



west virginia department of environmental protection

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

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

Tuesday, February 14, 2017
WELL WORK PERMIT
Horizontal 6A / New Drill

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

FORT WORTH , TX 76107

Re: Permit approval for HEAVEN HILL UNIT 2-3HM
47-051-01907-00-00

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

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

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

James A. Martin
Chief

Operator's Well Number: HEAVEN HILL UNIT 2-3HM
Farm Name: CHARLES R. HAGEDORN JR., ET UX
U.S. WELL NUMBER: 47-051-01907-00-00
Horizontal 6A / New Drill
Date Issued: 2/14/2017

Promoting a healthy environment.

02/17/2017

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.

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>
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Operator ID County District Quadrangle

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

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

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

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

(b) If Gas Shallow Deep
Horizontal

ju 2/19/17

6) Existing Pad: Yes or No No

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

8) Proposed Total Vertical Depth: 6,879'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 16,387'

11) Proposed Horizontal Leg Length: 9,229'

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: 2,167'

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

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

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

(a) If Yes, provide Mine Info: Name: Marshall County Coal Co. / Marshall County Mine
Depth: 1059' TVD and 300' subsea level
Seam: Pittsburgh #8
Owner: Murray Energy / Consolidated Coal Co.

WW-6B
(04/15)

API NO. 47-051 - 01907
 OPERATOR WELL NO. Heaven Hill Unit 2-3HM
 Well Pad Name: Heaven Hill Unit 2

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	125'	120'	338FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	48#	1,130'	1,120'	1142ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	1,130'	1,120'	1142ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,812'	2,802'	897ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	16,397'	16,387'	3689ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,358'	
Liners							

ju 2/9/17

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 1/2"	.33	1,730	1,384	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.33	1,730	1,384	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE#24	1.19
Production	5 1/2"	8 7/8_8 3/4	.361	12,640	10,112	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

PACKERS

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

WW-6B
(10/14)

API NO. 47-051 - 01907
OPERATOR WELL NO. Heaven Hill Unit 2-3HM
Well Pad Name: Heaven Hill Unit 2

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

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

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

Well to be completed with approximately 23,072,500 lb proppant and 631,747 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

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

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

23) Describe centralizer placement for each casing string:

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

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

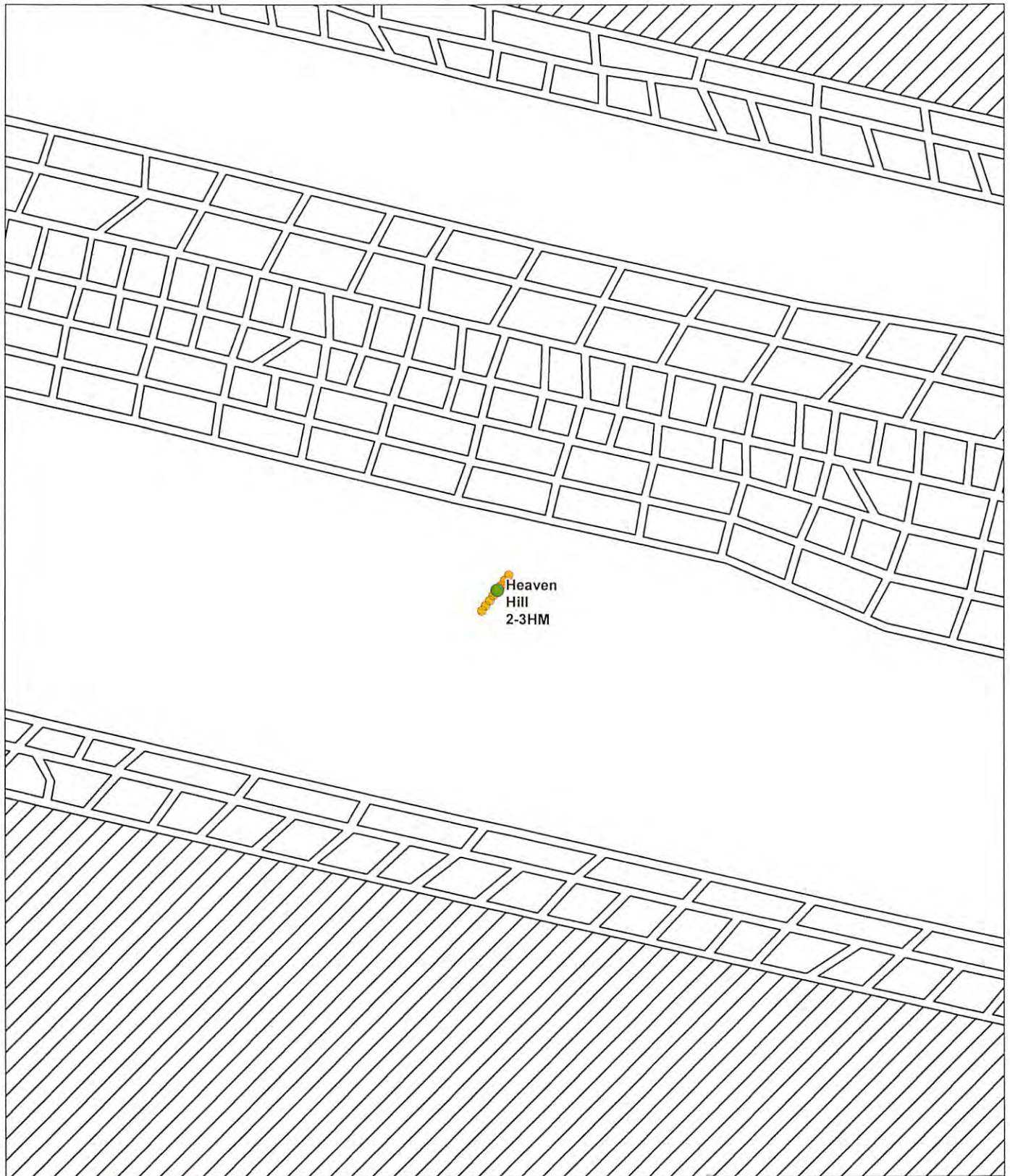
Sfc - Premium NE-1 + 2 CaCl; Int1 - Premium NE-1 + 1.5 CaCL + Flake; Int2 - Lead: Premium NE-1 + 5 BA-90 + .85 R-3 + 3 KCl + .75 gals/100sk FP-13L + 1 MPA-170 Tail: Premium NE-1 + .1 R-3 + 5 KCl + 1 CD-32 + .4 FL-52 + .2 ASA-301 + .6 Sodium Metasilicate; Kick Plug - Class H Cement + 1 CD-32 + .7 Sodium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

25) Proposed borehole conditioning procedures:

Will circulate a minimum of 3 hours at TD, short trip to curve, circulate bottoms up, check for flow, POOH

*Note: Attach additional sheets as needed.

Coal Map



Heaven Hill
2-3HM

CONFIDENTIAL

0 0.005 0.01 0.02 0.03 0.04 Miles

Heaven Hill Unit 2 Pad
Heaven Hill Unit 2-3HM Well Location

Category

- Surface Location
- Murray Mines

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51-01907



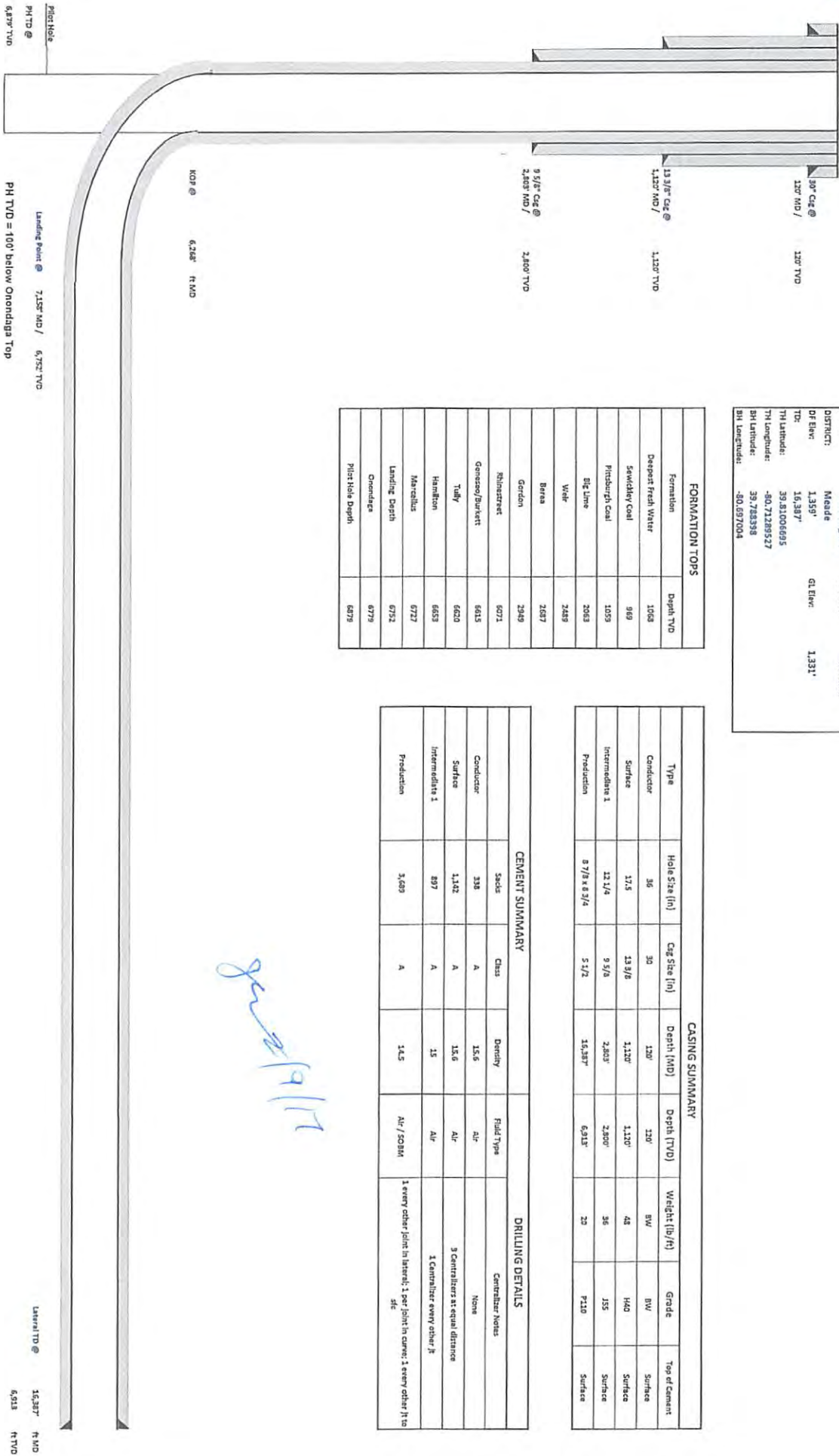
WELL NAME:	Heaven Hill 2-3HM	COUNTY:	Marshall
STATE:	West Virginia	GL Elev:	1,331'
DISTRICT:	Meade		
OF Elev:	1,359'		
TD:	16,387'		
TH Latitude:	33.81006695		
TH Longitude:	-80.7128527		
SH Latitude:	39.788338		
SH Longitude:	-80.697004		

FORMATION TOPS	Depth TVD
Formation	
Deepart Fresh Water	1068
Sewelky Coal	969
Pitcburgh Coal	1059
Big Lime	2068
Wdr	2489
Berna	2687
Gordon	2949
Rhinestret	6071
Gensco/Burkett	6615
Tully	6620
Hanlon	6653
Marcellus	6727
Landing Depth	6752
Onedaga	6779
Pilot Hole Depth	6878

