



---

west virginia department of environmental protection

---

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

Friday, October 27, 2017  
WELL WORK PERMIT  
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC  
550 BAILEY AVENUE, SUITE 510

FORT WORTH, TX 76107

Re: Permit approval for HEAVEN HILL 2W-13HU  
47-051-01957-00-00

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 2W-13HU  
Farm Name: C.R. JR. & A.H. HAGEDORN  
U.S. WELL NUMBER: 47-051-01957-00-00  
Horizontal 6A / New Drill  
Date Issued: 10/27/2017

Promoting a healthy environment.

10/27/2017

# 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

---

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

## PERMIT CONDITIONS

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



---

west virginia department of environmental protection

---

Oil and Gas Conservation Commission  
601 57<sup>th</sup> Street, SE Charleston, WV 25304  
(304)926-0499, Ext 1656

Jim Justice, Governor  
Barry K. Lay, Chairman  
ogcc.wv.gov

October 17, 2017

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

RE: Application for Deep Well Permit – API #47-051-01957

COMPANY: Tug Hill Operating, LLC

FARM: Tug Hill Operating, LLC Heaven Hill 2W-13HU

COUNTY: Marshall DISTRICT: Meade QUAD: Glen Easton 7 ½'

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

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

1. Comments to Notice of Deviation filed? No.
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners? Yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells: 47-051-01912, 47-051-1911, and 47-051-01910, permitted through Hearing Docket No. 244-233.
4. Provided a plat showing that the proposed location is a distance of 400+ feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Susan Rose  
Administrator

WW-6B  
(04/15)

API NO. 47-051 - \_\_\_\_\_  
 OPERATOR WELL NO. Heaven Hill 2W-13HU  
 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

<u>494510851</u>	<u>Marshall</u>	<u>Meade</u>	<u>Glen Easton 7.5'</u>
------------------	-----------------	--------------	-------------------------

  
Operator ID County District Quadrangle
- 2) Operator's Well Number: Heaven Hill 2W-13HU 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 Yes *JW*  
8/5/17
- 7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Point Pleasant is the target formation at a depth of 11509' - 11639' thickness of 130' and anticipated pressure of approx. (9500 psi)
- 8) Proposed Total Vertical Depth: 11,789'
- 9) Formation at Total Vertical Depth: Trenton
- 10) Proposed Total Measured Depth: 19,088'
- 11) Proposed Horizontal Leg Length: 6,338'
- 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 - 974' and Pittsburgh Coal - 1064'
- 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.

RECEIVED  
 Office of Oil and Gas  
 AUG 7 2017  
 WV Department of  
 Environmental Protection

WW-6B  
(04/15)

API NO. 47-051 - **01957**  
 OPERATOR WELL NO. Heaven Hill 2W-13HU  
 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	20"	NEW	J55	106.5#	1,210'	1,200'	1915ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2,885'	2,875'	2033ft^3(CTS)
Intermediate	9 5/8"	NEW	HP110	47#	11,135'	11,125'	3627ft^3(CTS)
Production	5 1/2"	NEW	HP110	23#	19,088'	19,078'	4559ft^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		11,450'	
Liners							

*8/5/17*

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	20"	26"	.5	2,410	1,928	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.38	2,740	2,192	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.472	10,730	6,968	SEE#24	1.99
Production	5 1/2"	8 1/2"	.415	13,580	10,864	SEE#24	1.18
Tubing	2 7/8"			14,530	11,624		
Liners							

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

**PACKERS**

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

WW-6B  
(10/14)

API NO. 47-051 - 01957  
OPERATOR WELL NO. Heaven Hill 2W-13HU  
Well Pad Name: Heaven Hill Unit 2

*JW*  
8/5/17

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

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

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

Well to be completed with approximately 15,845,000 lb proppant and 244,975 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:

\*See Attachment

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

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.

WW6B Attachment to #24

**Conductor and Fresh Water Casing Cement:**

*Premium NE-1 + 2% CaCl*

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

**Coal Casing Cement:**

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

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

**Intermediate Casing Cement:**

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

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

10/27/2017



LS-01957

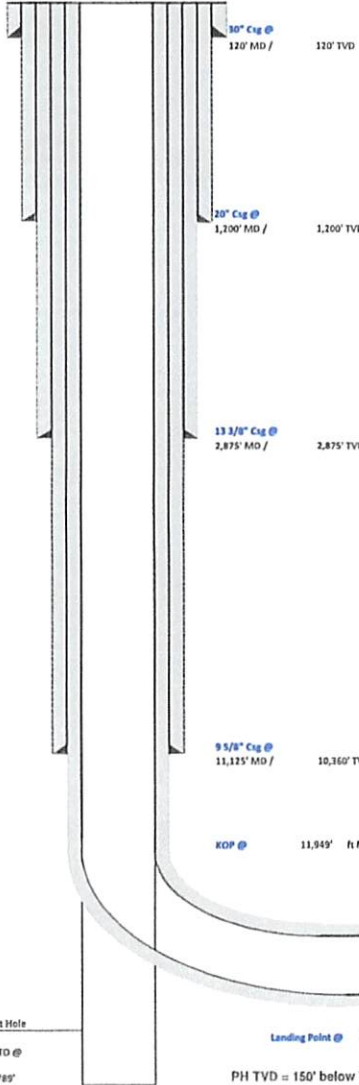


WELL NAME: Heaven Hill 2W-13HU  
 STATE: West Virginia COUNTY: Marshall  
 DISTRICT: Meade  
 DF Elev: 1,364' GL Elev: 1,331'  
 TD: 19,078'  
 TH Latitude: 39.81007436  
 TH Longitude: -80.71298161  
 BH Latitude: 39.78523042  
 BH Longitude: -80.71021762

RECEIVED  
 Office of Oil and Gas

AUG 7 2017

WV Department of  
 Environmental Protection



FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	1,073'
Sewickley Coal	974'
Pittsburgh Coal	1,064'
Big Lime	2,068'
Berea	2,692'
Tully	6,615'
Marcellus	6,732'
Onondaga	6,784'
Salina	7,489'
Lockport	8,545'
Utica	11,342'
Point Pleasant	11,509'
Landing Depth	11,531'
Trenton	11,639'
Pilot Hole TD	11,789'

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	26	20	1,200'	1,200'	106.5	J55	Surface
Intermediate 1	17 1/2	13 3/8	2,875'	2,875'	54.5	J55	Surface
Intermediate 2	12 1/4	9 5/8	11,125'	10,360'	47	HP110	Surface
Production	8 1/2	5 1/2	19,078'	11,642'	23	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	2,068	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	2,702	A	15	Air	1 Centralizer every other jt
Intermediate 2	2,916	A	14.5	Air	1 Centralizer every other jt
Production	3,912	A	15	Air / SOBMM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to slc

*Handwritten signature and date: 8/5/17*

Pilot Hole  
 PH TD @ 11,789'  
 PH TVD = 150' below Trenton Top

Landing Point @ 12,740' MD / 11,531' TVD  
 Lateral TD @ 19,078' R MD / 11,642' R TVD

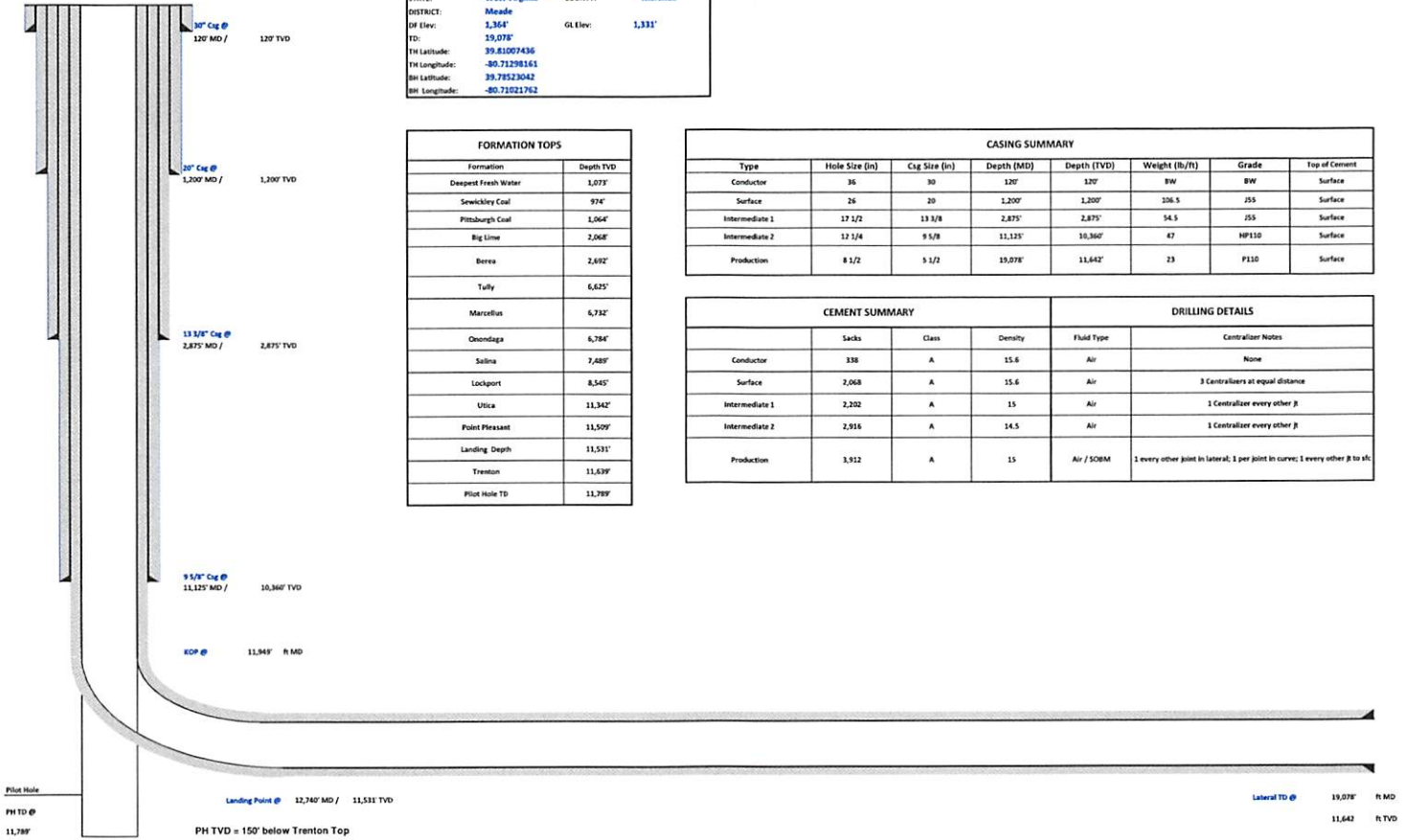


WELL NAME:	Heaven Hill 2W-13HJ		
STATE:	West Virginia	COUNTY:	Marshall
DISTRICT:	Meade		
DF Elev:	1,364'	GL Elev:	1,331'
FD:	19,078'		
TH Latitude:	39.81007436		
TH Longitude:	-80.71298161		
BH Latitude:	39.78523042		
BH Longitude:	-80.71021762		

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	1,073'
Sewickley Coal	974'
Pittsburgh Coal	1,064'
Big Lime	2,068'
Berea	2,692'
Tully	6,625'
Marcellus	6,732'
Oondaga	6,784'
Salina	7,489'
Lockport	8,545'
Utica	11,342'
Point Pleasant	11,509'
Landing Depth	11,531'
Trenton	11,839'
Pilot Hole TD	11,789'

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	8W	Surface
Surface	26	20	1,200'	1,200'	106.5	J55	Surface
Intermediate 1	17 1/2	13 1/8	2,875'	2,875'	54.5	J55	Surface
Intermediate 2	17 1/4	9 5/8	11,125'	10,360'	47	HP110	Surface
Production	8 1/2	5 1/2	19,078'	11,642'	23	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Contractor Notes
Conductor	338	A	15.6	Air	None
Surface	2,068	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	2,202	A	15	Air	1 Centralizer every other j
Intermediate 2	2,916	A	14.5	Air	1 Centralizer every other j
Production	1,912	A	15	Air / SOBIM	1 every other joint in lateral; 1 per joint in curve; 1 every other 8 to etc.



**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

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection  
Page 1 of 4

10/27/2017

Permit well - Heaven Hill 2W-13HU

Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101918	Tug Hill Operating	6879' TVD proposed	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating permitted offset Marcellus well. Not yet drilled
4705101906	Tug Hill Operating	6879' TVD proposed	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating permitted offset Marcellus well. Not yet drilled
4705101907	Tug Hill Operating	6879' TVD proposed	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating permitted offset Marcellus well. Not yet drilled
4705101908	Tug Hill Operating	6879' TVD proposed	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating permitted offset Marcellus well. Not yet drilled
4705101884	Tug Hill Operating	6879' TVD proposed	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating permitted offset Marcellus well. Not yet drilled

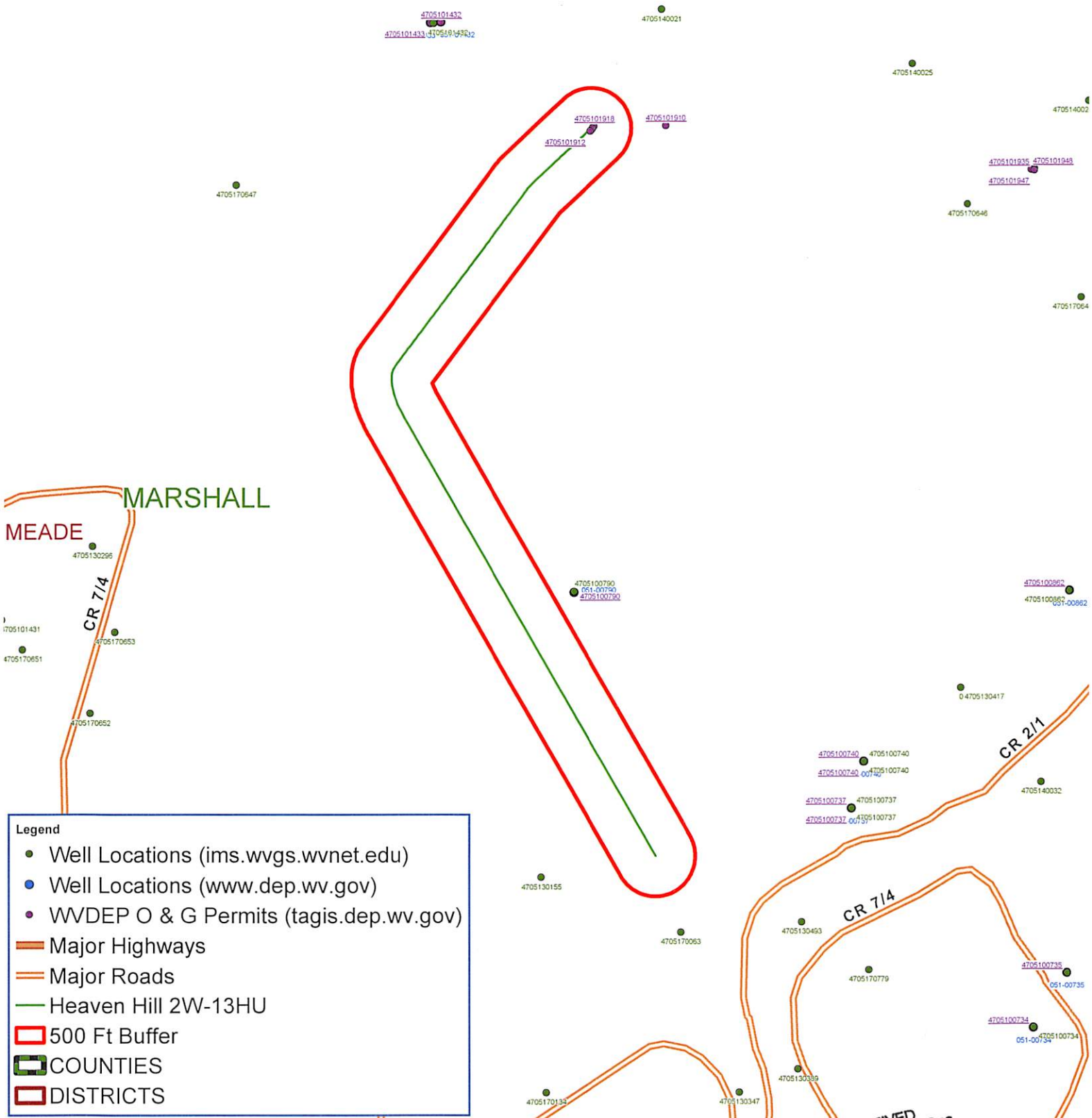
RECEIVED  
Office of Oil and Gas  
AUG 7 2017  
WV Department of  
Environmental Protection

10/27/2017

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101910	Tug Hill Operating	11784' TVD Proposed	Utica Proposed	None	Yes. The well is planned to be drilled into the Point Pleasant Formation. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Point Pleasant wells	Tug Hill Operating permitted offset Point Pleasant well. Not yet drilled
4705101911	Tug Hill Operating	11784' TVD Proposed	Utica Proposed	None	Yes. The well is planned to be drilled into the Point Pleasant Formation. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Point Pleasant wells	Tug Hill Operating permitted offset Point Pleasant well. Not yet drilled
4705101912	Tug Hill Operating	11784' TVD Proposed	Utica Proposed	None	Yes. The well is planned to be drilled into the Point Pleasant Formation. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Point Pleasant wells	Tug Hill Operating permitted offset Point Pleasant well. Not yet drilled

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.

