691.29	5.00	232.23	1,690.20	0.88	-28.45	14,457,672.55	1,720,992.04	39.80998748	-80.71307709	
Begin 5.00° tangent section										
1,700.00	5.00	232.23	1,698.87	0.42	-29.05	14,457,672.08	1,720,991.44	39.80998621	-80.71307923	
1,800.00	5.00	232.23	1,798.49	-4.92	-35.94	14,457,666.74	1,720,984.55	39.80997161	-80.71310382	
1,900.00	5.00	232.23	1,898.11	-10.26	-42.83	14,457,661.41	1,720,977.66	39.80995701	-80.71312842	
2,000.00	5.00	232.23	1,997.73	-15.60	-49.72	14,457,656.07	1,720,970.77	39.80994241	-80.71315301	
2,100.00	5.00	232.23	2,097.35	-20.94	-56.61	14,457,650.73	1,720,963.88	39.80992781	-80.71317760	
2,200.00	5.00	232.23	2,196.97	-26.27	-63.49	14,457,645.39	1,720,956.99	39.80991321	-80.71320220	
2,300.00	5.00	232.23	2,296.59	-31.61	-70.38	14,457,640.05	1,720,950.10	39.80989861	-80.71322679	
2,400.00	5.00	232.23	2,396.21	-36.95	-77.27	14,457,634.71	1,720,943.21	39.80988401	-80.71325138	
2,500.00	5.00	232.23	2,495.83	-42.29	-84.16	14,457,629.38	1,720,936.32	39.80986941	-80.71327598	
2,600.00	5.00	232.23	2,595.45	-47.63	-91.05	14,457,624.04	1,720,929.43	39.80985481	-80.71330057	
2,700.00	5.00	232.23	2,695.07	-52.96	-97.94	14,457,618.70	1,720,922.54	39.80984021	-80.71332516	
2,800.00	5.00	232.23	2,794.69	-58.30	-104.83	14,457,613.36	1,720,915.65	39.80982561	-80.71334976	
2,900.00	5.00	232.23	2,894.31	-63.64	-111.72	14,457,608.02	1,720,908.76	39.80981101	-80.71337435	
3,000.00	5.00	232.23	2,993.93	-68.98	-118.61	14,457,602.68	1,720,901.87	39.80979641	-80.71339894	
3,100.00	5.00	232.23	3,093.55	-74.32	-125.50	14,457,597.35	1,720,894.98	39.80978181	-80.71342354	
3,200.00	5.00	232.23	3,193.17	-79.66	-132.39	14,457,592.01	1,720,888.09	39.80976721	-80.71344813	
3,206.86	5.00	232.23	3,200.00	-80.02	-132.86	14,457,591.64	1,720,887.62	39.80976621	-80.71344982	
Begin 6°/100' build										
3,300.00	10.59	232.23	3,292.24	-87.76	-142.84	14,457,583.91	1,720,877.64	39.80974506	-80.71348545	
3,400.00	16.59	232.23	3,389.40	-102.14	-161.41	14,457,569.53	1,720,859.08	39.80970573	-80.71355171	
3,486.14	21.76	232.23	3,470.73	-119.46	-183.76	14,457,552.21	1,720,836.72	39.80965836	-80.71363152	
Begin 21.76° tangent										
3,500.00	21.76	232.23	3,483.61	-122.61	-187.82	14,457,549.06	1,720,832.66	39.80964975	-80.71364601	
3,600.00	21.76	232.23	3,576.48	-145.31	-217.12	14,457,526.36	1,720,803.36	39.80958766	-80.71375061	
3,700.00	21.76	232.23	3,669.36	-168.01	-246.43	14,457,503.65	1,720,774.06	39.80952557	-80.71385520	
3,800.00	21.76	232.23	3,762.24	-190.71	-275.73	14,457,480.95	1,720,744.76	39.80946349	-80.71395980	
3,900.00	21.76	232.23	3,855.11	-213.41	-305.03	14,457,458.25	1,720,715.46	39.80940140	-80.71406440	
4,000.00	21.76	232.23	3,947.99	-236.12	-334.33	14,457,435.55	1,720,686.16	39.80933931	-80.71416899	
4,100.00	21.76	232.23	4,040.87	-258.82	-363.63	14,457,412.85	1,720,656.85	39.80927722	-80.71427359	
4,200.00	21.76	232.23	4,133.74	-281.52	-392.93	14,457,390.14	1,720,627.55	39.80921513	-80.71437818	
4,300.00	21.76	232.23	4,226.62	-304.22	-422.23	14,457,367.44	1,720,598.25	39.80915304	-80.71448278	
4,400.00	21.76	232.23	4,319.50	-326.92	-451.53	14,457,344.74	1,720,568.95	39.80909096	-80.71458737	



Planning Report - Geographic

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Heaven Hill 2-5 HM (slot G)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1331+28 @ 1359.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1331+28 @ 1359.00usft
Site:	Heaven Hill	North Reference:	Grid
Well:	Heaven Hill 2-5 HM (slot G)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev8		

