



west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Tuesday, December 10, 2019
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit approval for MICHTER N-3HM
47-051-02277-00-00

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: MICHTER N-3HM
Farm Name: LARRY W. DUNLAP, ET AL
U.S. WELL NUMBER: 47-051-02277-00-00
Horizontal 6A New Drill
Date Issued: 12/10/2019

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.

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 (07/02/2018) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

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

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

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

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

Permit well - Michter N-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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705170216	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	State records are incomplete
4705170812	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	State records are incomplete

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection



Select County: (051) Marshall
 Enter Permit #: 70216
 Get Data Reset

Select datatypes: (Check All)
 Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/Show/Water Logs Btm Hole Loc

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

WV Geological & Economic Survey

Well: County = 51 Permit = 70216

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170216	Marshall	70216	Franklin	Powhatan Point	Clarrington	39.515039	-90.507085	516510.7	4427579.4

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
4705170216	Completed	A.G. Vivitar	1					..	..	..	..

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_FTG	KOD	G_BEF	G_AFT
4705170216	unclassified	unclassified	not available	unknown	unknown	..	..	..	..	..	..

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

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

There is no Plugging data for this well

There is no Sample data for this well



Select County: (051) Marshall
 Enter Permit #: 70812
 Get Data Reset

Select datatypes: (Check All)
 Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/Show/Water Logs Btm Hole Loc

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

WV Geological & Economic Survey

Well: County = 51 Permit = 70812

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170812	Marshall	70812	Franklin	Powhatan Point	Clarrington	39.516429	-90.506965	516350.3	4427400.3

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
4705170812	unknown	Prpty Map C S Kirkman						..	..	..	..

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_FTG	KOD	G_BEF	G_AFT
4705170812	unclassified	unclassified	not available	unknown	unknown	..	..	..	..	..	..

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

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

There is no Plugging data for this well

There is no Sample data for this well

RECEIVED
Office of Oil and Gas

OCT 02 2019

WW-6B
(04/15)

4705102277
API NO. 47-051 -
OPERATOR WELL NO. Michter N-3HM
Well Pad Name: Michter

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

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Franklin New Martinsville 7
Operator ID County District Quadrangle

2) Operator's Well Number: Michter N-3HM Well Pad Name: Michter

3) Farm Name/Surface Owner: Larry W. Dunlap & Charles Leroy Dunlap Public Road Access: Rines Ridge Road (County Route 76)

4) Elevation, current ground: 1,136.0' Elevation, proposed post-construction: 1,130.0'

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

(b) If Gas Shallow Deep
Horizontal

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 6265'- 6319' thickness of 54' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,419'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 16,368'

11) Proposed Horizontal Leg Length: 7,493.45'

12) Approximate Fresh Water Strata Depths: 70', 716'

13) Method to Determine Fresh Water Depths: Use shallow offset wells to determine deepest freshwater. Or determine using predrill tests, testing while drilling or petrophysical evaluation of resistivity.

14) Approximate Saltwater Depths: 2,167'

15) Approximate Coal Seam Depths: Sewickly Coal - 615' and Pittsburgh Coal - 710'

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: _____
Depth: _____
Seam: _____
Owner: _____

RECEIVED
Office of Oil and Gas

OCT 02 2019

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	120'	120'	259FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	48#	800'	800'	906ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	800'	800'	906ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,652'	2,652'	870ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	16,368'	16,368'	4174ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,113'	
Liners							

ju 9/24/19

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	9,000	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			

RECEIVED
Office of Oil and Gas

OCT 02 2019

WW-6B
(10/14)

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

Handwritten signature
9/14/19

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

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

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

Well to be completed with approximately 19,089,600 lb proppant and 295,139 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 21.11 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.49 acres

23) Describe centralizer placement for each casing string:

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

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

*See Attachment

25) Proposed borehole conditioning procedures:

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

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

*Note: Attach additional sheets as needed.



WELL NAME: Michter N-3HM
STATE: WV COUNTY: Marshall
DISTRICT: Franklin
DF Elev: 1,130' **GL Elev:** 1,130'
TD: 16,368'
TH Latitude: 39.8029425
TH Longitude: -80.79740745
BH Latitude: 39.82302554
BH Longitude: -80.8111207

30" Csg @ 120' MD / 120' TVD

13 3/8" Csg @ 800' MD / 800' TVD

9 5/8" Csg @ 2,652' MD / 2,650' TVD

KOP @ 5,813' ft MD

Landing Point @ 7,021' MD / 6,300' TVD

PH TVD = 100' below Onondaga Top

Pilot Hole
 PH TD @
 6,419' TVD

Lateral TD @ 16,368' ft MD
 6,437 ft TVD

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	716
Sewickley Coal	615
Pittsburgh Coal	710
Big Lime	2032
Weir	2420
Berea	2546
Gordon	2769
Rhonestreet	5738
Genesee/Burkett	6185
Tully	6205
Hamilton	6229
Marcellus	6265
Landing Depth	6300
Onondaga	6319
Pilot Hole Depth	6419

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	17.5	13 3/8	800'	800'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,652'	2,650'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	16,368'	6,137'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Sacks	Class	Density	Fluid Type	Centralizer Notes	
338	A	15.6	Air	None	
902	A	15.6	Air	3 Centralizers at equal distance	
891	A	15	Air	1 Centralizer every other jt	
3,829	A	14.5	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc	

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

8/27/19



Tug Hill Operating, LLC Casing and Cement Program

Michter N-3HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	800'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,652'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	16,368'	CTS

Cement

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

RECEIVED
Office of Oil and Gas

OCT 02 2019

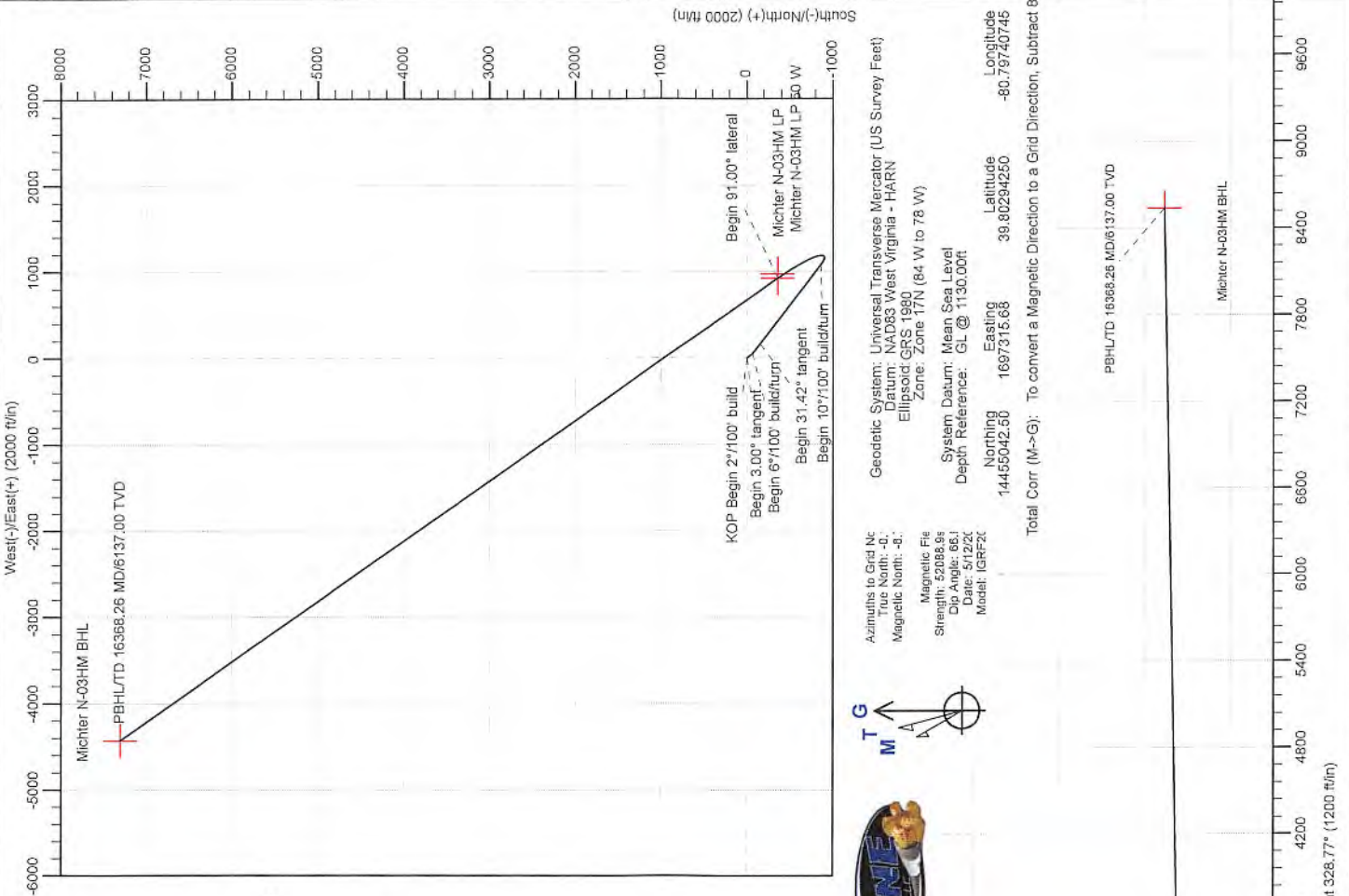
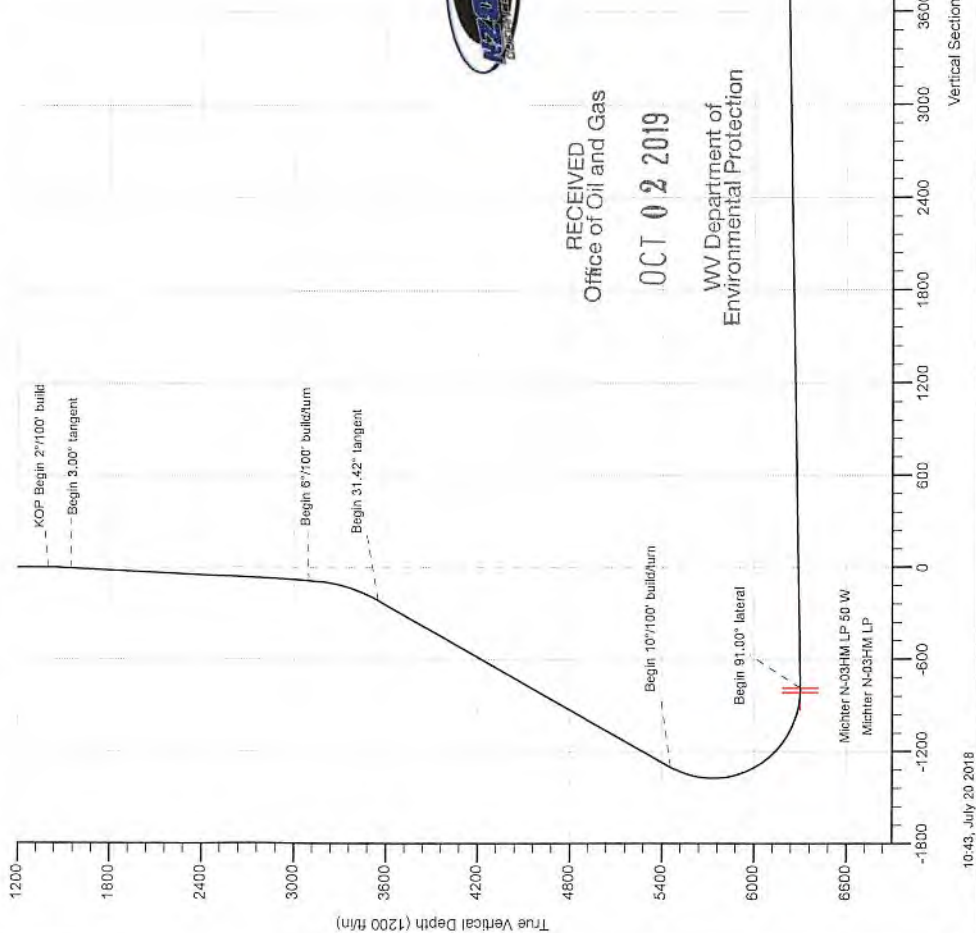
WV Department of
Environmental Protection



Well: Michter N-03HM (C)
 Site: Michter
 Project: Marshall County, West Virginia.
 Design: rev1

