



west virginia department of environmental protection

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

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

Friday, September 08, 2017
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
550 BAILEY AVENUE, SUITE 510

FORT WORTH, TX 76107

Re: Permit approval for GREER 1W-13HM
47-051-01953-00-00

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: GREER 1W-13HM
Farm Name: PPG INDUSTRIES, INC., ET AL
U.S. WELL NUMBER: 47-051-01953-00-00
Horizontal 6A / New Drill
Date Issued: 9/8/2017

Promoting a healthy environment.

PERMIT CONDITIONS

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

CONDITIONS

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

PERMIT CONDITIONS

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

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

1) Well Operator: Tug Hill Operating, LLC

494510851	Marshall	Franklin	Powhatan Point 7
-----------	----------	----------	------------------

Operator ID County District Quadrangle

2) Operator's Well Number: Greer 1W-14HM Well Pad Name: Greer

3) Farm Name/Surface Owner: PPG Industries, Inc. Public Road Access: Waynes Ridge Rd. - County Route 78

4) Elevation, current ground: 1,254' Elevation, proposed post-construction: 1,254'

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

(b) If Gas Shallow Deep _____
Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6369' - 6427', thickness of 58' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,527'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 15,223'

11) Proposed Horizontal Leg Length: 7,100'

12) Approximate Fresh Water Strata Depths: 70', 860'

13) Method to Determine Fresh Water Depths: Offset well reports or noticeable flow at the flowline or when need to start soaping

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickly Coal - 785' and Pittsburgh Coal - 879'

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: _____

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	125	120'	259FT^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	1,010	1,000	1045ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	1,010	1,000	1045ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,610	2,600	865ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	15,169	15,159'	3923ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,307'	
Liners							

ju
7/27/17

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17.5"	.33	2,740	2,192	SEE #24	1.2
Coal	13 3/8"	17.5"	.33	2,740	2,192	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE#24	1.19
Production	5 1/2"	8 7/8_8 3/4	.361	12,640	10,112	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

PACKERS

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

RECEIVED
Office of Oil and Gas
JUL 28 2017

WV Department of
Environmental Protection

WW-6B
(10/14)

API NO. 47-051 - _____

OPERATOR WELL NO. Greer 1W-13HM

Well Pad Name: Greer

ju
7/27/17

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

Drill through the Marcellus tagging less than 100' from the top of the Onondaga to get depths and log data. Plug back to proposed kick off point. Drill the horizontal section to planned and proposed TD. Run casing and cement to surface. Run Bond Log from app 60 deg to surface. Make clean out run and stimulate

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

Well to be completed with approximately 18,500,000 lb proppant and 286,024 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 17.78 Acres

22) Area to be disturbed for well pad only, less access road (acres): 5.38 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

JUL 28 2017

WV Department of
Environmental Protection

*Note: Attach additional sheets as needed.

WW6B Attachment to #24.

Conductor and Surface Casing Cement:

Premium NE-1 + 2% CaCl

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

Intermediate Casing:

Premium NE-1 + 1% CaCl + .25 lb/sk Cello Flake + .25% BA-10A + .75 gals/100sk FP-13L

- Premium NE-1 – Class A Portland API spec
- CaCl – Calcium Chloride
- Cello Flake – Fluid Loss Preventer
- BA-10A – Bonding Agent
- FP-13L – Anti-Foaming Agent

Production Casing Cement:

Lead: *50:50 (Poz:Premium NE-1) + .2% R-3 + .2% MPA-170 + .75 gal/100sk FP-13L*

Tail: *Premium NE-1 + .5% R-3 + .1% ASA-301 + .25% MPA-170 + .35% BA-10A + .75 gal-100sk FP-13L + 60 lb/sk ASCA-1*

- Poz – Fly Ash
- Premium NE-1 – Class A Portland API spec
- R-3 – Cement Retarder
- MPA-170 – Gelling Agent
- FP-13L – Anti-Foaming Agent
- ASA-301 – Free Water Control Agent
- BA-10A – Bonding Agent
- ASCA-1 – Solubility Additive