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	21.76	232.23	4,412.37	-349.63	-480.83	14,457,322.04	1,720,539.65	39.80902887	-80.71469197	
4,600.00	21.76	232.23	4,505.25	-372.33	-510.14	14,457,299.34	1,720,510.35	39.80896678	-80.71479656	
4,700.00	21.76	232.23	4,598.13	-395.03	-539.44	14,457,276.63	1,720,481.05	39.80890469	-80.71490116	
4,800.00	21.76	232.23	4,691.00	-417.73	-568.74	14,457,253.93	1,720,451.75	39.80884260	-80.71500575	
4,900.00	21.76	232.23	4,783.88	-440.43	-598.04	14,457,231.23	1,720,422.44	39.80878051	-80.71511034	
5,000.00	21.76	232.23	4,876.76	-463.13	-627.34	14,457,208.53	1,720,393.14	39.80871842	-80.71521494	
5,100.00	21.76	232.23	4,969.63	-485.84	-656.64	14,457,185.83	1,720,363.84	39.80865633	-80.71531953	
5,200.00	21.76	232.23	5,062.51	-508.54	-685.94	14,457,163.12	1,720,334.54	39.80859424	-80.71542412	
5,300.00	21.76	232.23	5,155.38	-531.24	-715.24	14,457,140.42	1,720,305.24	39.80853215	-80.71552872	
5,400.00	21.76	232.23	5,248.26	-553.94	-744.55	14,457,117.72	1,720,275.94	39.80847006	-80.71563331	
5,500.00	21.76	232.23	5,341.14	-576.64	-773.85	14,457,095.02	1,720,246.64	39.80840797	-80.71573790	
5,600.00	21.76	232.23	5,434.01	-599.35	-803.15	14,457,072.32	1,720,217.34	39.80834588	-80.71584249	
5,700.00	21.76	232.23	5,526.89	-622.05	-832.45	14,457,049.61	1,720,188.03	39.80828379	-80.71594709	
5,800.00	21.76	232.23	5,619.77	-644.75	-861.75	14,457,026.91	1,720,158.73	39.80822170	-80.71605168	
5,900.00	21.76	232.23	5,712.64	-667.45	-891.05	14,457,004.21	1,720,129.43	39.80815961	-80.71615627	
6,000.00	21.76	232.23	5,805.52	-690.15	-920.35	14,456,981.51	1,720,100.13	39.80809752	-80.71626086	
6,100.00	21.76	232.23	5,898.40	-712.86	-949.65	14,456,958.81	1,720,070.83	39.80803543	-80.71636545	
6,200.00	21.76	232.23	5,991.27	-735.56	-978.96	14,456,936.10	1,720,041.53	39.80797334	-80.71647005	
6,300.00	21.76	232.23	6,084.15	-758.26	-1,008.26	14,456,913.40	1,720,012.23	39.80791125	-80.71657464	
6,400.00	21.76	232.23	6,177.03	-780.96	-1,037.56	14,456,890.70	1,719,982.93	39.80784916	-80.71667923	
6,479.17	21.76	232.23	6,250.55	-798.93	-1,060.75	14,456,872.73	1,719,959.73	39.80780001	-80.71676203	
Begin 10°/100' build/tum										
6,500.00	22.10	226.73	6,269.88	-803.99	-1,066.66	14,456,867.68	1,719,953.82	39.80778619	-80.71678312	
6,600.00	25.98	203.91	6,361.39	-836.99	-1,089.29	14,456,834.67	1,719,931.19	39.80769575	-80.71686407	
6,700.00	32.43	188.13	6,448.76	-883.68	-1,101.99	14,456,787.98	1,719,918.49	39.80756764	-80.71690982	
6,800.00	40.23	177.50	6,529.33	-942.64	-1,104.38	14,456,729.02	1,719,916.10	39.80740573	-80.71691899	
6,900.00	48.73	169.93	6,600.67	-1,012.08	-1,096.38	14,456,659.58	1,719,924.10	39.80721497	-80.71689129	
7,000.00	57.60	164.15	6,660.60	-1,089.89	-1,078.24	14,456,581.78	1,719,942.25	39.80700113	-80.71682756	
7,100.00	66.69	159.42	6,707.30	-1,173.70	-1,050.50	14,456,497.96	1,719,969.98	39.80677072	-80.71672975	
7,200.00	75.90	155.31	6,739.35	-1,260.97	-1,014.02	14,456,410.69	1,720,006.47	39.80653073	-80.71660081	
7,300.00	85.17	151.52	6,755.78	-1,349.05	-969.89	14,456,322.62	1,720,050.59	39.80628847	-80.71644469	
7,341.15	89.00	150.00	6,757.87	-1,384.90	-949.82	14,456,286.76	1,720,070.67	39.80618983	-80.71637362	
Begin 89.00° lateral section										
7,400.00	89.00	150.00	6,758.89	-1,435.86	-920.40	14,456,235.81	1,720,100.09	39.80604963	-80.71626944	
7,500.00	89.00	150.00	6,760.64	-1,522.45	-870.41	14,456,149.22	1,720,150.08	39.80581140	-80.71609241	
7,600.00	89.00	150.00	6,762.39	-1,609.04	-820.41	14,456,062.63	1,720,200.07	39.80557317	-80.71591538	
7,700.00	89.00	150.00	6,764.13	-1,695.63	-770.42	14,455,976.04	1,720,250.06	39.80533494	-80.71573836	
7,800.00	89.00	150.00	6,765.88	-1,782.22	-720.43	14,455,889.45	1,720,300.06	39.80509671	-80.71556133	
7,900.00	89.00	150.00	6,767.62	-1,868.81	-670.44	14,455,802.86	1,720,350.05	39.80485847	-80.71538431	
8,000.00	89.00	150.00	6,769.37	-1,955.39	-620.44	14,455,716.27	1,720,400.04	39.80462024	-80.71520728	
8,100.00	89.00	150.00	6,771.11	-2,041.98	-570.45	14,455,629.68	1,720,450.03	39.80438201	-80.71503026	
8,200.00	89.00	150.00	6,772.86	-2,128.57	-520.46	14,455,543.09	1,720,500.03	39.80414377	-80.71485324	
8,300.00	89.00	150.00	6,774.60	-2,215.16	-470.47	14,455,456.50	1,720,550.02	39.80390554	-80.71467622	
8,400.00	89.00	150.00	6,776.35	-2,301.75	-420.47	14,455,369.91	1,720,600.01	39.80366731	-80.71449921	
8,500.00	89.00	150.00	6,778.09	-2,388.34	-370.48	14,455,283.32	1,720,650.00	39.80342907	-80.71432219	
8,600.00	89.00	150.00	6,779.84	-2,474.93	-320.49	14,455,196.73	1,720,700.00	39.80319084	-80.71414517	
8,700.00	89.00	150.00	6,781.58	-2,561.52	-270.50	14,455,110.14	1,720,749.99	39.80295260	-80.71396816	
8,800.00	89.00	150.00	6,783.33	-2,648.11	-220.50	14,455,023.55	1,720,799.98	39.80271437	-80.71379115	
8,900.00	89.00	150.00	6,785.07	-2,734.70	-170.51	14,454,936.96	1,720,849.97	39.80247613	-80.71361413	
9,000.00	89.00	150.00	6,786.82	-2,821.29	-120.52	14,454,850.38	1,720,899.96	39.80223790	-80.71343712	
9,100.00	89.00	150.00	6,788.56	-2,907.88	-70.53	14,454,763.79	1,720,949.96	39.80199966	-80.71326011	
9,200.00	89.00	150.00	6,790.31	-2,994.47	-20.53	14,454,677.20	1,720,999.95	39.80176142	-80.71308311	
9,300.00	89.00	150.00	6,792.05	-3,081.06	29.46	14,454,590.61	1,721,049.94	39.80152319	-80.71290610	
9,400.00	89.00	150.00	6,793.80	-3,167.65	79.45	14,454,504.02	1,721,099.93	39.80128495	-80.71272909	



Planning Report - Geographic

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Heaven Hill 2-5 HM (slot G)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1331+28 @ 1359.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1331+28 @ 1359.00usft
Site:	Heaven Hill	North Reference:	Grid
Well:	Heaven Hill 2-5 HM (slot G)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev8		