RECEIVED  
Office of Oil and Gas  
AUG 7 2017  
WV Department of  
Environmental Protection

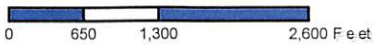


**Legend**

- 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 2W-13HU
- 500 Ft Buffer
- COUNTIES
- DISTRICTS



# Heaven Hill 2W-13HU Meade District Marshall County, WV



Map Created: July 24, 2017  
Map Current As Of: July 24, 2017

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

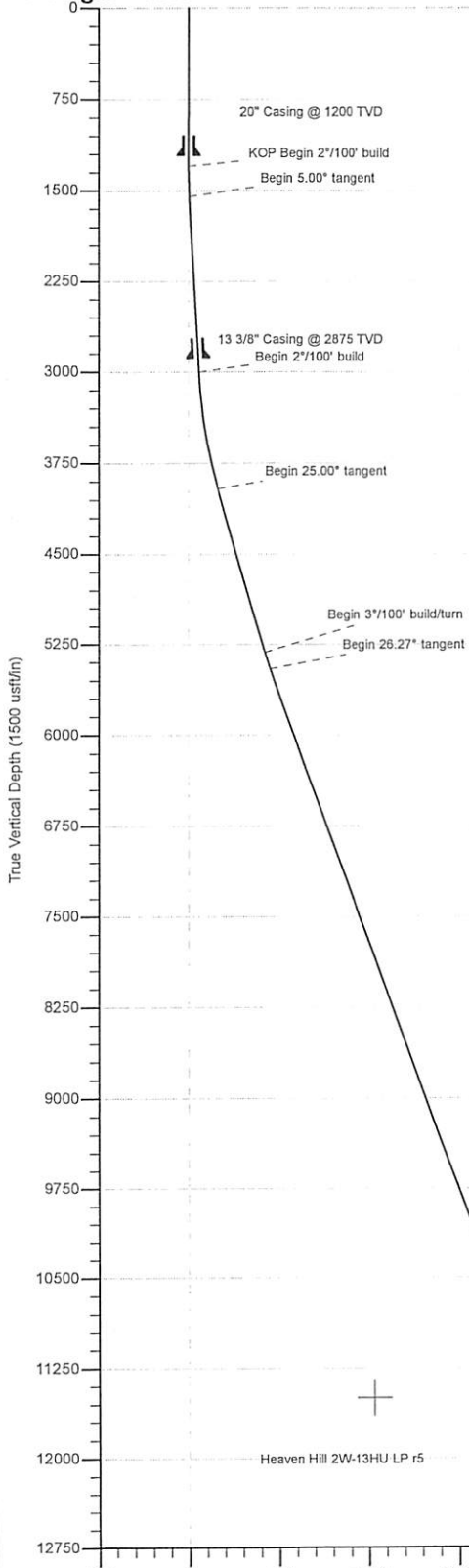
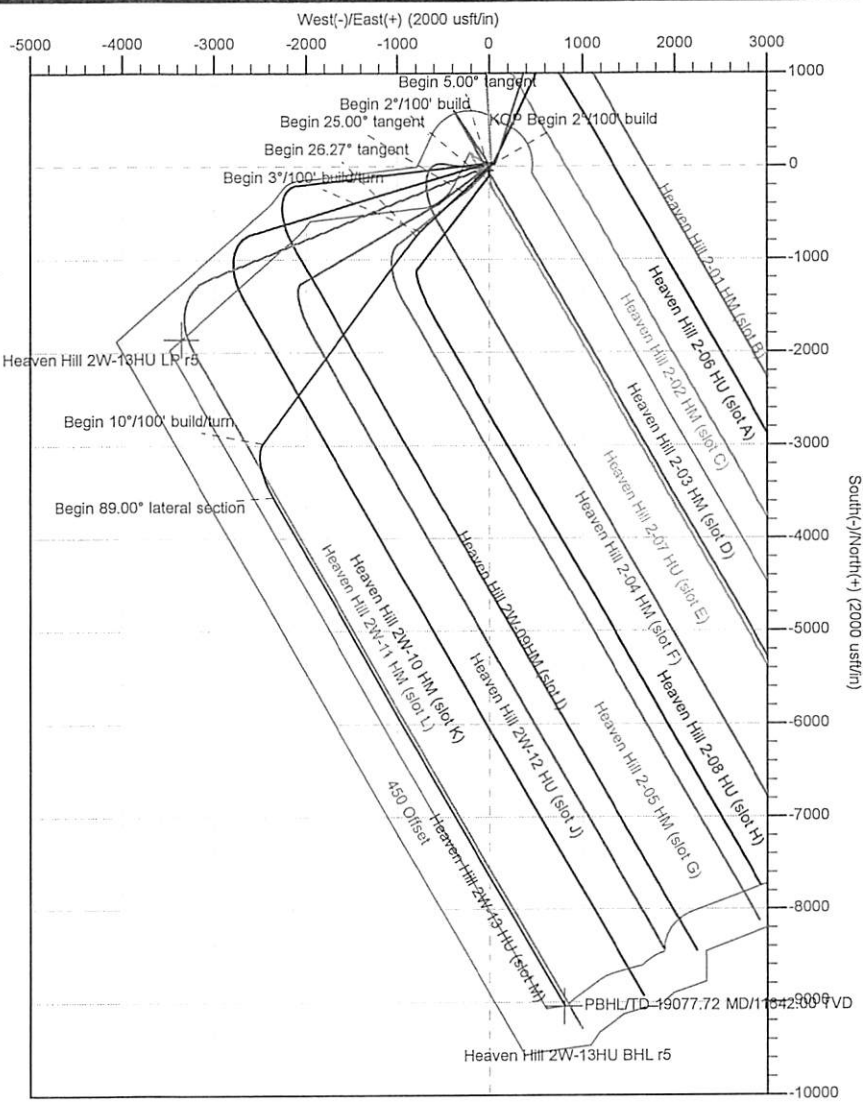
RECEIVED  
Office of Oil and Gas  
AUG 7 2017  
WV Department of  
Environmental Protection



Map Prepared by:  
**DPS**  
10/27/2017  
LAND SERVICES



**Tug Hill Operating LLC**  
**Well: Heaven Hill 2W-13 HU (slot M)**  
**Site: Heaven Hill 2**  
**Project: Marshall County, West Virginia**  
**Design: rev8**



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1550.00	5.00	227.00	1549.68	-7.43	-7.97	2.00	227.00	6.70	Begin 5.00° tangent
4	3005.86	5.00	227.00	3000.00	-93.97	-100.77	0.00	0.00	84.66	Begin 2°/100' build
5	4005.86	25.00	227.00	3961.03	-269.59	-289.10	2.00	0.00	242.88	Begin 25.00° tangent
6	5505.86	25.00	227.00	5320.49	-701.93	-752.73	0.00	0.00	632.38	Begin 3°/100' build/turn
7	5656.94	26.27	216.93	5456.77	-750.45	-796.19	3.00	-78.32	676.86	Begin 26.27° tangent
8	11949.04	26.27	216.93	11098.97	-2976.67	-2469.51	0.00	0.00	2745.86	Begin 10°/100' build/turn
9	12739.89	89.00	150.04	11531.39	-3553.79	-2359.12	10.00	-69.48	3330.49	Begin 89.00° lateral section
10	19077.72	89.00	150.04	11642.00	-9043.89	805.49	0.00	0.00	9079.68	PBHLTD 19077.72 MD/11642.00 TVD

Surface Location: RKB=1331+33 @ 1364.00usft (Nabors X08)  
 Universal Transverse Mercator (US Survey Feet)  
 Zone 17N (84 W to 78 W)

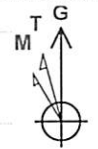
Northing: 14457704.27    Easting: 1721018.75    Latitude: 39.81007436    Longitude: -80.71298161

Total Correction (M => G)    To convert a Magnetic Direction to a Grid Direction, Subtract 8.87°

**RECEIVED**  
 Office of Oil and Gas  
**AUG 7 2017**  
 WV Department of  
 Environmental Protection

PBHLTD 19077.72 MD/11642.00 TVD

Heaven Hill 2W-13HU BHL r5





<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2W-13 HU (slot M)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Site:</b>	Heaven Hill 2	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2W-13 HU (slot M)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

<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 2				
<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 2W-13 HU (slot M)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,457,704.27 usft	<b>Latitude:</b>	39.81007436
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,721,018.75 usft	<b>Longitude:</b>	-80.71298161
<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	7/15/2017	-8.69	66.97	52,176.50581460

<b>Design</b>	rev8				
<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	174.91	

<b>Plan Survey Tool Program</b>	<b>Date</b>	7/19/2017			
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>	
1	0.00	19,077.72 rev8 (Original Hole)	MWD MWD - Standard		

**RECEIVED**  
 Office of Oil and Gas  
  
 AUG 7 2017  
  
 WV Department of  
 Environmental Protection





<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2W-13 HU (slot M)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Site:</b>	Heaven Hill 2	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2W-13 HU (slot M)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

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	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,550.00	5.00	227.00	1,549.68	-7.43	-7.97	2.00	2.00	0.00	227.00	
3,005.86	5.00	227.00	3,000.00	-93.97	-100.77	0.00	0.00	0.00	0.00	
4,005.86	25.00	227.00	3,961.03	-269.59	-289.10	2.00	2.00	0.00	0.00	
5,505.86	25.00	227.00	5,320.49	-701.93	-752.73	0.00	0.00	0.00	0.00	
5,656.94	26.27	216.93	5,456.77	-750.45	-796.19	3.00	0.84	-6.66	-78.32	
11,949.04	26.27	216.93	11,098.97	-2,976.67	-2,469.51	0.00	0.00	0.00	0.00	
12,739.89	89.00	150.04	11,531.39	-3,553.79	-2,359.12	10.00	7.93	-8.46	-69.48	
19,077.72	89.00	150.04	11,642.00	-9,043.89	805.49	0.00	0.00	0.00	0.00	Heaven Hill 2W-13HL

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

51-01957

AUG 7 2017



Planning Report - Geographic

WV Department of  
Environmental Protection

<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2W-13 HU (slot M)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Site:</b>	Heaven Hill 2	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2W-13 HU (slot M)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	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	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
100.00	0.00	0.00	100.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
200.00	0.00	0.00	200.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
300.00	0.00	0.00	300.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
400.00	0.00	0.00	400.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
500.00	0.00	0.00	500.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
600.00	0.00	0.00	600.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
700.00	0.00	0.00	700.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
800.00	0.00	0.00	800.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
900.00	0.00	0.00	900.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,457,704.27	1,721,018.75	39.81007436	-80.71298161	
<b>KOP Begin 2°/100' build</b>										
1,400.00	2.00	227.00	1,399.98	-1.19	-1.28	14,457,703.08	1,721,017.47	39.81007110	-80.71298617	
1,500.00	4.00	227.00	1,499.84	-4.76	-5.10	14,457,699.51	1,721,013.64	39.81006134	-80.71299984	
1,550.00	5.00	227.00	1,549.68	-7.43	-7.97	14,457,696.84	1,721,010.78	39.81005401	-80.71301009	
<b>Begin 5.00° tangent</b>										
1,600.00	5.00	227.00	1,599.49	-10.41	-11.16	14,457,693.86	1,721,007.59	39.81004588	-80.71302147	
1,700.00	5.00	227.00	1,699.11	-16.35	-17.53	14,457,687.92	1,721,001.21	39.81002961	-80.71304423	
1,800.00	5.00	227.00	1,798.73	-22.29	-23.91	14,457,681.98	1,720,994.84	39.81001335	-80.71306700	
1,900.00	5.00	227.00	1,898.35	-28.24	-30.28	14,457,676.03	1,720,988.47	39.80999708	-80.71308976	
2,000.00	5.00	227.00	1,997.97	-34.18	-36.66	14,457,670.09	1,720,982.09	39.80998081	-80.71311253	
2,100.00	5.00	227.00	2,097.59	-40.13	-43.03	14,457,664.14	1,720,975.72	39.80996454	-80.71313530	
2,200.00	5.00	227.00	2,197.21	-46.07	-49.40	14,457,658.20	1,720,969.34	39.80994828	-80.71315806	
2,300.00	5.00	227.00	2,296.83	-52.01	-55.78	14,457,652.26	1,720,962.97	39.80993201	-80.71318083	
2,400.00	5.00	227.00	2,396.45	-57.96	-62.15	14,457,646.31	1,720,956.59	39.80991574	-80.71320359	
2,500.00	5.00	227.00	2,496.07	-63.90	-68.53	14,457,640.37	1,720,950.22	39.80989947	-80.71322636	
2,600.00	5.00	227.00	2,595.69	-69.85	-74.90	14,457,634.42	1,720,943.85	39.80988320	-80.71324912	
2,700.00	5.00	227.00	2,695.31	-75.79	-81.28	14,457,628.48	1,720,937.47	39.80986694	-80.71327189	
2,800.00	5.00	227.00	2,794.93	-81.73	-87.65	14,457,622.54	1,720,931.10	39.80985067	-80.71329465	
2,900.00	5.00	227.00	2,894.55	-87.68	-94.02	14,457,616.59	1,720,924.72	39.80983440	-80.71331742	
3,000.00	5.00	227.00	2,994.17	-93.62	-100.40	14,457,610.65	1,720,918.35	39.80981813	-80.71334019	
3,005.86	5.00	227.00	3,000.00	-93.97	-100.77	14,457,610.30	1,720,917.98	39.80981718	-80.71334152	
<b>Begin 2°/100' build</b>										
3,100.00	6.88	227.00	3,093.63	-100.62	-107.90	14,457,603.65	1,720,910.85	39.80979899	-80.71336697	
3,200.00	8.88	227.00	3,192.68	-109.97	-117.93	14,457,594.30	1,720,900.82	39.80977340	-80.71340279	
3,300.00	10.88	227.00	3,291.19	-121.67	-130.48	14,457,582.60	1,720,888.27	39.80974136	-80.71344762	
3,400.00	12.88	227.00	3,389.05	-135.72	-145.54	14,457,568.55	1,720,873.21	39.80970293	-80.71350140	
3,500.00	14.88	227.00	3,486.12	-152.08	-163.09	14,457,552.19	1,720,855.66	39.80965815	-80.71356407	
3,600.00	16.88	227.00	3,582.30	-170.74	-183.10	14,457,533.53	1,720,835.65	39.80960707	-80.71363555	
3,700.00	18.88	227.00	3,677.46	-191.68	-205.56	14,457,512.59	1,720,813.19	39.80954976	-80.71371576	
3,800.00	20.88	227.00	3,771.50	-214.88	-230.43	14,457,489.39	1,720,788.32	39.80948628	-80.71380459	
3,900.00	22.88	227.00	3,864.29	-240.30	-257.69	14,457,463.97	1,720,761.06	39.80941672	-80.71390193	
4,000.00	24.88	227.00	3,955.72	-267.91	-287.29	14,457,436.36	1,720,731.45	39.80934115	-80.71400768	
4,005.86	25.00	227.00	3,961.03	-269.59	-289.10	14,457,434.68	1,720,729.65	39.80933654	-80.71401413	
<b>Begin 25.00° tangent</b>										
4,100.00	25.00	227.00	4,046.35	-296.72	-318.20	14,457,407.55	1,720,700.55	39.80926228	-80.71411805	
4,200.00	25.00	227.00	4,136.98	-325.55	-349.11	14,457,378.72	1,720,669.64	39.80918340	-80.71422844	
4,300.00	25.00	227.00	4,227.61	-354.37	-380.01	14,457,349.90	1,720,638.73	39.80910451	-80.71433883	
4,400.00	25.00	227.00	4,318.24	-383.19	-410.92	14,457,321.08	1,720,607.82	39.80902563	-80.71444922	
4,500.00	25.00	227.00	4,408.87	-412.01	-441.83	14,457,292.26	1,720,576.92	39.80894675	-80.71455960	
4,600.00	25.00	227.00	4,499.51	-440.84	-472.74	14,457,263.43	1,720,546.01	39.80886786	-80.71466999	



Planning Report - Geographic

AUG 7 2017

WV Department of Environmental Protection

Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Heaven Hill 2  
 Well: Heaven Hill 2W-13 HU (slot M)  
 Wellbore: Original Hole  
 Design: rev8

Local Co-ordinate Reference: Well Heaven Hill 2W-13 HU (slot M)  
 TVD Reference: RKB=1331+33 @ 1364.00usft (Nabors X08)  
 MD Reference: RKB=1331+33 @ 1364.00usft (Nabors X08)  
 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
4,700.00	25.00	227.00	4,590.14	-469.66	-503.65	14,457,234.61	1,720,515.10	39.80878898	-80.71478038
4,800.00	25.00	227.00	4,680.77	-498.48	-534.56	14,457,205.79	1,720,484.19	39.80871010	-80.71489076
4,900.00	25.00	227.00	4,771.40	-527.30	-565.47	14,457,176.97	1,720,453.28	39.80863121	-80.71500115
5,000.00	25.00	227.00	4,862.03	-556.13	-596.37	14,457,148.14	1,720,422.37	39.80855233	-80.71511153
5,100.00	25.00	227.00	4,952.66	-584.95	-627.28	14,457,119.32	1,720,391.47	39.80847345	-80.71522192
5,200.00	25.00	227.00	5,043.29	-613.77	-658.19	14,457,090.50	1,720,360.56	39.80839456	-80.71533230
5,300.00	25.00	227.00	5,133.92	-642.59	-689.10	14,457,061.68	1,720,329.65	39.80831568	-80.71544269
5,400.00	25.00	227.00	5,224.55	-671.42	-720.01	14,457,032.85	1,720,298.74	39.80823680	-80.71555307
5,500.00	25.00	227.00	5,315.18	-700.24	-750.92	14,457,004.03	1,720,267.83	39.80815791	-80.71566346
5,505.86	25.00	227.00	5,320.49	-701.93	-752.73	14,457,002.34	1,720,266.02	39.80815329	-80.71566992
<b>Begin 3°/100' build/tum</b>									
5,600.00	25.71	220.61	5,405.58	-731.00	-780.57	14,456,973.27	1,720,238.17	39.80807369	-80.71576941
5,656.94	26.27	216.93	5,456.77	-750.45	-796.19	14,456,953.82	1,720,222.56	39.80802040	-80.71582523
<b>Begin 26.27° tangent</b>									
5,700.00	26.27	216.93	5,495.38	-765.69	-807.64	14,456,938.58	1,720,211.11	39.80797867	-80.71586618
5,800.00	26.27	216.93	5,585.05	-801.07	-834.23	14,456,903.20	1,720,184.52	39.80788173	-80.71596127
5,900.00	26.27	216.93	5,674.72	-836.45	-860.83	14,456,867.82	1,720,157.92	39.80778480	-80.71605637
6,000.00	26.27	216.93	5,764.39	-871.83	-887.42	14,456,832.44	1,720,131.33	39.80768787	-80.71615146
6,100.00	26.27	216.93	5,854.06	-907.21	-914.01	14,456,797.06	1,720,104.73	39.80759093	-80.71624656
6,200.00	26.27	216.93	5,943.73	-942.59	-940.61	14,456,761.68	1,720,078.14	39.80749400	-80.71634165
6,300.00	26.27	216.93	6,033.40	-977.98	-967.20	14,456,726.29	1,720,051.55	39.80739706	-80.71643674
6,400.00	26.27	216.93	6,123.08	-1,013.36	-993.80	14,456,690.91	1,720,024.95	39.80730013	-80.71653184
6,500.00	26.27	216.93	6,212.75	-1,048.74	-1,020.39	14,456,655.53	1,719,998.36	39.80720320	-80.71662693
6,600.00	26.27	216.93	6,302.42	-1,084.12	-1,046.98	14,456,620.15	1,719,971.76	39.80710626	-80.71672202
6,700.00	26.27	216.93	6,392.09	-1,119.50	-1,073.58	14,456,584.77	1,719,945.17	39.80700933	-80.71681712
6,800.00	26.27	216.93	6,481.76	-1,154.88	-1,100.17	14,456,549.39	1,719,918.58	39.80691239	-80.71691221
6,900.00	26.27	216.93	6,571.43	-1,190.26	-1,126.77	14,456,514.01	1,719,891.98	39.80681546	-80.71700730
7,000.00	26.27	216.93	6,661.10	-1,225.64	-1,153.36	14,456,478.63	1,719,865.39	39.80671852	-80.71710240
7,100.00	26.27	216.93	6,750.77	-1,261.02	-1,179.95	14,456,443.25	1,719,838.79	39.80662159	-80.71719749
7,200.00	26.27	216.93	6,840.45	-1,296.41	-1,206.55	14,456,407.86	1,719,812.20	39.80652465	-80.71729258
7,300.00	26.27	216.93	6,930.12	-1,331.79	-1,233.14	14,456,372.48	1,719,785.61	39.80642772	-80.71738767
7,400.00	26.27	216.93	7,019.79	-1,367.17	-1,259.74	14,456,337.10	1,719,759.01	39.80633078	-80.71748276
7,500.00	26.27	216.93	7,109.46	-1,402.55	-1,286.33	14,456,301.72	1,719,732.42	39.80623385	-80.71757785
7,600.00	26.27	216.93	7,199.13	-1,437.93	-1,312.92	14,456,266.34	1,719,705.82	39.80613691	-80.71767294
7,700.00	26.27	216.93	7,288.80	-1,473.31	-1,339.52	14,456,230.96	1,719,679.23	39.80603998	-80.71776803
7,800.00	26.27	216.93	7,378.47	-1,508.69	-1,366.11	14,456,195.58	1,719,652.64	39.80594304	-80.71786312
7,900.00	26.27	216.93	7,468.14	-1,544.07	-1,392.71	14,456,160.20	1,719,626.04	39.80584611	-80.71795821
8,000.00	26.27	216.93	7,557.82	-1,579.45	-1,419.30	14,456,124.82	1,719,599.45	39.80574917	-80.71805330
8,100.00	26.27	216.93	7,647.49	-1,614.84	-1,445.89	14,456,089.43	1,719,572.85	39.80565224	-80.71814839
8,200.00	26.27	216.93	7,737.16	-1,650.22	-1,472.49	14,456,054.05	1,719,546.26	39.80555530	-80.71824348
8,300.00	26.27	216.93	7,826.83	-1,685.60	-1,499.08	14,456,018.67	1,719,519.66	39.80545837	-80.71833857
8,400.00	26.27	216.93	7,916.50	-1,720.98	-1,525.68	14,455,983.29	1,719,493.07	39.80536143	-80.71843366
8,500.00	26.27	216.93	8,006.17	-1,756.36	-1,552.27	14,455,947.91	1,719,466.48	39.80526449	-80.71852875
8,600.00	26.27	216.93	8,095.84	-1,791.74	-1,578.87	14,455,912.53	1,719,439.88	39.80516756	-80.71862383
8,700.00	26.27	216.93	8,185.51	-1,827.12	-1,605.46	14,455,877.15	1,719,413.29	39.80507062	-80.71871892
8,800.00	26.27	216.93	8,275.19	-1,862.50	-1,632.05	14,455,841.77	1,719,386.69	39.80497369	-80.71881401
8,900.00	26.27	216.93	8,364.86	-1,897.89	-1,658.65	14,455,806.38	1,719,360.10	39.80487675	-80.71890910
9,000.00	26.27	216.93	8,454.53	-1,933.27	-1,685.24	14,455,770.91	1,719,333.51	39.80477981	-80.71900418
9,100.00	26.27	216.93	8,544.20	-1,968.65	-1,711.84	14,455,735.62	1,719,306.91	39.80468288	-80.71909927
9,200.00	26.27	216.93	8,633.87	-2,004.03	-1,738.43	14,455,700.24	1,719,280.32	39.80458594	-80.71919436
9,300.00	26.27	216.93	8,723.54	-2,039.41	-1,765.02	14,455,664.86	1,719,253.72	39.80448900	-80.71928944
9,400.00	26.27	216.93	8,813.21	-2,074.79	-1,791.62	14,455,629.48	1,719,227.13	39.80439207	-80.71938453
9,500.00	26.27	216.93	8,902.88	-2,110.17	-1,818.21	14,455,594.10	1,719,200.54	39.80429513	-80.71947961
9,600.00	26.27	216.93	8,992.56	-2,145.55	-1,844.81	14,455,558.72	1,719,173.94	39.80419819	-80.71957470