RECEIVED
Office of Oil and Gas

JUL 28 2017

WV Department of
Environmental Protection



WELL NAME: Greer 1W-13HM
STATE: West Virginia
DISTRICT: Meade
GL Elev: 1,254'
TD: 15,159'
TH Latitude: 39.75710028
TH Longitude: -80.83612865
BH Latitude: 39.7703552
BH Longitude: -80.85683901

30" Csg @ 120' TVD

13 3/8" Csg @ 1,000' TVD

8 5/8" Csg @ 2,600' TVD

KOP @ 6,807' ft MD

Landing Point @ 7,755' MD / 6,379' TVD

PH TVD = 100' below Onondaga Top

Pilot Hole
PH TD @ 6,527' TVD

Lateral TD @ 15,159' ft MD
6,250' ft TVD

Formation	Depth TVD
Deepest Fresh Water	860
Sewickley Coal	785
Pittsburgh Coal	879
Big Lime	1937
Weir	2354
Berea	2544
Gordon	2862
Rhinestreet	5462
Geneese/Surkett	6310
Tully	6340
Hamilton	6360
Marcellus	6369
Landing Depth	6379
Onondaga	6427
Pilot Hole Depth	6527

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	17.5	13 3/8	1,000'	1,000'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,600'	2,600'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	15,159'	6,250'	20	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Sacks	Class	Density	Fluid Type	Centralizer Notes	
338	A	15.6	Air	None	
1,052	A	15.6	Air	3 Centralizers at equal distance	
847	A	15	Air	1 Centralizer every other ft	
3,463	A	14.5	Air / SOBMA	1 every other joint in lateral; 1 per joint in curve; 1 every other ft to stc	

Handwritten signature/initials

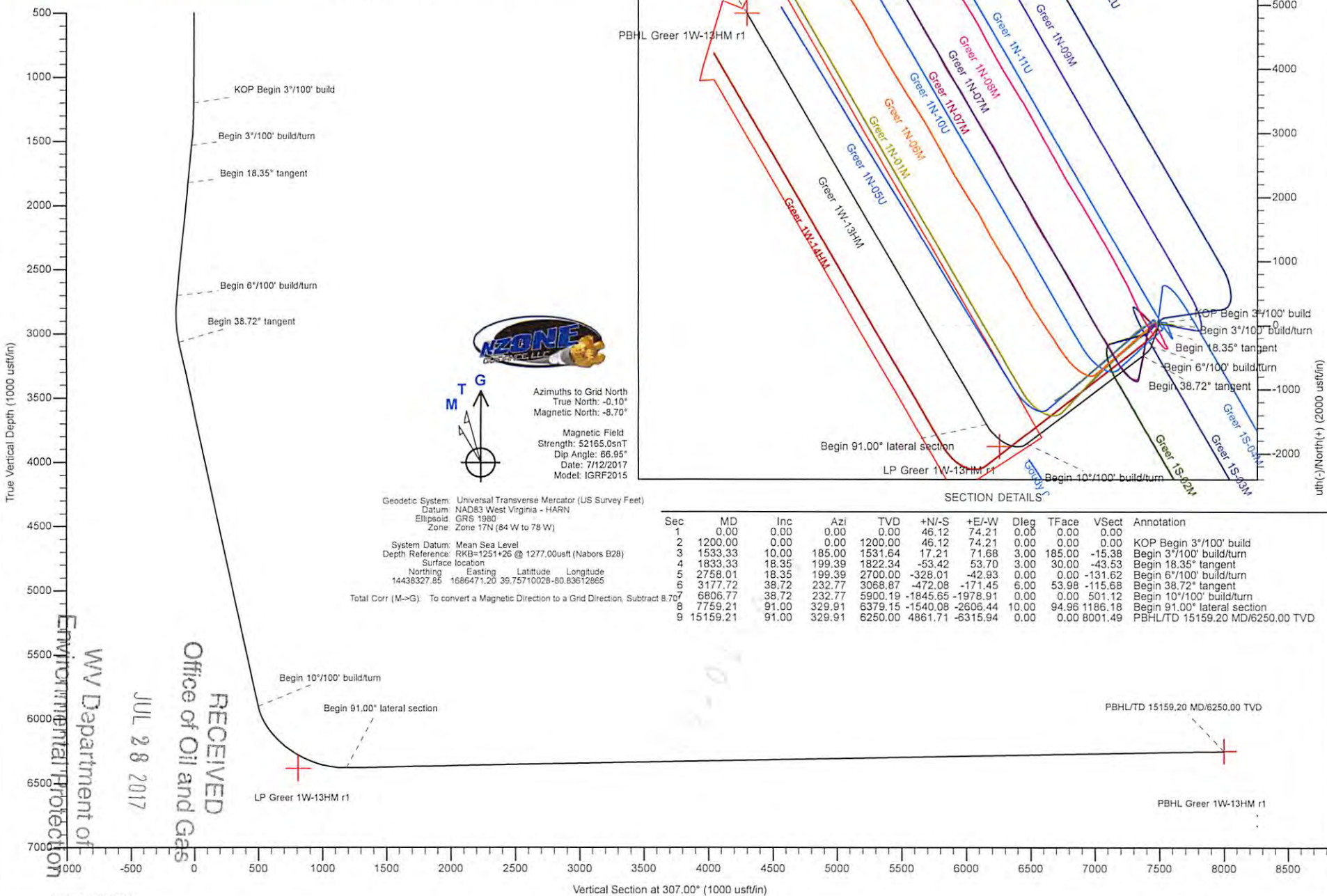
RECEIVED
 Office of Oil and Gas
 WV Department of Environmental Protection
 JUL 28 2017