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	6,795.55	-3,254.24	129.44	14,454,417.43	1,721,149.93	39.80104671	-80.71255209	
9,600.00	89.00	150.00	6,797.29	-3,340.82	179.43	14,454,330.84	1,721,199.92	39.80080848	-80.71237509	
9,700.00	89.00	150.00	6,799.04	-3,427.41	229.43	14,454,244.25	1,721,249.91	39.80057024	-80.71219808	
9,800.00	89.00	150.00	6,800.78	-3,514.00	279.42	14,454,157.66	1,721,299.90	39.80033200	-80.71202108	
9,900.00	89.00	150.00	6,802.53	-3,600.59	329.41	14,454,071.07	1,721,349.90	39.80009376	-80.71184408	
10,000.00	89.00	150.00	6,804.27	-3,687.18	379.40	14,453,984.48	1,721,399.89	39.79985552	-80.71166708	
10,100.00	89.00	150.00	6,806.02	-3,773.77	429.40	14,453,897.89	1,721,449.88	39.79961729	-80.71149009	
10,200.00	89.00	150.00	6,807.76	-3,860.36	479.39	14,453,811.30	1,721,499.87	39.79937905	-80.71131309	
10,300.00	89.00	150.00	6,809.51	-3,946.95	529.38	14,453,724.71	1,721,549.87	39.79914081	-80.71113610	
10,400.00	89.00	150.00	6,811.25	-4,033.54	579.37	14,453,638.12	1,721,599.86	39.79890257	-80.71095910	
10,500.00	89.00	150.00	6,813.00	-4,120.13	629.37	14,453,551.54	1,721,649.85	39.79866433	-80.71078211	
10,600.00	89.00	150.00	6,814.74	-4,206.72	679.36	14,453,464.95	1,721,699.84	39.79842609	-80.71060512	
10,700.00	89.00	150.00	6,816.49	-4,293.31	729.35	14,453,378.36	1,721,749.84	39.79818785	-80.71042813	
10,800.00	89.00	150.00	6,818.23	-4,379.90	779.34	14,453,291.77	1,721,799.83	39.79794961	-80.71025114	
10,900.00	89.00	150.00	6,819.98	-4,466.49	829.34	14,453,205.18	1,721,849.82	39.79771137	-80.71007415	
11,000.00	89.00	150.00	6,821.72	-4,553.08	879.33	14,453,118.59	1,721,899.81	39.79747313	-80.70989717	
11,100.00	89.00	150.00	6,823.47	-4,639.66	929.32	14,453,032.00	1,721,949.80	39.79723488	-80.70972018	
11,200.00	89.00	150.00	6,825.21	-4,726.25	979.31	14,452,945.41	1,721,999.80	39.79699664	-80.70954320	
11,300.00	89.00	150.00	6,826.96	-4,812.84	1,029.31	14,452,858.82	1,722,049.79	39.79675840	-80.70936622	
11,400.00	89.00	150.00	6,828.70	-4,899.43	1,079.30	14,452,772.23	1,722,099.78	39.79652016	-80.70918923	
11,500.00	89.00	150.00	6,830.45	-4,986.02	1,129.29	14,452,685.64	1,722,149.77	39.79628192	-80.70901225	
11,600.00	89.00	150.00	6,832.20	-5,072.61	1,179.28	14,452,599.05	1,722,199.77	39.79604367	-80.70883527	
11,700.00	89.00	150.00	6,833.94	-5,159.20	1,229.28	14,452,512.46	1,722,249.76	39.79580543	-80.70865830	
11,800.00	89.00	150.00	6,835.69	-5,245.79	1,279.27	14,452,425.87	1,722,299.75	39.79556719	-80.70848132	
11,900.00	89.00	150.00	6,837.43	-5,332.38	1,329.26	14,452,339.28	1,722,349.74	39.79532894	-80.70830435	
12,000.00	89.00	150.00	6,839.18	-5,418.97	1,379.25	14,452,252.70	1,722,399.74	39.79509070	-80.70812737	
12,100.00	89.00	150.00	6,840.92	-5,505.56	1,429.24	14,452,166.11	1,722,449.73	39.79485245	-80.70795040	
12,200.00	89.00	150.00	6,842.67	-5,592.15	1,479.24	14,452,079.52	1,722,499.72	39.79461421	-80.70777343	
12,300.00	89.00	150.00	6,844.41	-5,678.74	1,529.23	14,451,992.93	1,722,549.71	39.79437596	-80.70759646	
12,400.00	89.00	150.00	6,846.16	-5,765.33	1,579.22	14,451,906.34	1,722,599.71	39.79413772	-80.70741949	
12,500.00	89.00	150.00	6,847.90	-5,851.92	1,629.21	14,451,819.75	1,722,649.70	39.79389947	-80.70724252	
12,600.00	89.00	150.00	6,849.65	-5,938.50	1,679.21	14,451,733.16	1,722,699.69	39.79366123	-80.70706555	
12,700.00	89.00	150.00	6,851.39	-6,025.09	1,729.20	14,451,646.57	1,722,749.68	39.79342298	-80.70688859	
12,800.00	89.00	150.00	6,853.14	-6,111.68	1,779.19	14,451,559.98	1,722,799.68	39.79318474	-80.70671162	
12,900.00	89.00	150.00	6,854.88	-6,198.27	1,829.18	14,451,473.39	1,722,849.67	39.79294649	-80.70653466	
13,000.00	89.00	150.00	6,856.63	-6,284.86	1,879.18	14,451,386.80	1,722,899.66	39.79270824	-80.70635770	
13,100.00	89.00	150.00	6,858.37	-6,371.45	1,929.17	14,451,300.21	1,722,949.65	39.79247000	-80.70618074	
13,200.00	89.00	150.00	6,860.12	-6,458.04	1,979.16	14,451,213.62	1,722,999.64	39.79223175	-80.70600378	
13,300.00	89.00	150.00	6,861.86	-6,544.63	2,029.15	14,451,127.03	1,723,049.64	39.79199350	-80.70582682	
13,400.00	89.00	150.00	6,863.61	-6,631.22	2,079.15	14,451,040.44	1,723,099.63	39.79175525	-80.70564986	
13,500.00	89.00	150.00	6,865.35	-6,717.81	2,129.14	14,450,953.85	1,723,149.62	39.79151701	-80.70547291	
13,600.00	89.00	150.00	6,867.10	-6,804.40	2,179.13	14,450,867.27	1,723,199.61	39.79127876	-80.70529595	
13,700.00	89.00	150.00	6,868.85	-6,890.99	2,229.12	14,450,780.68	1,723,249.61	39.79104051	-80.70511900	
13,800.00	89.00	150.00	6,870.59	-6,977.58	2,279.12	14,450,694.09	1,723,299.60	39.79080226	-80.70494205	
13,900.00	89.00	150.00	6,872.34	-7,064.17	2,329.11	14,450,607.50	1,723,349.59	39.79056401	-80.70476509	
14,000.00	89.00	150.00	6,874.08	-7,150.76	2,379.10	14,450,520.91	1,723,399.58	39.79032576	-80.70458815	
14,100.00	89.00	150.00	6,875.83	-7,237.35	2,429.09	14,450,434.32	1,723,449.58	39.79008751	-80.70441120	
14,200.00	89.00	150.00	6,877.57	-7,323.93	2,479.08	14,450,347.73	1,723,499.57	39.78984926	-80.70423425	
14,300.00	89.00	150.00	6,879.32	-7,410.52	2,529.08	14,450,261.14	1,723,549.56	39.78961101	-80.70405730	
14,400.00	89.00	150.00	6,881.06	-7,497.11	2,579.07	14,450,174.55	1,723,599.55	39.78937276	-80.70388036	
14,500.00	89.00	150.00	6,882.81	-7,583.70	2,629.06	14,450,087.96	1,723,649.55	39.78913451	-80.70370341	
14,600.00	89.00	150.00	6,884.55	-7,670.29	2,679.05	14,450,001.37	1,723,699.54	39.78889626	-80.70352647	
14,700.00	89.00	150.00	6,886.30	-7,756.88	2,729.05	14,449,914.78	1,723,749.53	39.78865801	-80.70334953	
14,800.00	89.00	150.00	6,888.04	-7,843.47	2,779.04	14,449,828.19	1,723,799.52	39.78841976	-80.70317259	
14,900.00	89.00	150.00	6,889.79	-7,930.06	2,829.03	14,449,741.60	1,723,849.52	39.78818150	-80.70299565	