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	17.5	13 9/8	1,120'	1,120'	48	140	Surface
Intermediate 1	12 1/4	9 5/8	2,803'	2,800'	36	155	Surface
Production	8 7/8 x 8 9/4	5 1/2	16,387'	6,913'	20	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Comments/Notes
Conductor	338	A	15.6	Alp	None
Surface	1,142	A	15.6	Alp	3 Cementizers at equal distance
Intermediate 1	697	A	15	Alp	1 Cementizer every other 1/2
Production	3,093	A	14.5	Alp / SOBIM	1 every other joint in interval; 1 per joint in curve; 1 every other 1/2 to 3/4

Handwritten signature and date: j... 9/17



02/17/2017

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

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

Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (12/19/2016) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

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

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

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

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Page 1 of 3
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WV Department of
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4705101907


Permit well - Heaven Hill Unit 2-3HM

Wells within 500' Buffer

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

Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Comments
4705130417	Manufacturers Light & Heat Co	2848	Big Injun	Unknown	Based on completion info it is not deep enough to be within range of fracture propagation from Marcellus horizontal Old, shallow, plugged Big Injun producer



[Table Descriptions](#)
[County Code Translations](#)
[Permit Numbering Series](#)
[Usage Notes](#)
[Contact Information](#)
[Disclaimer](#)
[WVGES Main](#)
["Pipeline-Plus" New](#)

Select County: (051) Marshall Select datatypes: (Check All)

Enter Permit #: 30417

Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/Show/Water Logs Btm Hole Loc

Get Data Reset

WV Geological & Economic Survey: Well: County = 51 Permit = 30417

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX	DISTRICT	QUAD	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705130417	Marshall	30417	Meade	Glen Easton	Cameron	39 790925	-80 666546	525951.4	4404596.3	

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705130417	11/15/1904	Original Loc	Completed	W C Gamble (J Neely)	19	L-1230				Manufacturers Light & Heat Co.			
4705130417	1/25/1915	Drilled Deeper	Completed	W C Gamble (J Neely)		L-1230				Manufacturers Light & Heat Co.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FIG	G_BEF	G_AFT
4705130417	11/15/1904	10/13/1904	1113	Ground Level	Cameron-Garner	undetermined unit	Big Injun (undiff)	unclassified	unclassified	Gas	unknown	unknown	2780		2780	0	0
4705130417	1/25/1915	-/-	1113	Ground Level	Cameron-Garner	undetermined unit	undetermined unit	unclassified	unclassified	Gas	Cable Tool	unknown	2848		68	0	0

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Stratigraphy data for this well

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705130417	6/29/1960	0

There is no Sample data for this well

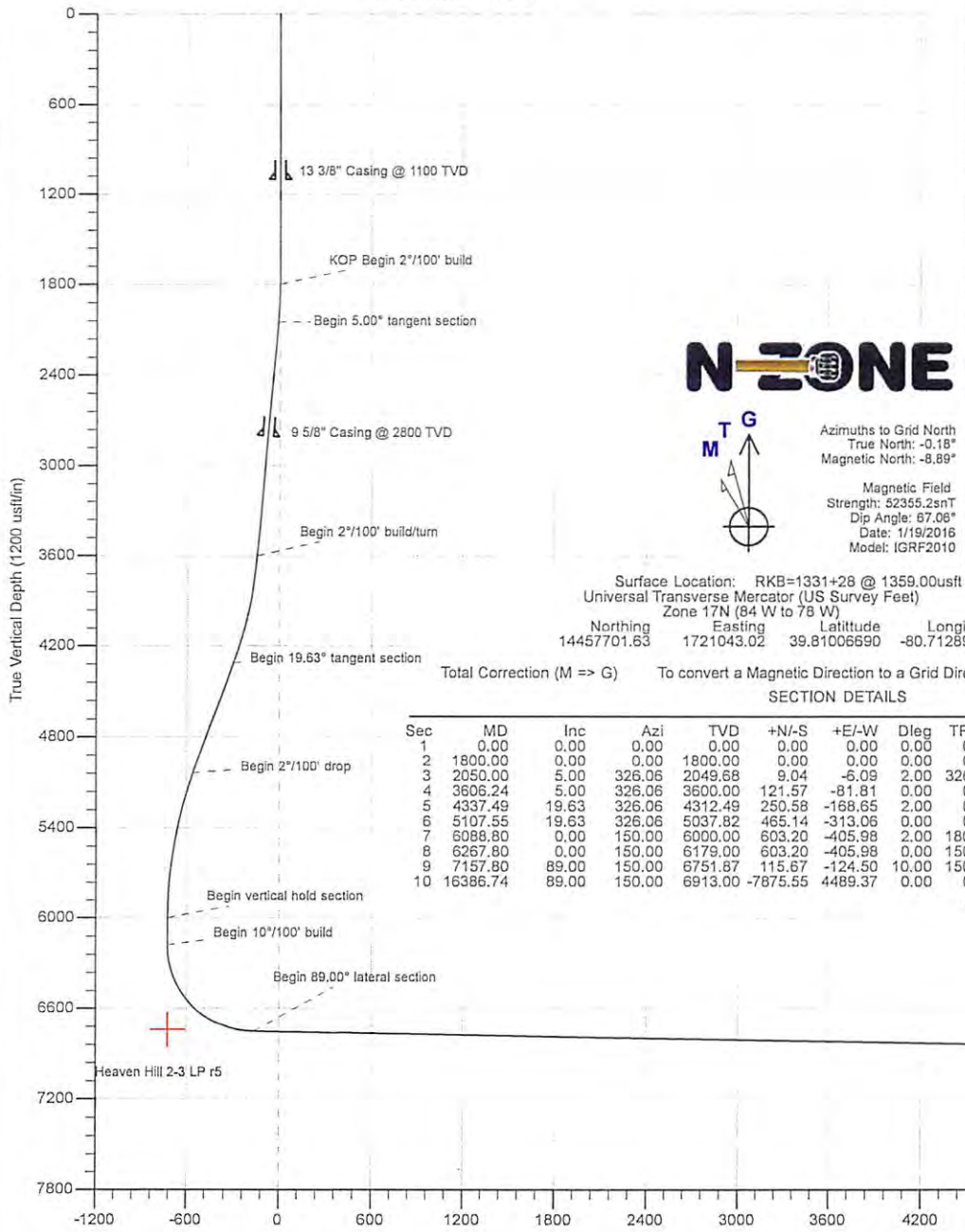
5.11 Area of Review-- The permittee shall review the area surrounding the proposed well pad so as to identify and evaluate potential conduits for unintended fracture propagation, a report of which the permittee shall provide to the Office with the application for well work. All existing active, plugged,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

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Tug Hill Operating LLC
 Well: Heaven Hill 2-3 HM (slot D)
 Site: Heaven Hill
 Project: Marshall County, West Virginia
 Design: rev5

51-01907



N-ZONE

MTG

Azimuths to Grid North
 True North: -0.18°
 Magnetic North: -8.89°

Magnetic Field
 Strength: 52355.2snT
 Dip Angle: 67.06°
 Date: 1/19/2016
 Model: IGRF2010

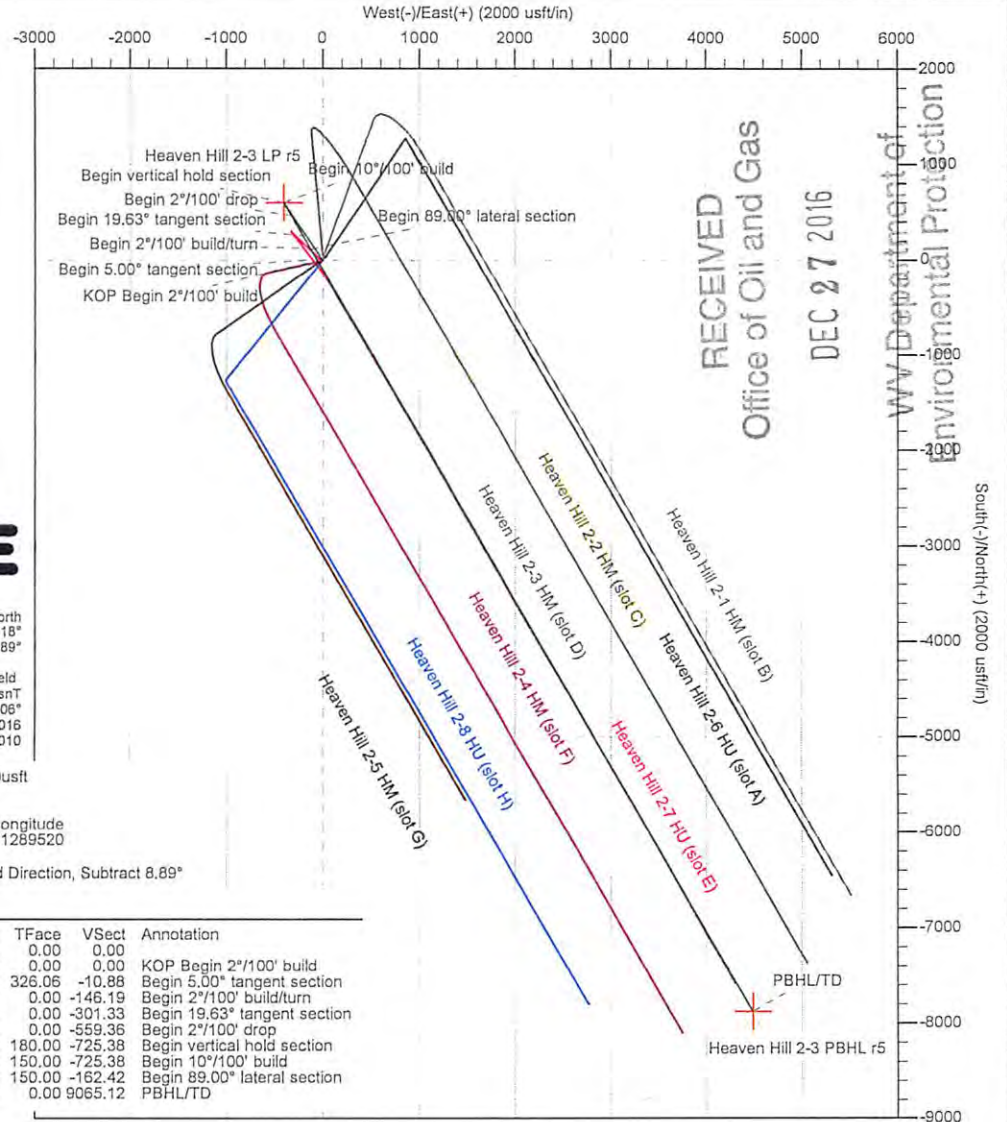
Surface Location: RKB=1331+28 @ 1359.00usft
 Universal Transverse Mercator (US Survey Feet)
 Zone 17N (84 W to 78 W)

Northing	Easting	Latitude	Longitude
14457701.63	1721043.02	39.81006690	-80.71289520

Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Subtract 8.89°

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1800.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	2050.00	5.00	326.06	2049.68	9.04	-5.09	2.00	326.06	-10.88	Begin 5.00° tangent section
4	3606.24	5.00	326.06	3600.00	121.57	-81.81	0.00	0.00	-146.19	Begin 2°/100' build/turn
5	4337.49	19.63	326.06	4312.49	250.58	-168.65	2.00	0.00	-301.33	Begin 19.63° tangent section
6	5107.55	19.63	326.06	5037.82	465.14	-313.06	0.00	0.00	-559.36	Begin 2°/100' drop
7	6088.80	0.00	150.00	6000.00	603.20	-405.98	2.00	180.00	-725.38	Begin vertical hold section
8	6267.80	0.00	150.00	6179.00	603.20	-405.98	0.00	150.00	-725.38	Begin 10°/100' build
9	7157.80	89.00	150.00	6751.87	115.67	-124.50	10.00	150.00	-162.42	Begin 89.00° lateral section
10	16386.74	89.00	150.00	6913.00	-7675.55	4489.37	0.00	0.00	9065.12	PBHL/TD



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WW-9
(4/16)

API Number 47 - 051-01907
Operator's Well No. Heaven Hill Unit 2-3HM

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 Wetzel County Sanitary Landfill

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfil (SWF-1021 / WW0109185)