470110



TUG HILL
OPERATING

Tug Hill Operating LLC
Well: Greer 1W-13HM
Site: Greer Unit N
Project: Marshall County, WV
Design: rev1



M T G

Azimuths to Grid North
True North: -0.10°
Magnetic North: -8.70°

Magnetic Field
Strength: 52165.0snT
Dip Angle: 66.95°
Date: 7/12/2017
Model: IGRF2015

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: RKB=1251+26 @ 1277.00usft (Nabors B28)
Surface location:
Northing: 14438327.85 Easting: 1686471.20 Latitude: 39.75710028-80.83612865

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.70°

RECEIVED
Office of Oil and Gas
JUL 28 2017
WV Department of Environmental Protection

Area of Review

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

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

Data Sources Reviewed:

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

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

Request maps for:

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

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

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

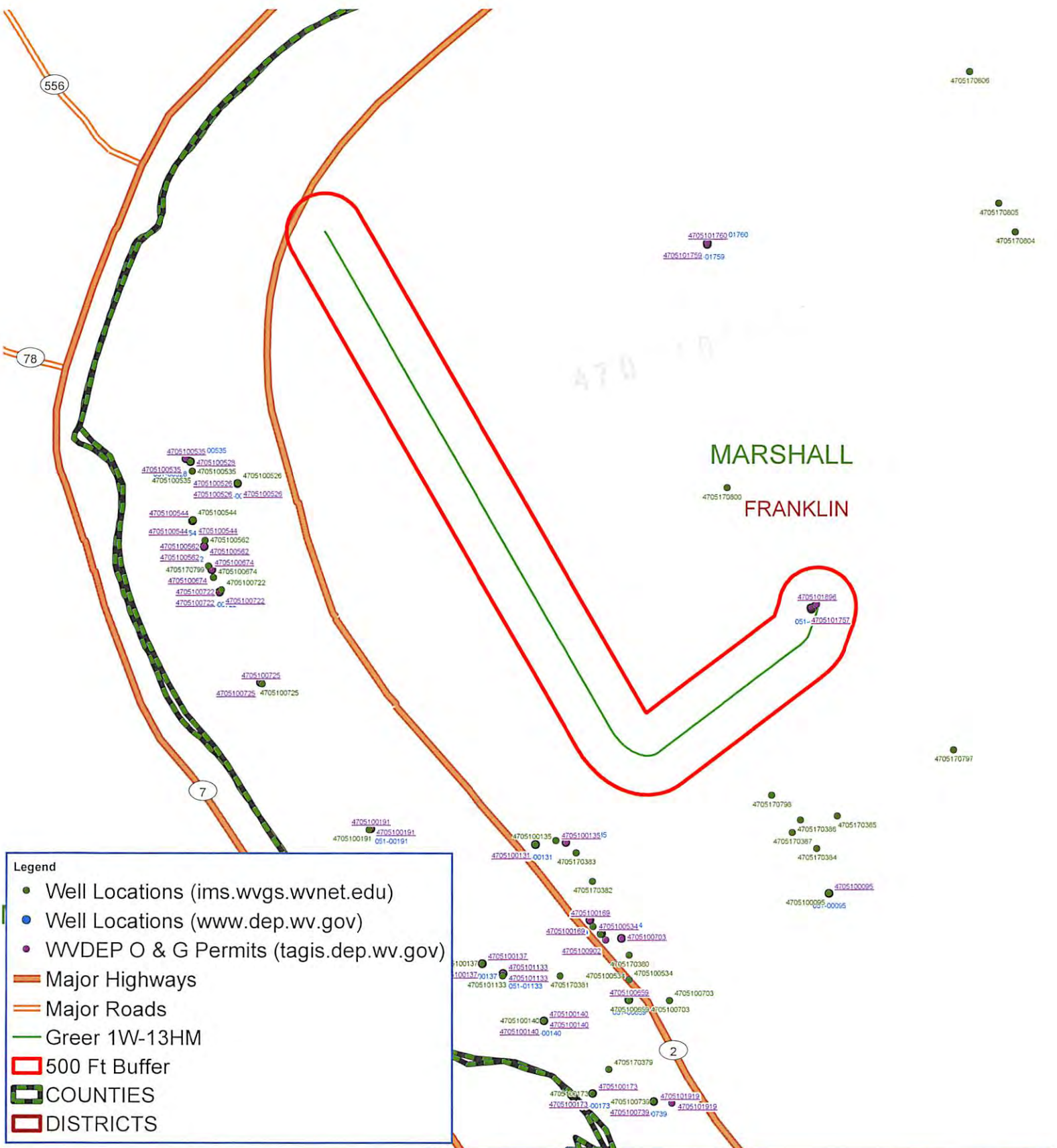
Permit well - Greer 1W-13HM

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
4705101757	Tug Hill Operating	6524' TVD proposed	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating permitted offset Marcellus well. Not yet drilled
4705101758	Tug Hill Operating	6399' TVD	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating offset Marcellus well. Drilled not yet completed
4705101890	Tug Hill Operating	6395' TVD	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating offset Marcellus well. Drilled not yet completed
4705101891	Tug Hill Operating	6422' TVD	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating offset Marcellus well. Drilled not yet completed
4705101892	Tug Hill Operating	6418' TVD	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating offset Marcellus well. Drilled not yet completed