Planning Report - Geographic

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Heaven Hill 2-5 HM (slot G)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1331+28 @ 1359.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1331+28 @ 1359.00usft
Site:	Heaven Hill	North Reference:	Grid
Well:	Heaven Hill 2-5 HM (slot G)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev8		

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	6,891.53	-8,016.65	2,879.02	14,449,655.01	1,723,899.51	39.78794325	-80.70281871
15,084.05	89.00	150.00	6,893.00	-8,089.43	2,921.04	14,449,582.24	1,723,941.53	39.78774300	-80.70267000
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 2-5 LP r8 - hit/miss target - Shape - Point	0.00	0.00	6,749.00	-953.76	-1,198.43	14,456,717.90	1,719,822.05	39.80737600	-80.71725400
- plan misses target center by 185.95usft at 6925.07usft MD (6616.84 TVD, -1030.89 N, -1092.77 E)									
Heaven Hill 2-5 PBHL r8 - plan hits target center - Point	0.00	0.00	6,893.00	-8,089.43	2,921.04	14,449,582.24	1,723,941.53	39.78774300	-80.70267000

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,100.00	1,100.00	13 3/8" Casing @ 1100 TD	13-3/8	17-1/2	
2,805.33	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	3.73	-10.24	Begin 2°/100' turn
1,691.29	1,690.20	0.88	-28.45	Begin 5.00° tangent section
3,206.86	3,200.00	-80.02	-132.86	Begin 6°/100' build
3,486.14	3,470.73	-119.46	-183.76	Begin 21.76° tangent
6,479.17	6,250.55	-798.93	-1,060.75	Begin 10°/100' build/turn
7,341.15	6,757.87	-1,384.90	-949.82	Begin 89.00° lateral section
15,084.05	6,893.00	-8,089.43	2,921.04	PBHL/TD



Well Site Safety Plan

Tug Hill Operating, LLC

AW
3/10/17

Well Name: Heaven Hill Unit 2-5HM

Pad Location: Heaven Hill Unit 2

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

NORTHING -4,406,707.1

EASTING -524,568.1

March 2017

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

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

Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (12/19/2016) 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.

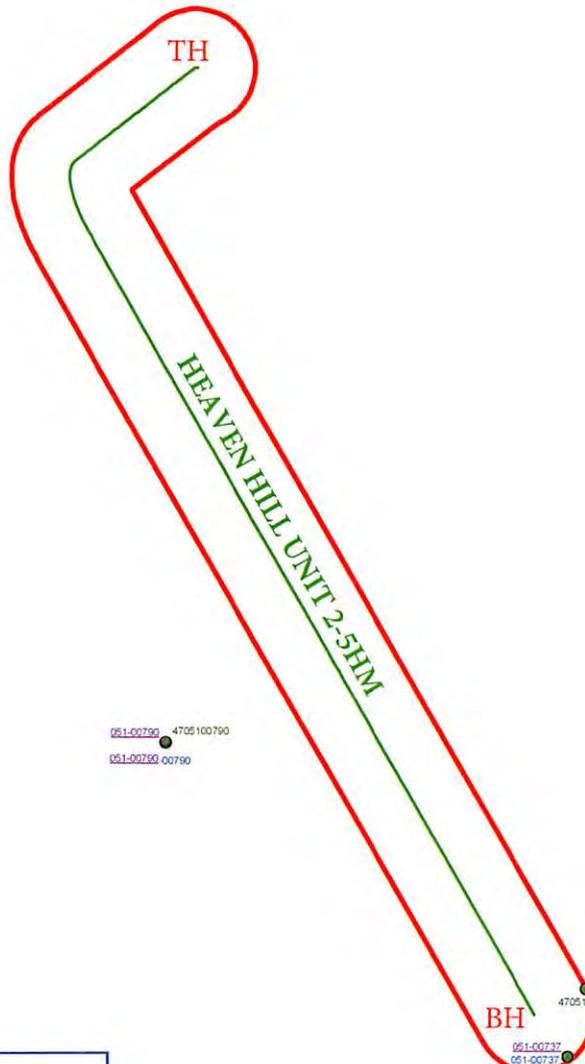
Request maps for:

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

4705101884 MWD



MARSHALL MEADE

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 Unit 2-5HM
- 500 Ft Buffer
- COUNTIES
- DISTRICTS