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

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

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

Company Official Signature [Signature]

Company Official (Typed Name) David Patterson

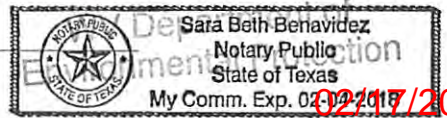
Company Official Title Senior Vice President, Operations

Subscribed and sworn before me this 19th day of December, 20 16

Sara Beth Benavidez

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Office of Oil and Gas
DEC 27 2016
Notary Public

My commission expires 2-4-18



02/17/2017

51-01907

Form WW-9

Operator's Well No. Heaven Hill Unit 2-3HM

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
Annual Ryegrass	40

Seed Type	lbs/acre
Orchard Grass	10
Ladino Clover	3

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *Jim Anderson*

Comments: _____

Title: Oil & Gas Inspector

Date: 12/20/16

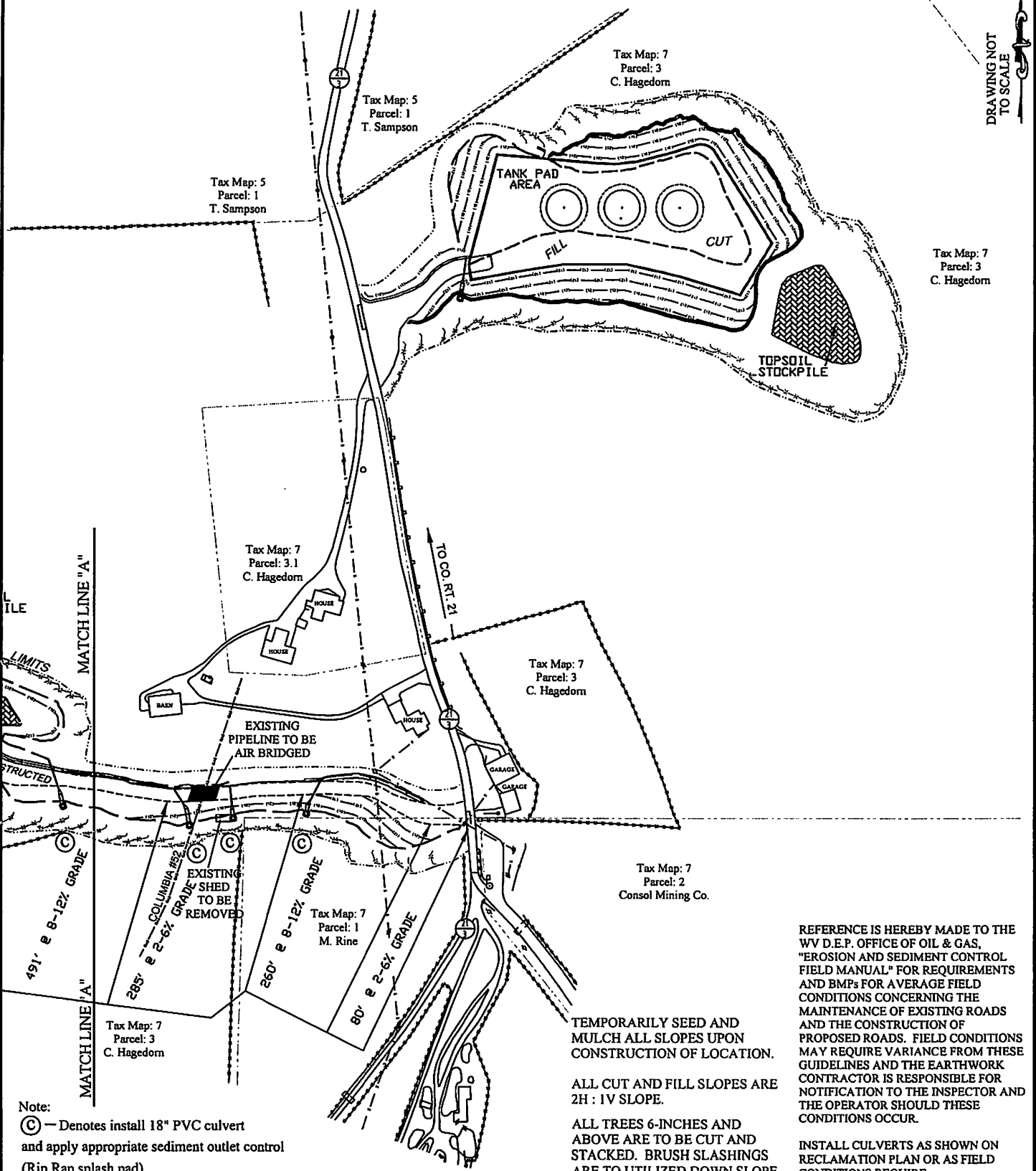
Field Reviewed? Yes No

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Office of Oil and Gas
DEC 27 2016

WV Department of
Environmental Protection
02/17/2017

PROPOSED HEAVEN HILL UNIT 2-3HM

DRAWING NOT TO SCALE



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

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

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

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

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

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

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

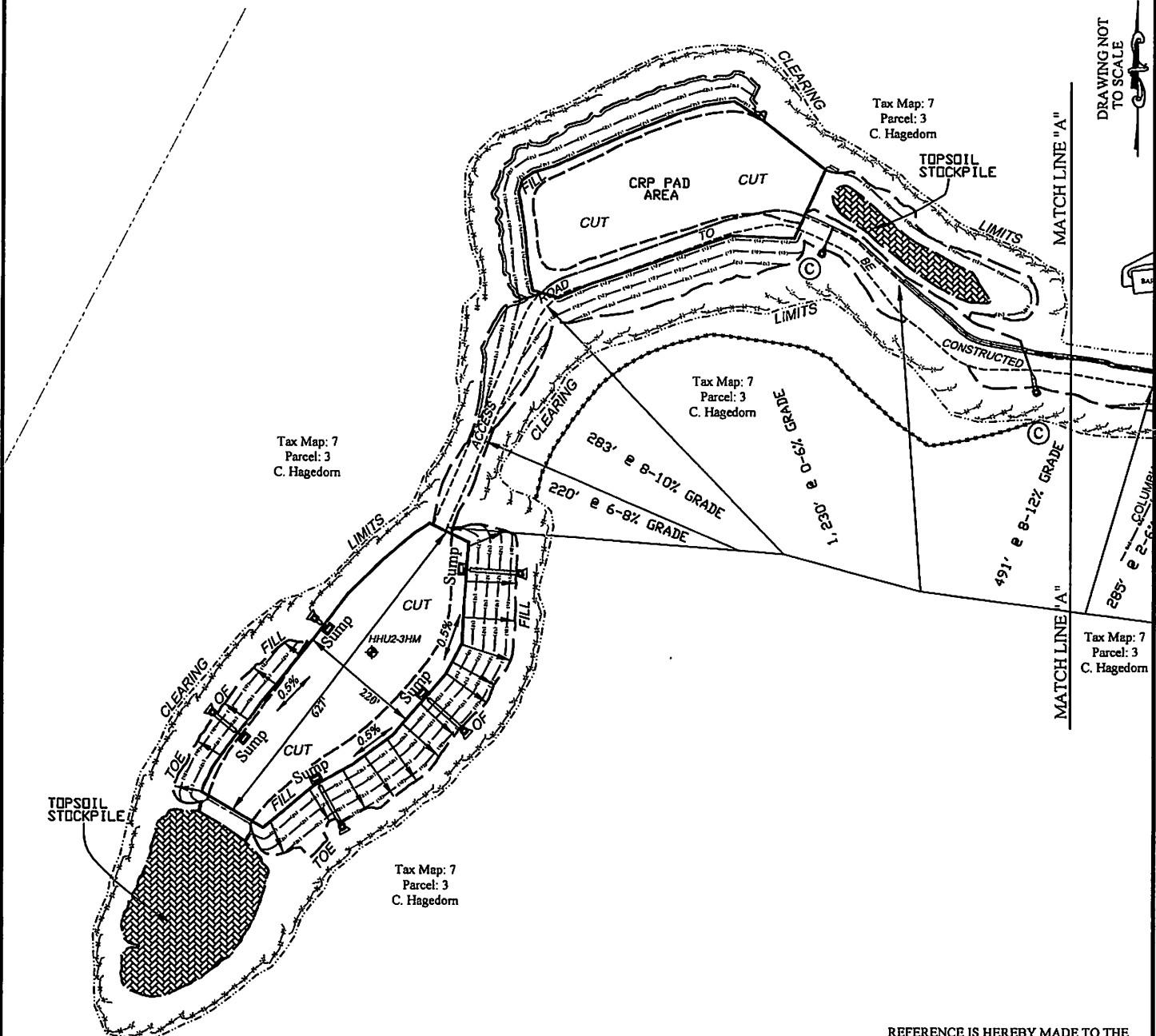
DATE: 12/13/16	PROJECT NO: W0160328	DRAWN BY: J.N.W.
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WW-9

**PROPOSED
HEAVEN HILL UNIT 2-3HM**

SUPPLEMENT PG 1-B

DRAWING NOT TO SCALE



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

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.
 ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.
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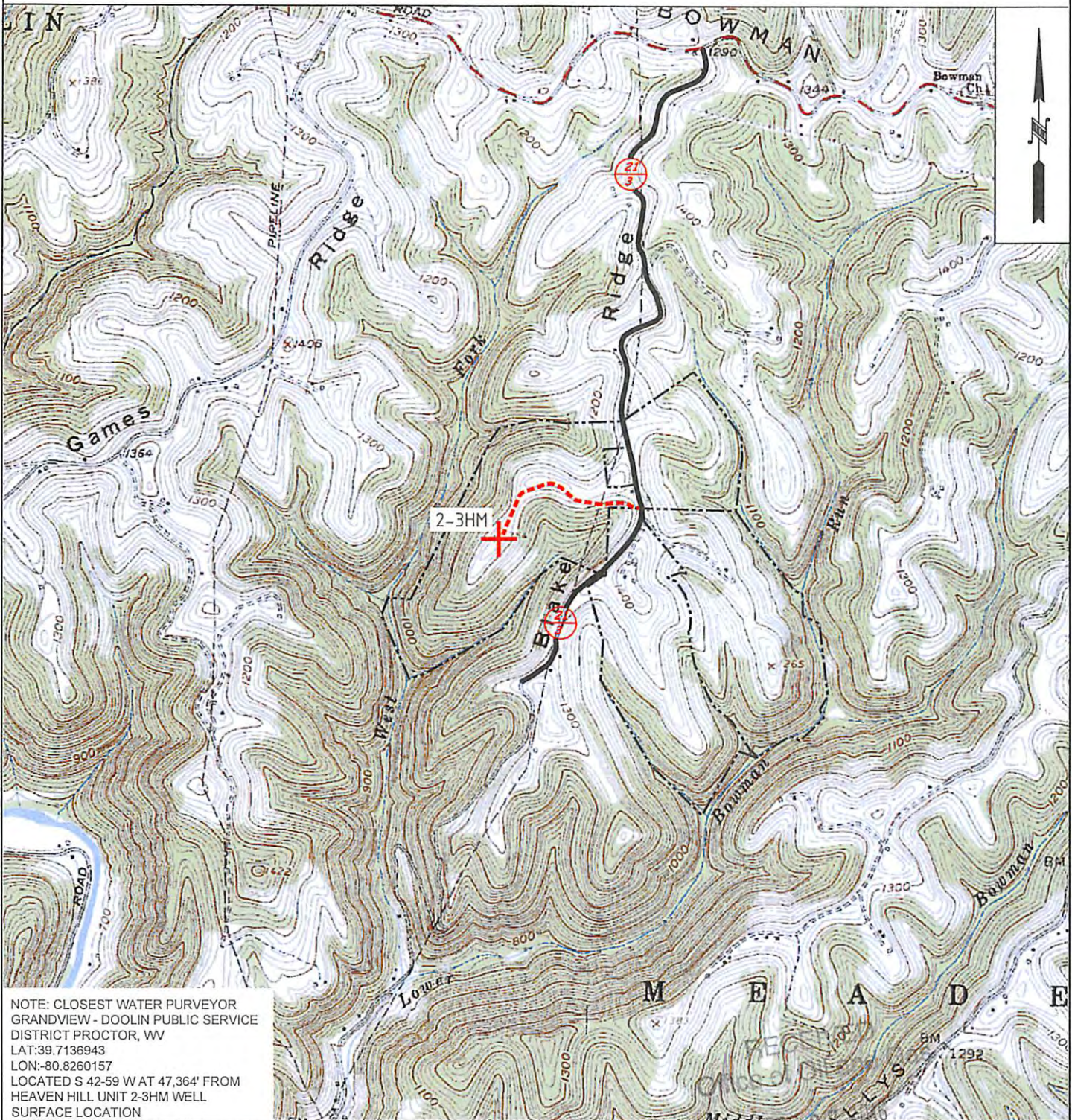
Office of Oil and Gas