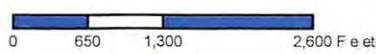
API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101887	Tug Hill Operating	6524' TVD proposed	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating permitted offset Marcellus well. Not yet drilled
4705101888	Tug Hill Operating	6524' TVD proposed	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating permitted offset Marcellus well. Not yet drilled
4705101889	Tug Hill Operating	6524' TVD proposed	Marcellus proposed	None	Yes. The well is planned to be drilled into the Marcellus Shale. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Marcellus wells	Tug Hill Operating permitted offset Marcellus well. Not yet drilled
4705101893	Tug Hill Operating	11640' TVD Proposed	Point Pleasant Proposed	None	Yes. The well is planned to be drilled into the Point Pleasant Formation. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Point Pleasant wells	Tug Hill Operating offset Point Pleasant well. Pilot hole drilled, lateral not yet drilled
4705101894	Tug Hill Operating	11784' TVD Proposed	Point Pleasant Proposed	None	Yes. The well is planned to be drilled into the Point Pleasant Formation. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Point Pleasant wells	Tug Hill Operating permitted offset Point Pleasant well. Not yet drilled
4705101895	Tug Hill Operating	11784' TVD Proposed	Point Pleasant Proposed	None	Yes. The well is planned to be drilled into the Point Pleasant Formation. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Point Pleasant wells	Tug Hill Operating permitted offset Point Pleasant well. Not yet drilled
4705101895	Tug Hill Operating	11784' TVD Proposed	Point Pleasant Proposed	None	Yes. The well is planned to be drilled into the Point Pleasant Formation. However, proper casing and cementing should prevent this well from being a conduit to surface for offset Point Pleasant wells	Tug Hill Operating permitted offset Point Pleasant well. Not yet drilled