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	1400.00	0.00	0.00	1400.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1550.00	3.00	140.00	1549.83	-3.01	2.52	2.00	140.00	-3.88	Begin 3.00° tangent
4	3102.20	3.00	140.00	3100.00	-65.24	54.74	0.00	0.00	-84.17	Begin 6°/100' build/turm
5	3577.20	31.42	127.59	3549.15	-152.10	163.09	6.00	-13.58	-214.62	Begin 31.42° tangent
6	5612.72	31.42	127.59	5466.79	-863.15	1086.58	0.00	0.00	-1301.45	Begin 10°/100' build/turm
7	7020.80	91.00	325.05	6300.00	-357.31	925.52	10.00	-159.56	-785.40	Begin 91.00° lateral
8	16368.26	91.00	325.05	6137.00	7303.23	-4428.42	0.00	0.00	8540.96	PBHL/TD 16368.26 MD/6137.00 TVD



Azimuths to Grid N:
 True North: 0°
 Magnetic North: 4°
 Magnetic File
 Strength: 52088.9a
 Dip Angle: 66.1
 Date: 5/12/20
 Model: IGRF20

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (84 W to 78 W)
 System Datum: Mean Sea Level
 Depth Reference: GL @ 1130.00ft
 Northing: 14455042.50
 Easting: 1697315.68
 Latitude: 39.80294250
 Longitude: -80.79740745

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.9°

RECEIVED
 Office of Oil and Gas
 OCT 02 2019
 WV Department of
 Environmental Protection

OCT 02 2019

WV Department of
Environmental Protection



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Michter N-03HM (C)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1130.00ft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1130.00ft
Site:	Michter	North Reference:	Grid
Well:	Michter N-03HM (C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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

Site	Michter				
Site Position:		Northing:	14,454,962.42 usft	Latitude:	39.80272253
From:	Lat/Long	Easting:	1,697,325.45 usft	Longitude:	-80.79737330
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.13 "

Well	Michter N-03HM (C)					
Well Position	+N/-S	0.00 ft	Northing:	14,455,042.50 usft	Latitude:	39.80294250
	+E/-W	0.00 ft	Easting:	1,697,315.68 usft	Longitude:	-80.79740745
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	1,130.00 ft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/12/2018	-8.66	66.91	52,088.94430459

Design	rev1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	328.77

Plan Survey Tool Program	Date	7/20/2018		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	16,368.26 rev1 (Original Hole)	MWD	MWD - Standard

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,550.00	3.00	140.00	1,549.93	-3.01	2.52	2.00	2.00	0.00	140.00	
3,102.20	3.00	140.00	3,100.00	-65.24	54.74	0.00	0.00	0.00	0.00	
3,577.20	31.42	127.59	3,549.15	-152.10	163.09	6.00	5.98	-2.61	-13.58	
5,812.72	31.42	127.59	5,456.79	-863.15	1,086.58	0.00	0.00	0.00	0.00	
7,020.80	91.00	325.05	6,300.00	-357.31	925.52	10.00	4.93	-13.45	-159.56	Michter N-03HM LP 5
16,368.26	91.00	325.05	6,137.00	7,303.23	-4,428.42	0.00	0.00	0.00	0.00	Michter N-03HM BHL

OCT 02 2019

WV Department of
Environmental Protection



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Michter N-03HM (C)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1130.00ft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1130.00ft
Site:	Michter	North Reference:	Grid
Well:	Michter N-03HM (C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
100.00	0.00	0.00	100.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
200.00	0.00	0.00	200.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
300.00	0.00	0.00	300.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
400.00	0.00	0.00	400.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
500.00	0.00	0.00	500.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
600.00	0.00	0.00	600.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
700.00	0.00	0.00	700.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
800.00	0.00	0.00	800.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
900.00	0.00	0.00	900.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
KOP Begin 2°/100' build										
1,500.00	2.00	140.00	1,499.98	-1.34	1.12	14,455,041.16	1,697,316.80	39.80293882	-80.79740347	
1,550.00	3.00	140.00	1,549.93	-3.01	2.52	14,455,039.49	1,697,318.20	39.80293423	-80.79739849	
Begin 3.00° tangent										
1,600.00	3.00	140.00	1,599.86	-5.01	4.21	14,455,037.49	1,697,319.88	39.80292871	-80.79739252	
1,700.00	3.00	140.00	1,699.73	-9.02	7.57	14,455,033.48	1,697,323.25	39.80291768	-80.79738057	
1,800.00	3.00	140.00	1,799.59	-13.03	10.93	14,455,029.47	1,697,326.61	39.80290665	-80.79736863	
1,900.00	3.00	140.00	1,899.45	-17.04	14.30	14,455,025.46	1,697,329.97	39.80289562	-80.79735668	
2,000.00	3.00	140.00	1,999.31	-21.05	17.66	14,455,021.45	1,697,333.34	39.80288459	-80.79734473	
2,100.00	3.00	140.00	2,099.18	-25.06	21.03	14,455,017.44	1,697,336.70	39.80287356	-80.79733279	
2,200.00	3.00	140.00	2,199.04	-29.07	24.39	14,455,013.43	1,697,340.07	39.80286252	-80.79732084	
2,300.00	3.00	140.00	2,298.90	-33.08	27.75	14,455,009.42	1,697,343.43	39.80285149	-80.79730890	
2,400.00	3.00	140.00	2,398.77	-37.09	31.12	14,455,005.41	1,697,346.79	39.80284046	-80.79729695	
2,500.00	3.00	140.00	2,498.63	-41.09	34.48	14,455,001.40	1,697,350.16	39.80282943	-80.79728501	
2,600.00	3.00	140.00	2,598.49	-45.10	37.85	14,454,997.39	1,697,353.52	39.80281840	-80.79727306	
2,700.00	3.00	140.00	2,698.36	-49.11	41.21	14,454,993.39	1,697,356.89	39.80280737	-80.79726112	
2,800.00	3.00	140.00	2,798.22	-53.12	44.57	14,454,989.38	1,697,360.25	39.80279634	-80.79724917	
2,900.00	3.00	140.00	2,898.08	-57.13	47.94	14,454,985.37	1,697,363.61	39.80278531	-80.79723722	
3,000.00	3.00	140.00	2,997.94	-61.14	51.30	14,454,981.36	1,697,366.98	39.80277427	-80.79722528	
3,100.00	3.00	140.00	3,097.81	-65.15	54.67	14,454,977.35	1,697,370.34	39.80276324	-80.79721333	
3,102.20	3.00	140.00	3,100.00	-65.24	54.74	14,454,977.26	1,697,370.42	39.80276300	-80.79721307	
Begin 6°/100' build/turn										
3,200.00	8.81	130.99	3,197.25	-72.12	62.05	14,454,970.38	1,697,377.72	39.80274406	-80.79718711	
3,300.00	14.80	129.11	3,295.09	-85.21	77.76	14,454,957.29	1,697,393.43	39.80270801	-80.79713129	
3,400.00	20.80	128.30	3,390.26	-104.29	101.62	14,454,938.21	1,697,417.30	39.80265547	-80.79704647	
3,500.00	26.79	127.84	3,481.71	-129.14	133.38	14,454,913.36	1,697,449.06	39.80258703	-80.79693358	
3,577.20	31.42	127.59	3,549.15	-152.10	163.09	14,454,890.40	1,697,478.76	39.80252378	-80.79682800	
Begin 31.42° tangent										
3,600.00	31.42	127.59	3,568.60	-159.35	172.50	14,454,883.15	1,697,488.18	39.80250381	-80.79679453	
3,700.00	31.42	127.59	3,653.93	-191.16	213.81	14,454,851.34	1,697,529.49	39.80241620	-80.79664770	
3,800.00	31.42	127.59	3,739.27	-222.97	255.13	14,454,819.53	1,697,570.80	39.80232859	-80.79650087	
3,900.00	31.42	127.59	3,824.60	-254.77	296.44	14,454,787.73	1,697,612.11	39.80224098	-80.79635405	
4,000.00	31.42	127.59	3,909.93	-286.58	337.75	14,454,755.92	1,697,653.42	39.80215337	-80.79620722	
4,100.00	31.42	127.59	3,995.27	-318.39	379.06	14,454,724.11	1,697,694.73	39.80206576	-80.79606039	
4,200.00	31.42	127.59	4,080.60	-350.19	420.37	14,454,692.30	1,697,736.04	39.80197815	-80.79591357	
4,300.00	31.42	127.59	4,165.93	-382.00	461.68	14,454,660.50	1,697,777.35	39.80189054	-80.79576674	
4,400.00	31.42	127.59	4,251.27	-413.81	502.99	14,454,628.69	1,697,818.66	39.80180293	-80.79561991	
4,500.00	31.42	127.59	4,336.60	-445.62	544.30	14,454,596.88	1,697,859.97	39.80171532	-80.79547309	
4,600.00	31.42	127.59	4,421.93	-477.42	585.61	14,454,565.08	1,697,901.28	39.80162772	-80.79532626	