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.
 DEC 27 2016
 ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV DOT REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

WW-9

PROPOSED HEAVEN HILL UNIT 2-3HM

SUPPLEMENT PG 2



NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN PUBLIC SERVICE
DISTRICT PROCTOR, WW
LAT:39.7136943
LON:-80.8260157
LOCATED S 42-59 W AT 47,364' FROM
HEAVEN HILL UNIT 2-3HM WELL
SURFACE LOCATION



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

TOPO SECTION **DEC 24**
GLEN EASTON
SCALE: **1" = 2000'**

LEASE NAME **Heaven Hill Unit 2**
DATE: **12/13/16**

02/17/2017



Well Site Safety Plan

Tug Hill Operating, LLC

Ju
12/20/16

Well Name: Heaven Hill Unit 2-3HM

Pad Name: Heaven Hill Unit 2

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:
Northing: 4,406,716.27
Easting: 524,574.97

December 2016

RECEIVED
Office of Oil and Gas

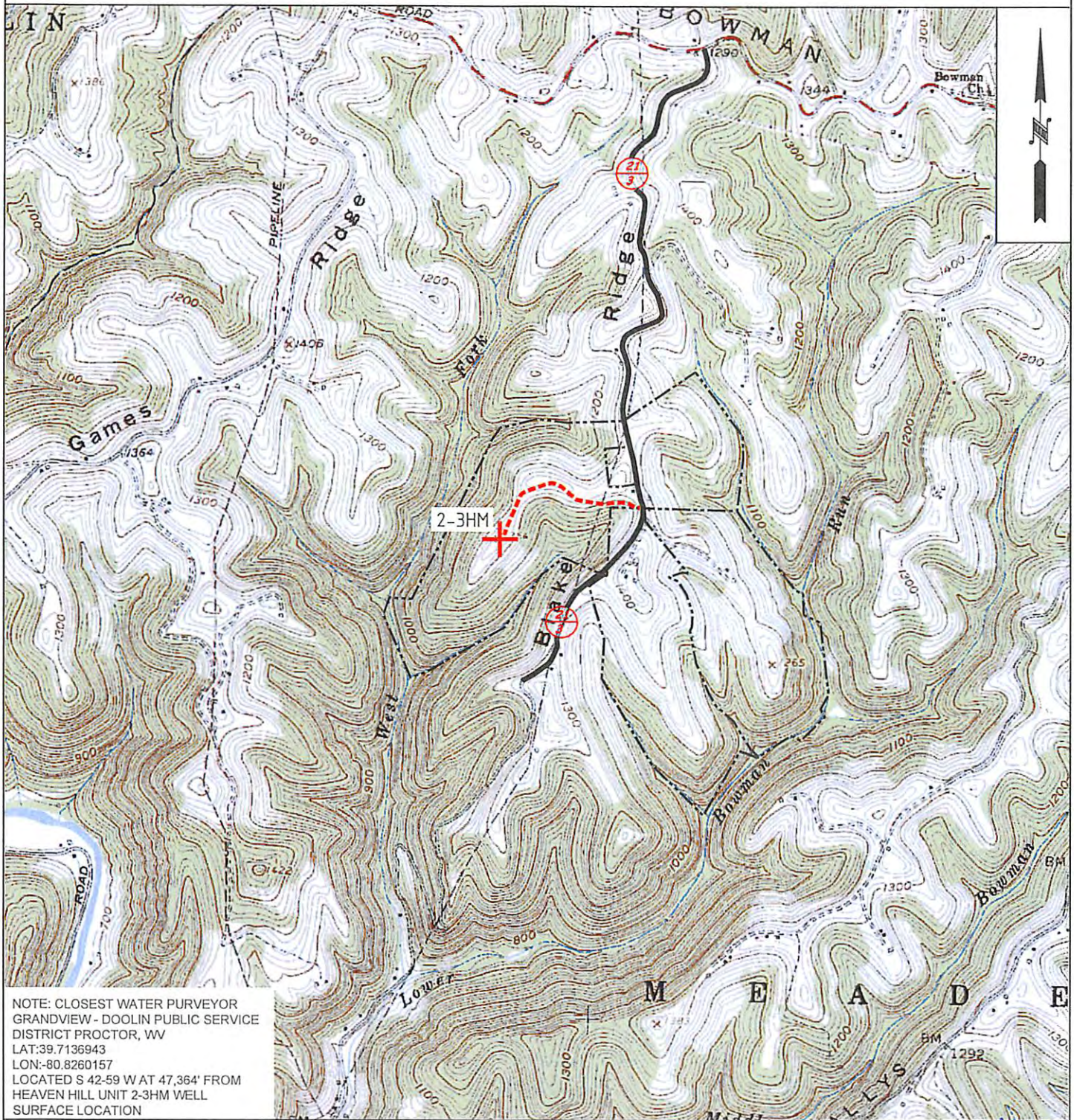
DEC 27 2016

WV Department of
Environmental Protection

02/17/2017

4705101907

PROPOSED HEAVEN HILL UNIT 2-3HM

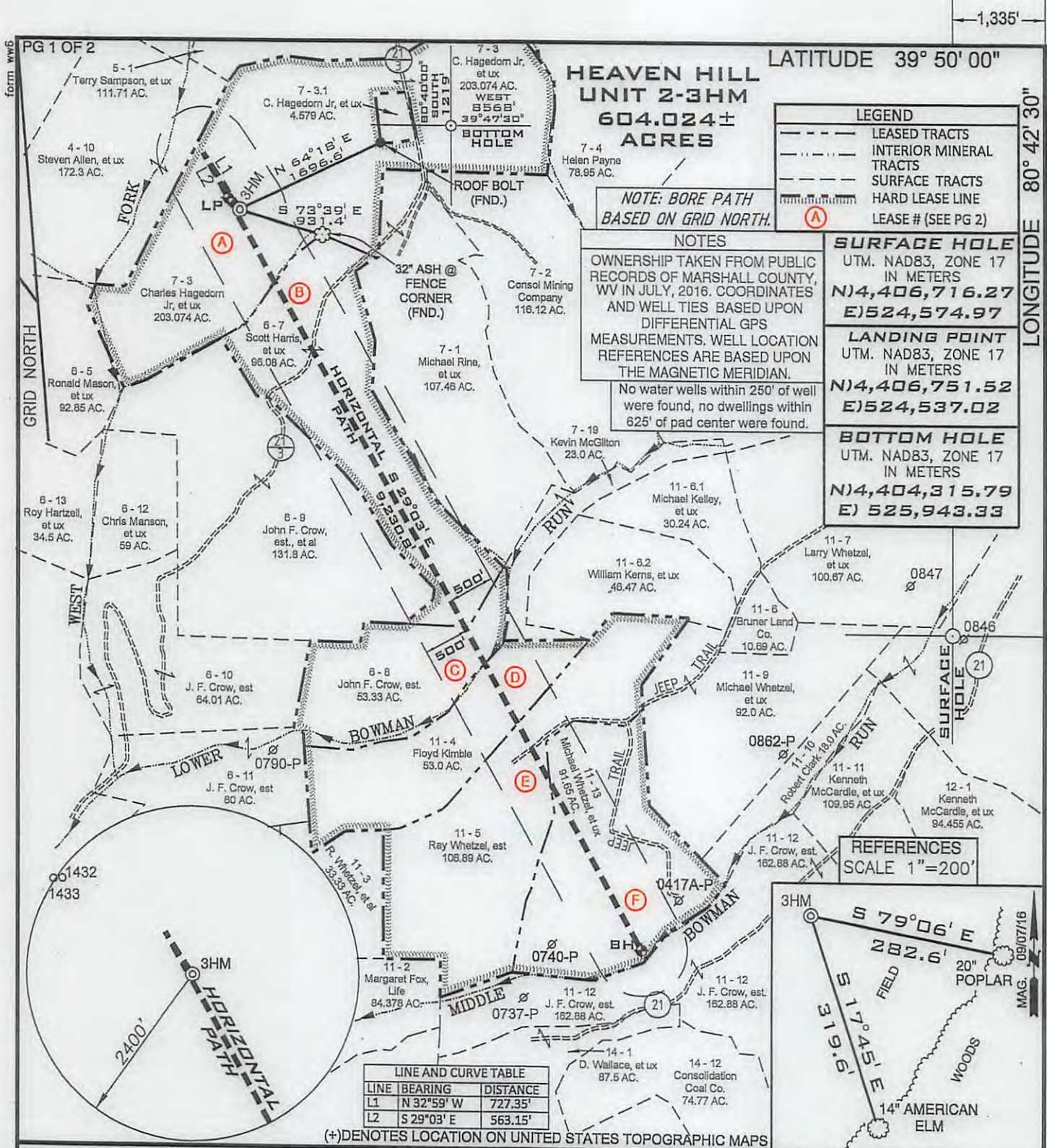


NOTE: CLOSEST WATER PURVEYOR
 GRANDVIEW - DOOLIN PUBLIC SERVICE
 DISTRICT PROCTOR, WV
 LAT:39.7136943
 LON:-80.8260157
 LOCATED S 42-59 W AT 47,364' FROM
 HEAVEN HILL UNIT 2-3HM WELL
 SURFACE LOCATION

 TUG HILL OPERATING	OPERATOR	163-697(CEC)	TOPO SECTION	LEASE NAME
	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		GLEN EASTON 7.5'	HEAVEN HILL UNIT 2
			SCALE: 1" = 2000'	DATE: DATE: 12/13/16

12/20/16

02/17/2017



HEAVEN HILL UNIT 2-3HM
604.024± ACRES

LATITUDE 39° 50' 00"

LEGEND

- LEASED TRACTS
- INTERIOR MINERAL TRACTS
- SURFACE TRACTS
- HARD LEASE LINE
- LEASE # (SEE PG 2)

NOTE: BORE PATH BASED ON GRID NORTH.

NOTES
 OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN JULY, 2016. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.
 No water wells within 250' of well were found, no dwellings within 625' of pad center were found.