AUG 7 2017

WV Department of  
Environmental Protection



Planning Report - Geographic

Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Heaven Hill 2  
 Well: Heaven Hill 2W-13 HU (slot M)  
 Wellbore: Original Hole  
 Design: rev8

Local Co-ordinate Reference: Well Heaven Hill 2W-13 HU (slot M)  
 TVD Reference: RKB=1331+33 @ 1364.00usft (Nabors X08)  
 MD Reference: RKB=1331+33 @ 1364.00usft (Nabors X08)  
 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	
9,700.00	26.27	216.93	9,082.23	-2,180.93	-1,871.40	14,455,523.34	1,719,147.35	39.80410128	-80.71966978	
9,800.00	26.27	216.93	9,171.90	-2,216.32	-1,897.99	14,455,487.95	1,719,120.75	39.80400432	-80.71976487	
9,900.00	26.27	216.93	9,261.57	-2,251.70	-1,924.59	14,455,452.57	1,719,094.16	39.80390738	-80.71985995	
10,000.00	26.27	216.93	9,351.24	-2,287.08	-1,951.18	14,455,417.19	1,719,067.57	39.80381045	-80.71995504	
10,100.00	26.27	216.93	9,440.91	-2,322.46	-1,977.78	14,455,381.81	1,719,040.97	39.80371351	-80.72005012	
10,200.00	26.27	216.93	9,530.58	-2,357.84	-2,004.37	14,455,346.43	1,719,014.38	39.80361657	-80.72014521	
10,300.00	26.27	216.93	9,620.25	-2,393.22	-2,030.96	14,455,311.05	1,718,987.78	39.80351964	-80.72024029	
10,400.00	26.27	216.93	9,709.93	-2,428.60	-2,057.56	14,455,275.67	1,718,961.19	39.80342270	-80.72033537	
10,500.00	26.27	216.93	9,799.60	-2,463.98	-2,084.15	14,455,240.29	1,718,934.60	39.80332576	-80.72043045	
10,600.00	26.27	216.93	9,889.27	-2,499.36	-2,110.75	14,455,204.91	1,718,908.00	39.80322882	-80.72052554	
10,700.00	26.27	216.93	9,978.94	-2,534.75	-2,137.34	14,455,169.52	1,718,881.41	39.80313189	-80.72062062	
10,800.00	26.27	216.93	10,068.61	-2,570.13	-2,163.93	14,455,134.14	1,718,854.81	39.80303495	-80.72071570	
10,900.00	26.27	216.93	10,158.28	-2,605.51	-2,190.53	14,455,098.76	1,718,828.22	39.80293801	-80.72081078	
11,000.00	26.27	216.93	10,247.95	-2,640.89	-2,217.12	14,455,063.38	1,718,801.63	39.80284107	-80.72090587	
11,100.00	26.27	216.93	10,337.62	-2,676.27	-2,243.72	14,455,028.00	1,718,775.03	39.80274413	-80.72100095	
11,200.00	26.27	216.93	10,427.30	-2,711.65	-2,270.31	14,454,992.62	1,718,748.44	39.80264720	-80.72109603	
11,300.00	26.27	216.93	10,516.97	-2,747.03	-2,296.80	14,454,957.24	1,718,721.84	39.80255026	-80.72119111	
11,400.00	26.27	216.93	10,606.64	-2,782.41	-2,323.50	14,454,921.86	1,718,695.25	39.80245332	-80.72128619	
11,500.00	26.27	216.93	10,696.31	-2,817.80	-2,350.09	14,454,886.47	1,718,668.66	39.80235638	-80.72138127	
11,600.00	26.27	216.93	10,785.98	-2,853.18	-2,376.69	14,454,851.09	1,718,642.06	39.80225944	-80.72147635	
11,700.00	26.27	216.93	10,875.65	-2,888.56	-2,403.28	14,454,815.71	1,718,615.47	39.80216250	-80.72157143	
11,800.00	26.27	216.93	10,965.32	-2,923.94	-2,429.87	14,454,780.33	1,718,588.87	39.80206557	-80.72166651	
11,900.00	26.27	216.93	11,054.99	-2,959.32	-2,456.47	14,454,744.95	1,718,562.28	39.80196863	-80.72176159	
11,949.04	26.27	216.93	11,098.97	-2,976.67	-2,469.51	14,454,727.60	1,718,549.24	39.80192109	-80.72180821	
Begin 10°/100' build/tum										
12,000.00	28.43	206.87	11,144.25	-2,996.52	-2,481.78	14,454,707.75	1,718,536.97	39.80186668	-80.72185211	
12,100.00	34.38	191.33	11,229.71	-3,045.56	-2,498.12	14,454,658.71	1,718,520.62	39.80173214	-80.72191086	
12,200.00	41.73	180.29	11,308.49	-3,106.88	-2,503.86	14,454,597.59	1,718,514.89	39.80156435	-80.72193194	
12,300.00	49.87	172.16	11,378.20	-3,178.02	-2,498.80	14,454,526.25	1,718,519.95	39.80136839	-80.72191473	
12,400.00	58.46	165.82	11,436.73	-3,257.41	-2,483.11	14,454,446.86	1,718,535.64	39.80115023	-80.72185974	
12,500.00	67.30	160.57	11,482.30	-3,342.44	-2,457.26	14,454,361.83	1,718,561.49	39.80091649	-80.72176864	
12,600.00	76.30	155.96	11,513.51	-3,430.53	-2,422.03	14,454,273.74	1,718,596.71	39.80067428	-80.72164420	
12,700.00	85.37	151.70	11,529.43	-3,518.99	-2,378.51	14,454,185.28	1,718,640.24	39.80043095	-80.72149021	
12,739.89	89.00	150.04	11,531.39	-3,553.79	-2,359.12	14,454,150.48	1,718,659.63	39.80033524	-80.72142155	
Begin 89.00° lateral section										
12,800.00	89.00	150.04	11,532.44	-3,605.86	-2,329.10	14,454,098.41	1,718,689.65	39.80019198	-80.72131526	
12,900.00	89.00	150.04	11,534.18	-3,692.48	-2,279.17	14,454,011.79	1,718,739.58	39.79995366	-80.72113845	
13,000.00	89.00	150.04	11,535.93	-3,779.11	-2,229.24	14,453,925.16	1,718,789.51	39.79971534	-80.72096163	
13,100.00	89.00	150.04	11,537.67	-3,865.73	-2,179.30	14,453,838.54	1,718,839.44	39.79947702	-80.72078482	
13,200.00	89.00	150.04	11,539.42	-3,952.36	-2,129.37	14,453,751.91	1,718,889.37	39.79923870	-80.72060801	
13,300.00	89.00	150.04	11,541.17	-4,038.98	-2,079.44	14,453,665.29	1,718,939.31	39.79900038	-80.72043120	
13,400.00	89.00	150.04	11,542.91	-4,125.60	-2,029.51	14,453,578.67	1,718,989.24	39.79876206	-80.72025439	
13,500.00	89.00	150.04	11,544.66	-4,212.23	-1,979.58	14,453,492.04	1,719,039.17	39.79852374	-80.72007758	
13,600.00	89.00	150.04	11,546.40	-4,298.85	-1,929.65	14,453,405.42	1,719,089.10	39.79828542	-80.71990077	
13,700.00	89.00	150.04	11,548.15	-4,385.48	-1,879.71	14,453,318.79	1,719,139.03	39.79804710	-80.71972396	
13,800.00	89.00	150.04	11,549.89	-4,472.10	-1,829.78	14,453,232.17	1,719,188.97	39.79780877	-80.71954716	
13,900.00	89.00	150.04	11,551.64	-4,558.72	-1,779.85	14,453,145.55	1,719,238.90	39.79757045	-80.71937036	
14,000.00	89.00	150.04	11,553.38	-4,645.35	-1,729.92	14,453,058.92	1,719,288.83	39.79733213	-80.71919355	
14,100.00	89.00	150.04	11,555.13	-4,731.97	-1,679.99	14,452,972.30	1,719,338.76	39.79709381	-80.71901675	
14,200.00	89.00	150.04	11,556.87	-4,818.60	-1,630.05	14,452,885.67	1,719,388.69	39.79685548	-80.71883995	
14,300.00	89.00	150.04	11,558.62	-4,905.22	-1,580.12	14,452,799.05	1,719,438.63	39.79661716	-80.71866315	
14,400.00	89.00	150.04	11,560.36	-4,991.85	-1,530.19	14,452,712.42	1,719,488.56	39.79637884	-80.71848636	
14,500.00	89.00	150.04	11,562.11	-5,078.47	-1,480.26	14,452,625.80	1,719,538.49	39.79614051	-80.71830956	
14,600.00	89.00	150.04	11,563.85	-5,165.09	-1,430.33	14,452,539.18	1,719,588.42	39.79590219	-80.71813276	



Planning Report - Geographic

Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Heaven Hill 2  
 Well: Heaven Hill 2W-13 HU (slot M)  
 Wellbore: Original Hole  
 Design: rev8

Local Co-ordinate Reference: Well Heaven Hill 2W-13 HU (slot M)  
 TVD Reference: RKB=1331+33 @ 1364.00usft (Nabors X08)  
 MD Reference: RKB=1331+33 @ 1364.00usft (Nabors X08)  
 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
14,700.00	89.00	150.04	11,565.60	-5,251.72	-1,380.39	14,452,452.55	1,719,638.35	39.79566386	-80.71795597
14,800.00	89.00	150.04	11,567.34	-5,338.34	-1,330.46	14,452,365.93	1,719,688.29	39.79542554	-80.71777918
14,900.00	89.00	150.04	11,569.09	-5,424.97	-1,280.53	14,452,279.30	1,719,738.22	39.79518722	-80.71760239
15,000.00	89.00	150.04	11,570.83	-5,511.59	-1,230.60	14,452,192.68	1,719,788.15	39.79494889	-80.71742560
15,100.00	89.00	150.04	11,572.58	-5,598.22	-1,180.67	14,452,106.05	1,719,838.08	39.79471056	-80.71724881
15,200.00	89.00	150.04	11,574.32	-5,684.84	-1,130.73	14,452,019.43	1,719,888.01	39.79447224	-80.71707202
15,300.00	89.00	150.04	11,576.07	-5,771.46	-1,080.80	14,451,932.81	1,719,937.95	39.79423391	-80.71689523
15,400.00	89.00	150.04	11,577.82	-5,858.09	-1,030.87	14,451,846.18	1,719,987.88	39.79399559	-80.71671845
15,500.00	89.00	150.04	11,579.56	-5,944.71	-980.94	14,451,759.56	1,720,037.81	39.79375726	-80.71654166
15,600.00	89.00	150.04	11,581.31	-6,031.34	-931.01	14,451,672.93	1,720,087.74	39.79351893	-80.71636488
15,700.00	89.00	150.04	11,583.05	-6,117.96	-881.07	14,451,586.31	1,720,137.67	39.79328061	-80.71618810
15,800.00	89.00	150.04	11,584.80	-6,204.59	-831.14	14,451,499.68	1,720,187.60	39.79304228	-80.71601132
15,900.00	89.00	150.04	11,586.54	-6,291.21	-781.21	14,451,413.06	1,720,237.54	39.79280395	-80.71583454
16,000.00	89.00	150.04	11,588.29	-6,377.83	-731.28	14,451,326.44	1,720,287.47	39.79256562	-80.71565776
16,100.00	89.00	150.04	11,590.03	-6,464.46	-681.35	14,451,239.81	1,720,337.40	39.79232730	-80.71548098
16,200.00	89.00	150.04	11,591.78	-6,551.08	-631.42	14,451,153.19	1,720,387.33	39.79208897	-80.71530421
16,300.00	89.00	150.04	11,593.52	-6,637.71	-581.48	14,451,066.56	1,720,437.26	39.79185064	-80.71512743
16,400.00	89.00	150.04	11,595.27	-6,724.33	-531.55	14,450,979.94	1,720,487.20	39.79161231	-80.71495066
16,500.00	89.00	150.04	11,597.01	-6,810.95	-481.62	14,450,893.32	1,720,537.13	39.79137398	-80.71477389
16,600.00	89.00	150.04	11,598.76	-6,897.58	-431.69	14,450,806.69	1,720,587.06	39.79113565	-80.71459712
16,700.00	89.00	150.04	11,600.50	-6,984.20	-381.76	14,450,720.07	1,720,636.99	39.79089732	-80.71442035
16,800.00	89.00	150.04	11,602.25	-7,070.83	-331.82	14,450,633.44	1,720,686.92	39.79065899	-80.71424358
16,900.00	89.00	150.04	11,603.99	-7,157.45	-281.89	14,450,546.82	1,720,736.86	39.79042066	-80.71406681
17,000.00	89.00	150.04	11,605.74	-7,244.08	-231.96	14,450,460.19	1,720,786.79	39.79018233	-80.71389005
17,100.00	89.00	150.04	11,607.48	-7,330.70	-182.03	14,450,373.57	1,720,836.72	39.78994400	-80.71371328
17,200.00	89.00	150.04	11,609.23	-7,417.32	-132.10	14,450,286.95	1,720,886.65	39.78970567	-80.71353652
17,300.00	89.00	150.04	11,610.97	-7,503.95	-82.16	14,450,200.32	1,720,936.58	39.78946734	-80.71335976
17,400.00	89.00	150.04	11,612.72	-7,590.57	-32.23	14,450,113.70	1,720,986.52	39.78922900	-80.71318300
17,500.00	89.00	150.04	11,614.47	-7,677.20	17.70	14,450,027.07	1,721,036.45	39.78899067	-80.71300624
17,600.00	89.00	150.04	11,616.21	-7,763.82	67.63	14,449,940.45	1,721,086.38	39.78875234	-80.71282948
17,700.00	89.00	150.04	11,617.96	-7,850.45	117.56	14,449,853.82	1,721,136.31	39.78851401	-80.71265272
17,800.00	89.00	150.04	11,619.70	-7,937.07	167.50	14,449,767.20	1,721,186.24	39.78827567	-80.71247596
17,900.00	89.00	150.04	11,621.45	-8,023.69	217.43	14,449,680.58	1,721,236.18	39.78803734	-80.71229921
18,000.00	89.00	150.04	11,623.19	-8,110.32	267.36	14,449,593.95	1,721,286.11	39.78779901	-80.71212246
18,100.00	89.00	150.04	11,624.94	-8,196.94	317.29	14,449,507.33	1,721,336.04	39.78756067	-80.71194570
18,200.00	89.00	150.04	11,626.68	-8,283.57	367.22	14,449,420.70	1,721,385.97	39.78732234	-80.71176895
18,300.00	89.00	150.04	11,628.43	-8,370.19	417.16	14,449,334.08	1,721,435.90	39.78708401	-80.71159220
18,400.00	89.00	150.04	11,630.17	-8,456.82	467.09	14,449,247.45	1,721,485.83	39.78684567	-80.71141545
18,500.00	89.00	150.04	11,631.92	-8,543.44	517.02	14,449,160.83	1,721,535.77	39.78660734	-80.71123870
18,600.00	89.00	150.04	11,633.66	-8,630.06	566.95	14,449,074.21	1,721,585.70	39.78636900	-80.71106196
18,700.00	89.00	150.04	11,635.41	-8,716.69	616.88	14,448,987.58	1,721,635.63	39.78613067	-80.71088521
18,800.00	89.00	150.04	11,637.15	-8,803.31	666.81	14,448,900.96	1,721,685.56	39.78589233	-80.71070847
18,900.00	89.00	150.04	11,638.90	-8,889.94	716.75	14,448,814.33	1,721,735.49	39.78565400	-80.71053173
19,000.00	89.00	150.04	11,640.64	-8,976.56	766.68	14,448,727.71	1,721,785.43	39.78541566	-80.71035498
19,077.72	89.00	150.04	11,642.00	-9,043.89	805.49	14,448,660.38	1,721,824.23	39.78523042	-80.71021762

PBHL/JD 19077.72 MD/11642.00 TVD

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

SI-01957



Planning Report - Geographic

<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2W-13 HU (slot M)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Site:</b>	Heaven Hill 2	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2W-13 HU (slot M)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Heaven Hill 2W-13HU LI	0.00	0.00	11,497.00	-1,857.88	-3,350.25	14,455,846.39	1,717,668.49	39.80500104	-80.72493183
- plan misses target center by 1474.85usft at 12000.00usft MD (11144.25 TVD, -2996.52 N, -2481.78 E)									
- Point									
Heaven Hill 2W-13HU B	0.00	0.00	11,642.00	-9,043.89	805.49	14,448,660.38	1,721,824.23	39.78523042	-80.71021762
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter	
(usft)	(usft)		(")	(")	
1,205.00	1,205.00	20" Casing @ 1200 TVD	20	24	
2,885.40	2,880.00	13 3/8" Casing @ 2875 TVD	13-3/8	17-1/2	
11,234.24	10,458.00	9 5/8" Casing @ 10453 TVD	9-5/8	12-1/4	

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
1,300.00	1,300.00	0.00	0.00	KOP Begin 2°/100' build	
1,550.00	1,549.68	-7.43	-7.97	Begin 5.00° tangent	
3,005.86	3,000.00	-93.97	-100.77	Begin 2°/100' build	
4,005.86	3,961.03	-269.59	-289.10	Begin 25.00° tangent	
5,505.86	5,320.49	-701.93	-752.73	Begin 3°/100' build/turn	
5,656.94	5,456.77	-750.45	-796.19	Begin 26.27° tangent	
11,949.04	11,098.97	-2,976.67	-2,469.51	Begin 10°/100' build/turn	
12,739.89	11,531.39	-3,553.79	-2,359.12	Begin 89.00° lateral section	
19,077.72	11,642.00	-9,043.89	805.49	PBHL/TD 19077.72 MD/11642.00 TVD	

RECEIVED  
Office of Oil and Gas  
AUG 7 2017  
WV Department of  
Environmental Protection

WW-9  
(4/16)

API Number 47 - 051 - 01957  
Operator's Well No. Heaven Hill 2W-13HU

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

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

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

Will a pit be used? Yes  No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109165) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1366426)

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 \_\_\_\_\_

Company Official (Typed Name) Sean Gasser

Company Official Title Engineer

RECEIVED  
Office of Oil and Gas

AUG 7 2017

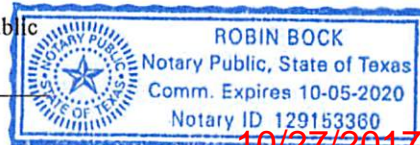
WV Department of  
Environmental Protection

Subscribed and sworn before me this 1st day of August, 20 17

Robin Bock

Notary Public

My commission expires 10-05-2020



10/27/2017

51-01957

Operator's Well No. Heaven Hill 2W-13HU

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

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
<u>Annual Ryegrass</u>	<u>40</u>	<u>Orchard Grass</u>	<u>10</u>
		<u>Ladino Clover</u>	<u>3</u>

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 Nilsson

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

RECEIVED  
Office of Oil and Gas  
AUG 7 2017  
WV Department of  
Environmental Protection