- Legend**
- Well Locations (ims.wvgs.wvnet.edu)
 - Well Locations (www.dep.wv.gov)
 - WVDEP O & G Permits (tagis.dep.wv.gov)
 - Major Highways
 - Major Roads
 - Greer 1W-13HM
 - 500 Ft Buffer
 - COUNTIES
 - DISTRICTS



Greer 1W-13HM Franklin District Marshall County, WV



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

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





Planning Report - Geographic

4703101257

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Site Greer Unit N
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1251+26 @ 1277.00usft (Nabors B28)
Project:	Marshall County, West Virginia	MD Reference:	RKB=1251+26 @ 1277.00usft (Nabors B28)
Site:	Greer Unit N	North Reference:	Grid
Well:	Greer 1W-13HM	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	Greer Unit N				
Site Position:		Northing:	14,438,281.73 usft	Latitude:	39.75697400
From:	Lat/Long	Easting:	1,686,396.99 usft	Longitude:	-80.83639300
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.10 °

Well	Greer 1W-13HM					
Well Position	+N/-S	46.12 usft	Northing:	14,438,327.85 usft	Latitude:	39.75710028
	+E/-W	74.21 usft	Easting:	1,686,471.20 usft	Longitude:	-80.83612865
Position Uncertainty	0.00 usft		Wellhead Elevation:	Ground Level: 1,251.00 usft		

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/12/2017	-8.59	66.95	52,165.03964904

Design	rev1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	46.12	74.21	307.00

Plan Survey Tool Program	Date	7/20/2017			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	15,159.21 rev1 (Original Hole)	MWD	MWD - Standard	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	46.12	74.21	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	46.12	74.21	0.00	0.00	0.00	0.00	0.00
1,533.33	10.00	185.00	1,531.64	17.21	71.68	3.00	3.00	0.00	185.00	30.00
1,833.33	18.35	199.39	1,822.34	-53.42	53.70	3.00	2.78	4.80	0.00	0.00
2,758.01	18.35	199.39	2,700.00	-328.01	-42.93	0.00	0.00	0.00	0.00	0.00
3,177.72	38.72	232.77	3,068.87	-472.08	-171.45	6.00	4.85	7.95	53.98	0.00
6,806.77	38.72	232.77	5,900.19	-1,845.65	-1,978.91	0.00	0.00	0.00	0.00	0.00
7,759.21	91.00	329.91	6,379.15	-1,540.08	-2,606.44	10.00	5.49	10.20	94.96	0.00
15,159.21	91.00	329.91	6,250.00	4,861.71	-6,315.94	0.00	0.00	0.00	0.00	0.00

RECEIVED
Office of Oil and Gas
JUL 28 2017
PBHL Greer 1W-13HM
Department of Environmental Protection