OCT 02 2019

WV Department of
Environmental Protection



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Michter N-03HM (C)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1130.00ft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1130.00ft
Site:	Michter	North Reference:	Grid
Well:	Michter N-03HM (C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,700.00	31.42	127.59	4,507.27	-509.23	626.92	14,454,533.27	1,697,942.59	39.80154011	-80.79517944	
4,800.00	31.42	127.59	4,592.60	-541.04	668.23	14,454,501.46	1,697,983.90	39.80145249	-80.79503262	
4,900.00	31.42	127.59	4,677.93	-572.84	709.54	14,454,469.66	1,698,025.21	39.80136488	-80.79488579	
5,000.00	31.42	127.59	4,763.27	-604.65	750.85	14,454,437.85	1,698,066.52	39.80127727	-80.79473897	
5,100.00	31.42	127.59	4,848.60	-636.46	792.16	14,454,406.04	1,698,107.83	39.80118966	-80.79459215	
5,200.00	31.42	127.59	4,933.93	-668.26	833.47	14,454,374.23	1,698,149.14	39.80110205	-80.79444532	
5,300.00	31.42	127.59	5,019.27	-700.07	874.78	14,454,342.43	1,698,190.45	39.80101444	-80.79429850	
5,400.00	31.42	127.59	5,104.60	-731.88	916.09	14,454,310.62	1,698,231.76	39.80092683	-80.79415168	
5,500.00	31.42	127.59	5,189.93	-763.69	957.40	14,454,278.81	1,698,273.07	39.80083922	-80.79400486	
5,600.00	31.42	127.59	5,275.27	-795.49	998.71	14,454,247.01	1,698,314.38	39.80075161	-80.79385804	
5,700.00	31.42	127.59	5,360.60	-827.30	1,040.02	14,454,215.20	1,698,355.69	39.80066399	-80.79371122	
5,800.00	31.42	127.59	5,445.93	-859.11	1,081.33	14,454,183.39	1,698,397.00	39.80057638	-80.79356440	
5,812.72	31.42	127.59	5,456.79	-863.15	1,086.58	14,454,179.35	1,698,402.26	39.80056524	-80.79354572	
Begin 10°/100' build/turn										
5,900.00	23.42	119.94	5,534.22	-885.73	1,119.71	14,454,156.77	1,698,435.38	39.80050301	-80.79342796	
6,000.00	15.20	102.28	5,628.59	-898.47	1,149.82	14,454,144.03	1,698,465.50	39.80046783	-80.79332086	
6,100.00	10.54	61.06	5,726.25	-896.83	1,170.69	14,454,145.67	1,698,486.36	39.80047221	-80.79324654	
6,200.00	13.75	14.42	5,824.22	-880.86	1,181.68	14,454,161.64	1,698,497.36	39.80051602	-80.79320727	
6,300.00	21.55	353.19	5,919.53	-851.03	1,182.47	14,454,191.47	1,698,498.14	39.80059791	-80.79320424	
6,400.00	30.62	343.46	6,009.29	-808.27	1,173.01	14,454,234.23	1,698,488.69	39.80071541	-80.79323754	
6,500.00	40.11	337.93	6,090.77	-753.86	1,153.62	14,454,288.64	1,698,469.29	39.80086495	-80.79330616	
6,600.00	49.77	334.25	6,161.48	-689.47	1,124.86	14,454,353.03	1,698,440.53	39.80104197	-80.79340802	
6,700.00	59.51	331.49	6,219.30	-617.04	1,087.82	14,454,425.46	1,698,403.29	39.80124111	-80.79354002	
6,800.00	69.30	329.25	6,262.44	-538.79	1,043.02	14,454,503.71	1,698,358.70	39.80145631	-80.79369816	
6,900.00	79.12	327.27	6,289.62	-457.07	992.43	14,454,585.42	1,698,308.10	39.80168103	-80.79387761	
7,000.00	88.95	325.43	6,299.99	-374.39	937.38	14,454,668.11	1,698,253.05	39.80190845	-80.79407295	
7,020.80	91.00	325.05	6,300.00	-357.31	925.52	14,454,685.19	1,698,241.19	39.80195545	-80.79411503	
Begin 91.00° lateral										
7,100.00	91.00	325.05	6,298.62	-292.40	880.16	14,454,750.10	1,698,195.83	39.80213398	-80.79427601	
7,200.00	91.00	325.05	6,296.88	-210.45	822.88	14,454,832.05	1,698,138.55	39.80235941	-80.79447928	
7,300.00	91.00	325.05	6,295.13	-128.49	765.60	14,454,914.01	1,698,081.28	39.80258484	-80.79468254	
7,400.00	91.00	325.05	6,293.39	-46.54	708.33	14,454,995.96	1,698,024.00	39.80281026	-80.79488581	
7,500.00	91.00	325.05	6,291.64	35.41	651.05	14,455,077.91	1,697,966.72	39.80303569	-80.79508908	
7,600.00	91.00	325.05	6,289.90	117.37	593.77	14,455,159.86	1,697,909.45	39.80326111	-80.79529235	
7,700.00	91.00	325.05	6,288.16	199.32	536.50	14,455,241.82	1,697,852.17	39.80348654	-80.79549562	
7,800.00	91.00	325.05	6,286.41	281.27	479.22	14,455,323.77	1,697,794.89	39.80371196	-80.79569889	
7,900.00	91.00	325.05	6,284.67	363.23	421.94	14,455,405.72	1,697,737.62	39.80393738	-80.79590216	
8,000.00	91.00	325.05	6,282.92	445.18	364.67	14,455,487.68	1,697,680.34	39.80416281	-80.79610544	
8,100.00	91.00	325.05	6,281.18	527.13	307.39	14,455,569.63	1,697,623.06	39.80438823	-80.79630871	
8,200.00	91.00	325.05	6,279.44	609.09	250.11	14,455,651.58	1,697,565.79	39.80461365	-80.79651199	
8,300.00	91.00	325.05	6,277.69	691.04	192.83	14,455,733.54	1,697,508.51	39.80483907	-80.79671527	
8,400.00	91.00	325.05	6,275.95	772.99	135.56	14,455,815.49	1,697,451.23	39.80506450	-80.79691855	
8,500.00	91.00	325.05	6,274.21	854.94	78.28	14,455,897.44	1,697,393.96	39.80528992	-80.79712183	
8,600.00	91.00	325.05	6,272.46	936.90	21.00	14,455,979.39	1,697,336.68	39.80551534	-80.79732511	
8,700.00	91.00	325.05	6,270.72	1,018.85	-36.27	14,456,061.35	1,697,279.40	39.80574076	-80.79752840	
8,800.00	91.00	325.05	6,268.97	1,100.80	-93.55	14,456,143.30	1,697,222.13	39.80596618	-80.79773168	
8,900.00	91.00	325.05	6,267.23	1,182.76	-150.83	14,456,225.25	1,697,164.85	39.80619160	-80.79793497	
9,000.00	91.00	325.05	6,265.49	1,264.71	-208.10	14,456,307.21	1,697,107.57	39.80641702	-80.79813826	
9,100.00	91.00	325.05	6,263.74	1,346.66	-265.38	14,456,389.16	1,697,050.29	39.80664244	-80.79834155	
9,200.00	91.00	325.05	6,262.00	1,428.62	-322.66	14,456,471.11	1,696,993.02	39.80686786	-80.79854484	
9,300.00	91.00	325.05	6,260.26	1,510.57	-379.94	14,456,553.06	1,696,935.74	39.80709328	-80.79874813	
9,400.00	91.00	325.05	6,258.51	1,592.52	-437.21	14,456,635.02	1,696,878.46	39.80731870	-80.79895142	
9,500.00	91.00	325.05	6,256.77	1,674.48	-494.49	14,456,716.97	1,696,821.19	39.80754411	-80.79915472	
9,600.00	91.00	325.05	6,255.02	1,756.43	-551.77	14,456,798.92	1,696,763.91	39.80776953	-80.79935801	

OCT 02 2019

WV Department of
Environmental Protection



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Michter N-03HM (C)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1130.00ft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1130.00ft
Site:	Michter	North Reference:	Grid
Well:	Michter N-03HM (C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,700.00	91.00	325.05	6,253.28	1,838.38	-609.04	14,456,880.88	1,696,706.63	39.80799495	-80.79956131	
9,800.00	91.00	325.05	6,251.54	1,920.34	-666.32	14,456,962.83	1,696,649.36	39.80822037	-80.79976461	
9,900.00	91.00	325.05	6,249.79	2,002.29	-723.60	14,457,044.78	1,696,592.08	39.80844578	-80.79996791	
10,000.00	91.00	325.05	6,248.05	2,084.24	-780.87	14,457,126.74	1,696,534.80	39.80867120	-80.80017121	
10,100.00	91.00	325.05	6,246.31	2,166.19	-838.15	14,457,208.69	1,696,477.53	39.80889661	-80.80037451	
10,200.00	91.00	325.05	6,244.56	2,248.15	-895.43	14,457,290.64	1,696,420.25	39.80912203	-80.80057782	
10,300.00	91.00	325.05	6,242.82	2,330.10	-952.70	14,457,372.59	1,696,362.97	39.80934744	-80.80078112	
10,400.00	91.00	325.05	6,241.07	2,412.05	-1,009.98	14,457,454.55	1,696,305.70	39.80957286	-80.80098443	
10,500.00	91.00	325.05	6,239.33	2,494.01	-1,067.26	14,457,536.50	1,696,248.42	39.80979827	-80.80118774	
10,600.00	91.00	325.05	6,237.59	2,575.96	-1,124.54	14,457,618.45	1,696,191.14	39.81002369	-80.80139105	
10,700.00	91.00	325.05	6,235.84	2,657.91	-1,181.81	14,457,700.41	1,696,133.87	39.81024910	-80.80159436	
10,800.00	91.00	325.05	6,234.10	2,739.87	-1,239.09	14,457,782.36	1,696,076.59	39.81047451	-80.80179767	
10,900.00	91.00	325.05	6,232.36	2,821.82	-1,296.37	14,457,864.31	1,696,019.31	39.81069993	-80.80200098	
11,000.00	91.00	325.05	6,230.61	2,903.77	-1,353.64	14,457,946.26	1,695,962.03	39.81092534	-80.80220430	
11,100.00	91.00	325.05	6,228.87	2,985.73	-1,410.92	14,458,028.22	1,695,904.76	39.81115075	-80.80240761	
11,200.00	91.00	325.05	6,227.12	3,067.68	-1,468.20	14,458,110.17	1,695,847.48	39.81137616	-80.80261093	
11,300.00	91.00	325.05	6,225.38	3,149.63	-1,525.47	14,458,192.12	1,695,790.20	39.81160157	-80.80281425	
11,400.00	91.00	325.05	6,223.64	3,231.58	-1,582.75	14,458,274.08	1,695,732.93	39.81182699	-80.80301757	
11,500.00	91.00	325.05	6,221.89	3,313.54	-1,640.03	14,458,356.03	1,695,675.65	39.81205240	-80.80322089	
11,600.00	91.00	325.05	6,220.15	3,395.49	-1,697.30	14,458,437.98	1,695,618.37	39.81227781	-80.80342421	
11,700.00	91.00	325.05	6,218.40	3,477.44	-1,754.58	14,458,519.94	1,695,561.10	39.81250322	-80.80362754	
11,800.00	91.00	325.05	6,216.66	3,559.40	-1,811.86	14,458,601.89	1,695,503.82	39.81272863	-80.80383086	
11,900.00	91.00	325.05	6,214.92	3,641.35	-1,869.14	14,458,683.84	1,695,446.54	39.81295404	-80.80403419	
12,000.00	91.00	325.05	6,213.17	3,723.30	-1,926.41	14,458,765.79	1,695,389.27	39.81317944	-80.80423751	
12,100.00	91.00	325.05	6,211.43	3,805.26	-1,983.69	14,458,847.75	1,695,331.99	39.81340485	-80.80444084	
12,200.00	91.00	325.05	6,209.69	3,887.21	-2,040.97	14,458,929.70	1,695,274.71	39.81363026	-80.80464417	
12,300.00	91.00	325.05	6,207.94	3,969.16	-2,098.24	14,459,011.65	1,695,217.44	39.81385567	-80.80484751	
12,400.00	91.00	325.05	6,206.20	4,051.12	-2,155.52	14,459,093.61	1,695,160.16	39.81408108	-80.80505084	
12,500.00	91.00	325.05	6,204.45	4,133.07	-2,212.80	14,459,175.56	1,695,102.88	39.81430648	-80.80525417	
12,600.00	91.00	325.05	6,202.71	4,215.02	-2,270.07	14,459,257.51	1,695,045.61	39.81453189	-80.80545751	
12,700.00	91.00	325.05	6,200.97	4,296.98	-2,327.35	14,459,339.46	1,694,988.33	39.81475730	-80.80566085	
12,800.00	91.00	325.05	6,199.22	4,378.93	-2,384.63	14,459,421.42	1,694,931.05	39.81498270	-80.80586418	
12,900.00	91.00	325.05	6,197.48	4,460.88	-2,441.91	14,459,503.37	1,694,873.78	39.81520811	-80.80606752	
13,000.00	91.00	325.05	6,195.74	4,542.83	-2,499.18	14,459,585.32	1,694,816.50	39.81543351	-80.80627087	
13,100.00	91.00	325.05	6,193.99	4,624.79	-2,556.46	14,459,667.28	1,694,759.22	39.81565892	-80.80647421	
13,200.00	91.00	325.05	6,192.25	4,706.74	-2,613.74	14,459,749.23	1,694,701.94	39.81588432	-80.80667755	
13,300.00	91.00	325.05	6,190.50	4,788.69	-2,671.01	14,459,831.18	1,694,644.67	39.81610973	-80.80688090	
13,400.00	91.00	325.05	6,188.76	4,870.65	-2,728.29	14,459,913.14	1,694,587.39	39.81633513	-80.80708424	
13,500.00	91.00	325.05	6,187.02	4,952.60	-2,785.57	14,459,995.09	1,694,530.11	39.81656053	-80.80728759	
13,600.00	91.00	325.05	6,185.27	5,034.55	-2,842.84	14,460,077.04	1,694,472.84	39.81678594	-80.80749094	
13,700.00	91.00	325.05	6,183.53	5,116.51	-2,900.12	14,460,158.99	1,694,415.56	39.81701134	-80.80769429	
13,800.00	91.00	325.05	6,181.79	5,198.46	-2,957.40	14,460,240.95	1,694,358.28	39.81723674	-80.80789764	
13,900.00	91.00	325.05	6,180.04	5,280.41	-3,014.67	14,460,322.90	1,694,301.01	39.81746214	-80.80810100	
14,000.00	91.00	325.05	6,178.30	5,362.37	-3,071.95	14,460,404.85	1,694,243.73	39.81768755	-80.80830435	
14,100.00	91.00	325.05	6,176.55	5,444.32	-3,129.23	14,460,486.81	1,694,186.45	39.81791295	-80.80850771	
14,200.00	91.00	325.05	6,174.81	5,526.27	-3,186.51	14,460,568.76	1,694,129.18	39.81813835	-80.80871106	
14,300.00	91.00	325.05	6,173.07	5,608.22	-3,243.78	14,460,650.71	1,694,071.90	39.81836375	-80.80891442	
14,400.00	91.00	325.05	6,171.32	5,690.18	-3,301.06	14,460,732.66	1,694,014.62	39.81858915	-80.80911778	
14,500.00	91.00	325.05	6,169.58	5,772.13	-3,358.34	14,460,814.62	1,693,957.35	39.81881455	-80.80932114	
14,600.00	91.00	325.05	6,167.83	5,854.08	-3,415.61	14,460,896.57	1,693,900.07	39.81903995	-80.80952450	
14,700.00	91.00	325.05	6,166.09	5,936.04	-3,472.89	14,460,978.52	1,693,842.79	39.81926535	-80.80972787	
14,800.00	91.00	325.05	6,164.35	6,017.99	-3,530.17	14,461,060.48	1,693,785.52	39.81949075	-80.80993123	
14,900.00	91.00	325.05	6,162.60	6,099.94	-3,587.44	14,461,142.43	1,693,728.24	39.81971614	-80.81013460	
15,000.00	91.00	325.05	6,160.86	6,181.90	-3,644.72	14,461,224.38	1,693,670.96	39.81994154	-80.81033797	
15,100.00	91.00	325.05	6,159.12	6,263.85	-3,702.00	14,461,306.34	1,693,613.69	39.82016694	-80.81054133	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Michter N-03HM (C)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1130.00ft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1130.00ft
Site:	Michter	North Reference:	Grid
Well:	Michter N-03HM (C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
15,200.00	91.00	325.05	6,157.37	6,345.80	-3,759.27	14,461,388.29	1,693,556.41	39.82039234	-80.81074470	
15,300.00	91.00	325.05	6,155.63	6,427.76	-3,816.55	14,461,470.24	1,693,499.13	39.82061773	-80.81094808	
15,400.00	91.00	325.05	6,153.88	6,509.71	-3,873.83	14,461,552.19	1,693,441.85	39.82084313	-80.81115145	
15,500.00	91.00	325.05	6,152.14	6,591.66	-3,931.11	14,461,634.15	1,693,384.58	39.82106853	-80.81135482	
15,600.00	91.00	325.05	6,150.40	6,673.62	-3,988.38	14,461,716.10	1,693,327.30	39.82129392	-80.81155820	
15,700.00	91.00	325.05	6,148.65	6,755.57	-4,045.66	14,461,798.05	1,693,270.02	39.82151932	-80.81176158	
15,800.00	91.00	325.05	6,146.91	6,837.52	-4,102.94	14,461,880.01	1,693,212.75	39.82174471	-80.81196495	
15,900.00	91.00	325.05	6,145.17	6,919.47	-4,160.21	14,461,961.96	1,693,155.47	39.82197011	-80.81216833	
16,000.00	91.00	325.05	6,143.42	7,001.43	-4,217.49	14,462,043.91	1,693,098.19	39.82219550	-80.81237171	
16,100.00	91.00	325.05	6,141.68	7,083.38	-4,274.77	14,462,125.86	1,693,040.92	39.82242090	-80.81257510	
16,200.00	91.00	325.05	6,139.93	7,165.33	-4,332.04	14,462,207.82	1,692,983.64	39.82264629	-80.81277848	
16,300.00	91.00	325.05	6,138.19	7,247.29	-4,389.32	14,462,289.77	1,692,926.36	39.82287168	-80.81298187	
16,368.26	91.00	325.05	6,137.00	7,303.23	-4,428.42	14,462,345.71	1,692,887.26	39.82302554	-80.81312070	