Title: DEP Inspector Date: 8/4/2017

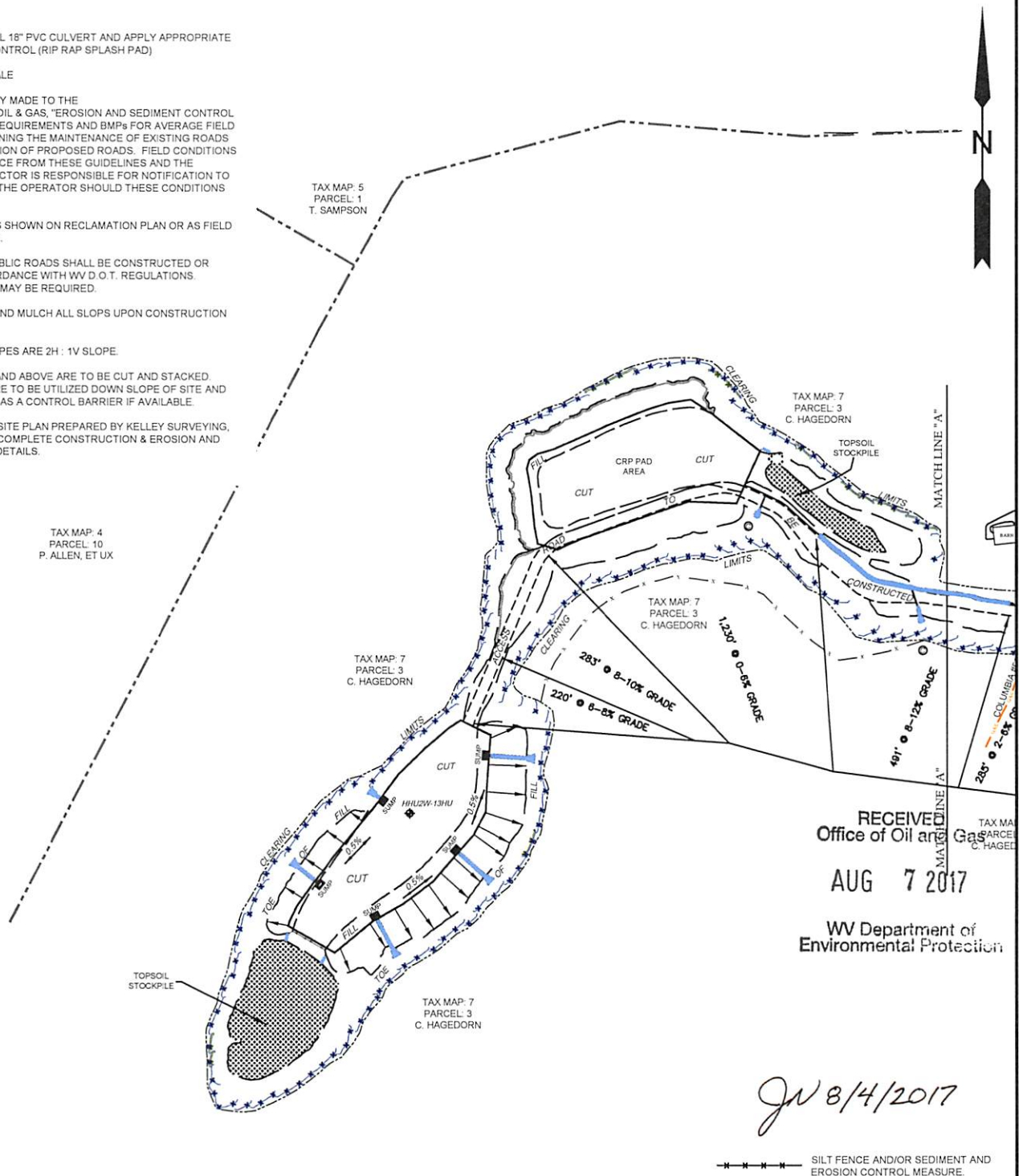
Field Reviewed? (  ) Yes (  ) No



# PROPOSED HEAVEN HILL 2W - 13HU

**NOTES:**

1. - DENOTES INSTALL 18" PVC CULVERT AND APPLY APPROPRIATE SEDIMENT OUTLET CONTROL (RIP RAP SPLASH PAD)
2. DRAWING NOT TO SCALE
3. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
4. INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.
5. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
6. TEMPORARILY SEED AND MULCH ALL SLOPS UPON CONSTRUCTION OF LOCATION.
7. ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.
8. ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO BE UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.
9. SEE HEAVEN HILL 2W SITE PLAN PREPARED BY KELLEY SURVEYING, DATED 4/27/2017 FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.



RECEIVED  
Office of Oil and Gas  
AUG 7 2017  
WV Department of  
Environmental Protection

*JN* 8/4/2017

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

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8703	07/27/2017	NONE

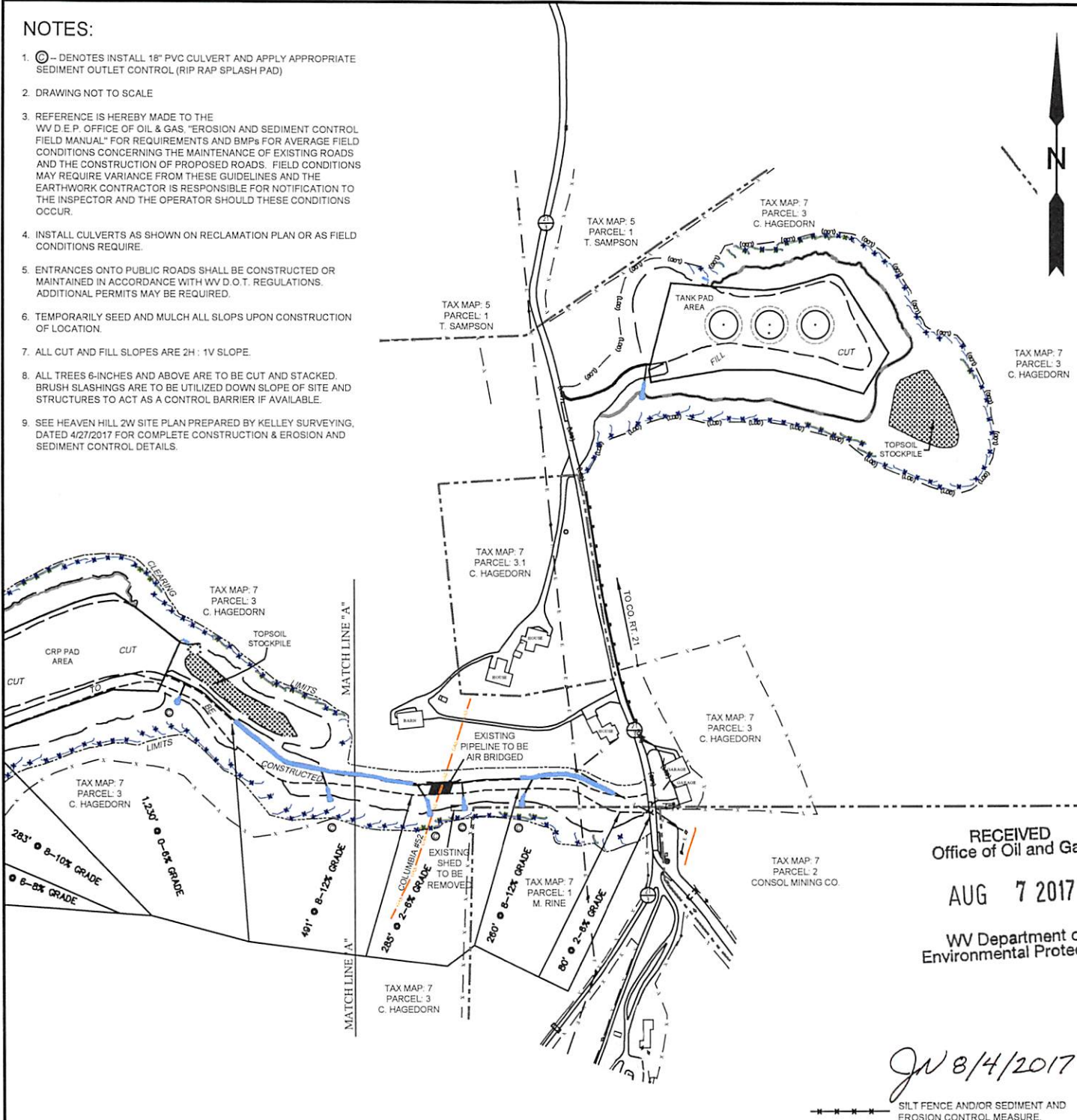
**TUG HILL**  
OPERATING

10/27/2017

# PROPOSED HEAVEN HILL 2W - 13HU

**NOTES:**

1. - DENOTES INSTALL 18" PVC CULVERT AND APPLY APPROPRIATE SEDIMENT OUTLET CONTROL (RIP RAP SPLASH PAD)
2. DRAWING NOT TO SCALE
3. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
4. INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.
5. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
6. TEMPORARILY SEED AND MULCH ALL SLOPS UPON CONSTRUCTION OF LOCATION.
7. ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.
8. ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO BE UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.
9. SEE HEAVEN HILL 2W SITE PLAN PREPARED BY KELLEY SURVEYING, DATED 4/27/2017 FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.



RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

*JN 8/4/2017*

-----  
SILT FENCE AND/OR SEDIMENT AND  
EROSION CONTROL MEASURE.

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

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8703	07/27/2017	NONE

**TUG HILL**  
**OPERATING**

10/27/2017



# Well Site Safety Plan

## Tug Hill Operating, LLC

*JW*  
*8/5/17*

Well Name: Heaven Hill Unit 2W-13HU

Pad Location: Heaven Hill Unit 2

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

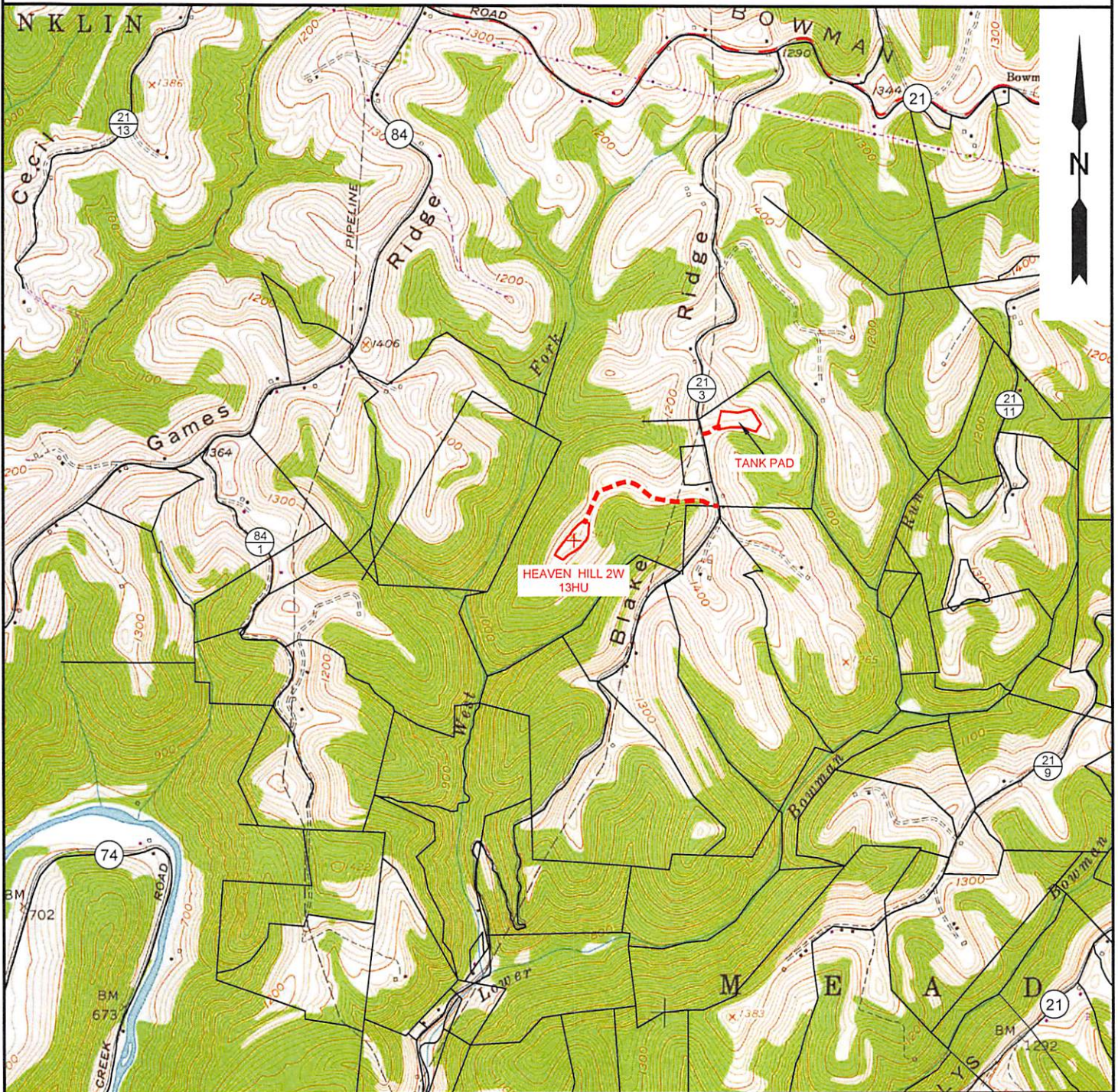
NORTHING -4,406,720.12

EASTING -524,569.86

August 2017

WW-9

# PROPOSED HEAVEN HILL 2W - 13HU



NOTE: CLOSEST WATER PURVEYOR  
GRANDVIEW - DOOLIN PUBLIC SERVICE DISTRICT  
PROCTOR, WV

LAT: 39.7137712  
LON: -80.8258327  
LOCATED: S 42°57'59" W AT 47,250' FROM HEAVEN HILL 2W - 13HU SURFACE LOCATION

JN 8/4/2017

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

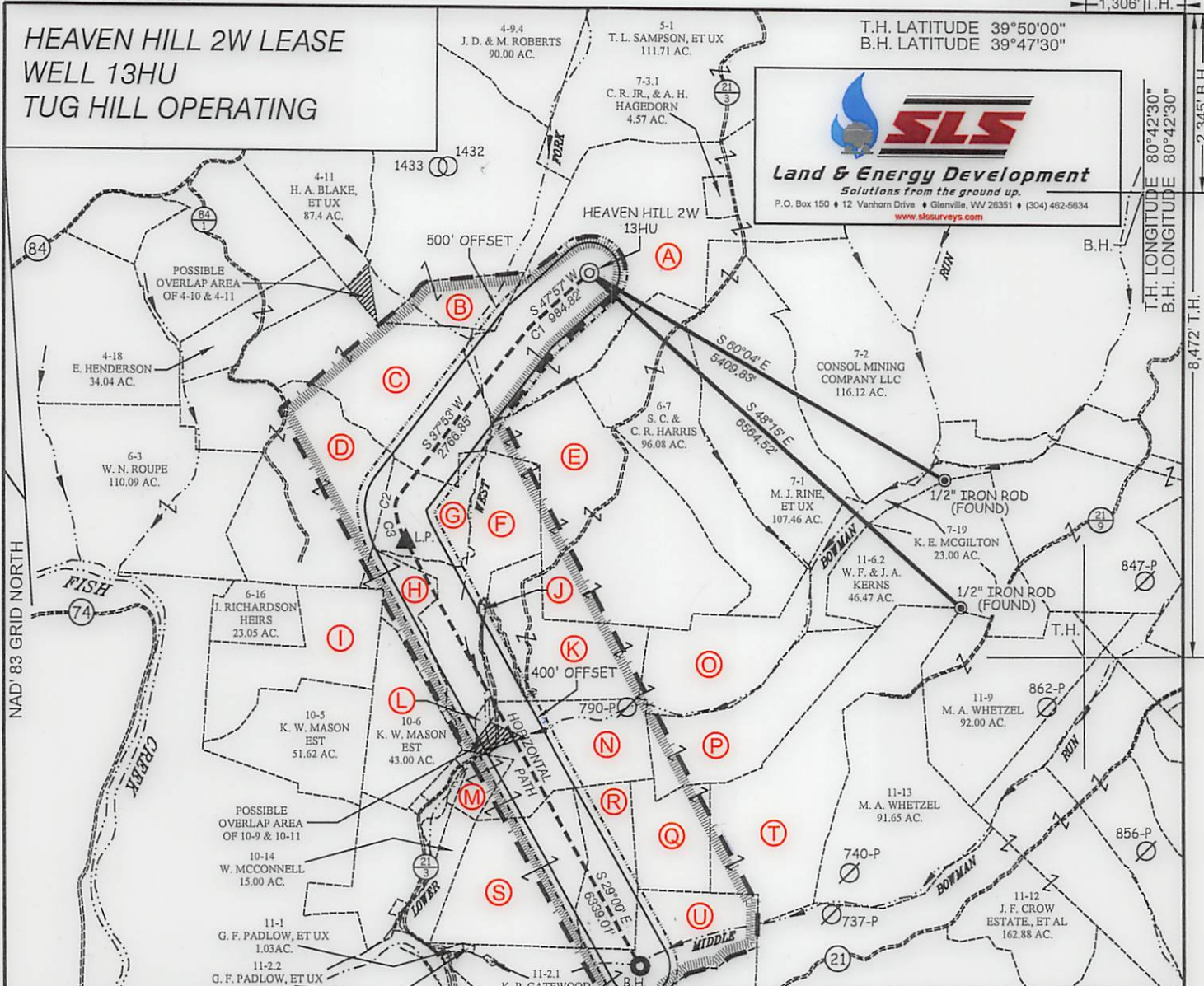
TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8703	07/27/2017	1" = 2000'

**TUG HILL**  
OPERATING

10/27/2017

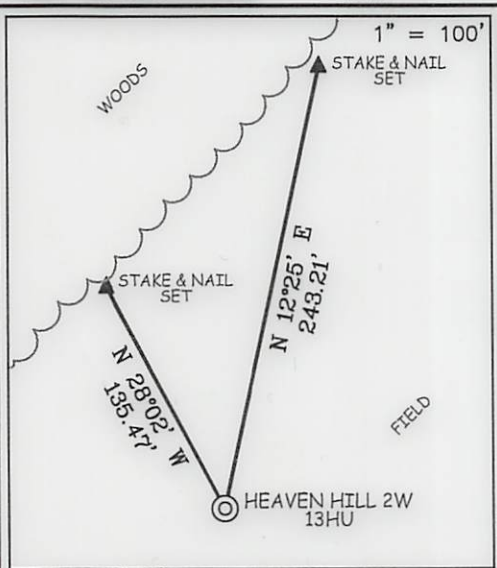
**HEAVEN HILL 2W LEASE  
WELL 13HU  
TUG HILL OPERATING**

**SLS**  
Land & Energy Development  
Solutions from the ground up.  
P.O. Box 150 • 12 Vanhorn Drive • Glenview, WV 26351 • (304) 462-5834  
www.slsurveys.com



T.H. LONGITUDE 80°42'30"  
B.H. LONGITUDE 80°42'30"  
T.H. 8,472' T.H.  
B.H. 2,345' B.H.