Heaven Hill Unit 2-5HM

Meade District

Marshall County, WV

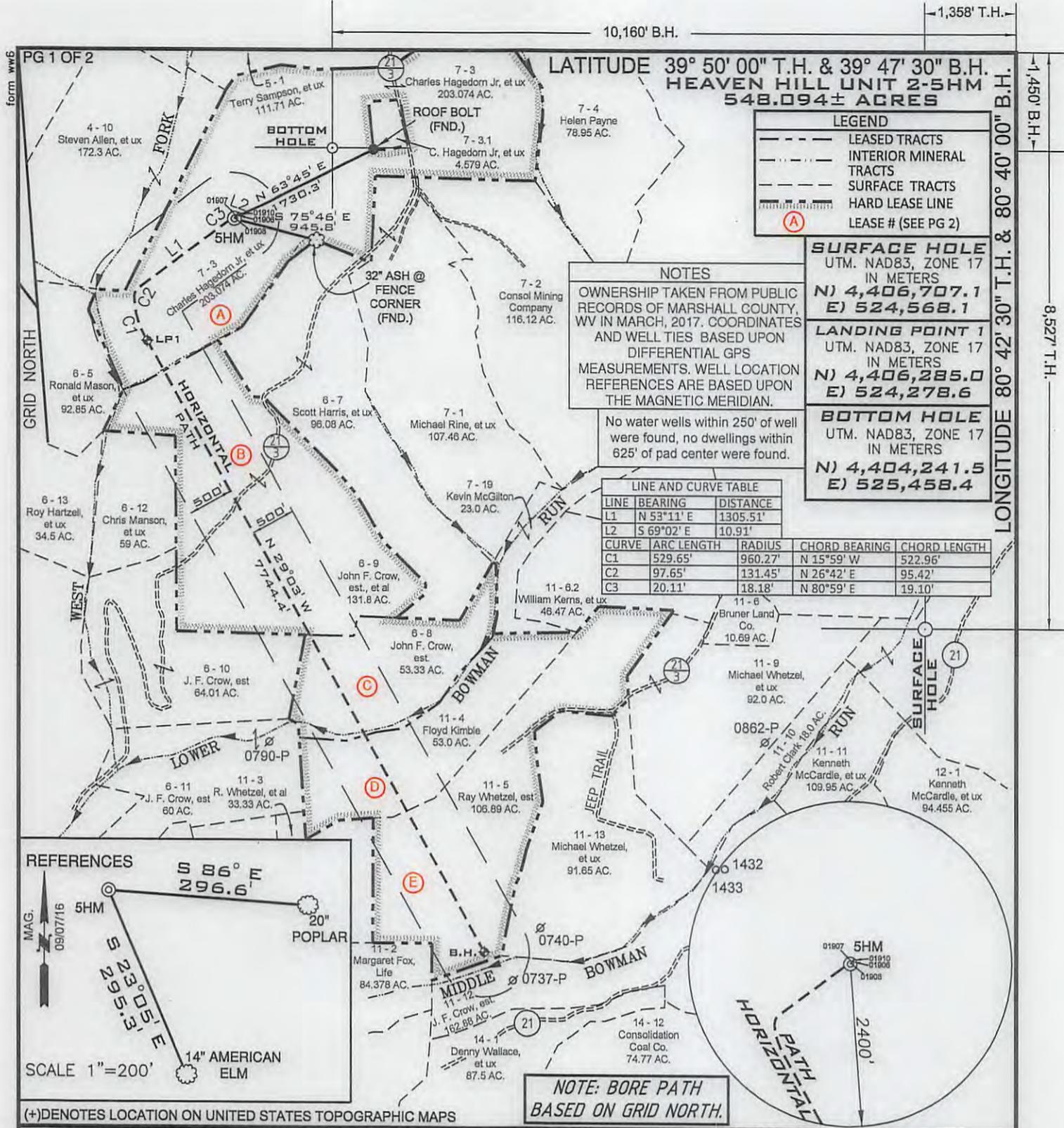


Map Created: December 19, 2016
 Map Current As Of: December 19, 2016

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

Map Prepared by:

03/24/2017



(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

FILE NUMBER 163-697

DRAWING NUMBER HHU2_WP_5HM REV1

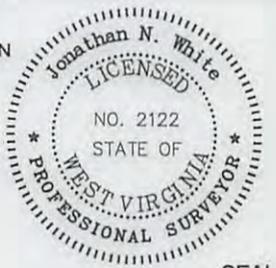
SCALE 1" = 1500'

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
3/10/17



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



DATE: SEPTEMBER 24, 2016
DATE REVISED: MARCH 07, 2017
OPERATORS WELL NO. Heaven Hill Unit 2-5HM

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X

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

API WELL NO. 47-051-01884
STATE COUNTY PERMIT

SURFACE OWNER CHARLES R. HAGEDORN, JR., ET UX ACREAGE 203.074

OIL & GAS ROYALTY OWNER CHARLES R. HAGEDORN, JR., ET AL LEASE ACREAGE 548.094

PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___
PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) ___

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 6,851' TMD:15,084'