PBHL/TD 16368.26 MD/6137.00 TVD

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Michter N-03HM BHL - hit/miss target - Shape - Point	0.00	0.00	6,137.00	7,303.23	-4,428.42	14,462,345.71	1,692,887.26	39.82302554	-80.81312070	
Michter N-03HM LP 50 V - plan hits target center - Point	0.00	0.00	6,300.00	-357.31	925.52	14,454,685.19	1,698,241.19	39.80195545	-80.79411503	
Michter N-03HM LP - plan misses target center by 41.12ft at 6993.11ft MD (6299.83 TVD, -380.07 N, 941.28 E) - Point	0.00	0.00	6,300.00	-357.31	975.52	14,454,685.19	1,698,291.20	39.80195513	-80.79393700	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,400.00	1,400.00	0.00	0.00	KOP Begin 2°/100' build	
1,550.00	1,549.93	-3.01	2.52	Begin 3.00° tangent	
3,102.20	3,100.00	-65.24	54.74	Begin 6°/100' build/turn	
3,577.20	3,549.15	-152.10	163.09	Begin 31.42° tangent	
5,812.72	5,456.79	-863.15	1,086.58	Begin 10°/100' build/turn	
7,020.80	6,300.00	-357.31	925.52	Begin 91.00° lateral	
16,368.26	6,137.00	7,303.23	-4,428.42	PBHL/TD 16368.26 MD/6137.00 TVD	

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Michter N-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 New Martinsville 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386426)

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

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

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

Company Official Signature *Jim Pancake*
Company Official (Typed Name) Jim Pancake
Company Official Title VP Geosciences

RECEIVED
Office of Oil and Gas
OCT 02 2019
WV Department of
Environmental Protection

Subscribed and sworn before me this 3 day of SEPTEMBER, 2019

Maureen A Stead

Notary Public

My commission expires 1/28/23

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

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 21.11 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Orchard Grass	12
Spring Oats	96	Ladino	3
		White Clover	2

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *Jim Mules*

Comments: _____

Title: Oil and Gas Inspector

Date: 9/4/19

Field Reviewed? () Yes () No

RECEIVED
Office of Oil and Gas

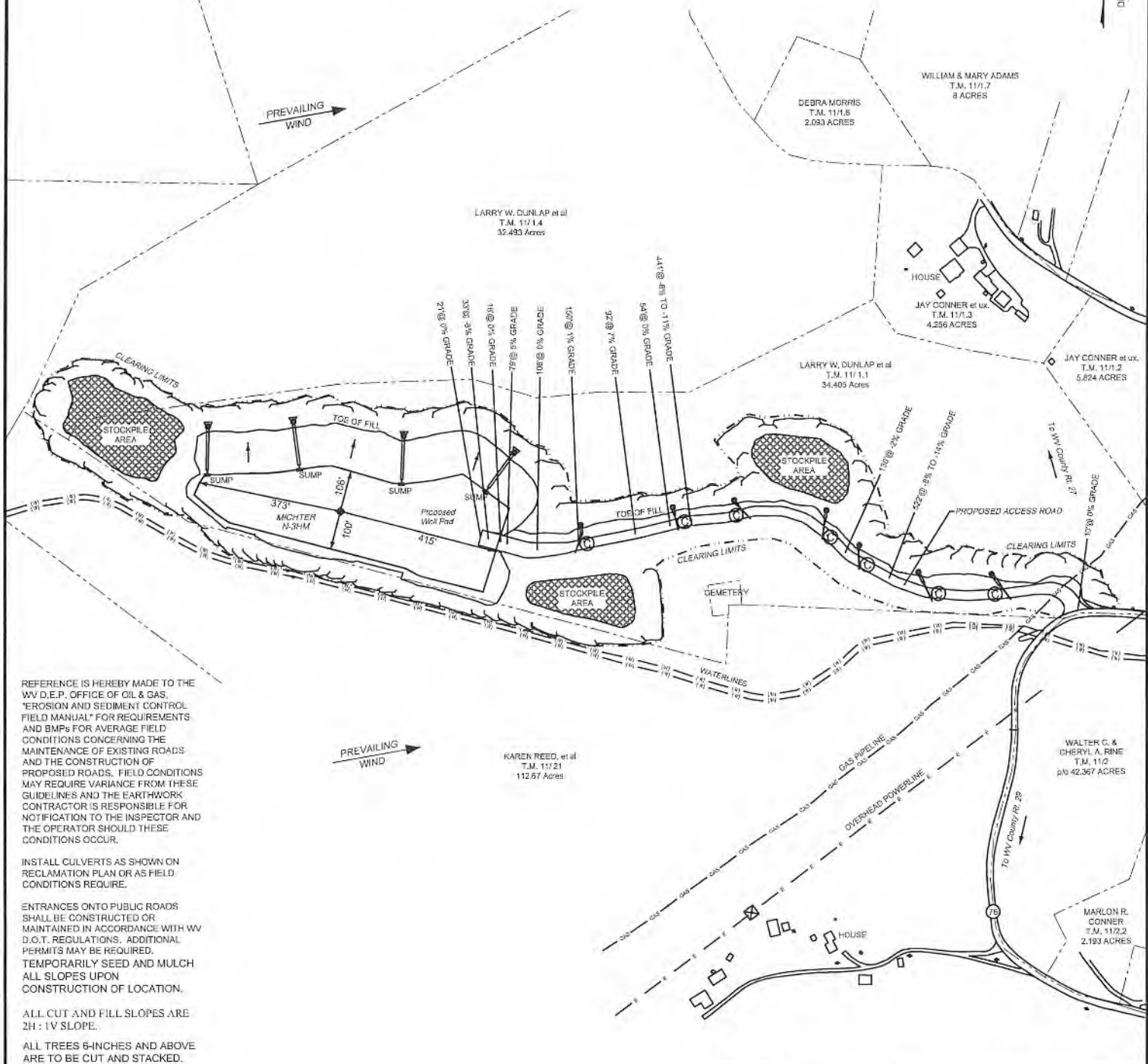
OCT 02 2019

WW-9

PROPOSED MIGHTER N-3HM

SUPPLEMENT PG 1

DRAWING NOT TO SCALE



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. 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.

PREVAILING WIND

RECEIVED Office of Oil and Gas

OCT 02 2019

WV Department of Environmental Protection

LEGEND

- Note:
- ⊙ — Denotes proposed culvert with appropriate sediment outlet control (Rip Rap splash pad).
 - Silt Fence and/or Sediment and Erosion Control Measure.
 - - - Surface Boundary



Jackson Surveying Inc.
 2415 E. Pike St., #112
 Clarksburg, WV 26301
 Phone: 804-823-6861

TOPO SECTION:		OPERATOR:	
POWHATAN POINT 7.5'		TUG HILL OPERATING, LLC	
COUNTY	DISTRICT	300 SOUTHPOINTE BLVD	
MARSHALL	FRANKLIN	SUITE 200	
DRAWN BY	JOB NO.	DATE	SCALE
J.D.C.	494510851	08-26-2019	NONE





Well Site Safety Plan

Tug Hill Operating, LLC

John
9/14/19

Well Name: Michter N-3HM

Pad Location: Michter Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,405,905.76

Easting: 517,342.85

September 2019

RECEIVED
Office of Oil and Gas

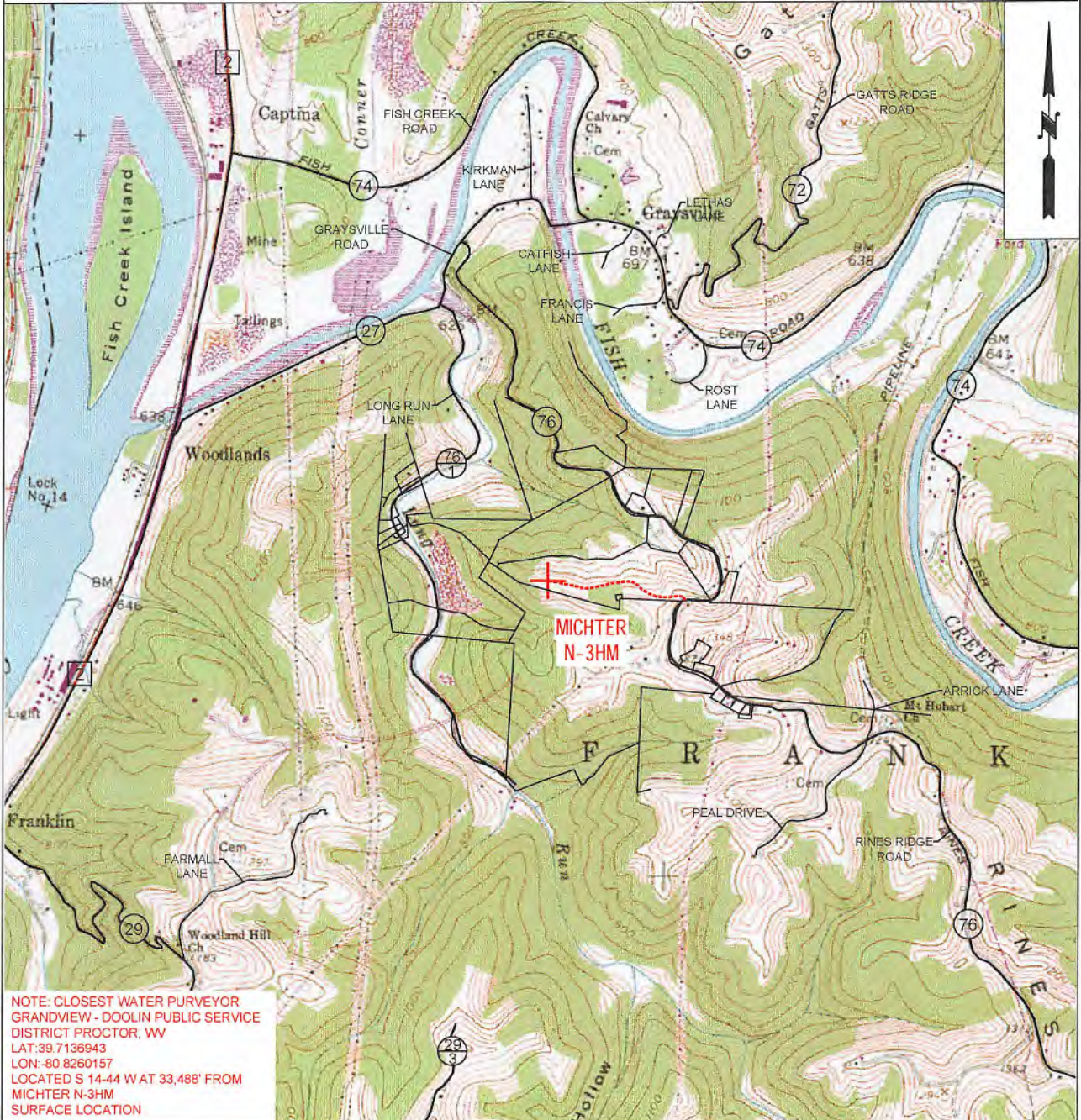
OCT 02 2019

WV Department of
Environmental Protection

WW-9

SUPPLEMENT PG 2

PROPOSED MICHTER N-3HM



NOTE: CLOSEST WATER PURVEYOR
 GRANDVIEW - DOOLIN PUBLIC SERVICE
 DISTRICT PROCTOR, WV
 LAT: 39.7136943
 LON: -80.8260157
 LOCATED S 14-44 W AT 33,488' FROM
 MICHTER N-3HM
 SURFACE LOCATION