**REFERENCES**



TAG	SURFACE OWNER	PARCEL	ACRES
A	CHARLES R. JR., & ANNE MARIE HAGEDORN	9-7-3	203.07
B	PAUL STEVEN ALLEN, ET UX	9-4-10	172.3
C	RONALD D. MASON, ET UX	9-6-5	92.85
D	ROBERT LEE CARNEY, ET UX	9-6-4	118.17
E	J. F. CROW ESTATE, ET AL	9-6-9	131.8
F	RONALD KEITH & RUBY MASON	9-6-12	59.00
G	RAY C. HARTZELL, ET AL	9-6-13	34.50
H	KENNETH W. MASON EST	9-6-14	19.37
I	J. F. CROW ESTATE, ET AL	9-6-15	55.23
J	J. F. CROW ESTATE, ET AL	9-6-11	7/8 AC.
K	J. F. CROW ESTATE, ET AL	9-6-10	64.01
L	RALPH MARTIN TAYLOR	9-10-10	2.23
M	J. F. CROW ESTATE, ET AL	9-10-9	17.14
N	J. F. CROW ESTATE, ET AL	9-10-11	60.00
O	J. F. CROW ESTATE, ET AL	9-6-8	53.33
P	RHDK INVESTMENTS LLC	9-11-4	53.00
Q	RAY A. WHETZEL JR., ET AL	9-11-3	33.33
R	RAY A. WHETZEL JR., ET AL	9-10-12	36.51
S	RAY A. WHETZEL JR., ET AL	9-10-13	71.11
T	RAY A. WHETZEL JR., ET AL	9-11-5	106.89
U	MARGARET K. FOX - LIFE	9-11-2	84.37

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	129'	596.32'	S 43°52' W	128.75'
C2	171.3'	247.44'	S 12°21' W	167.9'
C3	440.19'	1054.22'	S 18°14' E	437'

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
 NAD'83 S.P.C.(FT) N. 479,470.78 E. 1,627,756.59  
 NAD'83 GEO. LAT.(N) 39.810074 LONG.(W) 80.712982  
 NAD'83 UTM (M) N. 4,406,717.08 E. 524,567.56  
**LANDING POINT**  
 NAD'83 S.P.C.(FT) N. 475,955.7 E. 1,625,337.6  
 NAD'83 GEO. LAT.(N) 39.800335 LONG.(W) 80.721422  
 NAD'83 UTM (M) N. 4,405,633.9 E. 523,849.5  
**BOTTOM HOLE**  
 NAD'83 S.P.C.(FT) N. 470,411.6 E. 1,628,411.1  
 NAD'83 GEO. LAT.(N) 39.785230 LONG.(W) 80.710218  
 NAD'83 UTM (M) N. 4,403,960.5 E. 524,813.1



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

SCALE 1" = 2000' FILE NO. 8703P13HU.dwg  
 DATE JULY 27, 20 17  
 REVISED \_\_\_\_\_, 20 \_\_\_\_\_  
 OPERATORS WELL NO. HEAVEN HILL 2W-13HU  
 API WELL NO. 47 - 051 - 01957 HGA  
 NO. STATE COUNTY PERMIT

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



**LEGEND**

LEASE LINE	
SURFACE LINE	
WELL LATERAL	
OFFSET LINE	
TIE LINE	
CREEK	
ROAD	
COUNTY ROUTE	
PROPOSED WELL	
EXISTING WELL	
PERMITTED WELL	
TAX MAP-PARCEL	00-00
LEASE # (SEE PGS. 1 & 3)	A
SURFACE OWNER (SEE TABLE)	

COUNTY NAME PERMIT

10/27/2017

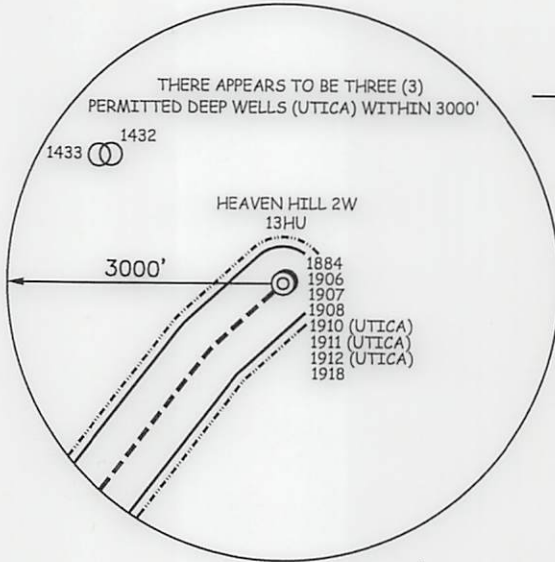
WELL OPERATOR TUG HILL OPERATING, LLC  
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500  
 FORT WORTH, TX 76107

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

**HEAVEN HILL 2W LEASE  
WELL 13HU  
TUG HILL OPERATING**

T.H. LATITUDE 39°50'00"  
B.H. LATITUDE 39°47'30"

No.	Lease Name or No.	Tag	Parcel	Oil & Gas Royalty Owners	Deed Book/Page
1	10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	722 281
2	10*15608	A	9-7-3	CHARLES R HAGEDORN JR	816 423
3	10*47051.073.1	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	888 618
4	10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	908 541
5	10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	878 330
6	10*17229	B	9-4-10	STEPHEN MENENDEZ	913 66
7	10*15661	C	9-6-5	CHESTNUT HOLDINGS LLC	839 170
8				ROBERT LEE CARNEY AND BONNIE ANNE CARNEY	682 255
9	10*15510	E	9-6-9	ELAINE PHELPS ET VIR	718 376
10	10*15511	E	9-6-9	DAVID E CROW	718 376
11	10*15512	E	9-6-9	FRANCES COFFEY	718 378
12	10*15513	E	9-6-9	KAY KEYES	718 330
13	10*15514	E	9-6-9	L PAUL CROW	718 336
14	10*15515	E	9-6-9	DESIRE L CROW	718 334
15	10*15516	E	9-6-9	ROSE MARIE KIELGCZEWSKI	718 354
16	10*15517	E	9-6-9	DIANNE GELLNER & GARY GELLNER	718 345
17	10*15518	E	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718 347
18	10*15519	E	9-6-9	JOHN CROW	726 580
19	10*15520	E	9-6-9	TIMOTHY CROW	726 582
20	10*47051.123.1	E	9-6-9	LLOYD G BAKER	865 389
21	10*47051.123.2	E	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873 143
22	10*15525	F	9-6-12	RONALD KEITH MASON ET UX	772 445
23	10*15541	F	9-6-12	MARY JETH FRODINAPPEL	781 312
24	10*15542	F	9-6-12	KENNETH D SIBURT	781 218
25	10*15543	F	9-6-12	SANDRA FRODIN	781 307
26	10*15544	F	9-6-12	VICKI J CHERY A/K/A VICKIE L CHERY	793 318
27	10*15545	F	9-6-12	JAMES B SIBURT ET UX	793 312
28	10*15546	F	9-6-12	ALAN K SIBURT ET UX	793 325
29	10*15547	F	9-6-12	RODNEY L SIBURT	793 346
30	10*15507	G	9-6-13	RAY C HARTZELL AND CAROL J, HARTZELL, HUSBAND AND WIFE	680 162
31	10*15504	H	9-6-14	JAMES MASON ET AL	692 461
32	10*15510	I	9-6-15	ELAINE PHELPS ET VIR	718 376
33	10*15511	I	9-6-15	DAVID E CROW	718 376
34	10*15512	I	9-6-15	FRANCES COFFEY	718 378
35	10*15513	I	9-6-15	KAY KEYES	718 330
36	10*15514	I	9-6-15	L PAUL CROW	718 336
37	10*15515	I	9-6-15	DESIRE L CROW	718 334
38	10*15516	I	9-6-15	ROSE MARIE KIELGCZEWSKI	718 354
39	10*15517	I	9-6-15	DIANNE GELLNER & GARY GELLNER	718 345
40	10*15518	I	9-6-15	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718 347
41	10*15519	I	9-6-15	JOHN CROW	726 580
42	10*15520	I	9-6-15	TIMOTHY CROW	726 582
43	10*47051.123.1	I	9-6-15	LLOYD G BAKER	865 389
44	10*47051.123.2	I	9-6-15	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873 143
45	10*15510	J	9-6-11	ELAINE PHELPS ET VIR	718 376
46	10*15511	J	9-6-11	DAVID E CROW	718 376
47	10*15512	J	9-6-11	FRANCES COFFEY	718 378
48	10*15513	J	9-6-11	KAY KEYES	718 330
49	10*15514	J	9-6-11	L PAUL CROW	718 336
50	10*15515	J	9-6-11	DESIRE L CROW	718 334
51	10*15516	J	9-6-11	ROSE MARIE KIELGCZEWSKI	718 354
52	10*15517	J	9-6-11	DIANNE GELLNER & GARY GELLNER	718 345
53	10*15518	J	9-6-11	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718 347
54	10*15519	J	9-6-11	JOHN CROW	726 580
55	10*15520	J	9-6-11	TIMOTHY CROW	726 582
56	10*47051.123.1	J	9-6-11	LLOYD G BAKER	865 389
57	10*47051.123.2	J	9-6-11	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873 143
58	10*15510	K	9-6-10	ELAINE PHELPS ET VIR	718 376
59	10*15511	K	9-6-10	DAVID E CROW	718 376
60	10*15512	K	9-6-10	FRANCES COFFEY	718 378
61	10*15513	K	9-6-10	KAY KEYES	718 330
62	10*15514	K	9-6-10	L PAUL CROW	718 336
63	10*15515	K	9-6-10	DESIRE L CROW	718 334
64	10*15516	K	9-6-10	ROSE MARIE KIELGCZEWSKI	718 354
65	10*15517	K	9-6-10	DIANNE GELLNER & GARY GELLNER	718 345
66	10*15518	K	9-6-10	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718 347
67	10*15519	K	9-6-10	JOHN CROW	726 580
68	10*15520	K	9-6-10	TIMOTHY CROW	726 582
69	10*47051.123.1	K	9-6-10	LLOYD G BAKER	865 389
70	10*47051.123.2	K	9-6-10	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873 143
71	10*47051.165.0	L	9-10-10	RALPH MARTIN TAYLOR	865 386
72	10*15510	M	9-10-9	ELAINE PHELPS ET VIR	718 376
73	10*15511	M	9-10-9	DAVID E CROW	718 376
74	10*15512	M	9-10-9	FRANCES COFFEY	718 378
75	10*15513	M	9-10-9	KAY KEYES	718 330



T.H. LONGITUDE 80°42'30"  
B.H. LONGITUDE 80°42'30"  
2,345' B.H.  
8,472' T.H.

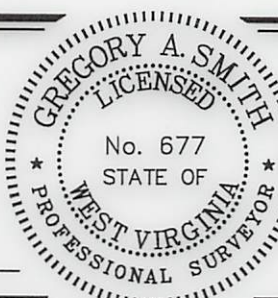
**NOTES ON SURVEY**

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

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD'83 S.P.C.(FT)	N. 479,470.78	E. 1,627,756.58	
NAD'83 GEO.	LAT-(N) 39.810074	LONG-(W) 80.712982	
NAD'83 UTM (M)	N. 4,406,717.08	E. 524,567.56	
LANDING POINT			
NAD'83 S.P.C.(FT)	N. 475,955.7	E. 1,625,337.6	
NAD'83 GEO.	LAT-(N) 39.800335	LONG-(W) 80.721422	
NAD'83 UTM (M)	N. 4,405,633.9	E. 523,848.5	
BOTTOM HOLE			
NAD'83 S.P.C.(FT)	N. 470,411.6	E. 1,628,411.1	
NAD'83 GEO.	LAT-(N) 39.785230	LONG-(W) 80.710218	
NAD'83 UTM (M)	N. 4,403,960.5	E. 524,813.1	



**Land & Energy Development**  
Solutions from the ground up.  
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 462-6634  
www.slsurveys.com



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

P.S.  
677 Gregory A. Smith

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
DATE JULY 27, 20 17  
REVISED \_\_\_\_\_, 20 \_\_\_\_  
OPERATORS WELL NO. HEAVEN HILL 2W-13HU  
API WELL NO. 47 - 051 - 01959H6A  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8703P13HU.dwg  
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

WELL TYPE: OIL    GAS X LIQUID WASTE IF "GAS" PRODUCTION X STORAGE    DEEP X SHALLOW     
LOCATION: GROUND = 1,350.0' ELEVATION PROPOSED = 1,331.26' WATERSHED WEST FORK OF LOWER BOWMAN RUN OF FISH CREEK (HUC 10)  
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'  
SURFACE OWNER C.R. JR. & A.H. HAGEDORN ACREAGE 203.07±  
ROYALTY OWNER C.R. JR. & A.H. HAGEDORN ET AL (SEE ABOVE) ACREAGE 203.07±  
PROPOSED WORK: LEASE NO. SEE PAGES 1 & 2  
DRILL X CONVERT    DRILL DEEPER    REDRILL    FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION    PERFORATE NEW FORMATION    PLUG AND ABANDON    CLEAN OUT AND REPLUG    OTHER     
PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION POINT PLEASANT  
ESTIMATED DEPTH TVD: 11,789' / TMD: 19,088'

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

COUNTY NAME PERMIT



HEAVEN HILL 2W LEASE  
WELL 13HU  
TUG HILL OPERATING



No.	Lease Name or No.	Tag	Parcel	Oil & Gas Royalty Owners - Continued	Deed Book/Page
76	10*15514	M	9-10-9	L PAUL CROW	718 336
77	10*15515	M	9-10-9	DESIRE L CROW	718 334
78	10*15516	M	9-10-9	ROSE MARIE KIELGCZEWSKI	718 354
79	10*15517	M	9-10-9	DIANNE GELLNER & GARY GELLNER	718 345
80	10*15518	M	9-10-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718 347
81	10*15519	M	9-10-9	JOHN CROW	726 582
82	10*15520	M	9-10-9	TIMOTHY CROW	726 582
83	10*47051.123.1	M	9-10-9	LLOYD G BAKER	865 389
84	10*47051.123.2	M	9-10-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873 343
85	10*15510	N	9-10-11	ELAINE PHELPS ET VIR	718 326
86	10*15511	N	9-10-11	DAVID E CROW	718 376
87	10*15512	N	9-10-11	FRANCES COFFEY	718 378
88	10*15513	N	9-10-11	KAY KEYES	718 330
89	10*15514	N	9-10-11	L PAUL CROW	718 336
90	10*15515	N	9-10-11	DESIRE L CROW	718 334
91	10*15516	N	9-10-11	ROSE MARIE KIELGCZEWSKI	718 354
92	10*15517	N	9-10-11	DIANNE GELLNER & GARY GELLNER	718 345
93	10*15518	N	9-10-11	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718 347
94	10*15519	N	9-10-11	JOHN CROW	726 580
95	10*15520	N	9-10-11	TIMOTHY CROW	726 582
96	10*47051.123.1	N	9-10-11	LLOYD G BAKER	865 389
97	10*47051.123.2	N	9-10-11	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873 343
98	10*15510	O	9-6-8	ELAINE PHELPS ET VIR	718 326
99	10*15511	O	9-6-8	DAVID E CROW	718 376
100	10*15512	O	9-6-8	FRANCES COFFEY	718 378
101	10*15513	O	9-6-8	KAY KEYES	718 330
102	10*15514	O	9-6-8	L PAUL CROW	718 336
103	10*15515	O	9-6-8	DESIRE L CROW	718 334
104	10*15516	O	9-6-8	ROSE MARIE KIELGCZEWSKI	718 354
105	10*15517	O	9-6-8	DIANNE GELLNER & GARY GELLNER	718 345
106	10*15518	O	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718 347
107	10*15519	O	9-6-8	JOHN CROW	726 580
108	10*15520	O	9-6-8	TIMOTHY CROW	726 582
109	10*47051.123.1	O	9-6-8	LLOYD G BAKER	865 389
110	10*47051.123.2	O	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873 343
111	10*15561	P	6-11-4	BRIK INDUSTRIES LLC KEITH B KIMBLE	907 550
112	10*15561	P	9-11-3	VICKIE MASON	680 415
113	10*15562	Q	9-11-3	MARY A SOUTH	682 231
114	10*15563	Q	9-11-3	MARK L WHETZEL	682 544
115	10*15564	Q	9-11-3	RAY A WHETZEL JR	682 548
116	10*15565	Q	9-11-3	ROBERT L WHETZEL	682 552
117	10*15566	Q	9-11-3	SHARON L WHETZEL	682 556
118	10*47051.108.1	Q	9-11-3	MICHAEL A WHETZEL	885 51
119	10*47051.108.5	Q	9-11-3	BRENDA J WHETZEL	885 55
120	10*47051.108.6	Q	9-11-3	TERRI MCCARDLE	895 23
121	10*47051.108.7	Q	9-11-3	GARY FRANCIS WHETZEL	895 26
122	10*15573	R	9-10-12	VICKIE MASON	680 405
123	10*15574	R	9-10-12	MARY A SOUTH	681 414
124	10*15575	R	9-10-12	MARK L WHETZEL	683 73
125	10*15576	R	9-10-12	RAY A WHETZEL JR	683 69
126	10*15577	R	9-10-12	ROBERT L WHETZEL	682 536
127	10*15578	R	9-10-12	SHARON L WHETZEL	682 540
128	10*15724	R	9-10-12	JAMES RODNEY BRIGGS	901 325
129	10*15725	R	9-10-12	ROGER JACOB BRIGGS	901 318
130	10*15726	R	9-10-12	JOHN DEAN BRIGGS AND PATTY KAY BRIGGS	901 321
131	10*16079	R	9-10-12	LORI ASTON DIXON	904 565
132	10*16236	R	9-10-12	FRANCIS Y RIGGLE	907 156
133	10*16237	R	9-10-12	GREGORY J ASTON AND TAMMY E ASTON	907 149
134	10*16275	R	9-10-12	JEFFREY A ASTON	907 153
135	10*47051.108.1	R	9-10-12	MICHAEL A WHETZEL	885 51
136	10*47051.108.29	R	9-10-12	PATRICIA ANN MCCOUGAL	901 306
137	10*47051.108.30	R	9-10-12	STEVEN L ASTON	901 308
138	10*47051.108.31	R	9-10-12	FRED T KERNS	901 298
139	10*47051.108.36	R	9-10-12	YVONNE K BOBERT	901 300
140	10*47051.108.37	R	9-10-12	CARL E ASTON	901 304
141	10*47051.108.38	R	9-10-12	CAROLYN SUE WELLS	901 310
142	10*47051.108.41	R	9-10-12	ELMER ASTON	901 296
143	10*47051.108.48	R	9-10-12	WILLIAM ASTON	901 312
144	10*47051.108.5	R	9-10-12	BRENDA J WHETZEL	885 55
145	10*47051.108.50	R	9-10-12	DAVID UASTON ESTATE BY EXECUTOR DAWN R MARKS	901 314
146	10*47051.108.52	R	9-10-12	CONNIE N ASTON	901 316
147	10*47051.108.53	R	9-10-12	MARY JANE KYLE	901 339
148	10*47051.108.56	R	9-10-12	PAULA HUNDL	901 347
149	10*47051.108.57	R	9-10-12	ROBERT B KERNS	901 349
150	10*47051.108.58	R	9-10-12	RONALD W KERNS	901 341
151	10*47051.108.59	R	9-10-12	PAUL ULYSSES KERNS ESTATE SALVATORE P PUGLISI, EXECUTOR	901 343
152	10*47051.108.6	R	9-10-12	TERRI MCCARDLE	895 23
153	10*47051.108.61	R	9-10-12	AMANDA FEIGH	901 345
154	10*47051.108.7	R	9-10-12	GARY FRANCIS WHETZEL	895 26
155	10*47051.108.73	R	9-10-12	JOHN ASTON JR	901 351
156	10*47051.108.77	R	9-10-12	SHONDA WOOD	901 356
157	10*47051.108.78	R	9-10-12	DONNA WOODS MOODY	901 354
158	10*47051.108.79	R	9-10-12	MARK A ASTON	901 358
159	10*47051.108.M1	R	9-10-12	KENNETH CHIPPS	899 20
160	10*15567	S	9-10-13	VICKIE MASON	680 409
161	10*15568	S	9-10-13	MARY A SOUTH	681 410
162	10*15569	S	9-10-13	MARK L WHETZEL	682 560
163	10*15570	S	9-10-13	RAY A WHETZEL JR	682 584
164	10*15571	S	9-10-13	SHARON L WHETZEL	682 568
165	10*15572	S	9-10-13	ROBERT L WHETZEL	682 500
166	10*15724	S	9-10-13	JAMES RODNEY BRIGGS	901 325
167	10*15725	S	9-10-13	ROGER JACOB BRIGGS	901 318
168	10*15726	S	9-10-13	JOHN DEAN BRIGGS AND PATTY KAY BRIGGS	901 321
169	10*16079	S	9-10-13	LORI ASTON DIXON	904 565
170	10*16236	S	9-10-13	FRANCIS Y RIGGLE	907 156
171	10*16237	S	9-10-13	GREGORY J ASTON AND TAMMY E ASTON	907 149
172	10*16275	S	9-10-13	JEFFREY A ASTON	907 153
173	10*47051.108.1	S	9-10-13	MICHAEL A WHETZEL	885 51
174	10*47051.108.29	S	9-10-13	PATRICIA ANN MCCOUGAL	901 306
175	10*47051.108.30	S	9-10-13	STEVEN L ASTON	901 308