SURFACE HOLE
 UTM. NAD83, ZONE 17 IN METERS
N)4,406,716.27
E)524,574.97

LANDING POINT
 UTM. NAD83, ZONE 17 IN METERS
N)4,406,751.52
E)524,537.02

BOTTOM HOLE
 UTM. NAD83, ZONE 17 IN METERS
N)4,404,315.79
E) 525,943.33

REFERENCES
 SCALE 1"=200'

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

FILE NUMBER 163-697

DRAWING NUMBER HHU2_WP_3HM

SCALE 1" = 1500'

MINIMUM DEGREE OF ACCURACY 1/2500

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING
GRADE GPS

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

P.S. Jonathan N. White
 2122



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



DATE: DECEMBER 19, 2016

OPERATORS WELL NO. Heaven Hill Unit 2-3HM

API WELL NO. 47-051-01907 H6A

STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL

(IF "GAS") PRODUCTION STORAGE DEEP SHALLOW

LOCATION ELEVATION 1331' WATERSHED (HUC 10) FISH CREEK

DISTRICT MEADE COUNTY MARSHALL

QUADRANGLE GLEN EASTON 7.5' LEASE NUMBER SEE ATTACHED PG 2 OF 2

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

OIL & GAS ROYALTY OWNER CHARLES R. HAGEDORN, JR., ET AL LEASE ACREAGE 604.024

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION

PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE (SPECIFY) _____

TARGET FORMATION MARCELLUS PLUG & ABANDON CLEAN OUT & REPLUG

WELL OPERATOR TUG HILL OPERATING, LLC ESTIMATED DEPTH TVD 6,929' TMD:16,387'

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

02/17/2017

COUNTY NAME PERMIT

**HEAVEN HILL UNIT 2-3HM
WELL PLAT LEASE INFORMATION**

Lease No.	Tag	Parcel	OIL & GAS ROYALTY OWNER	Deed Book	Deed Page
10*15505	A	9-7-3	RALPH E. WELLMAN	686	412
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	722	281
10*15608	A	9-7-3	CHARLES R HAGEDORN JR	816	423
10*47051.073.1	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	888	618
10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	908	541
10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	878	330
10*47051.255.0	B	9-6-7	SCOTT C & CAROLYN R HARRIS	879	296
10*15510	C	9-6-8	ELAINE PHELPS ET VIR	718	326
10*15511	C	9-6-8	DAVID E CROW	718	376
10*15512	C	9-6-8	FRANCES COFFEY	718	378
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10*15514	C	9-6-8	L PAUL CROW	718	336
10*15515	C	9-6-8	DESIRE L CROW	718	334
10*15516	C	9-6-8	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	C	9-6-8	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	C	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	C	9-6-8	JOHN CROW	726	580
10*15520	C	9-6-8	TIMOTHY CROW	726	582
10*47051.123.1	C	9-6-8	LLOYD G BAKER	865	389
10*47051.123.2	C	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
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10*15584	E	9-11-5	VICKIE MASON	686	239
10*15585	E	9-11-5	SHARON L WHETZAL	687	147
10*15586	E	9-11-5	MARY A SOUTH	690	615
10*15587	E	9-11-5	ROBERT L WHETZAL	690	559
10*15588	E	9-11-5	RAY A WHETZAL JR	693	571
10*15589	E	9-11-5	MARK L WHETZAL	693	576
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10*47051.108.5	E	9-11-5	BRENDA J WHETZEL	885	55
10*15604	F	9-11-13	HAYHURST COMPANY A FLORIDA PARTNERSHIP	724	8

RECEIVED
Office of Oil and Gas 02/17/2017

DEC 27 2016

WV Department of
Environmental Protection

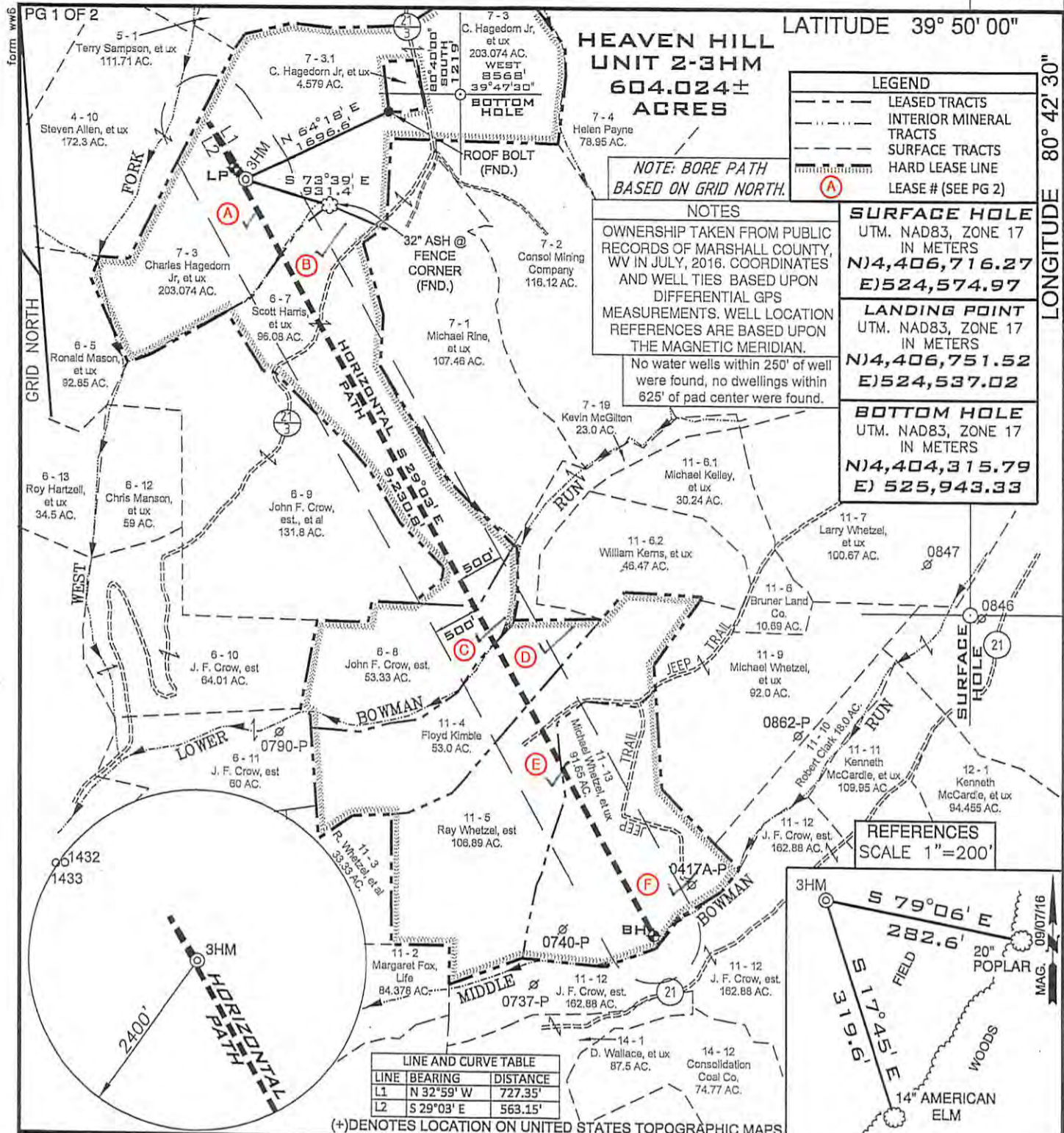
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FORT WORTH, TX 76107

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

1,335'

LATITUDE 39° 50' 00"

LONGITUDE 80° 42' 30"



**HEAVEN HILL
UNIT 2-3HM
604.024±
ACRES**

LEGEND

- LEASED TRACTS
- INTERIOR MINERAL TRACTS
- SURFACE TRACTS
- HARD LEASE LINE
- LEASE # (SEE PG 2)

*NOTE: BORE PATH
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IN METERS
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E)524,574.97

LANDING POINT
UTM. NAD83, ZONE 17
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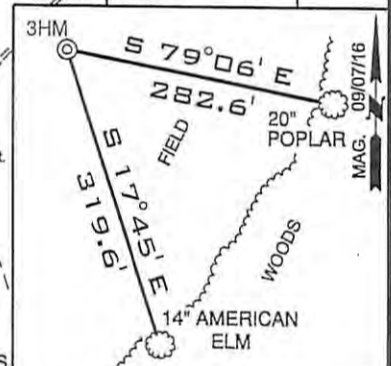
BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N)4,404,315.79
E) 525,943.33

REFERENCES
SCALE 1"=200'

LINE AND CURVE TABLE

LINE	BEARING	DISTANCE
L1	N 32°59' W	727.35'
L2	S 29°03' E	563.15'

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS



FILE NUMBER 163-697

DRAWING NUMBER HHU2_WP_3HM

SCALE 1" = 1500'

MINIMUM DEGREE OF ACCURACY 1/2500

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P.S. 2122 *Jonathan N. White*



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

DATE: DECEMBER 19, 2016

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API WELL NO. 47-051

STATE COUNTY PERMIT

WELL TYPE: OIL ___ GAS LIQUID INJECTION ___ WASTE DISPOSAL ___

(IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW

LOCATION ELEVATION 1331' WATERSHED (HUC 10) FISH CREEK

DISTRICT MEADE COUNTY MARSHALL

QUADRANGLE GLEN EASTON 7.5' LEASE NUMBER SEE ATTACHED PG 2 OF 2

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02/17/2017

COUNTY NAME PERMIT

HEAVEN HILL UNIT 2-3HM
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10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	878	330
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10*15511	C	9-6-8	DAVID E CROW	718	376
10*15512	C	9-6-8	FRANCES COFFEY	718	378
10*15513	C	9-6-8	KAY KEYES	718	330
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10*15516	C	9-6-8	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	C	9-6-8	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	C	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	C	9-6-8	JOHN CROW	726	580
10*15520	C	9-6-8	TIMOTHY CROW	726	582
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10*47051.123.2	C	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
10*16517	D	9-11-4	RHDK INVESTMENTS	907	550
10*15584	E	9-11-5	VICKIE MASON	686	239
10*15585	E	9-11-5	SHARON L WHETZAL	687	147
10*15586	E	9-11-5	MARY A SOUTH	690	615
10*15587	E	9-11-5	ROBERT L WHETZAL	690	559
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10*47051.108.1	E	9-11-5	MICHAEL A WHETZEL	885	51
10*47051.108.5	E	9-11-5	BRENDA J WHETZEL	885	55
10*15604	F	9-11-13	HAYHURST COMPANY A FLORIDA PARTNERSHIP	724	8

RECEIVED
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DEC 27 2016

WV Department of
Environmental Protection

02/17/2017

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

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

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

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

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

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

*See attached

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

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

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

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

Well Operator: Tug Hill Operating, LLC

By: Jonathan White *Jonathan White*

Its: Regulatory Analyst - Appalachia Region

RECEIVED
Office of Oil and Gas
Region 2
February 17, 2016

WV Department of
Environmental Protection

Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	Deed Book/Pg		Assignment	Assignment	Assignment
10*15505	A ✓	9-7-3	RALPH E. WELLMAN	TH EXPLORATION LLC	1/8+	686	412	N/A	N/A	
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	TRIENERGY HOLDINGS, LLC	1/8+	722	281	Tri Energy to NPAR: 24/196	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15608	A	9-7-3	CHARLES R HAGEDORN JR	CHEVRON USA INC	1/8+	816	423	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.073.1	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	TH EXPLORATION LLC	1/8+	888	618	N/A	N/A	
10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	TH EXPLORATION LLC	1/8+	908	541	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	
10*47051.255.0	B	9-6-7	SCOTT C & CAROLYN R HARRIS	TH EXPLORATION LLC	1/8+	879	296	#N/A	#N/A	
10*15510	C	9-6-8	ELAINE PHELPS ET VIR	TRIENERGY HOLDINGS, LLC	1/8+	718	326	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15511	C	9-6-8	DAVID E CROW	TRIENERGY HOLDINGS, LLC	1/8+	718	376	Tri Energy to NPAR: 25/463	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15512	C	9-6-8	FRANCES COFFEY	TRIENERGY HOLDINGS, LLC	1/8+	718	378	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15513	C	9-6-8	KAY KEYES	TRIENERGY HOLDINGS, LLC	1/8+	718	330	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15514	C	9-6-8	L PAUL CROW	TRIENERGY HOLDINGS, LLC	1/8+	718	336	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15515	C	9-6-8	DESIRE L CROW	TRIENERGY HOLDINGS, LLC	1/8+	718	334	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15516	C	9-6-8	ROSE MARIE KIELGCZEWSKI	TRIENERGY HOLDINGS, LLC	1/8+	718	354	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15517	C	9-6-8	DIANNE GELLNER & GARY GELLNER	TRIENERGY HOLDINGS, LLC	1/8+	718	345	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15518	C	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TRIENERGY HOLDINGS, LLC	1/8+	718	347	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15519	C	9-6-8	JOHN CROW	TRIENERGY HOLDINGS, LLC	1/8+	726	580	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15520	C	9-6-8	TIMOTHY CROW	TRIENERGY HOLDINGS, LLC	1/8+	726	582	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*47051.123.1	C	9-6-8	LLOYD G BAKER	TH EXPLORATION LLC	1/8+	865	389	N/A	N/A	N/A
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10*15585	E	9-11-5	SHARON L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	687	147	#N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15586	E	9-11-5	MARY A SOUTH	CHESAPEAKE APPALACHIA LLC	1/8+	690	615	#N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15587	E	9-11-5	ROBERT L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	690	559	#N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15588	E	9-11-5	RAY A WHETZAL JR	CHESAPEAKE APPALACHIA LLC	1/8+	693	571	#N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15589	E	9-11-5	MARK L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	693	576	#N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*47051.108.1	E	9-11-5	MICHAEL A WHETZEL	TH EXPLORATION LLC	1/8+	885	51	#N/A	#N/A	#N/A
10*47051.108.5	E	9-11-5	BRENDA J WHETZEL	TH EXPLORATION LLC	1/8+	885	55	#N/A	#N/A	#N/A
10*15604	F	9-11-13	HAYHURST COMPANY A FLORIDA PARTNERSHIP	CHESAPEAKE APPALACHIA LLC	1/8+	724	8	#N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148