OPERATOR	494510851	TOPO SECTION	LEASE NAME
TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	MICHTER
SCALE:		DATE:	
1" = 2000'		DATE: 08-26-2019	

Office of Oil and Gas

OCT 02 2019

MICHTER LEASE WELL N-3HM

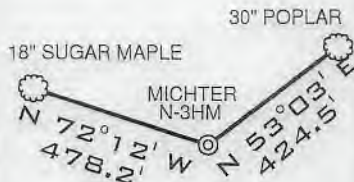
969,8489± ACRES

REFERENCES

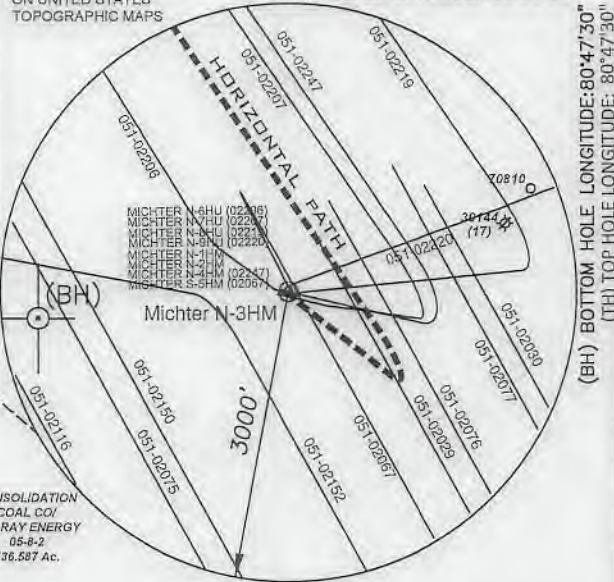
SCALE 1"=500'

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

TOP HOLE LATITUDE: 39°50'00"
BOTTOM HOLE LATITUDE: 39°50'00"



LINE	BEARING	DISTANCE
L1	N 72°28' W	865.38'
L2	N 78°18' E	1858.55'
L3	S 39°03' E	85.19'
L4	S 51°27' E	1165.92'



(BH) BOTTOM HOLE LONGITUDE: 80°47'30"
(TH) TOP HOLE LONGITUDE: 80°47'30"

GRID NORTH

1. BORE PATH BASED ON GRID NORTH.
 2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
 3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2017. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
 4. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.
 5. BOUNDARIES ALONG ROADWAYS ARE BASED UPON MEMORANDUM BY DICKIE, MCGAMEY & CHILCOTE, P.C. FILE 0058504.0401147.

CONSOL RCPC, LLC 05-12-2 60.88 Ac.

LIONEL L. PERSINGER ET UX 05-12-12 45 Ac.

KAREN REED, ET AL 05-11-21 112.87 Ac.

JAMES JACKSON, JR. et ux. 05-8-9 89,723 AC.

EDWIN G. MILLER 05-8-7 180.31 AC.

FRANCES E. NIEMAN 05-8-4-1 33,461 AC.

CURVE	CHORD BEARING	CHORD LENGTH	RADIUS	ARC LENGTH
C7	N 26°15' W	162.31'	1888.41'	162.38'
C8	N 31°30' W	262.20'	2811.61'	262.29'

SURFACE HOLE
 UTM. NAD83, ZONE 17
 IN METERS
 (TH)
 N) 4,405,905.76
 E) 517,342.85

LANDING POINT 1
 UTM. NAD83, ZONE 17
 IN METERS
 N) 4,405,796.86
 E) 517,624.95

BOTTOM HOLE
 UTM. NAD83, ZONE 17
 IN METERS
 N) 4,408,131.79
 E) 515,993.07

LEGEND

- LEASE TRACTS
- SURFACE TRACTS
- UNIT BOUNDARY
- (A) LEASE # (SEE 6A1 FORM)

DETAIL SKETCH "A" SCALE 1"=100'

- MICTER N-3HM (02206)
- MICTER N-7HU (02207)
- MICTER N-8HU (02210)
- MICTER N-9HU (02220)
- MICTER N-1HM
- MICTER N-2HM
- MICTER N-3HM
- MICTER N-4HM (02247)
- MICTER S-6HM (02087)

FILE NUMBER _____

DRAWING NUMBER MICTER_N-3HM_REV1

SCALE 1" = 2000'

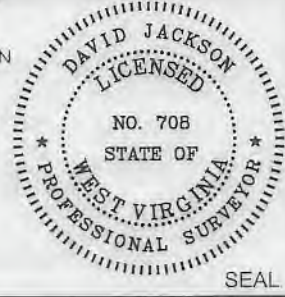
MINIMUM DEGREE OF ACCURACY 1/200

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

David L Jackson

P.S. 708



JACKSON SURVEYING INC.
 P.O. Box 1460
 Clarksburg, WV 26302
 304-623-5651



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

DATE: SEPTEMBER 27, 2019

OPERATORS WELL NO. MICHTER N-3HM

API WELL NO. 47-051-02277 H6A

STATE WV COUNTY MARSHALL PERMIT SEE WW-6A1 FORM

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

LOCATION ELEVATION 1127.11' WATERSHED (HUC 10) FISH CREEK

DISTRICT FRANKLIN COUNTY MARSHALL

QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER SEE WW-6A1 FORM

SURFACE OWNER LARRY W. DUNLAP, ET AL ACREAGE 34.405

OIL & GAS ROYALTY OWNER LARRY W. DUNLAP, ET AL LEASE ACREAGE 34.405

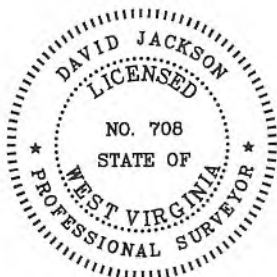
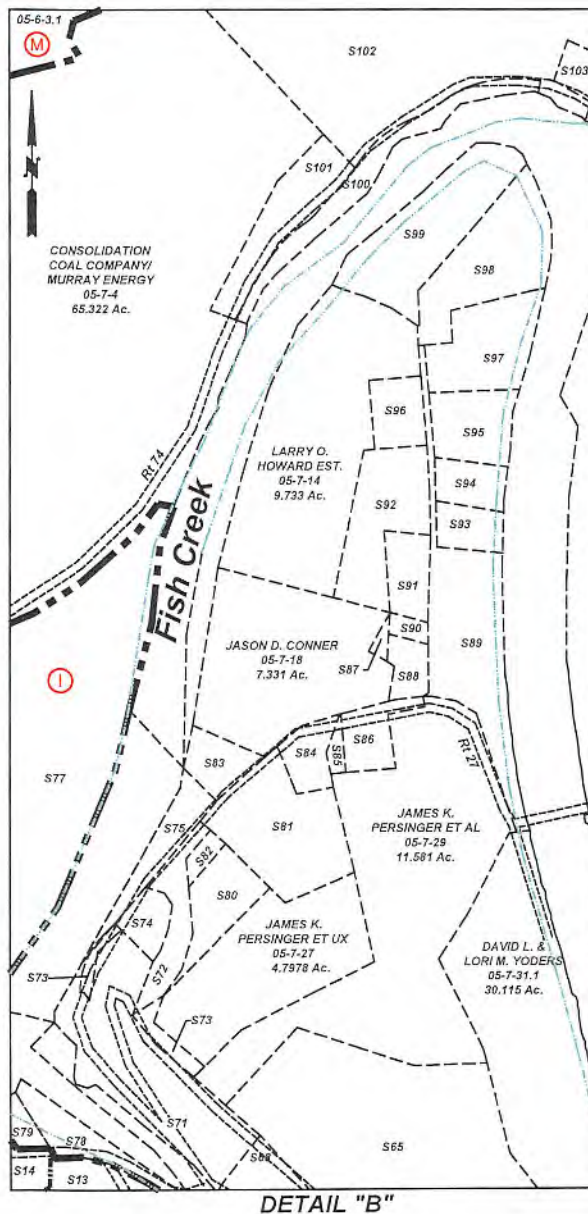
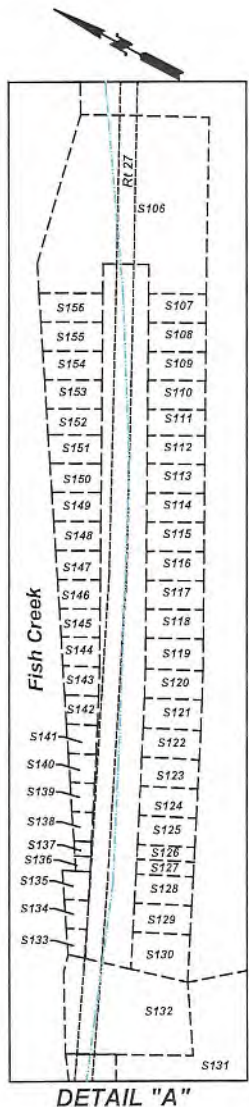
PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___
 PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) _____

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD: 6,419' TMD: 16,368'

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

COUNTY NAME PERMIT

PG 2 OF 3 MICTER LEASE
WELL N-3HM
969.8489± ACRES



P.S. 708

David L Jackson

Office of Oil and Gas

OCT 09 2019

Environmental Protection



TUG HILL
OPERATING

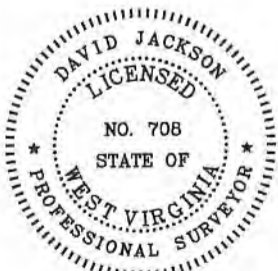
OPERATOR'S
 WELL #: Michter N-3HM
 DISTRICT: Franklin
 COUNTY: Marshall
 STATE: WV
 API #: 47-051-