No.	Lease Name or No.	Tag	Parcel	Oil & Gas Royalty Owners - Continued	Deed Book/Page
176	10*47051.108.31	S	9-10-13	FRED T KERNS	901 298
177	10*47051.108.36	S	9-10-13	YVONNE K BOBERT	901 300
178	10*47051.108.37	S	9-10-13	CARL E ASTON	901 304
179	10*47051.108.38	S	9-10-13	CAROLYN SUE WELLS	901 310
180	10*47051.108.41	S	9-10-13	ELMER ASTON	901 296
181	10*47051.108.48	S	9-10-13	WILLIAM ASTON	901 312
182	10*47051.108.5	S	9-10-13	BRENDA J WHETZEL	885 55
183	10*47051.108.50	S	9-10-13	DAVID UASTON ESTATE BY EXECUTOR DAWN R MARKS	901 314
184	10*47051.108.52	S	9-10-13	CONNIE N ASTON	901 316
185	10*47051.108.53	S	9-10-13	MARY JANE KYLE	901 339
186	10*47051.108.56	S	9-10-13	PAULA HUNDL	901 347
187	10*47051.108.57	S	9-10-13	ROBERT B KERNS	901 349
188	10*47051.108.58	S	9-10-13	RONALD W KERNS	901 341
189	10*47051.108.59	S	9-10-13	PAUL ULYSSES KERNS ESTATE SALVATORE P PUGLISI, EXECUTOR	901 343
190	10*47051.108.6	S	9-10-13	TERRI MCCARDLE	895 23
191	10*47051.108.61	S	9-10-13	AMANDA FEIGH	901 345
192	10*47051.108.7	S	9-10-13	GARY FRANCIS WHETZEL	895 26
193	10*47051.108.73	S	9-10-13	JOHN ASTON JR	901 351
194	10*47051.108.77	S	9-10-13	SHONDA WOOD	901 356
195	10*47051.108.78	S	9-10-13	DONNA WOODS MOODY	901 354
196	10*47051.108.79	S	9-10-13	MARK A ASTON	901 358
197	10*47051.108.M1	S	9-10-13	KENNETH CHIPPS	899 20
198	10*15584	T	9-11-5	VICKIE MASON	686 239
199	10*15585	T	9-11-5	SHARON L WHETZEL	687 147
200	10*15586	T	9-11-5	MARY A SOUTH	690 615
201	10*15587	T	9-11-5	ROBERT L WHETZEL	690 589
202	10*15588	T	9-11-5	RAY A WHETZEL JR	693 571
203	10*15589	T	9-11-5	MARK L WHETZEL	693 576
204	10*47051.108.1	T	9-11-5	MICHAEL A WHETZEL	885 51
205	10*47051.108.5	T	9-11-5	BRENDA J WHETZEL	885 55
206	10*47051.243.1	U	9-11-2	MARY A FOX	879 332
207	10*47051.243.2	U	9-11-2	PAUL G FOX	879 335
208	10*47051.243.3	U	9-11-2	MARK H FOX	879 338
209	10*47051.243.4	U	9-11-2	DAVID E FOX	876 55
210	10*47051.243.5	U	9-11-2	LOUIS T FOX	876 58
211	10*47051.243.6	U	9-11-2	THOMAS J FOX	876 61

47-051-01957 H4A

FILE NO. 8703P13HU.dwg  
 DATE JULY 27, 20 17  
 REVISED \_\_\_\_\_, 20 \_\_\_\_\_  
 OPERATORS WELL NO. HEAVEN HILL 2W-13HU  
 API WELL NO. 47 — 051 — 01957  
 STATE COUNTY PERMIT



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



COUNTY NAME PERMIT

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

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

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

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

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

\*See attached pages

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

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

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

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

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

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



Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Dead Book/Pago	Assignment	Assignment	Assignment	Assignment
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	TRIENERGY HOLDINGS, LLC	1/8+	722 281	N/A	TriEnergy 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 U.S.A. INC.	1/8+	816 423	N/A	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	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	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	N/A
10*17229	B	9-4-10	STEPHEN MENENDEZ	TH EXPLORATION LLC	1/8+	913 66	N/A	N/A	N/A	N/A
10*15661	C	9-6-5	CHESTNUT HOLDINGS LLC	REPUBLIC ENERGY VENTURES LLC	1/8+	839 170	N/A	N/A	Republic to Chevron: 32/415	Chevron to Tug Hill: 36/148
10*19116	D	9-6-4	ROBERT LEE CARNEY AND BONNIE ANNE CARNEY	CHESAPEAKE APPALACHIA LLC	1/8+	682 255	Chesapeake to Statoll: 22/671	Chesapeake to Chevron: 30/392	Statoll to Chevron: 30/404	Chevron to Tug Hill: 40/127
10*15510	E	9-6-9	ELAINE PHELPS ET VIR	TRIENERGY HOLDINGS LLC	1/8+	718 326	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15511	E	9-6-9	DAVID E CROW	TRIENERGY HOLDINGS LLC	1/8+	718 376	N/A	TriEnergy to NPAR: 25/463	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15512	E	9-6-9	FRANCES COFFEY	TRIENERGY HOLDINGS LLC	1/8+	718 378	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15513	E	9-6-9	KAY KEYES	TRIENERGY HOLDINGS LLC	1/8+	718 330	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15514	E	9-6-9	L PAUL CROW	TRIENERGY HOLDINGS LLC	1/8+	718 335	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15515	E	9-6-9	DESIRE L CROW	TRIENERGY HOLDINGS LLC	1/8+	718 334	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15516	E	9-6-9	ROSE MARIE KIELGCZEWSKI	TRIENERGY HOLDINGS LLC	1/8+	718 354	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15517	E	9-6-9	DIANNE GELLNER & GARY GELLNER	TRIENERGY HOLDINGS LLC	1/8+	718 345	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15518	E	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TRIENERGY HOLDINGS LLC	1/8+	718 347	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15519	E	9-6-9	JOHN CROW	TRIENERGY HOLDINGS LLC	1/8+	726 580	N/A	TriEnergy to NPAR: 25/449	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15520	E	9-6-9	TIMOTHY CROW	TRIENERGY HOLDINGS LLC	1/8+	726 582	N/A	TriEnergy to NPAR: 25/449	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*47051.123.1	E	9-6-9	LLOYD G BAKER	TH EXPLORATION LLC	1/8+	865 389	N/A	N/A	N/A	N/A
10*47051.123.2	E	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TH EXPLORATION LLC	1/8+	873 143	N/A	N/A	N/A	N/A
10*15525	F	9-6-12	RONALD KEITH MASON ET UX	CHEVRON U.S.A. INC.	1/8+	772 445	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15541	F	9-6-12	MARY RUTH FROHNAPPEL	CHEVRON U.S.A. INC.	1/8+	781 312	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15542	F	9-6-12	KENNETH D SIBURT	CHEVRON U.S.A. INC.	1/8+	781 218	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15543	F	9-6-12	SANDRA FROWEN	CHEVRON U.S.A. INC.	1/8+	781 307	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15544	F	9-6-12	VICKI J CHERRY A/K/A VICKIE L CHERRY	CHEVRON U.S.A. INC.	1/8+	793 318	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15545	F	9-6-12	JAMES B SIBURT ET UX	CHEVRON U.S.A. INC.	1/8+	793 332	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15546	F	9-6-12	ALAN K SIBURT ET UX	CHEVRON U.S.A. INC.	1/8+	793 325	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15547	F	9-6-12	RODNEY L SIBURT	CHEVRON U.S.A. INC.	1/8+	793 346	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15507	G	9-6-13	RAY C. HARTZELL AND CAROL J. HARTZELL, HUSBAND AND WIFE	AB RESOURCES LLC	1/8+	689 162	N/A	AB Res. to Chief: 24/382	Chief to Chevron: 25/1	Chevron to Tug Hill: 36/148
10*15504	H	9-6-14	JAMES MASON ET AL	AB RESOURCES	1/8+	692 461	N/A	AB Res. to Chief: 24/382	Chief to Chevron: 25/1	Chevron to Tug Hill: 36/148
10*15510	I	9-6-15	ELAINE PHELPS ET VIR	TRIENERGY HOLDINGS LLC	1/8+	718 326	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15511	I	9-6-15	DAVID E CROW	TRIENERGY HOLDINGS LLC	1/8+	718 376	N/A	TriEnergy to NPAR: 25/463	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15512	I	9-6-15	FRANCES COFFEY	TRIENERGY HOLDINGS LLC	1/8+	718 378	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15513	I	9-6-15	KAY KEYES	TRIENERGY HOLDINGS LLC	1/8+	718 330	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15514	I	9-6-15	L PAUL CROW	TRIENERGY HOLDINGS LLC	1/8+	718 336	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15515	I	9-6-15	DESIRE L CROW	TRIENERGY HOLDINGS LLC	1/8+	718 334	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15516	I	9-6-15	ROSE MARIE KIELGCZEWSKI	TRIENERGY HOLDINGS LLC	1/8+	718 354	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15517	I	9-6-15	DIANNE GELLNER & GARY GELLNER	TRIENERGY HOLDINGS LLC	1/8+	718 345	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15518	I	9-6-15	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TRIENERGY HOLDINGS LLC	1/8+	718 347	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15519	I	9-6-15	JOHN CROW	TRIENERGY HOLDINGS LLC	1/8+	726 580	N/A	TriEnergy to NPAR: 25/449	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15520	I	9-6-15	TIMOTHY CROW	TRIENERGY HOLDINGS LLC	1/8+	726 582	N/A	TriEnergy to NPAR: 25/449	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*47051.123.1	I	9-6-15	LLOYD G BAKER	TH EXPLORATION LLC	1/8+	865 389	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.123.2	I	9-6-15	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TH EXPLORATION LLC	1/8+	873 143	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15510	J	9-6-11	ELAINE PHELPS ET VIR	TRIENERGY HOLDINGS LLC	1/8+	718 326	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15511	J	9-6-11	DAVID E CROW	TRIENERGY HOLDINGS LLC	1/8+	718 376	N/A	TriEnergy to NPAR: 25/463	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15512	J	9-6-11	FRANCES COFFEY	TRIENERGY HOLDINGS LLC	1/8+	718 378	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15513	J	9-6-11	KAY KEYES	TRIENERGY HOLDINGS LLC	1/8+	718 330	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15514	J	9-6-11	L PAUL CROW	TRIENERGY HOLDINGS LLC	1/8+	718 336	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15515	J	9-6-11	DESIRE L CROW	TRIENERGY HOLDINGS LLC	1/8+	718 334	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148

51-01957



10*15515	O	9-6-8	DESIRE L CROW	TRIENERGY HOLDINGS LLC	1/8+	718	334	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15516	O	9-6-8	ROSE MARIE KIELGCZEWSKI	TRIENERGY HOLDINGS LLC	1/8+	718	354	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15517	O	9-6-8	DIANNE GELLNER & GARY GELLNER	TRIENERGY HOLDINGS LLC	1/8+	718	345	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15518	O	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TRIENERGY HOLDINGS LLC	1/8+	718	347	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15519	O	9-6-8	JOHN CROW	TRIENERGY HOLDINGS LLC	1/8+	726	580	N/A	TriEnergy to NPAR: 25/449	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*15520	O	9-6-8	TIMOTHY CROW	TRIENERGY HOLDINGS LLC	1/8+	726	582	N/A	TriEnergy to NPAR: 25/449	NPAR to Chevron: 28/356	Chevron to Tug Hill: 36/148
10*47051.123.1	O	9-6-8	LLOYD G BAKER	TH EXPLORATION LLC	1/8+	865	389	N/A	N/A	N/A	N/A
10*47051.123.2	O	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TH EXPLORATION LLC	1/8+	873	143	N/A	N/A	N/A	N/A
10*16517	P	9-11-4	RHDX INVESTMENTS LLC KEITH B KIMBLE	TH EXPLORATION LLC	1/8+	907	550	N/A	N/A	N/A	N/A
10*15561	Q	9-11-3	VICKIE MASON	CHESAPEAKE APPALACHIA LLC	1/8+	680	413	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15562	Q	9-11-3	MARY A SOUTH	CHEVRON U.S.A. INC.	1/8+	682	231	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15563	Q	9-11-3	MARK L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682	544	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15564	Q	9-11-3	RAY A WHETZAL JR	CHESAPEAKE APPALACHIA LLC	1/8+	682	548	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15565	Q	9-11-3	ROBERT L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682	552	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15566	Q	9-11-3	SHARON L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682	556	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*47051.108.1	Q	9-11-3	MICHAEL A WHETZEL	TH EXPLORATION LLC	1/8+	885	51	N/A	N/A	N/A	N/A
10*47051.108.5	Q	9-11-3	BRENDA J WHETZEL	TH EXPLORATION LLC	1/8+	885	55	N/A	N/A	N/A	N/A
10*47051.108.6	Q	9-11-3	TERRI MCCARDLE	TH EXPLORATION LLC	1/8+	895	23	N/A	N/A	N/A	N/A
10*47051.108.7	Q	9-11-3	GARY FRANCIS WHETZAL	TH EXPLORATION LLC	1/8+	895	26	N/A	N/A	N/A	N/A
10*15573	R	9-10-12	VICKIE MASON	CHEVRON U.S.A. INC.	1/8+	680	405	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15574	R	9-10-12	MARY A SOUTH	CHESAPEAKE APPALACHIA LLC	1/8+	681	414	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15575	R	9-10-12	MARK L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	683	73	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15576	R	9-10-12	RAY A WHETZAL JR	CHESAPEAKE APPALACHIA LLC	1/8+	683	69	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15577	R	9-10-12	ROBERT L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682	536	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15578	R	9-10-12	SHARON L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682	540	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15724	R	9-10-12	JAMES RODNEY BRIGGS	TH EXPLORATION LLC	1/8+	901	325	N/A	N/A	N/A	N/A
10*15725	R	9-10-12	ROGER JACOB BRIGGS	TH EXPLORATION LLC	1/8+	901	318	N/A	N/A	N/A	N/A
10*15726	R	9-10-12	JOHN DEAN BRIGGS AND PATTY KAY BRIGGS	TH EXPLORATION LLC	1/8+	901	321	N/A	N/A	N/A	N/A
10*16079	R	9-10-12	LORI ASTON DIXON	TH EXPLORATION LLC	1/8+	904	565	N/A	N/A	N/A	N/A
10*16236	R	9-10-12	FRANCIS Y RIGGLE	TH EXPLORATION LLC	1/8+	907	156	N/A	N/A	N/A	N/A
10*16237	R	9-10-12	GREGORY J ASTON AND TAMMY E ASTON	TH EXPLORATION LLC	1/8+	907	149	N/A	N/A	N/A	N/A
10*16275	R	9-10-12	JEFFREY A ASTON	TH EXPLORATION LLC	1/8+	907	153	N/A	N/A	N/A	N/A
10*47051.108.1	R	9-10-12	MICHAEL A WHETZEL	TH EXPLORATION LLC	1/8+	895	51	N/A	N/A	N/A	N/A
10*47051.108.29	R	9-10-12	PATRICIA ANN MCDUGAL	TH EXPLORATION LLC	1/8+	901	306	N/A	N/A	N/A	N/A
10*47051.108.30	R	9-10-12	STEVEN L ASTON	TH EXPLORATION LLC	1/8+	901	308	N/A	N/A	N/A	N/A
10*47051.108.31	R	9-10-12	FRED T KERNS	TH EXPLORATION LLC	1/8+	901	298	N/A	N/A	N/A	N/A
10*47051.108.35	R	9-10-12	YVONNE K BOGERT	TH EXPLORATION LLC	1/8+	901	300	N/A	N/A	N/A	N/A
10*47051.108.37	R	9-10-12	CARL E ASTON	TH EXPLORATION LLC	1/8+	901	304	N/A	N/A	N/A	N/A
10*47051.108.38	R	9-10-12	CAROLYN SUE WELLS	TH EXPLORATION LLC	1/8+	901	310	N/A	N/A	N/A	N/A
10*47051.108.41	R	9-10-12	ELMER ASTON	TH EXPLORATION LLC	1/8+	901	296	N/A	N/A	N/A	N/A
10*47051.108.48	R	9-10-12	WILLIAM ASTON	TH EXPLORATION LLC	1/8+	901	312	N/A	N/A	N/A	N/A
10*47051.108.5	R	9-10-12	BRENDA J WHETZEL	TH EXPLORATION LLC	1/8+	885	55	N/A	N/A	N/A	N/A
10*47051.108.50	R	9-10-12	DAVID U ASTON ESTATE BY EXECUTOR DAWN R MARKS	TH EXPLORATION LLC	1/8+	901	314	N/A	N/A	N/A	N/A
10*47051.108.52	R	9-10-12	CONNIE N ASTON	TH EXPLORATION LLC	1/8+	901	316	N/A	N/A	N/A	N/A
10*47051.108.53	R	9-10-12	MARY JANE KYLE	TH EXPLORATION LLC	1/8+	901	339	N/A	N/A	N/A	N/A
10*47051.108.56	R	9-10-12	PAULA HUNDL	TH EXPLORATION LLC	1/8+	901	347	N/A	N/A	N/A	N/A
10*47051.108.57	R	9-10-12	ROBERT B KERNS	TH EXPLORATION LLC	1/8+	901	349	N/A	N/A	N/A	N/A
10*47051.108.58	R	9-10-12	RONALD W KERNS	TH EXPLORATION LLC	1/8+	901	341	N/A	N/A	N/A	N/A
10*47051.108.59	R	9-10-12	PAULI ULYSSES KERNS ESTATE SALVATORE P PUGLISI, EXECUTOR	TH EXPLORATION LLC	1/8+	901	343	N/A	N/A	N/A	N/A
10*47051.108.6	R	9-10-12	TERRI MCCARDLE	TH EXPLORATION LLC	1/8+	895	23	N/A	N/A	N/A	N/A
10*47051.108.61	R	9-10-12	AMANDA FEIGH	TH EXPLORATION LLC	1/8+	901	345	N/A	N/A	N/A	N/A
10*47051.108.7	R	9-10-12	GARY FRANCIS WHETZAL	TH EXPLORATION LLC	1/8+	895	26	N/A	N/A	N/A	N/A