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Site Greer Unit N
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1251+26 @ 1277.00usft (Nabors B28)
Project:	Marshall County, West Virginia	MD Reference:	RKB=1251+26 @ 1277.00usft (Nabors B28)
Site:	Greer Unit N	North Reference:	Grid
Well:	Greer 1W-13HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
100.00	0.00	0.00	100.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
200.00	0.00	0.00	200.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
300.00	0.00	0.00	300.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
400.00	0.00	0.00	400.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
500.00	0.00	0.00	500.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
600.00	0.00	0.00	600.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
700.00	0.00	0.00	700.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
800.00	0.00	0.00	800.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
900.00	0.00	0.00	900.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
1,000.00	0.00	0.00	1,000.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
1,100.00	0.00	0.00	1,100.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
1,200.00	0.00	0.00	1,200.00	46.12	74.21	14,438,327.85	1,686,471.20	39.75710028	-80.83612865	
KOP Begin 3°/100' build										
1,300.00	3.00	185.00	1,299.95	43.51	73.98	14,438,325.25	1,686,470.97	39.75709312	-80.83612948	
1,400.00	6.00	185.00	1,399.63	35.70	73.30	14,438,317.43	1,686,470.28	39.75707166	-80.83613196	
1,500.00	9.00	185.00	1,498.77	22.69	72.16	14,438,304.43	1,686,469.15	39.75703596	-80.83613610	
1,533.33	10.00	185.00	1,531.64	17.21	71.68	14,438,298.95	1,686,468.67	39.75702092	-80.83613784	
Begin 3°/100' build/turn										
1,600.00	11.77	189.91	1,597.11	4.75	70.01	14,438,286.48	1,686,466.99	39.75698668	-80.83614388	
1,700.00	14.54	194.99	1,694.48	-17.44	65.00	14,438,264.30	1,686,461.99	39.75692578	-80.83616183	
1,800.00	17.39	198.46	1,790.61	-43.75	57.02	14,438,237.99	1,686,454.01	39.75685357	-80.83619041	
1,833.33	18.35	199.39	1,822.34	-53.42	53.70	14,438,228.31	1,686,450.69	39.75682702	-80.83620228	
Begin 18.35° tangent										
1,900.00	18.35	199.39	1,885.61	-73.22	46.73	14,438,208.52	1,686,443.72	39.75677269	-80.83622719	
2,000.00	18.35	199.39	1,980.53	-102.91	36.28	14,438,178.82	1,686,433.27	39.75669119	-80.83626457	
2,100.00	18.35	199.39	2,075.45	-132.61	25.83	14,438,149.13	1,686,422.82	39.75660969	-80.83630194	
2,200.00	18.35	199.39	2,170.36	-162.30	15.38	14,438,119.43	1,686,412.37	39.75652819	-80.83633932	
2,300.00	18.35	199.39	2,265.28	-192.00	4.93	14,438,089.73	1,686,401.92	39.75644669	-80.83637669	
2,400.00	18.35	199.39	2,360.19	-221.69	-5.52	14,438,060.04	1,686,391.47	39.75636519	-80.83641407	
2,500.00	18.35	199.39	2,455.11	-251.39	-15.97	14,438,030.34	1,686,381.02	39.75628369	-80.83645144	
2,600.00	18.35	199.39	2,550.02	-281.08	-26.41	14,438,000.65	1,686,370.57	39.75620219	-80.83648881	
2,700.00	18.35	199.39	2,644.94	-310.78	-36.86	14,437,970.95	1,686,360.12	39.75612069	-80.83652619	
2,758.01	18.35	199.39	2,700.00	-328.01	-42.93	14,437,953.73	1,686,354.06	39.75607341	-80.83654787	
Begin 6°/100' build/turn										
2,800.00	19.93	205.37	2,739.67	-340.71	-48.19	14,437,941.03	1,686,348.80	39.75603855	-80.83656667	
2,900.00	24.32	216.30	2,832.33	-372.73	-67.70	14,437,909.00	1,686,329.29	39.75595070	-80.83663631	