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 Office of Oil and Gas
 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

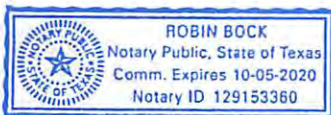
JURAT

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

STATE OF TEXAS §
COUNTY OF TARRANT §

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

51-01907

AB 24/196

Image Print

Page 2 of 2

SH10024, REC 0196

STATE OF WEST VIRGINIA :
COUNTY OF MARSHALL :

ASSIGNMENT OF
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

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

A 100% WORKING INTEREST IN AND TO THOSE CERTAIN OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA SET FORTH ON EXHIBIT "A", ATTACHED HERETO AND MADE A PART HEREOF (EACH INDIVIDUALLY A "LEASE" AND COLLECTIVELY THE "LEASES"); BUT EXCEPTING AND RESERVING UNTO ASSIGNOR IN AND TO EACH LEASE AN OVERRIDING ROYALTY EQUAL TO THE DIFFERENCE BETWEEN 10% AND THE LESSOR'S ROYALTY PROVIDED IN EACH LEASE, ON A LEASE BY LEASE BASIS IN ALL OIL, GAS, COALBED METHANE GAS AND ASSOCIATED HYDROCARBONS PRODUCED, SAVED AND SOLD FROM THE LEASES, SUBJECT TO A PROPORTIONATE REDUCTION BASED ON PARTIAL LEASEHOLD INTEREST, AS DESCRIBED BELOW.

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

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

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

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

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

Witness:

ASSIGNOR
TRIENERGY HOLDINGS, LLC

Joseph E. Bojlad
President and Managing Partner

ASSIGNEE

Witness:

NPAR, LLC

AB
LEGAL
CS

Gordon O. Yonel
Chief Executive Officer

RECEIVED
Office of Oil and Gas

10/29/2015
DEC 27 2016

WV Department of
Environmental Protection

02/17/2017

Pages Omitted

BOOK PAGE 0024 30

ASN 24/430

AP 04/15

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

ASSIGNMENT OF
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

TRIENERGY HOLDINGS, LLC

412 Beaver Street, 2nd floor
Sewickley, PA 15143
("Assignor")

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

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

Return

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

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

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

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND MADE DULY EFFECTIVE THIS INSTRUMENT THIS 28TH DAY OF MAY, 2011.

Witness:

[Handwritten signature]

ASSIGNOR
TRIENERGY HOLDINGS, LLC

Joseph E. Bojalad
President and Managing Partner

Jan Pest
MARSHALL County 11:45:09 AM
Instrument No 1306153
Date Recorded 06/13/2011
Document 1749 184
Pages Recorded 13
Book-Page 24-430
Recording Fee \$23.00
Additional Fee \$7.00

Office of Oil and Gas

ASSIGNEE

Witness:

[Handwritten signature]

ASSIGNEE

NPAR, LLC

DEC 27 2016

WV Department of
Environmental Protection

BOOK 0025 PAGE 0463
ASN 25/463

STATE OF WEST VIRGINIA :
:
COUNTY OF MARSHALL :

ASSIGNMENT OF
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

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Brecksville, OH 44141
("Assignee")

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

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

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

Witness:

Debra Reed

ASSIGNOR
TRIENERGY HOLDINGS, LLC

Joseph E. Bojalad
President and Managing Partner

TRIENERGY HOLDINGS, LLC
PO BOX 69
SEWICKLEY, PA 15143-0069

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

ASSIGNEE

Witness:

Gavin A. Dui

NPAR, LLC

Gordon O. Yonel
Chief Executive Officer

8/5/2011

RECEIVED
Office of Oil and Gas

DEC 27 2016

WV Department of
Environmental Protection

Pages Omitted

ASN 25/449

BOOK 0025 PAGE 0449

STATE OF WEST VIRGINIA :
COUNTY OF MARSHALL :

ASSIGNMENT OF OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

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

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

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

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

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

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

Witness:

Debra Reid

ASSIGNOR
TRIENERGY HOLDINGS, LLC

Joseph E. Bojalad
President and Managing Partner

ASSIGNEE

Witness:

Patricia A. Pitt

Jan Pest
MARSHALL County 12:48:53 PM
Instrument No 1308985
Date Recorded 08/04/2011
Document Type ASH
Pages Recorded 14
Book-Page 25-449
Recording Fee \$14.00
Additional \$7.00

NPAR-LLC
Gordon O. Yoncl

Gordon O. Yoncl
Chief Executive Officer 8/3/2011

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

A Pages Omitted

51-01907
DB 756/332

~~BOOK 0756 PAGE 0332~~

JIM BOURBEAU LAND SERVICE INC
11106 ST HWY 18
CONNEAUT LAKE, PA 16316-3620

BOOK 0756 PAGE 0332

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

MARSHALL COUNTY, WEST VIRGINIA

CONVEYANCE

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

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

ARTICLE I
CONVEYANCE

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

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

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

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

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

JIN865779.1

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WV Department of
Environmental Protection

02/17/2017



December 13, 2016

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

RE: Heaven Hill Unit 2-3HM

Subject: County Route 21/3 Road Crossing Letter

Dear Laura:

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

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

Sincerely,

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

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

RECEIVED
Office of Oil and Gas

DEC 27 2016

WV Department of
Environmental Protection

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

Date of Notice Certification: 12/21/2016

API No. 47- 051 - 01907
Operator's Well No. Heaven Hill Unit 2-3HM
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:

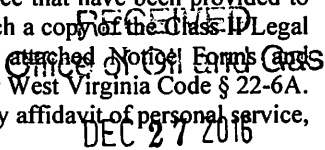
State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>524,574.97</u>
County: <u>Marshall</u>	Northing: <u>4,406,716.27</u>
District: <u>Meade</u>	Public Road Access: <u>Blake Ridge Road (Co. Rt. 21/3)</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Charles R. Hagedorn, Jr., et ux</u>
Watershed: <u>(HUC 10) Fish Creek</u>	

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

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

Required Attachments:

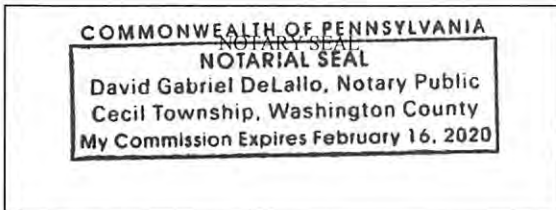
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class I Legal Advertisement with publication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


 WV Department of
 Environmental Protection
 02/17/2017

Certification of Notice is hereby given:

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

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



Subscribed and sworn before me this 20 day of DECEMBER, 2016.

David Gabriel DeLallo Notary Public

My Commission Expires 2/16/2020

Oil and Gas Privacy Notice:

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

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Office of Oil and Gas

DEC 27 2016

WV Department of
Environmental Protection

02/17/2017

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: 12/21/2016 Date Permit Application Filed: 12/22/2016

Notice of:

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

Delivery method pursuant to West Virginia Code § 22-6A-10(b)

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

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice WSSP Notice E&S Plan Notice Well Plat Notice is hereby provided to:

SURFACE OWNER(s)
 Name: Charles R. Hagedorn, Jr., ex ux
 Address: 78 Hagedorn Drive
Glen Easton, WV 26039
 Name: None
 Address: _____

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

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

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

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

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

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

*Please attach additional forms if necessary

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 WV Department of Environmental Protection
 02/17/2017

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2015 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

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

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02/17/2017

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.

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WW-6A
(8-13)

API NO. 47- 051 - 01907
OPERATOR WELL NO. Heaven Hill Unit 2-3HM
Well Pad Name: Heaven Hill Unit 2

Notice is hereby given by:

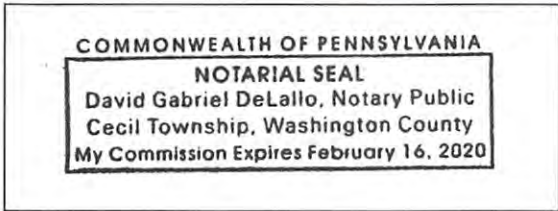
Well Operator: Tug Hill Operating, LLC
Telephone: 724-338-2026
Email: jwhite@tug-hillop.com

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

Jonathan White

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 20 day of December, 2016.

David DeLallo Notary Public

My Commission Expires 2/16/2020

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02/17/2017

51-01907

WW-6A

Supplement Pg. 1A

December 13, 2016
Tug Hill Operating, LLC
380 Southpointe BLVD
Suite 200
Canonsburg, PA 15317

WATER WELL REPORT

Well: Heaven Hill Unit 2-3HM
District: Meade
County: Marshall
State: WV

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

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

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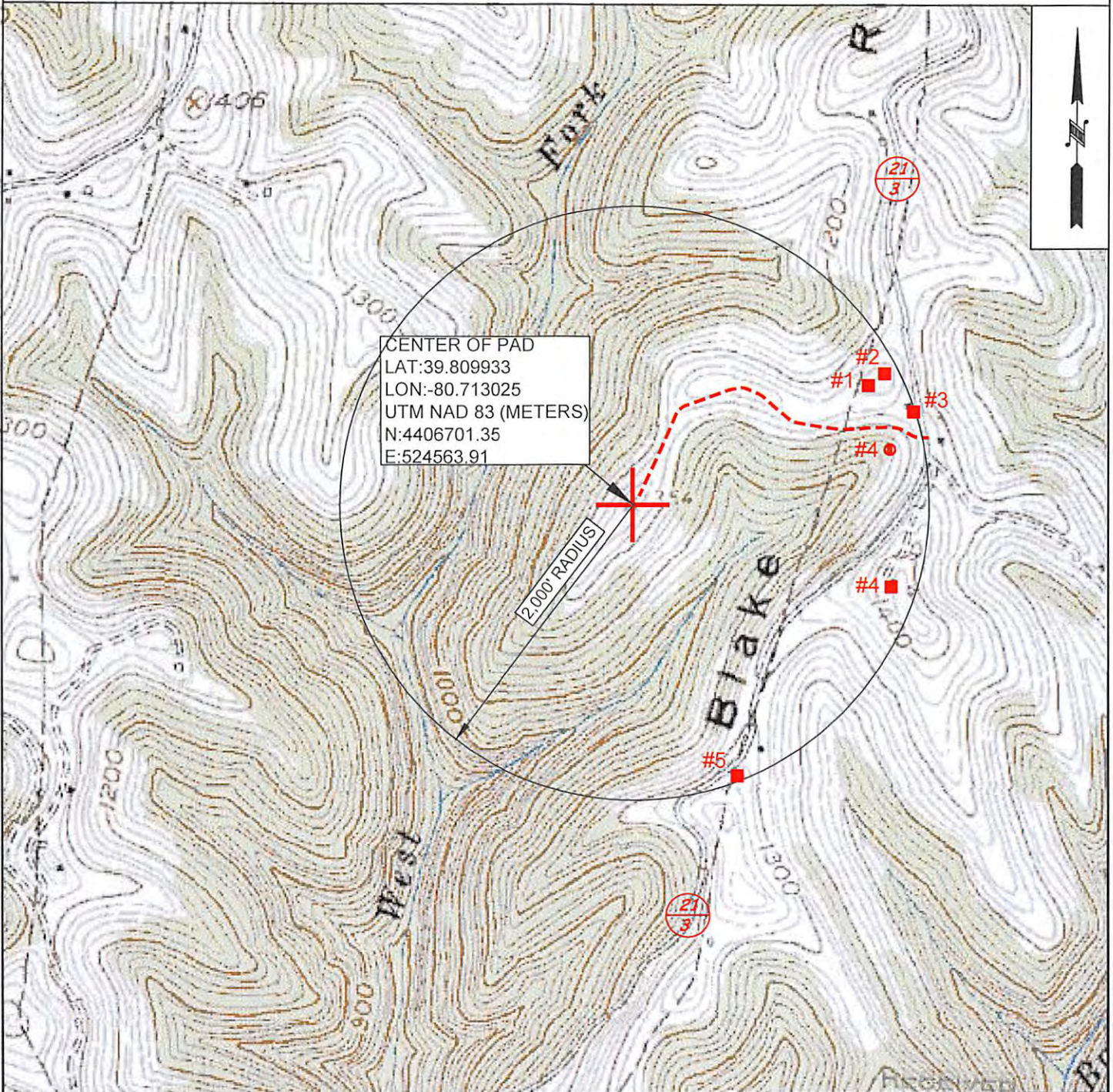
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02/17/2017