10*47051.108.73	R	9-10-12	JOHN ASTON JR	TH EXPLORATION LLC	1/8+	901	351	N/A	N/A	N/A	N/A
10*47051.108.77	R	9-10-12	SHONDA WOOD	TH EXPLORATION LLC	1/8+	901	356	N/A	N/A	N/A	N/A
10*47051.108.78	R	9-10-12	DONNA WOODS MOODY	TH EXPLORATION LLC	1/8+	901	354	N/A	N/A	N/A	N/A
10*47051.108.79	R	9-10-12	MARK A ASTON	TH EXPLORATION LLC	1/8+	901	358	N/A	N/A	N/A	N/A
10*47051.108.M1	R	9-10-12	KENNETH CHIPPS	TH EXPLORATION LLC	1/8+	899	20	N/A	N/A	N/A	N/A
10*15567	S	9-10-13	VICKIE MASON	CHEVRON U.S.A. INC.	1/8+	680	409	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15568	S	9-10-13	MARY A SOUTH	CHESAPEAKE APPALACHIA LLC	1/8+	681	410	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15569	S	9-10-13	MARK L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682	560	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15570	S	9-10-13	RAY A WHETZAL JR	CHESAPEAKE APPALACHIA LLC	1/8+	682	584	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15571	S	9-10-13	SHARON L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682	568	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15572	S	9-10-13	ROBERT L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682	500	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15724	S	9-10-13	JAMES RODNEY BRIGGS	TH EXPLORATION LLC	1/8+	901	325	N/A	N/A	N/A	N/A
10*15725	S	9-10-13	ROGER JACOB BRIGGS	TH EXPLORATION LLC	1/8+	901	318	N/A	N/A	N/A	N/A
10*15726	S	9-10-13	JOHN DEAN BRIGGS AND PATTY KAY BRIGGS	TH EXPLORATION LLC	1/8+	901	321	N/A	N/A	N/A	N/A
10*16079	S	9-10-13	LORI ASTON DIXON	TH EXPLORATION LLC	1/8+	904	565	N/A	N/A	N/A	N/A
10*16236	S	9-10-13	FRANCIS Y RIGGLE	TH EXPLORATION LLC	1/8+	907	156	N/A	N/A	N/A	N/A
10*16237	S	9-10-13	GREGORY J ASTON AND TAMMY E ASTON	TH EXPLORATION LLC	1/8+	907	149	N/A	N/A	N/A	N/A
10*16275	S	9-10-13	JEFFREY A ASTON	TH EXPLORATION LLC	1/8+	907	153	N/A	N/A	N/A	N/A
10*47051.108.1	S	9-10-13	MICHAEL A WHETZEL	TH EXPLORATION LLC	1/8+	885	51	N/A	N/A	N/A	N/A
10*47051.108.29	S	9-10-13	PATRICIA ANN MCDUGAL	TH EXPLORATION LLC	1/8+	901	306	N/A	N/A	N/A	N/A
10*47051.108.30	S	9-10-13	STEVEN L ASTON	TH EXPLORATION LLC	1/8+	901	308	N/A	N/A	N/A	N/A
10*47051.108.31	S	9-10-13	FRED T KERNS	TH EXPLORATION LLC	1/8+	901	298	N/A	N/A	N/A	N/A
10*47051.108.36	S	9-10-13	YVONNE K BOBERT	TH EXPLORATION LLC	1/8+	901	300	N/A	N/A	N/A	N/A
10*47051.108.37	S	9-10-13	CARL E ASTON	TH EXPLORATION LLC	1/8+	901	304	N/A	N/A	N/A	N/A
10*47051.108.38	S	9-10-13	CAROLYN SUE WELLS	TH EXPLORATION LLC	1/8+	901	310	N/A	N/A	N/A	N/A
10*47051.108.41	S	9-10-13	ELMER ASTON	TH EXPLORATION LLC	1/8+	901	296	N/A	N/A	N/A	N/A
10*47051.108.48	S	9-10-13	WILLIAM ASTON	TH EXPLORATION LLC	1/8+	901	312	N/A	N/A	N/A	N/A
10*47051.108.5	S	9-10-13	BRENDA J WHETZEL	TH EXPLORATION LLC	1/8+	885	55	N/A	N/A	N/A	N/A
10*47051.108.50	S	9-10-13	DAVID U ASTON ESTATE BY EXECUTOR DAWN R MARKS	TH EXPLORATION LLC	1/8+	901	314	N/A	N/A	N/A	N/A
10*47051.108.52	S	9-10-13	CONNIE N ASTON	TH EXPLORATION LLC	1/8+	901	316	N/A	N/A	N/A	N/A
10*47051.108.53	S	9-10-13	MARY JANE KYLE	TH EXPLORATION LLC	1/8+	901	339	N/A	N/A	N/A	N/A
10*47051.108.56	S	9-10-13	PAULA HUNDL	TH EXPLORATION LLC	1/8+	901	347	N/A	N/A	N/A	N/A
10*47051.108.57	S	9-10-13	ROBERT B KERNS	TH EXPLORATION LLC	1/8+	901	349	N/A	N/A	N/A	N/A
10*47051.108.58	S	9-10-13	RONALD W KERNS	TH EXPLORATION LLC	1/8+	901	341	N/A	N/A	N/A	N/A
10*47051.108.59	S	9-10-13	PAUL ULYSSES KERNS ESTATE SALVATORE P PUGLISI, EXECUTOR	TH EXPLORATION LLC	1/8+	901	343	N/A	N/A	N/A	N/A
10*47051.108.6	S	9-10-13	TERRI MCCARDLE	TH EXPLORATION LLC	1/8+	895	23	N/A	N/A	N/A	N/A
10*47051.108.61	S	9-10-13	AMANDA FEIGH	TH EXPLORATION LLC	1/8+	901	345	N/A	N/A	N/A	N/A
10*47051.108.7	S	9-10-13	GARY FRANCIS WHETZAL	TH EXPLORATION LLC	1/8+	895	26	N/A	N/A	N/A	N/A
10*47051.108.73	S	9-10-13	JOHN ASTON JR	TH EXPLORATION LLC	1/8+	901	351	N/A	N/A	N/A	N/A
10*47051.108.77	S	9-10-13	SHONDA WOOD	TH EXPLORATION LLC	1/8+	901	356	N/A	N/A	N/A	N/A
10*47051.108.78	S	9-10-13	DONNA WOODS MOODY	TH EXPLORATION LLC	1/8+	901	354	N/A	N/A	N/A	N/A
10*47051.108.79	S	9-10-13	MARK A ASTON	TH EXPLORATION LLC	1/8+	901	358	N/A	N/A	N/A	N/A
10*47051.108.M1	S	9-10-13	KENNETH CHIPPS	TH EXPLORATION LLC	1/8+	899	20	N/A	N/A	N/A	N/A
10*15584	T	9-11-5	VICKIE MASON	CHEVRON U.S.A. INC.	1/8+	686	239	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15585	T	9-11-5	SHARON L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	687	147	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15586	T	9-11-5	MARY A SOUTH	CHEVRON U.S.A. INC.	1/8+	690	615	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15587	T	9-11-5	ROBERT L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	690	559	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15588	T	9-11-5	RAY A WHETZAL JR	CHESAPEAKE APPALACHIA LLC	1/8+	693	571	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15589	T	9-11-5	MARK L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	693	576	N/A	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*47051.108.1	T	9-11-5	MICHAEL A WHETZEL	TH EXPLORATION LLC	1/8+	885	51	N/A	N/A	N/A	N/A
10*47051.108.5	T	9-11-5	BRENDA J WHETZEL	TH EXPLORATION LLC	1/8+	885	55	N/A	N/A	N/A	N/A
10*47051.243.1	U	9-11-2	MARY A FOX	TH EXPLORATION LLC	1/8+	879	332	N/A	N/A	N/A	N/A

51-01957

WW-6A1 Supplement

Operator's Well No. Heaven Hill 2W-13HU

10*47051.243.2	U	9-11-2	PAUL G FOX	TH EXPLORATION LLC	1/8+	879	335	N/A	N/A	N/A	N/A
10*47051.243.3	U	9-11-2	MARK H FOX	TH EXPLORATION LLC	1/8+	879	338	N/A	N/A	N/A	N/A
10*47051.243.4	U	9-11-2	DAVID E FOX	TH EXPLORATION LLC	1/8+	876	55	N/A	N/A	N/A	N/A
10*47051.243.5	U	9-11-2	LOUIS T FOX	TH EXPLORATION LLC	1/8+	876	58	N/A	N/A	N/A	N/A
10*47051.243.6	U	9-11-2	THOMAS J FOX	TH EXPLORATION LLC	1/8+	876	61	N/A	N/A	N/A	N/A

51-01957



Assignor represents and warrants that Assignor has paid any and all bonuses, rentals, royalties, overriding royalties, and other payments required by the Leases which were due for the period in which Assignor held its interests in the Leases, and that Assignor has fully performed all conditions necessary to maintain the Leases in full force and effect during such period, free and clear of all Encumbrances, except for and subject only to Permitted Encumbrances.

3. Successors and Assigns. The terms of this Assignment shall be binding upon and inure to the benefit of the parties hereto and each of their respective successors and assigns, and such terms shall be covenants running with the land, and with each subsequent transfer or assignment thereof.

4. Further Assurances. Assignor and Assignee hereby agree to take all actions and execute, acknowledge, and deliver all such instruments as are necessary or advisable to effectuate the purposes of this Assignment.

5. Counterparts; Recordation. This Assignment may be executed in any number of counterparts, each of which will be deemed an original instrument, but all of which shall collectively constitute one and the same instrument; provided that none of the parties will be bound to this Assignment unless and until all parties have executed a counterpart. For recording purposes, the signature and/or acknowledgment pages from multiple counterparts may be combined with one or more other counterparts without affecting the effect or validity of this Assignment. Assignee will be responsible for recording this Assignment in the appropriate public record, and will bear any costs associated with such recording.

6. Drafting. Preparation of this Assignment has been a joint effort of the parties and the resulting Assignment must not be construed more severely against any of the parties than against any other.

7. Incorporation. This Assignment is subject to and expressly incorporates the terms of the Acreage Trade Agreement by and between Assignor and Assignee. The Acreage Trade Agreement will govern to the extent of any conflict between the terms of this Assignment and the Acreage Trade Agreement.

(The remainder of this page intentionally left blank, signature pages to follow)

RECEIVED  
Office of Oil and Gas  
AUG 7 2017  
WV Department of  
Environmental Protection

IN WITNESS WHEREOF, and intending to be legally bound hereby, Assignor and Assignee have caused this Assignment to be duly executed the day and year first above written.

ASSIGNOR:

CHEVRON U.S.A. INC.

By: Marc Tate  
Name: Marc Tate  
Title: Attorney-In-Fact

ASSIGNEE:

TH EXPLORATION, LLC

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

RECEIVED  
Office of Oil and Gas  
AUG 7 2017  
WV Department of  
Environmental Protection



IN WITNESS WHEREOF, and intending to be legally bound hereby, Assignor and Assignee have caused this Assignment to be duly executed the day and year first above written.

ASSIGNOR:

CHEVRON U.S.A. INC.

By: \_\_\_\_\_  
Name: Marc Tate  
Title: Attorney-In-Fact

ASSIGNEE:

TH EXPLORATION, LLC

By: David D. Kalish  
Name: David D. Kalish  
Title: VP-Land

RECEIVED  
Office of Oil and Gas  
AUG 7 2017  
WV Department of  
Environmental Protection

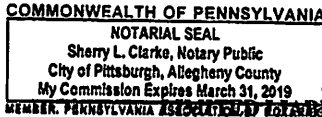
CORPORATE ACKNOWLEDGEMENT

STATE/Commonwealth of PENNSYLVANIA )  
 ) SS:  
COUNTY OF ALLEGHENY )

On this the 16th day of May, 2016, before me, SHERRY L. CLARKE the undersigned authority, personally appeared Marc Tate, who acknowledged himself to be the Attorney-In-Fact of CHEVRON U.S.A. INC., a Pennsylvania corporation, and that he as such Attorney-In-Fact, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the corporation by himself as Attorney-In-Fact.

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

MY COMMISSION EXPIRES: March 31, 2019



Sherry L. Clarke  
Notary Public

MEMBER, PENNSYLVANIA ASSOCIATION OF LIMITED LIABILITY COMPANY ACKNOWLEDGEMENT

STATE/Commonwealth of \_\_\_\_\_ )  
 ) SS:  
COUNTY OF \_\_\_\_\_ )

On this the \_\_\_\_\_ day of \_\_\_\_\_, 2016, before me, \_\_\_\_\_ the undersigned authority, personally appeared \_\_\_\_\_, who acknowledged himself to be a \_\_\_\_\_, a limited liability company and that he as such \_\_\_\_\_, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the limited liability company by himself as \_\_\_\_\_.

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

MY COMMISSION EXPIRES:

\_\_\_\_\_  
Notary Public

Prepared by:

CHEVRON U.S.A. INC.  
Attn: Land Department  
700 Cherrington Parkway,  
Coraopolis, PA 15108

RECEIVED  
Office of Oil and Gas  
AUG 7 2017  
WV Department of  
Environmental Protection

**CORPORATE ACKNOWLEDGEMENT**

STATE/Commonwealth of PENNSYLVANIA )  
 ) SS:  
COUNTY OF ALLEGHENY )

On this the \_\_\_\_ day of \_\_\_\_\_, 2016, before me, \_\_\_\_\_ the undersigned authority, personally appeared Marc Tate, who acknowledged himself to be the Attorney-In-Fact of **CHEVRON U.S.A. INC.**, a Pennsylvania corporation, and that he as such Attorney-In-Fact, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the corporation by himself as Attorney-In-Fact.

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

MY COMMISSION EXPIRES:

\_\_\_\_\_  
Notary Public

**LIMITED LIABILITY COMPANY ACKNOWLEDGEMENT**

STATE/Commonwealth of Texas )  
 ) SS:  
COUNTY OF Tarrant )

On this the 17<sup>th</sup> day of May, 2016, before me, Jennifer McHugh the undersigned authority, personally appeared David A. Kalish, who acknowledged himself to be Vice President Land of TH Exploration, a limited liability company and that he as such Vice President Land, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the limited liability company by himself as Vice President Land.

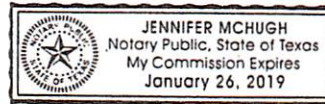
IN WITNESS WHEREOF, I hereto set my hand and official seal.

MY COMMISSION EXPIRES: 1-26-2019

Jennifer McHugh  
Notary Public

**Prepared by:**

CHEVRON U.S.A. INC.  
Attn: Land Department  
700 Cherrington Parkway,  
Coraopolis, PA 15108



RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

AFFIDAVIT

STATE OF TEXAS §
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

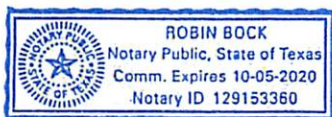
JURAT

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

STATE OF TEXAS §
COUNTY OF TARRANT §

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

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



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

RECEIVED
Office of Oil and Gas

AUG 7 2017

WV Department of Environmental Protection

10/27/2017



August 4, 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 2W-13HU

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 2W-13HU 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 304-376-0111, or by email at [amiller@tug-hillop.com](mailto:amiller@tug-hillop.com).

Sincerely,

Amy L. Miller  
Permitting Specialist– Appalachia Region

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

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

Date of Notice Certification: 08/04/2017

API No. 47- 051 - 01951  
 Operator's Well No. Heaven Hill Unit 2W-13HU  
 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>524,569.86</u>
County: <u>Marshall</u>	Northing: <u>4,406,720.12</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.

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

**Required Attachments:**

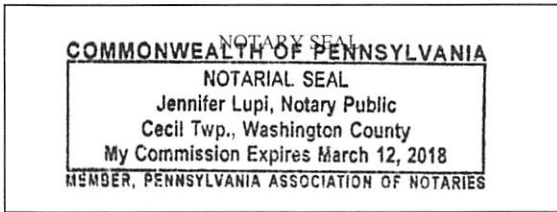
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

RECEIVED  
 Office of Oil and Gas  
**AUG 7 2017**  
 WV Department of  
 Environmental Protection

**Certification of Notice is hereby given:**

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

Well Operator:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Blvd, Southpointe Plaza II, Suite 200</u>
By:	<u>Amy Miller <i>Amy Miller</i></u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Permitting Specialist - Appalachia</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>724-338-2026</u>	Email:	<u>amiller@tug-hillop.com</u>



Subscribed and sworn before me this 4th day of Aug 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 [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

10/27/2017

**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:** 8/4/2017 **Date Permit Application Filed:** 8/7/2017

**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: \_\_\_\_\_  
Address: \_\_\_\_\_

SURFACE OWNER(s) (Road and/or Other Disturbance)  
Name: Michael J. Rine, et ux  
Address: 1466 Blake Ridge Road  
Glen Easton, WV 26039

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

SURFACE OWNER(s) (Impoundments or Pits)  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

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

COAL OPERATOR  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

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

\*See supplement page 1A attached

OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

\*Please attach additional forms if necessary

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection  
10/27/2017



WW-6A  
(8-13)

RECEIVED  
Office of Oil and Gas

AUG 7 2017

API NO. 47- 051 - 01957  
OPERATOR WELL NO. Heaven Hill Unit 2W-13HU  
Well Pad Name: Heaven Hill Unit 2

WV Department of  
Environmental Protection

**Notice is hereby given:**

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

**This Notice Shall Include:**

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

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

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

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

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 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 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

10/27/2017

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

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

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.**

10/27/2017

**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.

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

10/27/2017

WW-6A  
(8-13)

API NO. 47-051 - 01957  
OPERATOR WELL NO. Heaven Hill Unit 2W-13HU  
Well Pad Name: Heaven Hill Unit 2

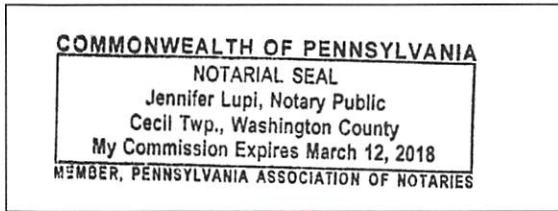
**Notice is hereby given by:**

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

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

**Oil and Gas Privacy Notice:**

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



Subscribed and sworn before me this 14th day of Aug. 2017.  
Jennifer Lupi Notary Public  
My Commission Expires March 12, 2018

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

10/27/2017

~~SI-01957~~  
SI-01957

**Exhibit WW-6A**

**Supplement Pg. 1A**

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

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

Well: Heaven Hill 2W - 13HU  
District: Meade (House #'s 1, 2, 3, 4, 5 & 6)  
State: WV

There are six (6) residences, no businesses, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

<b>House 1</b> TM 7 Pcl. 3.1 Charles R. Hagedorn Jr., Et Ux Phone: 304-845-7332 <b>Physical Address:</b> 102 Hagedorn Dr. Glen Easton, WV 26039 <b>Tax Address:</b> 78 Hagedorn Dr. Glen Easton, WV 26039	<b>House 2</b> TM 7 Pcl. 3.1 Charles R. Hagedorn Jr., Et Ux Phone: 304-845-7332 <b>Physical Address:</b> 78 Hagedorn Dr. Glen Easton, WV 26039 <b>Tax Address:</b> 78 Hagedorn Dr. Glen Easton, WV 26039
<b>House 3</b> TM 7 Pcl. 3 Charles R. Jr., & Annemarie H. Hagedorn Phone: 304-845-7332 <b>Physical Address:</b> 1367 Blake Ridge Rd. Glen Easton, WV 26039 <b>Tax Address:</b> 78 Hagedorn Dr. Glen Easton, WV 26039	<b>House 4</b> TM 7 Pcl. 1 Michael J. Rine, Et Ux Phone: None Found <b>Physical Address:</b> UNKNOWN <b>Tax Address:</b> 1466 Blake Ridge Rd. Glen Easton, WV 26039
<b>House 5</b> TM 7 Pcl. 1 Michael J. Rine, Et Ux Phone: None Found <b>Physical Address:</b> 1466 Blake Ridge Rd. Glen Easton, WV 26039 <b>Tax Address:</b> Same	<b>House 6</b> TM 6 Pcl. 7 Scott C. & Carolyn R. Harris Phone: None Found <b>Physical Address:</b> 1944 Blake Ridge Rd. Glen Easton, WV 26039 <b>Tax Address:</b> Same

RECEIVED  
Office of Oil and Gas

AUG 7 2017

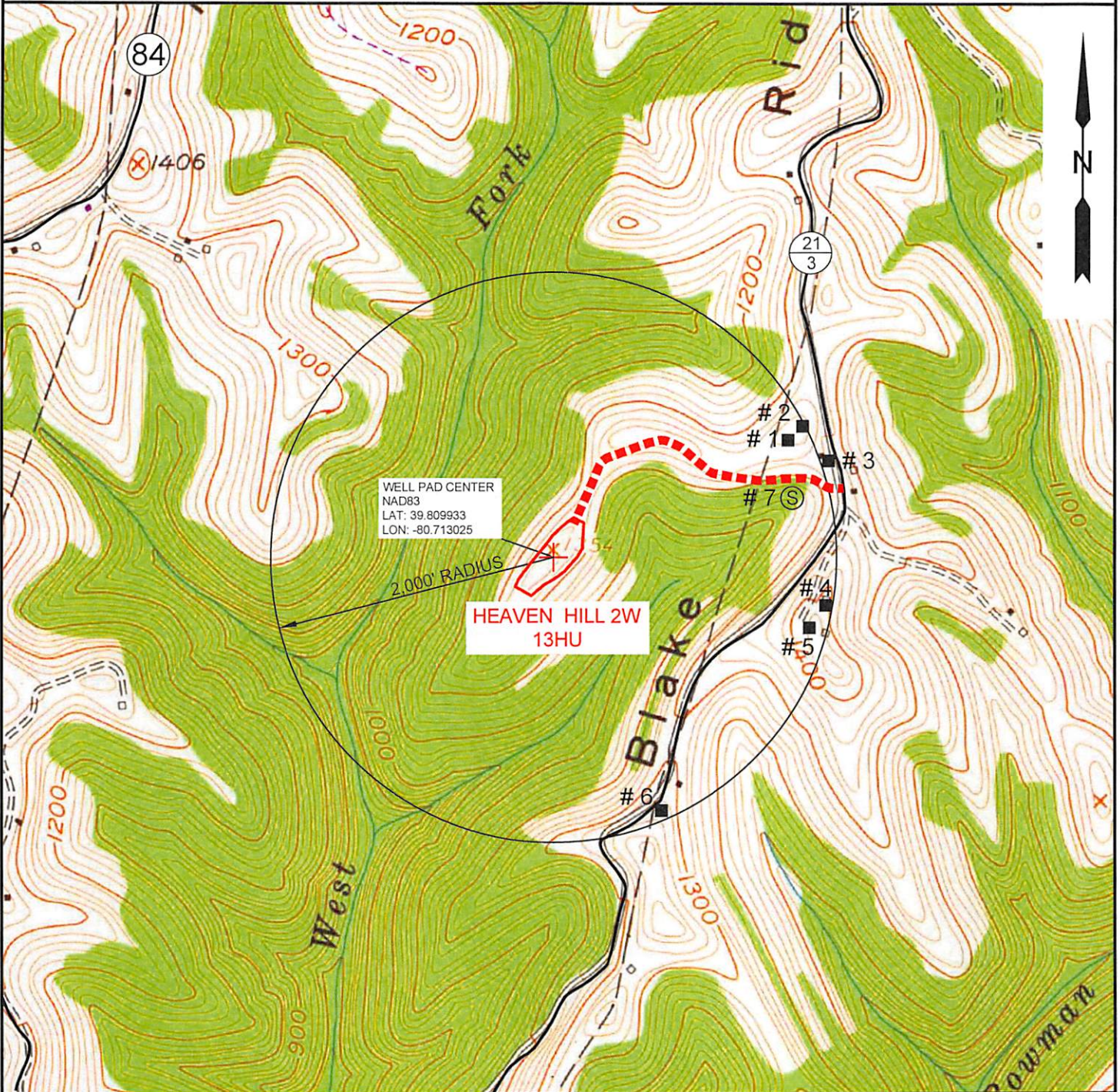
WV Department of  
Environmental Protection

10/27/2017

WW-6A

PROPOSED AUG 7 2017 SUPPLEMENT PG. 1B  
HEAVEN HILL 2W - 13HU

WV Department of  
Environmental Protection



NOTE: THERE APPEARS TO BE SEVEN (7) POSSIBLE WATER SOURCES WITHIN 2,000'.