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

03/24/2017

COUNTY NAME PERMIT

**HEAVEN HILL UNIT 2-5HM
WELL PLAT LEASE INFORMATION**

Lease No.	Tag	Parcel	Oil & Gas Royalty Owner	Deed Book	Deed Page
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*15510	B	9-6-9	ELAINE PHELPS ET VIR	718	326
10*15511	B	9-6-9	DAVID E CROW	718	376
10*15512	B	9-6-9	FRANCES COFFEY	718	328
10*15513	B	9-6-9	KAY KEYES	718	330
10*15514	B	9-6-9	L PAUL CROW	716	336
10*15515	B	9-6-9	DESIRE L CROW	718	334
10*15516	B	9-6-9	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	B	9-6-9	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	B	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	B	9-6-9	JOHN CROW	726	580
10*15520	B	9-6-9	TIMOTHY CROW	726	582
10*47051.123.1	B	9-6-9	LLOYD G BAKER	865	389
10*47051.123.2	B	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
10*15510	C	9-6-8	ELAINE PHELPS ET VIR	718	326
10*15511	C	9-6-8	DAVID E CROW	718	376
10*15512	C	9-6-8	FRANCES COFFEY	718	328
10*15513	C	9-6-8	KAY KEYES	718	330
10*15514	C	9-6-8	L PAUL CROW	718	336
10*15515	C	9-6-8	DESIRE L CROW	718	334
10*15516	C	9-6-8	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	C	9-6-8	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	C	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	C	9-6-8	JOHN CROW	726	580
10*15520	C	9-6-8	TIMOTHY CROW	726	582
10*15526	C	9-6-8	CYNTHIA GAY BURNS	782	114
10*15527	C	9-6-8	JOYCE HOPE JARMON	782	329
10*15528	C	9-6-8	FLOY CARLEEN CRADDOCK	782	348
10*15529	C	9-6-8	ANN MADISON	783	176
10*15530	C	9-6-8	JO ANN LITTLEFIELD	783	141
10*15531	C	9-6-8	FLOYDENE S GROVES	783	619
10*15532	C	9-6-8	ALTA BELL KAY	782	89
10*15533	C	9-6-8	LAURA L MORGAN	782	119
10*15534	C	9-6-8	WILLIAM RIAL DENMAN	782	109
10*15535	C	9-6-8	MERRIET E LEWIS	782	125
10*15536	C	9-6-8	JEFFIE HAMAR	792	213
10*15537	C	9-6-8	CHARLOTTE L LOWRY	783	208
10*15538	C	9-6-8	JAMIE C BOREN	797	331
10*15539	C	9-6-8	WILLIAM K HAVINS	800	144
10*15540	C	9-6-8	REBECCA BELL LEVESQUE	800	515
10*15548	C	9-6-8	CHARLOTTE PRICKETT	783	191
10*15549	C	9-6-8	WILLIAM H STURMAN	782	145
10*15550	C	9-6-8	CRAIG STURMAN	782	130
10*15551	C	9-6-8	JOHN FRANK STURMAN	782	135
10*15552	C	9-6-8	JANIE E STURMAN	782	140
10*47051.123.1	C	9-6-8	LLOYD G BAKER	865	389
10*47051.123.2	C	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
10*16517	D	9-11-4	RHDK INVESTMENTS	907	550
10*15584	E	9-11-5	VICKIE MASON	686	239
10*15585	E	9-11-5	SHARON L WHETZAL	687	147
10*15586	E	9-11-5	MARY A SOUTH	690	615
10*15587	E	9-11-5	ROBERT L WHETZAL	690	559
10*15588	E	9-11-5	RAY A WHETZAL JR	693	571
10*15589	E	9-11-5	MARK L WHETZAL	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

03/24/2017

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

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

WW-6A1
(5/13)

Operator's Well No. Heaven Hill Unit 2-5HM

**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

WV DEPARTMENT OF ENVIRONMENTAL PROTECTION
Environmental Filings
Page 1 of 2

03/24/2017

4705101884 MOD

Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	Deed Book/Pg	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*15510	B	9-6-9	ELAINE PHELPS ET VIR	TRIENERGY HOLDINGS, LLC	1/8+	718 326	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15511	B	9-6-9	DAVID E CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 376	Tri Energy to NPAR: 25/463	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15512	B	9-6-9	FRANCES COFFEY	TRIENERGY HOLDINGS, LLC	1/8+	718 328	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15513	B	9-6-9	KAY KEYES	TRIENERGY HOLDINGS, LLC	1/8+	718 330	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15514	B	9-6-9	L PAUL CROW	TRIENERGY HOLDINGS, LLC	1/8+	716 336	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15515	B	9-6-9	DESIRE L CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 334	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15516	B	9-6-9	ROSE MARIE KIELGCZEWSKI	TRIENERGY HOLDINGS, LLC	1/8+	718 354	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15517	B	9-6-9	DIANNE GELLNER & GARY GELLNER	TRIENERGY HOLDINGS, LLC	1/8+	718 345	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15518	B	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TRIENERGY HOLDINGS, LLC	1/8+	718 347	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15519	B	9-6-9	JOHN CROW	TRIENERGY HOLDINGS, LLC	1/8+	726 580	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15520	B	9-6-9	TIMOTHY CROW	TRIENERGY HOLDINGS, LLC	1/8+	726 582	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*47051.123.1	B	9-6-9	LLOYD G BAKER	TH EXPLORATION LLC	1/8+	865 389	N/A	N/A	N/A
10*47051.123.2	B	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TH EXPLORATION LLC	1/8+	873 143	N/A	N/A	N/A
10*15510	C	9-6-8	ELAINE PHELPS ET VIR	TRIENERGY HOLDINGS, LLC	1/8+	718 326	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15511	C	9-6-8	DAVID E CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 376	Tri Energy to NPAR: 25/463	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15512	C	9-6-8	FRANCES COFFEY	TRIENERGY HOLDINGS, LLC	1/8+	718 328	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15513	C	9-6-8	KAY KEYES	TRIENERGY HOLDINGS, LLC	1/8+	718 330	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15514	C	9-6-8	L PAUL CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 336	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15515	C	9-6-8	DESIRE L CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 334	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15516	C	9-6-8	ROSE MARIE KIELGCZEWSKI	TRIENERGY HOLDINGS, LLC	1/8+	718 354	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15517	C	9-6-8	DIANNE GELLNER & GARY GELLNER	TRIENERGY HOLDINGS, LLC	1/8+	718 345	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15518	C	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TRIENERGY HOLDINGS, LLC	1/8+	718 347	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15519	C	9-6-8	JOHN CROW	TRIENERGY HOLDINGS, LLC	1/8+	726 580	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15520	C	9-6-8	TIMOTHY CROW	TRIENERGY HOLDINGS, LLC	1/8+	726 582	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15526	C	9-6-8	CYNTHIA GAY BURNS	CHEVRON USA INC	1/8+	782 114	N/A	N/A	Chevron to Tug Hill: 36/148
10*15527	C	9-6-8	JOYCE HOPE JARMON	CHEVRON USA INC	1/8+	782 329	N/A	N/A	Chevron to Tug Hill: 36/148
10*15528	C	9-6-8	FLOY CARLEEN CRADDOCK	CHEVRON USA INC	1/8+	782 348	N/A	N/A	Chevron to Tug Hill: 36/148
10*15529	C	9-6-8	ANN MADISON	CHEVRON USA INC	1/8+	783 176	N/A	N/A	Chevron to Tug Hill: 36/148
10*15530	C	9-6-8	JO ANN LITTLEFIELD	CHEVRON USA INC	1/8+	783 141	N/A	N/A	Chevron to Tug Hill: 36/148
10*15531	C	9-6-8	FLOYDENE S GROVES	CHEVRON USA INC	1/8+	783 619	N/A	N/A	Chevron to Tug Hill: 36/148
10*15532	C	9-6-8	ALTA BELL KAY	CHEVRON USA INC	1/8+	782 89	N/A	N/A	Chevron to Tug Hill: 36/148
10*15533	C	9-6-8	LAURA L MORGAN	CHEVRON USA INC	1/8+	782 119	N/A	N/A	Chevron to Tug Hill: 36/148
10*15534	C	9-6-8	WILLIAM RIAL DENMAN	CHEVRON USA INC	1/8+	782 109	N/A	N/A	Chevron to Tug Hill: 36/148
10*15535	C	9-6-8	MERRIET E LEWIS	CHEVRON USA INC	1/8+	782 125	N/A	N/A	Chevron to Tug Hill: 36/148
10*15536	C	9-6-8	JEFFIE HAMAR	CHEVRON USA INC	1/8+	792 213	N/A	N/A	Chevron to Tug Hill: 36/148
10*15537	C	9-6-8	CHARLOTTE L LOWRY	CHEVRON USA INC	1/8+	783 208	N/A	N/A	Chevron to Tug Hill: 36/148
10*15538	C	9-6-8	JAMIE C BOREN	CHEVRON USA INC	1/8+	797 331	N/A	N/A	Chevron to Tug Hill: 36/148
10*15539	C	9-6-8	WILLIAM K HAVINS	CHEVRON USA INC	1/8+	800 144	N/A	N/A	Chevron to Tug Hill: 36/148
10*15540	C	9-6-8	REBECCA BELL LEVESQUE	CHEVRON USA INC	1/8+	800 515	N/A	N/A	Chevron to Tug Hill: 36/148