WW-6A

PROPOSED HEAVEN HILL UNIT 2-3HM


SUPPLEMENT PG 1B

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



CENTER OF PAD
 LAT:39.809933
 LON:-80.713025
 UTM NAD 83 (METERS)
 N:4406701.35
 E:524563.91

2,000' RADIUS

 TUG HILL OPERATING	OPERATOR TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	TOPO SECTION GLEN EASTON 7.5'	Office of Oil and Gas UNIT NAME HEAVEN HILL UNIT 2
	SCALE: 1" = 1000'	DATE: 12/13/16	DATE: 12/13/16
	Environmental Protection	Environmental Protection	Environmental Protection

02/17/2017

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

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

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

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

Notice is hereby provided to:

SURFACE OWNER(s)

Name: Charles R. Hagedorn

Address: 78 Hagedorn Drive
Glen Easton, WV 26039

Name: Michael J. Rine

Address: 1466 Blake Ridge Road
Glen Easton, WV 26039

Name: _____

Address: _____

COAL OWNER OR LESSEE

Name: Murray Energy Corporation

Address: 46226 National Road
St. Clairsville, OH 43950

MINERAL OWNER(s)

Name: JMK Irrevocable Trust

Address: 600 Texas Street, Suite 101
Fort Worth, TX 76102

*please attach additional forms if necessary

Notice is hereby given:

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

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>Lat: 39.8098685, Long: -80.7132025</u>
County: <u>Marshall</u>	Public Road Access: <u>Blake Ridge Road (Co. Rt. 21/3)</u>
District: <u>Meade</u>	Watershed: <u>West Fork / HUC-10 Fish Creek</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Charles R. Hagedorn</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC

Telephone: 724-338-2026

Email: jwhite@tug-hillop.com

Address: 380 Southpointe Blvd, Suite 200
Canonsburg, PA 15317

Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

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

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WW-6A3 Notice of Entry for Plat Survey

Attachment 1 of 1

Mineral Owner(s):

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

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

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

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

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

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

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



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WV Department of
Environmental Protection 02/17/2017

51-01907

Operator Well No. Heaven Hill Unit 2-3HM

WW-6A3 Notice of Entry for Plat Survey

Attachment 1 of 1

Mineral Owner(s):

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

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

Name: Charles R. Hagedorn
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Glen Easton, WV 26039

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

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

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

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



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

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

Date of Notice: April 25, 2016 **Date of Planned Entry:** May 4, 2016

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

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

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

Notice is hereby provided to:

SURFACE OWNER(s)

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Address: 78 Hagedorn Drive
Glen Easton, WV 26039

Name: Michael J. Rine

Address: 1466 Blake Ridge Road
Glen Easton, WV 26039

Name: _____

Address: _____

COAL OWNER OR LESSEE

Name: Murray Energy Corporation

Address: 46226 National Road
St. Clairsville, OH 43950

MINERAL OWNER(s)

Name: JMK Irrevocable Trust

Address: 600 Texas Street, Suite 101
Fort Worth, TX 76102

*please attach additional forms if necessary

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County: <u>Marshall</u>	Public Road Access: <u>Blake Ridge Road (Co. Rt. 21/3)</u>
District: <u>Meade</u>	Watershed: <u>West Fork / HUC-10 Fish Creek</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Charles R. Hagedorn</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

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Telephone: 724-338-2026

Email: jwhite@tug-hillop.com

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

Oil and Gas Privacy Notice:

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

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WV Department of
Environmental Protection
02/17/2017

SI-01907

Operator Well No. Heaven Hill Unit 2-3HM

WW-6A3 Notice of Entry for Plat Survey

Attachment 1 of 1

Mineral Owner(s):

Name: Marcellus TX Minerals Partners, LTD
Address: 307 W 7th St.
Fort Worth, TX 76102

Name: Purpleburgh Ventures, LLC
Address: 306 W 7th St.
Fort Worth, TX 76102

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

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

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

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

Name: Ralph E. Wellman
Address: 2209 Bowman Ridge Rd.
Glen Easton, WV 26039

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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: 12/21/2016 **Date Permit Application Filed:** 12/22/2016

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>524,570.38</u>
County:	<u>Marshall</u>		Northing:	<u>4,406,710.18</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 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

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

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

Oil and Gas Privacy Notice:

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

DEC 27 2016

WV Department of
Environmental Protection

02/17/2017

51-01907



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Earl Ray Tomblin
Governor

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

November 2, 2016

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

Subject: DOH Permit for the Heaven Hills Unit 2 Pad, Marshall County
Heaven Hills Unit 2-3HM Well site ✓

Dear Mr. Martin,

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

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

Very Truly Yours,

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

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

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DEC 27 2016

WV Department of Environmental Protection
02/17/2017



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Heaven Hill Unit 2-3HM

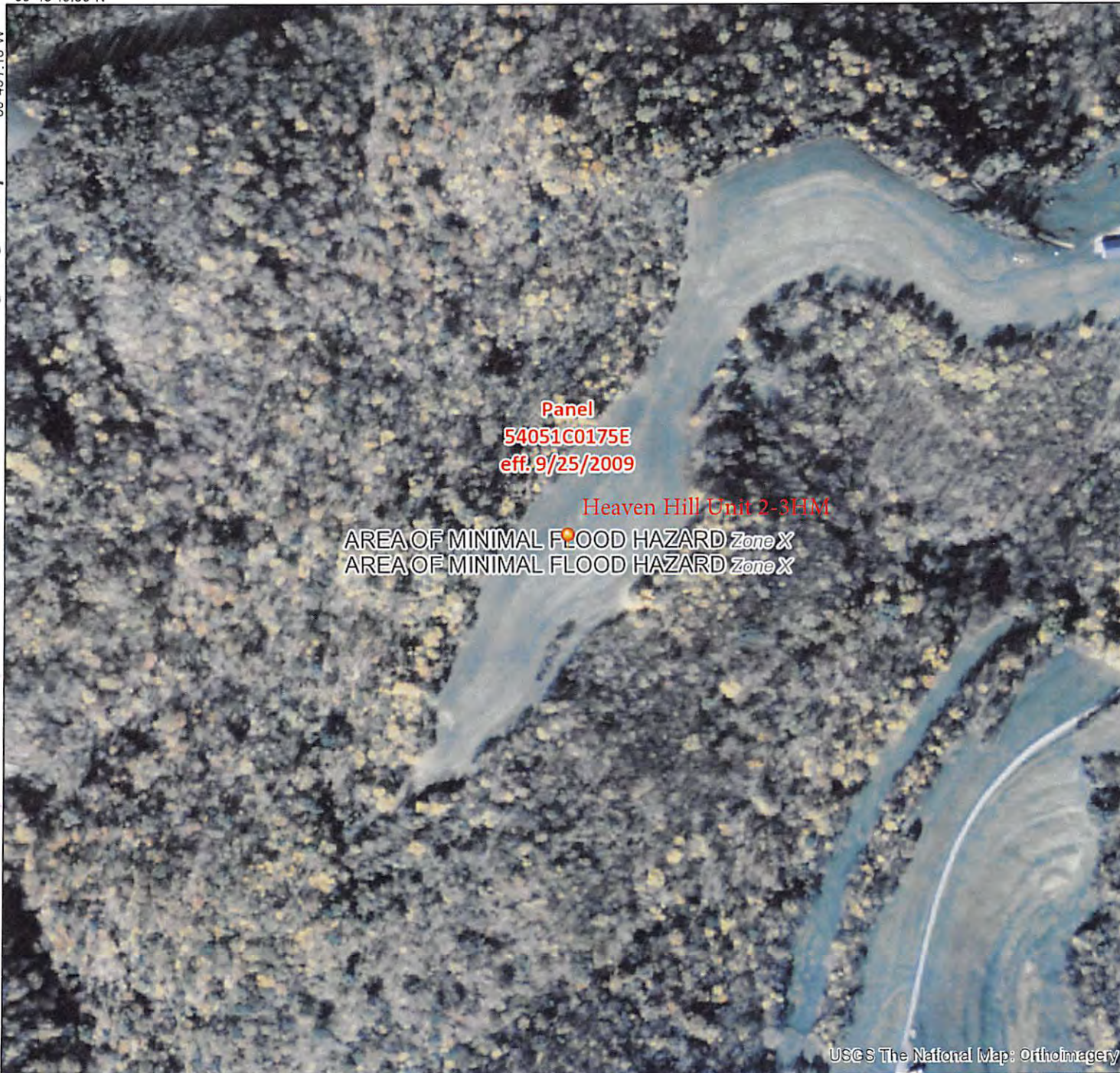
PRODUCT NAME:	CHEMICAL DESCRIPTION:	PRODUCT USE:	HAZARDOUS COMPONENT:
GBW-20C	Hemicellulase Breaker	Breaker - Water	None
ALPHA 1427		Biocide	Glutaraldehyde – CAS#000111-30-8 Quaternary ammonium chloride CAS# 007173-51-5 Alky dimethyl benzyl ammonium Chloride (C12-16) – CAS#068424-85-1 Ethanol – CAS# 000064-17-5 Water – CAS# 007732-18-5
FRAC SAND	Silica Sand (various Mesh sizes)	Proppant	Crystalline silica (quartz) CAS# 14808-60-7
S-8C, Sand	Silica Sand (100 mesh)	Sand	Silica – CAS# 14808-60-7
GW-3LDF		Gellant - Water	Petroleum Distillate Blend – Proprietary, (Not Associated with Diesel Fuel) Guar gum – CAS# 009000-30-0
FRW-18		Friction Reducer	Hydrotreated light distillate CAS# 064742-47-8
Scaletrol		Scale Inhibitor	Ethylene glycol – CAS# 000107-21-1 Diethylene glycol – CAS# 000111-46-6

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National Flood Hazard Layer FIRMette

39°48'49.69"N

80°43'7.18"W
51-01907



Legend

- Cross-Sections
- ~ Base Flood Elevations
- Flood Hazard Zones**
- 1% Annual Chance Flood
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee
- LOMRs**
- Effective
- Map Panels**
- Digital Data
- Unmodernized Maps
- Unmapped



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 DEC 27 2016
 WV Department of
 Environmental Protection

This map complies with FEMA's standards for the use of digital flood maps. The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. The base map shown complies with FEMA's base map accuracy standards.