LEGEND: (S) = SPRING    ■ = RESIDENCE

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

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8703	07/27/2017	1" = 1000'



TUG HILL  
OPERATING

10/27/2017

**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 06, 2017      **Date of Planned Entry:** April 13, 2017

**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, Jr., et ux  
 Address: 78 Hagedorn Drive  
Glen Easton, WV 26039  
 Name: Michael J. Rine  
 Address: 1466 Blake Ridge Road  
Glen Easton, WV 26039  
 Name: None  
 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: 39.8099328, LON: -80.7130249</u>
County: <u>Marshall</u>	Public Road Access: <u>Blake Ridge Road (Co. Rt. 21/3)</u>
District: <u>Meade</u>	Watershed: <u>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).

**RECEIVED**  
Office of Oil and Gas

AUG 7 2017

**Notice is hereby given by:**

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

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

WV Department of  
Environmental Protection

**Oil and Gas Privacy Notice:**

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

10/27/2017

**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, Jr., et ux ✓  
**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

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

10/27/2017



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:** 08/02/2017      **Date Permit Application Filed:** 08/04/2017

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

CERTIFIED MAIL                                       HAND  
RETURN RECEIPT REQUESTED                                      DELIVERY

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

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

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

Name: Charles R. Hagedorn, Jr., et ux ✓  
Address: 78 Hagedorn Drive  
Glen Easton, WV 26039

Name: Michael J. Rine, et ux ✓  
Address: 1466 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:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>524,569.86</u>
County:	<u>Marshall</u>		Northing:	<u>4,406,720.12</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>			

**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  
Telephone: 724-338-2026  
Email: amiller@tug-hillop.com

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

**Oil and Gas Privacy Notice:**

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

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection  
10/27/2017



## WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## Division of Highways

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

Jim Justice  
 Governor

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

April 10, 2017

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 2W-13HU Well site

47-051-01957

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

RECEIVED  
 Office of Oil and Gas

AUG 7 2017

WV Department of  
 Environmental Protection



51-01957

**PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION**

Well No. Heaven Hill Unit 2W-13HU

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

RECEIVED  
Office of Oil and Gas

AUG 7 2017

WV Department of  
Environmental Protection

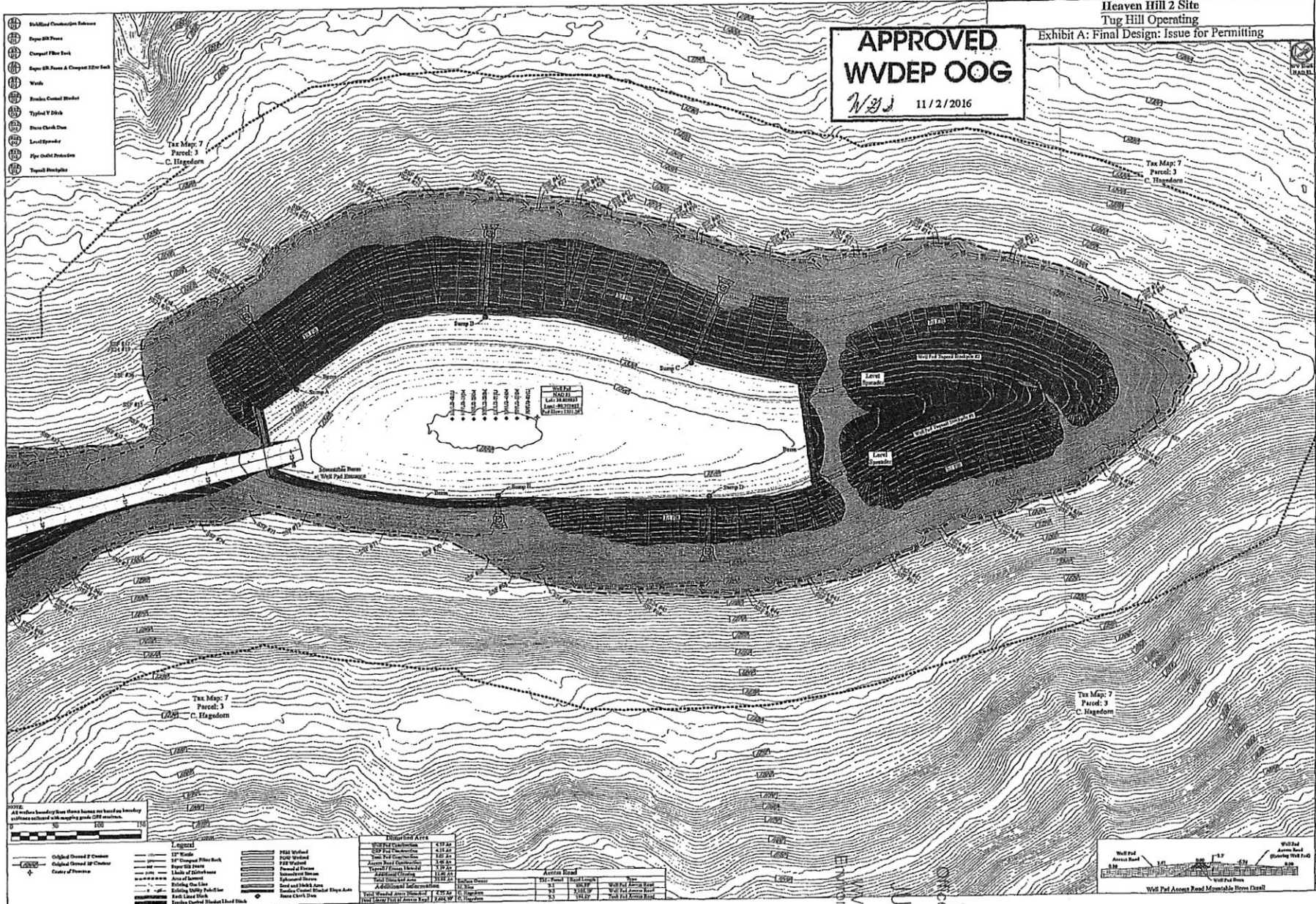


- ⊕ Stabilized Construction Entrance
- ⊕ Super 800 Fence
- ⊕ Compact Fiber Bank
- ⊕ Super 800 Fence & Compact Fiber Bank
- ⊕ Work
- ⊕ Erosion Control Blanket
- ⊕ TYPED V Ditch
- ⊕ Stone Check Dam
- ⊕ Level Spreader
- ⊕ Pipe Outlet Protection
- ⊕ Topsoil Protection

Tax Map: 7  
Parcel: 3  
C. Hagedorn

Heaven Hill 2 Site  
Tug Hill Operating  
Exhibit A: Final Design: Issue for Permitting

**APPROVED**  
**WVDEP OOG**  
*NJS* 11/2/2016



Tax Map: 7  
Parcel: 3  
C. Hagedorn

Tax Map: 7  
Parcel: 3  
C. Hagedorn

NOTES  
All surface boundary lines shown herein are based on boundary  
evidence collected with varying precision. SEE annotations.

Symbol	Description
⊕	Original Center of Channel
⊕	Revised Channel of Channel
⊕	Center of Channel
⊕	1" Gravel
⊕	2" Gravel
⊕	3" Gravel
⊕	4" Gravel
⊕	5" Gravel
⊕	6" Gravel
⊕	7" Gravel
⊕	8" Gravel
⊕	9" Gravel
⊕	10" Gravel
⊕	12" Gravel
⊕	15" Gravel
⊕	18" Gravel
⊕	24" Gravel
⊕	30" Gravel
⊕	36" Gravel
⊕	42" Gravel
⊕	48" Gravel
⊕	54" Gravel
⊕	60" Gravel
⊕	66" Gravel
⊕	72" Gravel
⊕	78" Gravel
⊕	84" Gravel
⊕	90" Gravel
⊕	96" Gravel
⊕	102" Gravel
⊕	108" Gravel
⊕	114" Gravel
⊕	120" Gravel
⊕	126" Gravel
⊕	132" Gravel
⊕	138" Gravel
⊕	144" Gravel
⊕	150" Gravel
⊕	156" Gravel
⊕	162" Gravel
⊕	168" Gravel
⊕	174" Gravel
⊕	180" Gravel
⊕	186" Gravel
⊕	192" Gravel
⊕	198" Gravel
⊕	204" Gravel
⊕	210" Gravel
⊕	216" Gravel
⊕	222" Gravel
⊕	228" Gravel
⊕	234" Gravel
⊕	240" Gravel
⊕	246" Gravel
⊕	252" Gravel
⊕	258" Gravel
⊕	264" Gravel
⊕	270" Gravel
⊕	276" Gravel
⊕	282" Gravel
⊕	288" Gravel
⊕	294" Gravel
⊕	300" Gravel
⊕	306" Gravel
⊕	312" Gravel
⊕	318" Gravel
⊕	324" Gravel
⊕	330" Gravel
⊕	336" Gravel
⊕	342" Gravel
⊕	348" Gravel
⊕	354" Gravel
⊕	360" Gravel
⊕	366" Gravel
⊕	372" Gravel
⊕	378" Gravel
⊕	384" Gravel
⊕	390" Gravel
⊕	396" Gravel
⊕	402" Gravel
⊕	408" Gravel
⊕	414" Gravel
⊕	420" Gravel
⊕	426" Gravel
⊕	432" Gravel
⊕	438" Gravel
⊕	444" Gravel
⊕	450" Gravel
⊕	456" Gravel
⊕	462" Gravel
⊕	468" Gravel
⊕	474" Gravel
⊕	480" Gravel
⊕	486" Gravel
⊕	492" Gravel
⊕	498" Gravel
⊕	504" Gravel
⊕	510" Gravel
⊕	516" Gravel
⊕	522" Gravel
⊕	528" Gravel
⊕	534" Gravel
⊕	540" Gravel
⊕	546" Gravel
⊕	552" Gravel
⊕	558" Gravel
⊕	564" Gravel
⊕	570" Gravel
⊕	576" Gravel
⊕	582" Gravel
⊕	588" Gravel
⊕	594" Gravel
⊕	600" Gravel
⊕	606" Gravel
⊕	612" Gravel
⊕	618" Gravel
⊕	624" Gravel
⊕	630" Gravel
⊕	636" Gravel
⊕	642" Gravel
⊕	648" Gravel
⊕	654" Gravel
⊕	660" Gravel
⊕	666" Gravel
⊕	672" Gravel
⊕	678" Gravel
⊕	684" Gravel
⊕	690" Gravel
⊕	696" Gravel
⊕	702" Gravel
⊕	708" Gravel
⊕	714" Gravel
⊕	720" Gravel
⊕	726" Gravel
⊕	732" Gravel
⊕	738" Gravel
⊕	744" Gravel
⊕	750" Gravel
⊕	756" Gravel
⊕	762" Gravel
⊕	768" Gravel
⊕	774" Gravel
⊕	780" Gravel
⊕	786" Gravel
⊕	792" Gravel
⊕	798" Gravel
⊕	804" Gravel
⊕	810" Gravel
⊕	816" Gravel
⊕	822" Gravel
⊕	828" Gravel
⊕	834" Gravel
⊕	840" Gravel
⊕	846" Gravel
⊕	852" Gravel
⊕	858" Gravel
⊕	864" Gravel
⊕	870" Gravel
⊕	876" Gravel
⊕	882" Gravel
⊕	888" Gravel
⊕	894" Gravel
⊕	900" Gravel
⊕	906" Gravel
⊕	912" Gravel
⊕	918" Gravel
⊕	924" Gravel
⊕	930" Gravel
⊕	936" Gravel
⊕	942" Gravel
⊕	948" Gravel
⊕	954" Gravel
⊕	960" Gravel
⊕	966" Gravel
⊕	972" Gravel
⊕	978" Gravel
⊕	984" Gravel
⊕	990" Gravel
⊕	996" Gravel
⊕	1002" Gravel
⊕	1008" Gravel
⊕	1014" Gravel
⊕	1020" Gravel
⊕	1026" Gravel
⊕	1032" Gravel
⊕	1038" Gravel
⊕	1044" Gravel
⊕	1050" Gravel
⊕	1056" Gravel
⊕	1062" Gravel
⊕	1068" Gravel
⊕	1074" Gravel
⊕	1080" Gravel
⊕	1086" Gravel
⊕	1092" Gravel
⊕	1098" Gravel
⊕	1104" Gravel
⊕	1110" Gravel
⊕	1116" Gravel
⊕	1122" Gravel
⊕	1128" Gravel
⊕	1134" Gravel
⊕	1140" Gravel
⊕	1146" Gravel
⊕	1152" Gravel
⊕	1158" Gravel
⊕	1164" Gravel
⊕	1170" Gravel
⊕	1176" Gravel
⊕	1182" Gravel
⊕	1188" Gravel
⊕	1194" Gravel
⊕	1200" Gravel
⊕	1206" Gravel
⊕	1212" Gravel
⊕	1218" Gravel
⊕	1224" Gravel
⊕	1230" Gravel
⊕	1236" Gravel
⊕	1242" Gravel
⊕	1248" Gravel
⊕	1254" Gravel
⊕	1260" Gravel
⊕	1266" Gravel
⊕	1272" Gravel
⊕	1278" Gravel
⊕	1284" Gravel
⊕	1290" Gravel
⊕	1296" Gravel
⊕	1302" Gravel
⊕	1308" Gravel
⊕	1314" Gravel
⊕	1320" Gravel
⊕	1326" Gravel
⊕	1332" Gravel
⊕	1338" Gravel
⊕	1344" Gravel
⊕	1350" Gravel
⊕	1356" Gravel
⊕	1362" Gravel
⊕	1368" Gravel
⊕	1374" Gravel
⊕	1380" Gravel
⊕	1386" Gravel
⊕	1392" Gravel
⊕	1398" Gravel
⊕	1404" Gravel
⊕	1410" Gravel
⊕	1416" Gravel
⊕	1422" Gravel
⊕	1428" Gravel
⊕	1434" Gravel
⊕	1440" Gravel
⊕	1446" Gravel
⊕	1452" Gravel
⊕	1458" Gravel
⊕	1464" Gravel
⊕	1470" Gravel
⊕	1476" Gravel
⊕	1482" Gravel
⊕	1488" Gravel
⊕	1494" Gravel
⊕	1500" Gravel

Material	Quantity
1" Gravel	4,114 cu yd
2" Gravel	1,114 cu yd
3" Gravel	1,114 cu yd
4" Gravel	1,114 cu yd
5" Gravel	1,114 cu yd
6" Gravel	1,114 cu yd
7" Gravel	1,114 cu yd
8" Gravel	1,114 cu yd
9" Gravel	1,114 cu yd
10" Gravel	1,114 cu yd
12" Gravel	1,114 cu yd
15" Gravel	1,114 cu yd
18" Gravel	1,114 cu yd
24" Gravel	1,114 cu yd
30" Gravel	1,114 cu yd
36" Gravel	1,114 cu yd
42" Gravel	1,114 cu yd
48" Gravel	1,114 cu yd
54" Gravel	1,114 cu yd
60" Gravel	1,114 cu yd
66" Gravel	1,114 cu yd
72" Gravel	1,114 cu yd
78" Gravel	1,114 cu yd
84" Gravel	1,114 cu yd
90" Gravel	1,114 cu yd
96" Gravel	1,114 cu yd
102" Gravel	1,114 cu yd
108" Gravel	1,114 cu yd
114" Gravel	1,114 cu yd
120" Gravel	1,114 cu yd
126" Gravel	1,114 cu yd
132" Gravel	1,114 cu yd
138" Gravel	1,114 cu yd
144" Gravel	1,114 cu yd
150" Gravel	1,114 cu yd
156" Gravel	1,114 cu yd
162" Gravel	1,114 cu yd
168" Gravel	1,114 cu yd
174" Gravel	1,114 cu yd
180" Gravel	1,114 cu yd
186" Gravel	1,114 cu yd
192" Gravel	1,114 cu yd
198" Gravel	1,114 cu yd
204" Gravel	1,114 cu yd
210" Gravel	1,114 cu yd
216" Gravel	1,114 cu yd
222" Gravel	1,114 cu yd
228" Gravel	1,114 cu yd
234" Gravel	1,114 cu yd
240" Gravel	1,114 cu yd
246" Gravel	1,114 cu yd
252" Gravel	1,114 cu yd
258" Gravel	1,114 cu yd
264" Gravel	1,114 cu yd
270" Gravel	1,114 cu yd
276" Gravel	1,114 cu yd
282" Gravel	1,114 cu yd
288" Gravel	1,114 cu yd
294" Gravel	1,114 cu yd
300" Gravel	1,114 cu yd
306" Gravel	1,114 cu yd
312" Gravel	1,114 cu yd
318" Gravel	1,114 cu yd
324" Gravel	1,114 cu yd
330" Gravel	1,114 cu yd
336" Gravel	1,114 cu yd
342" Gravel	1,114 cu yd
348" Gravel	1,114 cu yd
354" Gravel	1,114 cu yd
360" Gravel	1,114 cu yd
366" Gravel	1,114 cu yd
372" Gravel	1,114 cu yd
378" Gravel	1,114 cu yd
384" Gravel	1,114 cu yd
390" Gravel	1,114 cu yd
396" Gravel	1,114 cu yd
402" Gravel	1,114 cu yd
408" Gravel	1,114 cu yd
414" Gravel	1,114 cu yd
420" Gravel	1,114 cu yd
426" Gravel	1,114 cu yd
432" Gravel	1,114 cu yd
438" Gravel	1,114 cu yd
444" Gravel	1,114 cu yd
450" Gravel	1,114 cu yd
456" Gravel	1,114 cu yd
462" Gravel	1,114 cu yd
468" Gravel	1,114 cu yd
474" Gravel	1,114 cu yd
480" Gravel	1,114 cu yd
486" Gravel	1,114 cu yd
492" Gravel	1,114 cu yd
498" Gravel	1,114 cu yd
504" Gravel	1,114 cu yd
510" Gravel	1,114 cu yd
516" Gravel	1,114 cu yd
522" Gravel	1,114 cu yd
528" Gravel	1,114 cu yd
534" Gravel	1,114 cu yd
540" Gravel	1,114 cu yd
546" Gravel	1,114 cu yd
552" Gravel	1,114 cu yd
558" Gravel	1,114 cu yd
564" Gravel	1,114 cu yd
570" Gravel	1,114 cu yd
576" Gravel	1,114 cu yd
582" Gravel	1,114 cu yd
588" Gravel	1,114 cu yd
594" Gravel	1,114 cu yd
600" Gravel	1,114 cu yd
606" Gravel	1,114 cu yd
612" Gravel	1,114 cu yd
618" Gravel	1,114 cu yd
624" Gravel	1,114 cu yd
630" Gravel	1,114 cu yd
636" Gravel	1,114 cu yd
642" Gravel	1,114 cu yd
648" Gravel	1,114 cu yd
654" Gravel	1,114 cu yd
660" Gravel	1,114 cu yd
666" Gravel	1,114 cu yd
672" Gravel	1,114 cu yd
678" Gravel	1,114 cu yd
684" Gravel	1,114 cu yd
690" Gravel	1,114 cu yd
696" Gravel	1,114 cu yd
702" Gravel	1,114 cu yd