WELL PLAT
PAGE 2 OF 3
DATE: 09/27/2019

**MICHTER LEASE
WELL N-3HM
969.8489± ACRES**

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S1	05-12-11	Wesley Bryan & Wesley Bryan II	52.478
S2	05-12-10	Consolidation Coal Company/ Murray Energy c/o Land Dept	13.76
S3	05-12-10.1	Consolidation Coal Company/ Murray Energy	38.48
S4	05-07-42.4	Jason Reed Hartley	0.94
S5	05-07-42.3	Joshua David Hartley	0.886
S6	05-07-42.2	Steven & Rhonda Lloyd	0.85
S7	05-07-44	Crystal B. Darrah	1.726
S8	05-07-42	Tracy M. Kesterson	0.54
S9	05-07-42.5	Matthew V. Conner, et al	3.791
S10	05-07-41	James A. Wade	1.00
S11	05-12-09	Lionel & Mary Lee Persinger	10.15
S12	05-07-42.1	Lionel L. & Mary Lee Persinger	5.99
S13	05-07-35	Samuel L. Persinger	10.708
S14	05-07-36	John Persinger	4.329
S15	05-07-38	John K. Persinger, et ux	2.65
S16	05-07-37	John K. Persinger, et ux	0.133
S17	05-07-43.3	M. Frank Mason	0.327
S18	05-7B-48	Cassidy Rain Carpenter	1.325
S19	05-7B-49	Cassidy Rain Carpenter	1.1441
S20	05-07-43.4	Ida L. Campbell	0.403
S21	05-07-43.1	WW DOH	1.48
S22		State Road Commission	17.62 Cole
S23	05-7A-32	Dawn Thompson Tennant	0.3091
S24	05-7A-31	WW Dept. of Natural Resources	3.18
S25	05-07-03	Consolidation Coal Company/ Murray Energy	12.2641
S26	05-07-3.5	Wheeling Power Company	1.5004
S27	05-11-1.4	Larry Dunlap, et al	32.493
S28	05-07-3.1	Ohio Power Co.	28.9966
S29	05-06-16	Appalachian Power CP	0.61
S30	05-06-11	Consolidation Coal Company/ Murray Energy	1.05
S31	05-06-14	CII Carbon, LLC	1.408
S32	05-06-13	CII Carbon, LLC	0.318
S33	05-06-09	CII Carbon, LLC	1.15
S34	05-06-12	CII Carbon, LLC	0.43458
S35	05-06-18	CII Carbon, LLC	0.2754
S36	05-06-1.2	Ohio Power Co.	0.693
S37	05-06-1.1	CII Carbon, LLC	13.269
S38	05-06-06	Consolidation Coal Company/ Murray Energy	18.50
S39	05-06-05	Consolidation Coal Company/ Murray Energy	17.159
S40	05-06-04	Consolidation Coal Company/ Murray Energy	5.47
S41	05-8A-39	Barbara L. Daniels & Elaine Wills	3.223
S42	05-8A-40	Barbara L. Daniels & Elaine Wills	0.627
S43	05-8A-42	Robert M. White	7.23
S44	05-8A-46	Barbara L. Rose & Mary L. Rose	1.5
S45	05-8A-47	Barbara L. Rose & Mary L. Rose	3.0
S46	05-8A-45	Raymond A. Jr. & Lariette Scott	0.305
S47	05-11-01	William N. & Virginia A. Roupe	4.527
S48	05-11-1.6	Debra Morris	2.093
S49	05-11-1.7	William S. & Mary K. Adams	8.00
S50	05-11-1.3	Jay A. Conner, et ux	4.256
S51	05-11-1.5	Paul & Sandy Witt	3.507
S52	05-11-1.2	Jay A. Conner, et ux	5.824
S53	05-08-9.1	Scott E. Jackson, Tammy S. South & Marion Jackson	1.957
S54	05-11-02	Walter C. & Cheryl A. Rine	42.36
S55	05-11-2.2	Joshua A. Myers	2.193
S56	05-11-2.1	Walter C. & Cheryl A. Rine	1.19
S57	05-11-20	David E. Gray	0.569
S58	05-11-19	David E. Gray	0.532
S59	05-11-03	Kevin R. Corley, et ux	13.18
S60	05-11-17	Kevin R. Corley, et ux	36.13
S61	05-11-14	Hiram's Estate Family, LTD LLP	158.054
S62	05-11-1.1	Larry W. Dunlap, et al	34.405
S63	05-07-33	William N. Roupe	24.60
S64	05-07-32	William N. & Virginia A. Roupe	4.2

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S65	05-07-31	William N. Roupe, et ux	43.147
S66	05-07-31.4	Grandview-Doolen PSD	0.23
S67	05-07-31.2	William N. Roupe, et ux	3.304
S68	05-07-34	WW DOH	10.88
S69	05-07-31.3	William N. & Virginia A. Roupe	0.230
S70	05-07-43.2	M. Frank Mason	1.36
S71	05-07-26	James A. Wade	7.80
S72	05-07-23.1	WW DOH	2.37
S73	05-07-25	WW DOH	0.50
S74	05-07-24	James A. Wade	0.578
S75	05-07-45	Robert L. Henry (Life) & Jeffrey S. Henry	0.65
S76	H Fish Creek	State of WV	3.5388 Cole
S77	I 05-07-3.2	Ohio Power Company	45.5348
S78	05-07-35.1	Lionel L. & Marylee Persinger	0.812
S79	05-07-36.1	Lionel L. & Mary Lee Persinger	0.5579
S80	05-07-23	Arlie L. Powell	1.435
S81	05-07-27.1	Mark L. Riter, et ux	3.427
S82	05-07-23.2	Robert L. Henry (Life) & Jeffrey S. Henry	0.256
S83	05-07-21	Aaron S. Meyer	1.775
S84	05-07-22	Jesus & Mary Bustamante	0.782
S85	05-07-28.1	Jesus & Mary Bustamante	0.200
S86	05-07-28	Thelma M. Roupe	0.940
S87	05-07-18.1	Deborah L. Bennett	0.13
S88	05-07-17	Deborah L. Bennett	0.614
S89	05-07-15	William Roupe, et ux	6.631
S90	05-07-16	Deborah L. Bennett	0.235
S91	05-07-14.2	Robert L. Eyles, Sr. & Jessica L. Bennett	0.998
S92	05-07-14.3	Steven H. Howard	2.669
S93	05-07-15.1	Woodland Hills Recreation Club	1.016
S94	05-07-13	Woodland Hills Recreation Club	1.109
S95	05-07-12	Carol A. & Shelva G. Smith	2.01
S96	05-07-14.1	Larry O. Howard, Est.	1.00
S97	05-07-11	Roy S. & Cynthia M. Meadows	2.90
S98	05-07-10.1	Sandra Kay Beymer & Chad M. Wright	4.237
S99	05-07-10	Darren Edward Thacker	4.737
S100	05-07-5.1	George A. Knuth	2.95
S101	05-07-05	CNX Gas Company, LLC	1.407
S102	05-07-06	CNX Gas Company, LLC	21.171
S103	05-07-07	Consolidation Coal Company/ Murray Energy	1.00
S104	L 05-07-02	Consolidation Coal Company/ Murray Energy	46.46
S105	05-06-03	Ohio Power Co.	281.046
S106	05-7B-01	Patricia L. Robinson	1.257
S107	05-7B-47	Daniel D. Robinson, et ux	0.1148
S108	05-7B-46	Daniel D. Robinson, et ux	0.1148
S109	05-7B-45	Daniel D. & Mary E. Robinson	0.1148
S110	05-7B-44	Daniel D. & Mary E. Robinson	0.1148
S111	05-7B-43	Teresa & Thomas Gouldsberry	0.1148
S112	05-7B-42	Teresa & Thomas Gouldsberry	0.1194
S113	05-7B-41	Teresa & Thomas Gouldsberry	0.1148
S114	05-7B-40	Teresa & Thomas Gouldsberry	0.1148
S115	05-7B-39	Teresa & Thomas Gouldsberry	0.1148
S116	05-7B-38	Teresa & Thomas Gouldsberry	0.1148
S117	05-7B-37	Teresa & Thomas Gouldsberry	0.1148
S118	05-7B-36	Albert J. Anderson, Jr.	0.1148
S119	05-7B-35	Albert J. Anderson, Jr.	0.1217
S120	05-7B-34	Albert J. Anderson, Jr.	0.1148
S121	05-7B-33	Albert J. Anderson, Jr.	0.1182
S122	05-7B-32	Albert J. Anderson, Jr.	0.1148
S123	05-7B-31	Cindy D. Aliff, et al	0.1148
S124	05-7B-30	Cindy D. Aliff, et al	0.1148
S125	05-7B-29	Cindy D. Aliff	0.1148
S126	05-7B-28.1	Cindy D. Aliff	0.0574
S127	05-7B-28	Cindy D. Aliff	0.0574
S128	05-7B-27	Patricia A. Johnson	0.1148
S129	05-7B-26	Cindy D. Aliff	0.1148
S130	05-7B-25	Cindy D. Aliff	0.1673
S131	05-7A-02	Raymond M. & Amy A. Litman	2.23
S132	05-7A-01	Lucille Myers	0.529
S133	05-7B-24	Cindy D. Aliff	0.0354
S134	05-7B-23	Cindy D. Aliff	0.0471
S135	05-7B-22	Cindy D. Aliff	0.0505
S136	05-7B-21	Cindy D. Aliff	0.0287
S137	05-7B-21.1	Cindy D. Aliff	0.0296
S138	05-7B-20	Cindy D. Aliff	0.0626
S139	05-7B-19	Cindy D. Aliff	0.0712
S140	05-7B-18	Cindy D. Aliff	0.0763
S141	05-7B-17	Albert J. Anderson, Jr.	0.0849
S142	05-7B-16	Albert J. Anderson, Jr.	0.0903
S143	05-7B-15	Albert J. Anderson, Jr.	0.0970
S144	05-7B-14	Albert J. Anderson, Jr.	0.0991
S145	05-7B-13	Albert J. Anderson, Jr.	0.1067
S146	05-7B-12	Teresa & Thomas Gouldsberry	0.1113
S147	05-7B-11	Teresa & Thomas Gouldsberry	0.1159
S148	05-7B-10	Teresa & Thomas Gouldsberry	0.1199
S149	05-7B-09	Teresa & Thomas Gouldsberry	0.1240
S150	05-7B-08	Teresa & Thomas Gouldsberry	0.1286
S151	05-7B-07	Teresa & Thomas Gouldsberry	0.1331
S152	05-7B-06	Teresa & Thomas Gouldsberry	0.1377
S153	05-7B-05	Daniel D. & Mary E. Robinson	0.1418
S154	05-7B-04	Daniel D. & Mary E. Robinson	0.1458
S155	05-7B-03	Daniel D. Robinson, et ux	0.1504
S156	05-7B-02	Daniel D. Robinson, et ux	0.1550
S157	Railroad	CSX Transportation	



RECEIVED
Office of Oil and Gas
OCT 02 2019
WV Department of
Environment and Protection

P.S. 708 *David L Jackson*



**TUG HILL
OPERATING**

OPERATOR'S
WELL #: Michter N-3HM
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV
API #: 47-051-

WELL PLAT
PAGE 3 OF 3
DATE: 09/27/2019

WW-6A1
(5/13)

Operator's Well No. Michter N-3HM

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

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

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

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

*See attached pages

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

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

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

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

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

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

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*47051.089.0	5-11-1.1	A	LARRY W DUNLAP AND BARBARA E DUNLAP	TH EXPLORATION LLC	1/8+	864 148	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22667	5-11-21	B	REEBEKAH DRAVER ELDRIDGE AND CHRISTOPHER ELDRIDGE	NOBLE ENERGY INC	1/8+	850 157	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22773	5-11-21	B	CHRISTA DRAYER STALEY AND JOSHUA STALEY	NOBLE ENERGY INC	1/8+	851 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22777	5-11-21	B	BOYD BUESKING	NOBLE ENERGY INC	1/8+	850 159	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22780	5-11-21	B	BRENDA FAYE THOMAS PETRACK	NOBLE ENERGY INC	1/8+	850 161	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22786	5-11-21	B	GUY YATES	NOBLE ENERGY INC	1/8+	848 206	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22787	5-11-21	B	GALL ANN YATES WOOD AND WESLEY J WOOD	NOBLE ENERGY INC	1/8+	848 208	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22788	5-11-21	B	GENIE SUE THOMAS HOLMES AND JOHN L HOLMES	NOBLE ENERGY INC	1/8+	848 204	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22801	5-11-21	B	BOYD DALL YATES JR AND MARLA YATES	NOBLE ENERGY INC	1/8+	848 210	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22808	5-11-21	B	SHIRLEY YATES HARTSELL AND FREDDIE LEE HARTSELL	NOBLE ENERGY INC	1/8+	848 212	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22810	5-11-21	B	CLYDE V. & KAREN S REED	NOBLE ENERGY INC	1/8+	864 190	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.089.0	5-11-1.4	C	LARRY W DUNLAP AND BARBARA E DUNLAP	TH EXPLORATION LLC	1/8+	864 148	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22751	5-7-33	D	WILLIAM N ROUPE AND VIRGINIA A ROUPE	TH EXPLORATION LLC	1/8+	977 367	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0074648012	5-7-33	D	BLACK GOLD GROUP, LTD.	NOBLE ENERGY INC	1/8+	850 155	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0074648010	5-7-33	D	CHAD L OLIVER, A SINGLE MAN	NOBLE ENERGY INC	1/8+	849 649	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0074648006	5-7-33	D	CRISTI LANAGHAN AND MARTIN LANAGHAN, WIFE AND HUSBAND	NOBLE ENERGY INC	1/8+	846 327	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Office of Oil and Gas