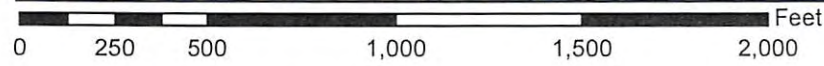
The NFHL is a living database, updated daily, and this map represents a snapshot of information at a specific time.

Flood risks are dynamic and can change frequently due to a variety of factors, including weather patterns, erosion, and new development. FEMA flood maps are continually updated through a variety of processes. Users should always verify through the Map Service Center (<http://msc.fema.gov>) or the Community Map Repository that they have the current effective information.

NFHL maps should not be created for unmapped or unmodernized areas.



FEMA



39°48'20.87"N

80°42'28.10"W

USGS The National Map: Orthoimagery



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WVDEP OOG
11/2/2016

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

Pertinent Site Information
Heaven Hill 2 Site
Emergency Number: 304-843-1929
Marshall County Emergency: 911 (Moundsville, WV)
Meade District, Marshall County, WV
Watershed: Middle Fish Creek

Section	Description
1-1	Site Plan
1-2	Site Plan
1-3	Site Plan
1-4	Site Plan
1-5	Site Plan
1-6	Site Plan
1-7	Site Plan
1-8	Site Plan
1-9	Site Plan
1-10	Site Plan
1-11	Site Plan
1-12	Site Plan
1-13	Site Plan
1-14	Site Plan
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1-98	Site Plan
1-99	Site Plan
1-100	Site Plan



Exhibit A: Final Design: Issue for Permitting



North Arrow

Scale: 1" = 1380'

Project Contacts

Design Consultant:
Tug Hill Operating, LLC
1480 S. 14th St.
Martinsburg, WV 26157
Phone: 304-271-1111
Fax: 304-271-1112
Email: info@tughill.com

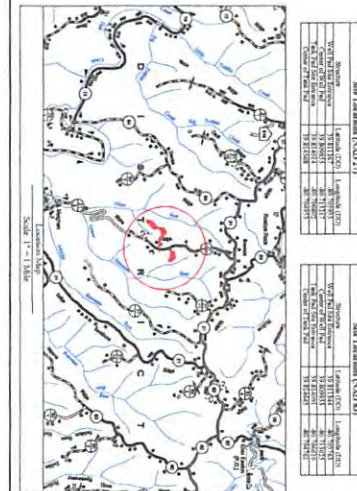
Client:
Tug Hill Operating, LLC
1480 S. 14th St.
Martinsburg, WV 26157
Phone: 304-271-1111
Fax: 304-271-1112
Email: info@tughill.com

Preparer:
K&S Engineering, Inc.
1480 S. 14th St.
Martinsburg, WV 26157
Phone: 304-271-1111
Fax: 304-271-1112
Email: info@kseng.com

811
Know what's below.
Call before you dig.

Permitting Information

This plan was prepared under contract for Tug Hill Operating, LLC. The client is responsible for obtaining all necessary permits and for ensuring that the design complies with all applicable regulations. The designer is not responsible for any errors or omissions in this plan.



Notes:

1. All construction shall conform to the following specifications:
2. All work shall be done in accordance with the approved plans and specifications.
3. All materials used shall be of the highest quality and shall be approved by the engineer.
4. All work shall be done in accordance with the approved plans and specifications.
5. All work shall be done in accordance with the approved plans and specifications.
6. All work shall be done in accordance with the approved plans and specifications.
7. All work shall be done in accordance with the approved plans and specifications.
8. All work shall be done in accordance with the approved plans and specifications.
9. All work shall be done in accordance with the approved plans and specifications.
10. All work shall be done in accordance with the approved plans and specifications.

Revision Table:

No.	Date	Description
1	11/2/2016	Initial Issue
2	11/2/2016	Revised Erosion Control Details
3	11/2/2016	Revised Site Plan
4	11/2/2016	Revised Specifications
5	11/2/2016	Revised Notes
6	11/2/2016	Revised Sheet
7	11/2/2016	Revised Title Block
8	11/2/2016	Revised Cover Sheet
9	11/2/2016	Revised Appendix
10	11/2/2016	Revised Index

Sheet	Description
1-1	Cross Section - Typical
1-2	Cross Section - Typical
1-3	Cross Section - Typical
1-4	Cross Section - Typical
1-5	Cross Section - Typical
1-6	Cross Section - Typical
1-7	Cross Section - Typical
1-8	Cross Section - Typical
1-9	Cross Section - Typical
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1-100	Cross Section - Typical

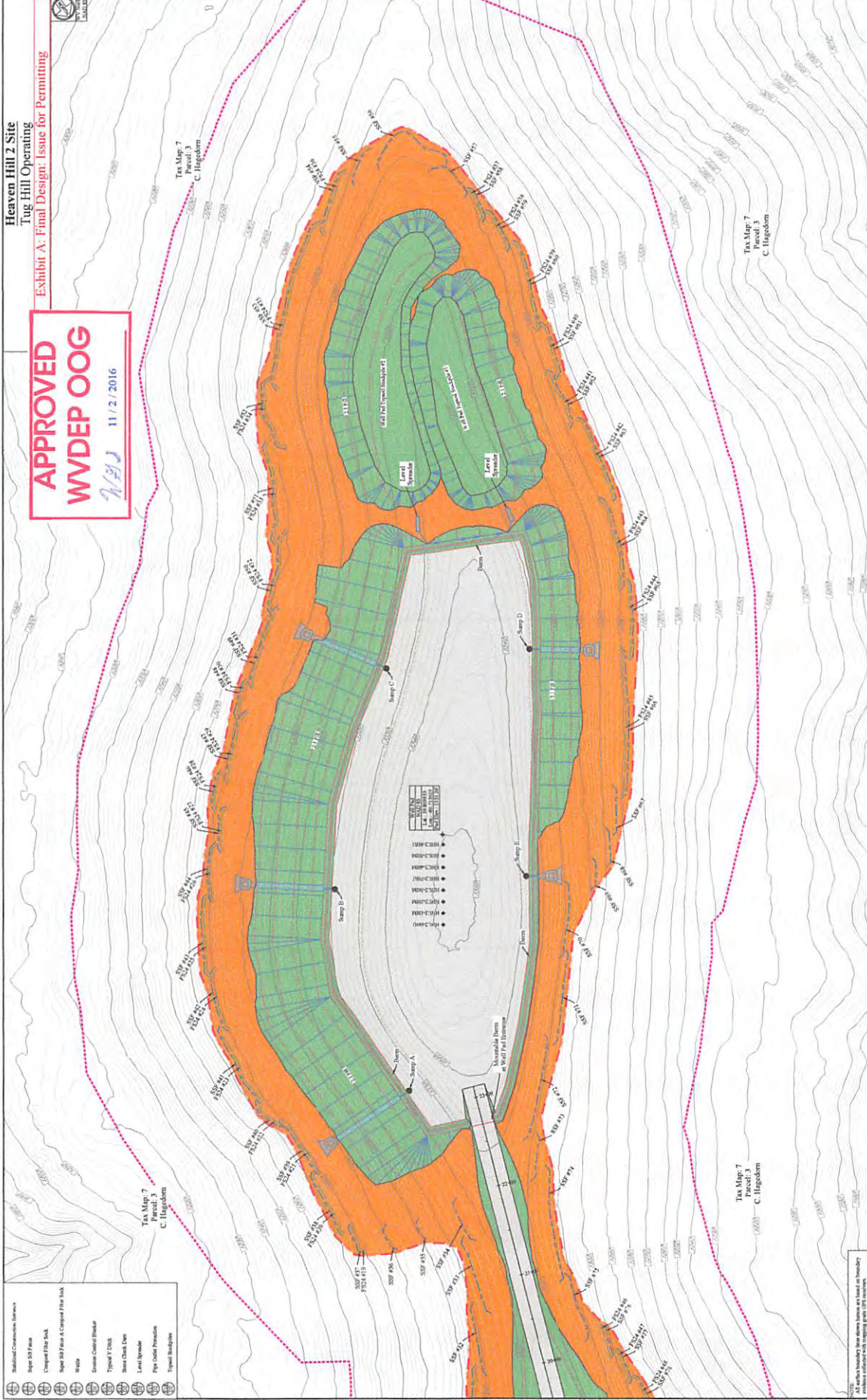
Cover Sheet
Heaven Hill 2 Site
Meade District
Marshall County, WV

TUG HILL OPERATING

K&S Engineering, Inc.

THIS DOCUMENT IS THE PROPERTY OF TUG HILL OPERATING, LLC. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED. IT IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF TUG HILL OPERATING, LLC.

02/17/2017



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

Standard Constructions Summary

	12' Stormwater Pipe
	18' Stormwater Pipe
	24' Stormwater Pipe
	30' Stormwater Pipe
	36' Stormwater Pipe
	42' Stormwater Pipe
	48' Stormwater Pipe
	54' Stormwater Pipe
	60' Stormwater Pipe
	66' Stormwater Pipe
	72' Stormwater Pipe
	78' Stormwater Pipe
	84' Stormwater Pipe
	90' Stormwater Pipe
	96' Stormwater Pipe
	102' Stormwater Pipe
	108' Stormwater Pipe
	114' Stormwater Pipe
	120' Stormwater Pipe
	126' Stormwater Pipe
	132' Stormwater Pipe
	138' Stormwater Pipe
	144' Stormwater Pipe
	150' Stormwater Pipe
	156' Stormwater Pipe
	162' Stormwater Pipe
	168' Stormwater Pipe
	174' Stormwater Pipe
	180' Stormwater Pipe
	186' Stormwater Pipe
	192' Stormwater Pipe
	198' Stormwater Pipe
	204' Stormwater Pipe
	210' Stormwater Pipe
	216' Stormwater Pipe
	222' Stormwater Pipe
	228' Stormwater Pipe
	234' Stormwater Pipe
	240' Stormwater Pipe
	246' Stormwater Pipe
	252' Stormwater Pipe
	258' Stormwater Pipe
	264' Stormwater Pipe
	270' Stormwater Pipe
	276' Stormwater Pipe
	282' Stormwater Pipe
	288' Stormwater Pipe
	294' Stormwater Pipe
	300' Stormwater Pipe

Legend

	12' Stormwater Pipe
	18' Stormwater Pipe
	24' Stormwater Pipe
	30' Stormwater Pipe
	36' Stormwater Pipe
	42' Stormwater Pipe
	48' Stormwater Pipe
	54' Stormwater Pipe
	60' Stormwater Pipe
	66' Stormwater Pipe
	72' Stormwater Pipe
	78' Stormwater Pipe
	84' Stormwater Pipe
	90' Stormwater Pipe
	96' Stormwater Pipe
	102' Stormwater Pipe
	108' Stormwater Pipe
	114' Stormwater Pipe
	120' Stormwater Pipe
	126' Stormwater Pipe
	132' Stormwater Pipe
	138' Stormwater Pipe
	144' Stormwater Pipe
	150' Stormwater Pipe
	156' Stormwater Pipe
	162' Stormwater Pipe
	168' Stormwater Pipe
	174' Stormwater Pipe
	180' Stormwater Pipe
	186' Stormwater Pipe
	192' Stormwater Pipe
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	270' Stormwater Pipe
	276' Stormwater Pipe
	282' Stormwater Pipe
	288' Stormwater Pipe
	294' Stormwater Pipe
	300' Stormwater Pipe

Stormwater Basin Area

Area	Area (Acres)	Area (Sq. Ft.)
Stormwater Basin	1.14	49,116
Level Spreader	0.15	65,340
Stormwater Basin	1.14	49,116
Level Spreader	0.15	65,340
Stormwater Basin	1.14	49,116
Level Spreader	0.15	65,340
Stormwater Basin	1.14	49,116
Level Spreader	0.15	65,340
Stormwater Basin	1.14	49,116
Level Spreader	0.15	65,340
Stormwater Basin	1.14	49,116
Level Spreader	0.15	65,340

02/17/2017