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Office of Oil & Gas
MAR 13 2017
WV Dept of Environmental Protection

03/24/2017

4705101884 MoD

Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	Deed Book/Pg		Assignment	Assignment	Assignment
10*15548	C	9-6-8	CHARLOTTE PRICKETT	CHEVRON USA INC	1/8+	783	191	N/A	N/A	Chevron to Tug Hill: 36/148
10*15549	C	9-6-8	WILLIAM H STURMAN	CHEVRON USA INC	1/8+	782	145	N/A	N/A	Chevron to Tug Hill: 36/148
10*15550	C	9-6-8	CRAIG STURMAN	CHEVRON USA INC	1/8+	782	130	N/A	N/A	Chevron to Tug Hill: 36/148
10*15551	C	9-6-8	JOHN FRANK STURMAN	CHEVRON USA INC	1/8+	782	135	N/A	N/A	Chevron to Tug Hill: 36/148
10*15552	C	9-6-8	JANIE E STURMAN	CHEVRON USA INC	1/8+	782	140	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.123.1	C	9-6-8	LLOYD G BAKER	TH EXPLORATION LLC	1/8+	865	389	N/A	N/A	N/A
10*47051.123.2	C	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TH EXPLORATION LLC	1/8+	873	143	N/A	N/A	N/A
10*16517	D	9-11-4	RHDK INVESTMENTS	TH EXPLORATION LLC	0.16	907	550	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 WHETZAL	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 WHETZAL	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 WHETZAL 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 WHETZAL	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

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 Office of Oil and Gas
 MAR 15 2017
 WV Department of Environmental Protection

AFFIDAVIT

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

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.

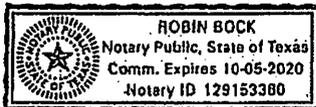
David D. Kalish
Affiant: David D. Kalish

JURAT

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

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

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



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

Carroll & Heasht
WELZEL County 10:29:27 AM
Instrument No 212095
Date Recorded 10/20/2016
Document Type AFDI
Pages Recorded 1
Book-Page 119-291
Recording Fee \$5.00
Additional \$6.00

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Oil and Gas
MAR 15 2017
Robin Bock

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

Jan Pest
MARSHALL County 12:43:01 PM
Instrument No 1404976
Date Recorded 05/20/2016
Document Type ASN
Pages Recorded 20
Book-Page 36-148
Recording Fee \$20.00
Additional \$8.00

ASSIGNMENT AND CONVEYANCE

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

WITNESSETH:

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

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

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

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

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

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

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MAR 15 2017
WV Department of Environmental Protection

ASSIGNMENT, BILL OF SALE AND CONVEYANCE

STATE OF WEST VIRGINIA §

COUNTY OF MARSHALL §

THIS ASSIGNMENT, BILL OF SALE AND CONVEYANCE (this "Assignment"), dated effective as of December 1, 2013 at 7:00 a.m. Central Time (the "Effective Time"), is made by **CHEESAPEAKE APPALACHIA, L.L.C.**, an Oklahoma limited liability company ("Assignor") to **CHEVRON U.S.A. INC.**, a Pennsylvania corporation ("Assignee"). This Assignment is executed and delivered in connection with and pursuant to the terms of that certain Acreage Trade Agreement between Assignor and Assignee dated December 16, 2013 (the "Swap Agreement"). Capitalized terms used and not otherwise defined herein shall have the meanings assigned to such terms in the Swap Agreement.

1. Assignment. For and in consideration of Ten Dollars (\$10.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor does hereby **GRANT, BARGAIN, SELL, CONVEY, ASSIGN, TRANSFER, SET OVER, AND DELIVER** unto Assignee, all of Assignor's right, title, and interest in and to the following, subject to the terms and reservations hereof and specifically **LESS AND EXCEPT** the Excluded Assets (as hereinafter defined): all oil, gas and mineral leases (or portions thereof) described in Exhibit "A" attached hereto and made a part hereof, whether producing or non-producing (the "Leases"), and all easements to the extent appurtenant thereto, and all operating rights, Working Interests, Net Revenue Interests, and other rights to Petroleum Substances thereunder (collectively, the "Properties").

It is the intent of Assignor to convey and this Assignment hereby conveys to Assignee, subject to the reservations and conditions herein contained, from and after the Effective Time, Assignor's interest in the Properties, regardless of errors in description, any incorrect or misspelled names, or any transcribed or incorrect recording references.

TO HAVE AND TO HOLD all and singular such Properties together with all rights, titles, interests, estates, remedies, powers, and privileges thereunto appertaining unto Assignee and Assignee's successors and assigns forever; subject to Permitted Encumbrances and the Swap Agreement.

Each Assignor agrees to warrant and forever defend title to such Assignor's interest in the Properties unto Assignee against the claims and demands of all persons claiming, or to claim the same, or any part thereof, by, through or under Assignor, but not otherwise.

2. Excluded Assets. Assignor specifically excepts from this Assignment and reserves unto itself all of its right, title and interest in and to the following (the "Excluded Assets"): (a) Assignor's minute books and financial, tax and legal records (other than title records); (b) all of Assignor's and its Affiliates' proprietary computer software, patents, trade secrets, copyrights,

Jan Pest
MARSHALL County 11:17:49 AM
Instrument No 1355565
Date Recorded 02/03/2014
Document Type ASN
Pages Recorded 33
Book-Page 30-461
Recording Fee \$33.00
Additional \$9.00

AB 24/196

Image Print

000024 REC 0196

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, 2nd 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 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 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 IN ALL OIL, GAS, COALEED 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.