OCT 02 2019

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment						
0074648015	5-7-33	D	DEVIN J. OLIVER, A SINGLE MAN	NOBLE ENERGY INC	1/8+	851 426	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1 41/398	HG Energy II Appalachia to TH Exploration LLC: 41/398				
0074648003	5-7-33	D	JAMES N. OLIVER, A SINGLE MAN	NOBLE ENERGY INC	1/8+	842 502	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1 41/398	HG Energy II Appalachia to TH Exploration LLC: 41/398			
0074648007	5-7-33	D	JANET MILLER AND JAMES A. MILLER, WIFE AND HUSBAND	NOBLE ENERGY INC	1/8+	846 325	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1 41/398	HG Energy II Appalachia to TH Exploration LLC: 41/398			
0074648008	5-7-33	D	JOAN KIDD AND ROBERT KIDD, WIFE AND HUSBAND	NOBLE ENERGY INC	1/8+	846 329	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1 41/398	HG Energy II Appalachia to TH Exploration LLC: 41/398			
0074648005	5-7-33	D	JOHN E. OLIVER AND GAIL S. OLIVER, HUSBAND AND WIFE	NOBLE ENERGY INC	1/8+	842 498	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1 41/398	HG Energy II Appalachia to TH Exploration LLC: 41/398			
0074648009	5-7-33	D	KENNETH E. OLIVER AND RHONDA OLIVER, HUSBAND AND WIFE	NOBLE ENERGY INC	1/8+	846 323	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1 41/398	HG Energy II Appalachia to TH Exploration LLC: 41/398			
0074648011	5-7-33	D	LAWRENCE K. OLIVER, II AND PHYLLIS K. OLIVER, HUSBAND AND WIFE	NOBLE ENERGY INC	1/8+	849 645	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1 41/398	HG Energy II Appalachia to TH Exploration LLC: 41/398			
0074648002	5-7-33	D	LOIS J. LAND AND CECIL H. LAND, WIFE AND HUSBAND	NOBLE ENERGY INC	1/8+	842 500	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia LLC: 39/1 41/398	HG Energy II Appalachia to TH Exploration LLC: 41/398			
0074648013	5-7-33	D	NICHOLAS A. OLIVER AND STEPHANIE OLIVER, HUSBAND AND WIFE	NOBLE ENERGY INC	1/8+	850 153	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia to TH Exploration LLC: 41/398	HG Energy II Appalachia to TH Exploration LLC: 41/398			
0074648004	5-7-33	D	PEGGIANN E. MOSHER AND ROWAN MOSHER, WIFE AND HUSBAND	NOBLE ENERGY INC	1/8+	842 508	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II Appalachia to TH Exploration LLC: 41/398	HG Energy II Appalachia to TH Exploration LLC: 41/398			
10*16914	5-7-39	E	LIONEL L AND MARY LEE PERSINGER	TH EXPLORATION LLC	1/8+	976 620	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Chesapeake Appalachia LLC to Chevron USA Inc: 30/392		N/A		
10*26036	5-7-35	F	PERSINGER SAMUEL L ET UX	CHESAPEAKE APPALACHIA LLC	1/8+	707 626	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Chesapeake Appalachia LLC to Chevron USA Inc: 30/392		Chevron USA Inc to TH Exploration LLC: 43/95 & 43/164		
10*26009	5-7-36	G	JOHN K PERSINGER JOSEPHINE E WOLFE	TRIEENERGY HOLDINGS, LLC	1/8+	711 304	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TriEnergy Holdings LLC to NPAR LLC: 24/430	AB Resources LLC & NPAR LLC to Chief Exploration & Development LLC & Radler 2000 LP: 24/466	Chief E&D LLC, Chief O&G LLC, Radler 2000 L.P. & Eberplus Resources (USA) Corp to Chevron USA Inc: 25/1	TriEnergy Holdings LLC & TriEnergy Inc to Chevron USA Inc: 28/356	Chevron USA Inc to TH Exploration LLC: 43/95

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
CO091960000	FISH CREEK - ST OF WV	H	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	NOBLE ENERGY INC	1/8+	865	558	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
PENDING	5-7-3.2	I	WHEELING POWER COMPANY ET AL	HG ENERGY II APPALACHIA, LLC	1/8+	1040	103	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
10*27550	5-7-3.3	J	CERTAINTED GYPSUM WEST VIRGINIA INC, ET AL	TH EXPLORATION LLC	1/8+	Pending	Pending	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
624061	5-7-3.4	K	LOUCKS, CHARLES H; KEISTER, FENTON O, JR, ET AL	CONSOLIDATION COAL COMPANY	1/8+	273	326	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
CO095360000	5-7-3	L	CSX TRANSPORTATION INC	NOBLE ENERGY INC	1/8+	879	251	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
624074	5-7-2	L	GATTS, ALICE	THE M. A. HANNA COMPANY	1/8+	282	394	Consolidation Coal Company: 315/417	Name Change: Pittsburgh Consolidation Coal Company: 6/203	Pittsburgh Consolidation Coal Company: 387/363	Consolidation Coal Company, CNX Land Resources Inc, Et Al to CNX Gas Company LLC: 646/493	CNX Gas Company LLC to Noble Energy Inc: 752/66	909/94	Noble Energy Inc to HG Energy II Appalachia LLC: 931/43	34/392	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286
624074	5-6-3.1	M	GATTS, ALICE	THE M. A. HANNA COMPANY	1/8+	282	394	Consolidation Coal Company: 315/417	Name Change: Pittsburgh Consolidation Coal Company: 6/203	Pittsburgh Consolidation Coal Company: 387/363	Consolidation Coal Company, CNX Land Resources Inc, Et Al to CNX Gas Company LLC: 646/493	CNX Gas Company LLC to Noble Energy Inc: 752/66	909/94	Noble Energy Inc to HG Energy II Appalachia LLC: 931/43	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
624080	5-6-3.1	M	GATTS, ELIZABETH R J & HARLEY	THE M. A. HANNA COMPANY	1/8+	290	97	The M. A. Hanna Company to Pittsburgh Consolidation Coal Company: 315/417	Name Change: Pittsburgh Consolidation Coal Company: 6/203	Pittsburgh Consolidation Coal Company: 387/363	Consolidation Coal Company, CNX Land Resources Inc, Et Al to CNX Gas Company LLC: 646/493	CNX Gas Company LLC to Noble Energy Inc: 752/66	909/94	Noble Energy Inc to HG Energy II Appalachia LLC: 931/43	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	

OCT 02 2019

WV Department of Environmental Protection

RECEIVED
Office of Oil and Gas

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment		
Q074011003	5-6-3-1	M	JOSEPH MOORE NEAL	NOBLE ENERGY INC	1/8+	859 512	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
Q074011005	5-6-3-1	M	ANN ALEXANDER	NOBLE ENERGY INC	1/8+	853 310	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
Q074011006	5-6-3-1	M	FRANCES GALE NEAL	NOBLE ENERGY INC	1/8+	851 218	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
Q074011007	5-6-3-1	M	SUSAN WITTEN NEAL MYERS ET AL	NOBLE ENERGY INC	1/8+	815 375	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
Q074011008	5-6-3-1	M	JANE WITTEN VOTH	NOBLE ENERGY INC	1/8+	853 306	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	
Q074011013	5-6-3-1	M	MARY WITTEN NEAL WISEMAN	NOBLE ENERGY INC	1/8+	851 216	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memorandum of Operating Agreement between TH Exploration LLC and HG Energy II Appalachia, LLC: 988/286	

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

ASSIGNMENT AND BILL OF SALE

This **ASSIGNMENT AND BILL OF SALE** (this "Assignment") dated as of February 7, 2019 (the "Signing Date"), but effective from and after 7:00 a.m., Eastern Standard Time on February 1, 2019 (the "Effective Date"), is made by **Chevron U.S.A. Inc.**, a Pennsylvania corporation, with an address at 700 Cherrington Parkway, Coraopolis, PA 15108 ("Chevron" or "Assignor") to **TH Exploration II, LLC** and **TH Exploration, LLC**, Texas limited liability companies, with an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (collectively "Assignee") and is accepted by Assignee upon the following terms and conditions.

RECITALS

- A. Assignor desires to sell, convey, transfer, assign and deliver to Assignee Assignor's Crawford 1 well and certain related assets, including certain leasehold interests, located in Marshall County, West Virginia.
- B. Through an Acreage Trade Agreement to be executed contemporaneously with this Assignment, Assignor desires to transfer, convey and assign to Assignee certain of Assignor's oil and gas leasehold interests located in Marshall County, West Virginia in exchange for the transfer, conveyance and assignment to Assignor by Assignee certain of Assignee's oil and gas leasehold interests located in Marshall County, West Virginia.
- C. In consideration of the mutual promises set out in this Assignment, including execution of the Acreage Trade Agreement, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree to be bound by the terms of this Assignment.

1. DEFINITIONS

1.1 **Definitions.** As used in this Assignment, these words and expressions have the following meanings:

"Acreage Trade Agreement" means that certain Acreage Trade Agreement by and between Chevron U.S.A. Inc. and TH Exploration, LLC with an Effective Date of February 1, 2019 to be contemporaneously executed with this Assignment.

"Act" has the meaning given to such term in Section 9.1(C).

"Affiliate" means any legal entity which controls, is controlled by, or is under common control with, another legal entity. An entity is deemed to "control" another if it owns directly or indirectly at least fifty percent of either of the following: (A) the shares entitled to vote at a general election of directors of such

MEMORANDUM OF OPERATING AGREEMENT AND FINANCING STATEMENT

This Memorandum of Operating Agreement and Financing Statement (hereinafter referred to as "Memorandum") is executed to be effective concurrently with that certain Operating Agreement (the "Operating Agreement") by and between TH Exploration, LLC, as Operator, and HG Energy II Appalachia, LLC and TH Exploration II, LLC, as Non-Operators, covering, among other things, the development and production of crude oil, natural gas and associated substances from the leases (hereinafter called the "Contract Area") described on Exhibit "A-1" and Exhibit "A-2" attached hereto and owned by Operator and Non-Operator in the respective percentages of shares indicated on Exhibit "A" to the Operating Agreement.

The Operating Agreement contains an Accounting Procedure, along with provisions giving the parties hereto mutual liens and security interests where one or more parties hereto are or may become Debtors to one or more other parties hereto. This Memorandum incorporates by reference all of the terms and conditions of the Operating Agreement, including but not limited to the lien and security interest provisions.

The purpose of this Memorandum is to place third parties on notice of the Operating Agreement, and to secure and perfect the mutual liens and security interests of the parties hereto.

The Operating Agreement specifically provides and the parties do hereby confirm and agree that:

1. The Operator shall conduct and direct and have full control of all operations on the Contract Area as permitted and required by, and within the limits of, the Operating Agreement.
2. The liability of the parties under the Operating Agreement shall be several, not joint or collective. Each party shall be responsible only for its obligations and shall be liable only for its proportionate share of costs.
3. Each Non-Operator grants to Operator a lien upon its oil and gas rights, oil and gas leases and mineral interests in the Contract Area, and a security interest in its share of oil and/or gas when extracted and its interest in all fixtures, inventory, personal property and equipment located on or used on the Contract Area and in all its contract rights and receivables related thereto and arising therefrom to secure payment of its present and future share of costs and expenses, together with interest thereon at the rate provided in the Accounting Procedure referred to above. To the extent that Operator has a security interest under the Uniform Commercial Code ("Code") of the state or states in which the Contract Area is located, Operator without prejudice and in addition to all other legal, equitable and contractual remedies which are expressly reserved, shall be entitled to exercise the rights and remedies of a secured party under the Code. The bringing of a suit and the obtaining of judgment by Operator for the secured indebtedness shall not be deemed an election of remedies or otherwise affect the rights or security interests for the payment thereof.
4. The Operator grants to Non-Operator a lien and security interest equivalent to that granted to Operator as described in Paragraph 3 above, to secure payment by Operator of its own share of costs and expenses when due.