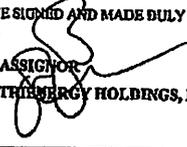
Assignor's overriding royalty interest reserved hereunder shall be calculated and paid in the same manner as the Lessor's royalty provided for in the subject LEASE. Furthermore, if any LEASE covers less than a full mineral interest in the lands described therein or if Assignor owns less than a full interest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

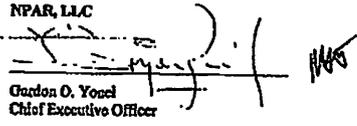
This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND MADE DULY EFFECTIVE THIS INSTRUMENT THIS 2nd DAY OF MARCH, 2011.

Witness: 
ASSIGNOR
TRIENERGY HOLDINGS, LLC

Joseph E. Bejlad
President and Managing Partner

ASSIGNEE
Witness: 
AB LEGAL
Gordon O. Yonel
Chief Executive Officer

NPAR, LLC

Gordon O. Yonel
Chief Executive Officer

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Office of Oil and Gas
MAR 15 2017
WV Dept. of Environmental Protection
10/29/2015

Pages Omitted

BOOK PAGE

ASN 24/430

AP 24/5

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, 2nd 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 8/8TH) OR LESS THAN TWO PERCENT (2% OF 8/8TH) 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.

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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 28TH DAY OF MAY, 2011.

Witness: 

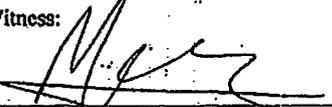
ASSIGNOR
TRIENERGY HOLDINGS, LLC

Joseph E. Bojalad
President and Managing Partner

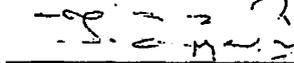
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Instrument No 1306153
Date Recorded 06/13/2011
Document 1749 184
Pages Recorded 13
Book-Page 24-430
Recording Fee \$23.00
Additional \$7.00

Office of
MAR 15 2017

ASSIGNEE

Witness: 

ASSIGNEE
NPAR, LLC



ENVIRONMENTAL PROTECTION
MAR 15 2017

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, 2nd 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 BATHS (4% of 8/8") OR LESS THAN TWO PERCENT OF BATHS (2% of 8/8") 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.

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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:

Janice A. Gail

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

NPAR, LLC

Gordon O. Yonel
Chief Executive Officer

RECEIVED
Office of Oil and Gas
MAR 15 2017
WV DEPT. OF ENVIRONMENT & NATURAL RESOURCES

TRIENERGY HOLDINGS, LLC
PO BOX 99
SEWICKLEY, PA 15143-0099

Pages Omitted

RECORDED

ASN 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, 2nd 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 8/8TH) OR LESS THAN TWO PERCENT OF 8/8THS (2% OF 8/8TH) 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:

Patrick A. Dill

NPAR, LLC

Gordon O. Yonel
Chief Executive Officer

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

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Office of Oil and Gas

MAR 15 2011

8/3/2011
WV Department of Environmental Protection

** Pages Omitted*

4705101884 MOD
DB 756/332

BOOK 0756 PAGE 0332

JIM BOURGEOIS LAND SERVICE INC
11106 GT HWY 19
BORNEAUX LAKE, PA 16316-3620

BOOK PAGE 756 332

Jan Pest
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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 tenements, 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

110065779.1

03/24/2017



TUG HILL

4705101884 *ms*

March 13, 2017

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

RE: Heaven Hill Unit 2-5HM

Subject: County Route 21/3 Road Crossing Letter

Dear Laura:

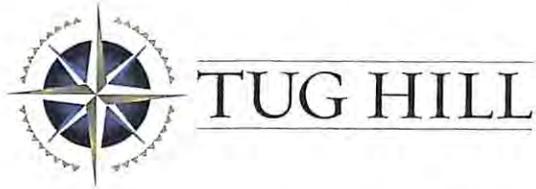
Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 21/3 in the area reflected on the Heaven Hill Unit 2-5HM well plat. THO has conducted a full title search in the relevant Court 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.

Sincerely,

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

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WV Department of Environmental Protection



March 13, 2017

MS LAURA ADKINS
 WVDEP OFFICE OF OIL & GAS
 601 57TH STREET SE
 CHARLESTON WV 25304-2345

VIA FEDEX

**RE: Heaven Hill Unit 2-5HM – API No. 47-051-01884-00-00 – Meade District, Marshall County
 Request for Permit Modification Review and Approval (Lengthen lateral and revise bottom
 hole location)**

Dear Laura:

Tug Hill Operating, LLC (“THO”) would like to respectfully request a permit modification review of the above referenced and permitted well. THO is requesting to extend the length of the horizontal lateral resulting in a change to the bottom hole location (“BHL”). Please note that the revised BHL will require drilling through new leases; the revised Form WW-6A1 is enclosed, along with the following documents, which have been approved, if applicable, by the Department’s Oil and Gas Inspector:

- Revised Form WW-6A1
 - Includes two new leases (Tags “D”+“E”) along revised lateral path and BHL
- Revised Form WW-6B
 - 7) Revised formation depth
 - 8) Revised TVD
 - 18) Revised footage for drilling, intervals left in well and cement fill-up
 - 13 3/8”
 - 5 ½”
- WW-6B WBD
 - Changed TVD
 - 13 3/8”
 - KOP
 - Pilot Hole
 - Landing Point
 - Casing summary
 - Changed TVD and MD
 - Surface
 - Production
 - Cement summary

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MAR 15 2017

WV Department of
 Environmental Protection



TUG HILL

4705101884 MOD

- Changed Sacks
 - Surface
 - Production
- WW-6B revised well design and plan
- Revised Well Site Safety Plan
 - CD with SSP PDF file
 - Hard copy of signed cover page
 - Revised the following items
 - Cover page and date
 - Updated site directions
 - Well plat
 - Collision avoidance – Updated spider map
 - WW-6B
 - Cement and casing program
 - WBD
 - Emergency notification list
- Water Management Plan modification made due the extending of the lateral (please forward)
- Area of review revised due to the extending of the lateral
- County and State Route mineral extraction letter, which was added to clarify that the laterals revised location doesn't cross any new County Routes only County Route 21/3 as previously submitted.
- Revised Mylar Well plat
 - Extended lateral and BHL
 - Lease acreage
 - TVD and MD

Please let me know if you have any questions, or require any additional information. Thank you in advance for your consideration of THO's permit modification request.

Sincerely,

Jonathan White
Regulatory Analyst

Enclosures

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MAR 15 2017

West Virginia Department of Environmental Protection

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03/24/2017