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection



September 24, 2019

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

RE: Michter N-3HM

Subject: Marshall County Route 76/1 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 76/1 in the area reflected on the Michter N-3HM well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

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

Sincerely,

Amy Miller
Permit Specialist – Appalachia Region
Cell 304-376-0111
Email: amiller@tug-hilop.com

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

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

Date of Notice Certification: 09/24/2019

API No. 47- 051

Operator's Well No. Michter N-3HM

Well Pad Name: Michter

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	Eastings:	<u>517,342.85</u>
County:	<u>Marshall</u>		Northing:	<u>4,405,905.76</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road (County Route 76)</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>Larry W. Dunlap and Charles Leroy Dunlap</u>	
Watershed:	<u>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: 40px;"><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 II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

RECEIVED
Office of Oil and Gas

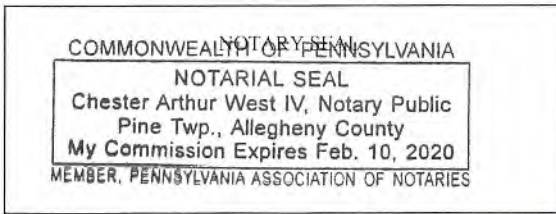
OCT 02 2019

WV Department of
Environmental Protection

Certification of Notice is hereby given:

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

Well Operator:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Boulevard, Plaza II, Suite 200</u>
By:	<u>Amy L. Miller <i>amy l miller</i></u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Permitting Specialist - Appalachia Region</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>724-749-8388</u>	Email:	<u>amiller@tug-hillop.com</u>



Subscribed and sworn before me this 24th day of September 2019
 _____ Notary Public
 My Commission Expires 2-10-2020

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.

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

WW-6A
(9-13)

4705102277
API NO. 47- 051
OPERATOR WELL NO. Michter N-3HM
Well Pad Name: Michter

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: 9/6/2019 Date Permit Application Filed: 9/11/2019

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: Larry W. and Barbara E. Dunlap (Pad and Access Road)
Address: 1549 Irish Ridge Road
Cameron, WV 26033

Name: Karen Sue Reed and Clyde Reed (Well Pad)
Address: 100 Orchard Lane
Moundsville, WV 26041

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: Charles Leroy Dunlap (Pad and Access Road)
Address: 21 Gypsy Drive
Moundsville, WV 26041

Name: _____
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)
Name: _____
Address: _____

COAL OWNER OR LESSEE
Name: CNX Resources, LLC - Attn: Casey Saunders
Address: 1000 CONSOL Energy Drive
Canonsburg, PA 15318

COAL OPERATOR
Name: _____
Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: *See attached pages
Address: _____

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

*Please attach additional forms if necessary

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

WW-6A
(8-13)

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

4705102277

API NO. 47- 051 -
OPERATOR WELL NO. Michter N-3HM
Well Pad Name: Michter

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

OCT 02 2019

API NO. 47-051 - _____

OPERATOR WELL NO. Michter N-3HM

Well Pad Name: Michter

WW-6A
(8-13)WV Department of
Environmental Protection

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

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

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

WW-6A
(8-13)

API NO. 47-051 -
OPERATOR WELL NO. Michter N-3HM
Well Pad Name: Michter

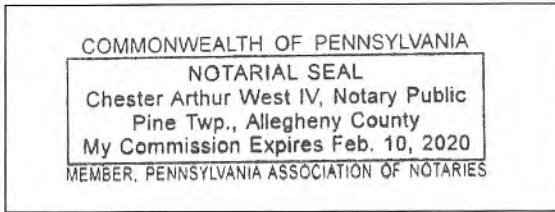
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 6th day of Sept, 2019.
[Signature] Notary Public
My Commission Expires 2-10-2020

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

OCT 02 2019

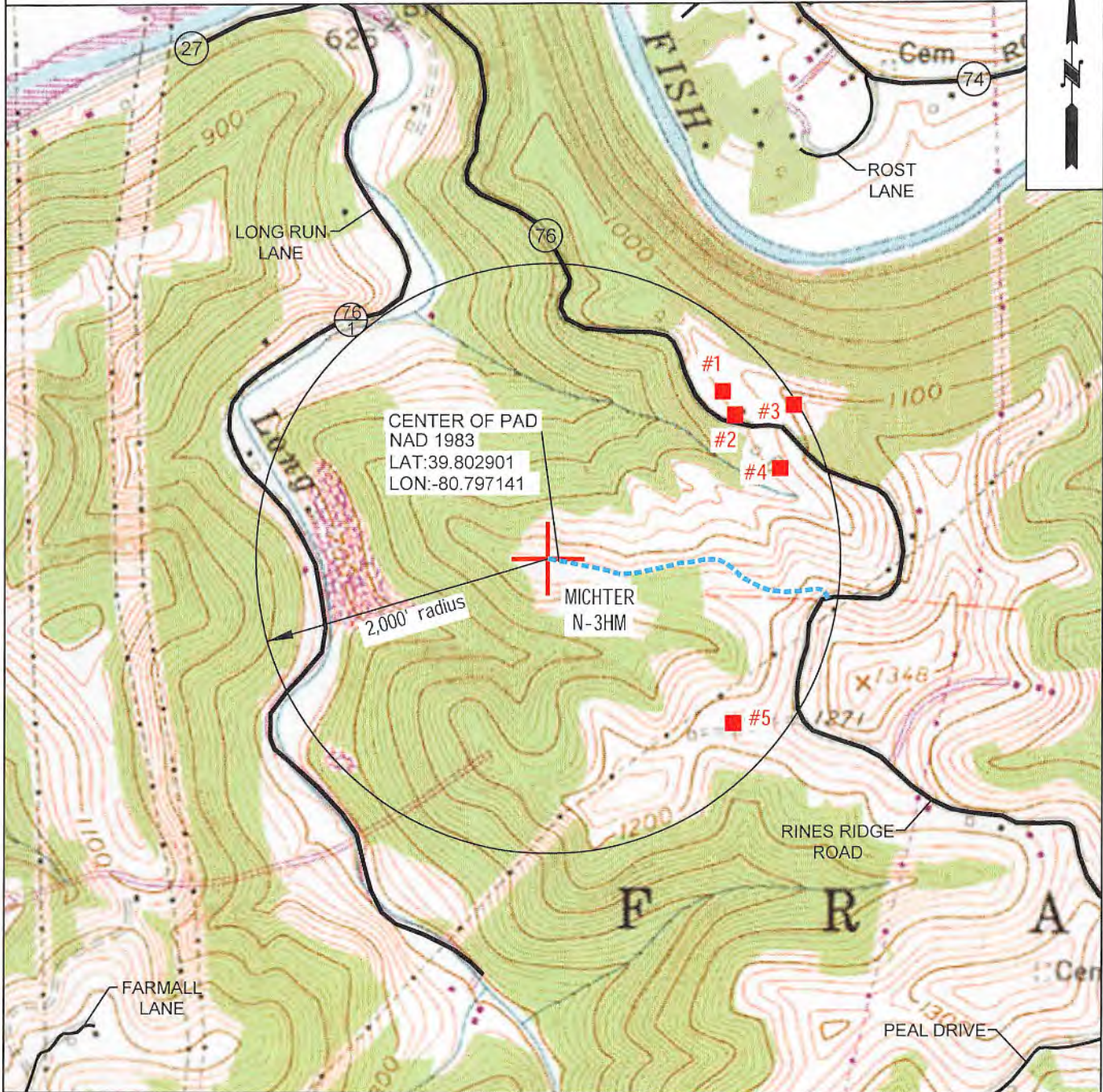
WW-6A

PROPOSED
MICHTER N-3HM

WV Department of
Environmental Protection

SUPPLEMENT PG 1

There appears to be Five (5) possible water sources within 2,000'.



OPERATOR 494510851
 TUG HILL OPERATING, LLC
 380 SOUTHPOINTE BLVD
 SUITE 200
 CANONSBURG, PA 15317

TOPO SECTION
 POWHATAN POINT 7.5'
SCALE:
 1" = 1000'

LEASE NAME
 MICHTER
DATE:
 DATE: 08-26-2019

WW-6A

Supplement Pg. 1A

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

WATER WELL REPORT

Well: MICHTER N-3HM
 District: Franklin
 County: Marshall
 State: WV

There appears to be Five (5) possible water sources within 2,000 feet of the above referenced well location.

Topo Spot # 1 TM 11 Par. 1.6 Debra Morris 304-810-0813 1082 Rines Ridge Rd. Proctor, WV 26055	Topo Spot # 2 TM 11 Par. 1.6 Debra Morris 304-810-0813 1082 Rines Ridge Rd. Proctor, WV 26055	Topo Spot # 3 TM 11 Par. 1.7 William S. & Mary K. Adams 330-718-0404 P.O. Box 303 Canfield, OH 44406
Topo Spot # 4 TM 11 Par. 1.3 Jay A. Conner, et ux 304-845-0641 1117 Rine Ridge Rd. Proctor, WV 26055	Topo Spot # 5 TM 11 Par. 21 Karen Reed, et al 304-845-7536 100 Orchard Ln. Moundsville, WV 26041	

RECEIVED
 Office of Oil and Gas
 OCT 02 2019
 WV Department of
 Environmental Protection

OCT 02 2019

Operator Well No. Michter N-3HM

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

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

Date of Notice: 5/8/2018 **Date of Planned Entry:** 5/15/2018

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: Larry W. and Barbara E. Dunlap (Pad and Access Road)
 Address: 1549 Irish Ridge Road
Cameron, WV 26033

Name: Charles Leroy Dunlap (Pad and Access Road)
 Address: 2500 Ohio St. Lot # 10
Moundsville, WV 26041

Name: Karen Sue Reed and Clyde Reed (Well Pad)
 Address: RR 4 Box 237
Moundsville, WV 26041

COAL OWNER OR LESSEE

Name: CNX Land Resources, LLC Attn: Casey Saunders
 Address: 1000 CONSOL Energy Drive
Canonsburg, PA 15317

MINERAL OWNER(s)

Name: Larry W. and Barbara E. Dunlap (see attached list)
 Address: 1549 Irish Ridge Road
Cameron, WV 26033

*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: West Virginia
 County: Marshall
 District: Franklin
 Quadrangle: Powhatan Point 7.5'

Approx. Latitude & Longitude: 39.8027785; -80.7973528
 Public Road Access: Rines Ridge Road (County Route 76)
 Watershed: Fish Creek (HUC 10)
 Generally used farm name: Larry Dunlap, et al

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: 724-749-8388
 Email: amiller@tug-hillop.com

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

Oil and Gas Privacy Notice:

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

WW-6A3 NOTICE OF ENTRY FOR PLAT SURVEY

ATTACHMENT #1

WELL: MICHTER N-3HM

Mineral Owners (Well Pad)

Charles Leroy Dunlap
2500 Ohio St. Lot #10
Moundsville, WV 26041

Boyd Dail Yates, Jr.
909 North Street
Hebron, OH 43025

Karen Sue Reed and Clyde Reed
RR 4 Box 237
Moundsville, WV 26041

Boyde Buesking
402 Hickory Street
Bloomington, IL 61701

Christian Drayer Staley
6725 Minier Road
Minier, IL 61759

Rebecca Drayer Eldridge
465 Harts Way
Collierville, TN 38017

Gennie Sue Thomas Petrack
704 N. School Street
Normal, IL 61761

Brenda Faye Thomas Petrack
998 Willow Drive
Pittsburgh, PA 15237

Guy Yates
4102 Blacks Road SW
Hebron, OH 43025

Gail Ann Yates Wood
8161 Goldsmith Drive
Reynoldsburg, OH 43068

Shirley Yates Hartsell
2150 Yorkdale Lane
Reynoldsburg, OH 13068

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

WW-6A5
(1/12)Operator Well No. Michter N-3HM

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: 09/10/2019 **Date Permit Application Filed:** 09/27/2019

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: Larry W. and Barbara E. Dunlap (Pad and Access Road)
Address: 1549 Irish Ridge Road
Cameron, WV 26033

Name: Karen Sue Reed and Clyde Reed (Pad and Access Road)
Address: 100 Orchard Lane
Moundsville, WV 26041 *See attachment

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>517,342.85</u>
County:	<u>Marshall</u>		Northing:	<u>4,405,905.76</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road (County Route 76)</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>Larry W. Dunlap & Charles Leroy Dunlap</u>	
Watershed:	<u>Fish Creek</u>			

This Notice Shall Include:

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

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

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

Oil and Gas Privacy Notice:

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

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

4705102277

WW-6A5 Attachment
Michter N-3HM

Additional Landowner

Charles Leroy Dunlap
21 Gypsy Drive
Moundsville, WV 26041



RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

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

September 23, 2019

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

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

Subject: DOH Permit for the Mitcher Well Pad, Marshall County
 Mitcher N-3HM Well Site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2018-0480 which has been issued to Tug Hill Operating for access to the State Road for a well site located off Marshall County Route 76 SLS.

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

Very Truly Yours,

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

Cc: Amy Miller
 Tug Hill Operating
 CH, OM, D-6
 File

RECEIVED
 Office of Oil and Gas

OCT 02 2019

WV Department of
 Environmental Protection



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Michter N-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

RECEIVED
Office of Oil and Gas

OCT 02 2019

WV Department of
Environmental Protection