3,000.00	29.26	223.90	2,921.59	-406.97	-96.86	14,437,874.77	1,686,300.12	39.75585684	-80.83674030	
3,100.00	34.51	229.42	3,006.49	-443.03	-135.36	14,437,838.70	1,686,261.63	39.75575798	-80.83687749	
3,177.72	38.72	232.77	3,068.87	-472.08	-171.45	14,437,809.66	1,686,225.54	39.75567839	-80.83700611	
Begin 38.72° tangent										
3,200.00	38.72	232.77	3,086.25	-480.51	-182.55	14,437,801.22	1,686,214.44	39.75565529	-80.83704564	
3,300.00	38.72	232.77	3,164.27	-518.36	-232.35	14,437,763.37	1,686,164.64	39.75555159	-80.83722310	
3,400.00	38.72	232.77	3,242.29	-556.21	-282.16	14,437,725.52	1,686,114.83	39.75544789	-80.83740056	
3,500.00	38.72	232.77	3,320.31	-594.06	-331.96	14,437,687.68	1,686,065.03	39.75534420	-80.83757801	
3,600.00	38.72	232.77	3,398.32	-631.91	-381.77	14,437,649.83	1,686,015.22	39.75524050	-80.83775547	
3,700.00	38.72	232.77	3,476.34	-669.76	-431.57	14,437,611.98	1,685,965.41	39.75513680	-80.83793293	
3,800.00	38.72	232.77	3,554.36	-707.61	-481.38	14,437,574.13	1,685,915.61	39.75503310	-80.83811038	
3,900.00	38.72	232.77	3,632.38	-745.46	-531.18	14,437,536.28	1,685,865.80	39.75492940	-80.83828784	
4,000.00	38.72	232.77	3,710.40	-783.31	-580.99	14,437,498.43	1,685,816.00	39.75482570	-80.83846529	
4,100.00	38.72	232.77	3,788.42	-821.16	-630.79	14,437,460.58	1,685,766.19	39.75472200	-80.83864274	
4,200.00	38.72	232.77	3,866.43	-859.01	-680.60	14,437,422.73	1,685,716.39	39.75461831	-80.83882020	
4,300.00	38.72	232.77	3,944.45	-896.85	-730.40	14,437,384.88	1,685,666.58	39.75451461	-80.83899765	
4,400.00	38.72	232.77	4,022.47	-934.70	-780.21	14,437,347.03	1,685,616.78	39.75441091	-80.83917510	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Site Greer Unit N
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1251+26 @ 1277.00usft (Nabors B28)
Project:	Marshall County, West Virginia	MD Reference:	RKB=1251+26 @ 1277.00usft (Nabors B28)
Site:	Greer Unit N	North Reference:	Grid
Well:	Greer 1W-13HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,500.00	38.72	232.77	4,100.49	-972.55	-830.02	14,437,309.18	1,685,566.97	39.75430720	-80.83935255	
4,600.00	38.72	232.77	4,178.51	-1,010.40	-879.82	14,437,271.33	1,685,517.17	39.75420350	-80.83953000	
4,700.00	38.72	232.77	4,256.53	-1,048.25	-929.63	14,437,233.48	1,685,467.36	39.75409980	-80.83970745	
4,800.00	38.72	232.77	4,334.54	-1,086.10	-979.43	14,437,195.63	1,685,417.56	39.75399610	-80.83988490	
4,900.00	38.72	232.77	4,412.56	-1,123.95	-1,029.24	14,437,157.78	1,685,367.75	39.75389240	-80.84006235	
5,000.00	38.72	232.77	4,490.58	-1,161.80	-1,079.04	14,437,119.93	1,685,317.95	39.75378870	-80.84023980	
5,100.00	38.72	232.77	4,568.60	-1,199.65	-1,128.85	14,437,082.08	1,685,268.14	39.75368500	-80.84041725	
5,200.00	38.72	232.77	4,646.62	-1,237.50	-1,178.65	14,437,044.24	1,685,218.34	39.75358129	-80.84059470	
5,300.00	38.72	232.77	4,724.64	-1,275.35	-1,228.46	14,437,006.39	1,685,168.53	39.75347759	-80.84077214	
5,400.00	38.72	232.77	4,802.65	-1,313.20	-1,278.26	14,436,968.54	1,685,118.72	39.75337389	-80.84094959	
5,500.00	38.72	232.77	4,880.67	-1,351.05	-1,328.07	14,436,930.69	1,685,068.92	39.75327019	-80.84112703	
5,600.00	38.72	232.77	4,958.69	-1,388.90	-1,377.87	14,436,892.84	1,685,019.11	39.75316648	-80.84130448	
5,700.00	38.72	232.77	5,036.71	-1,426.75	-1,427.68	14,436,854.99	1,684,969.31	39.75306278	-80.84148193	
5,800.00	38.72	232.77	5,114.73	-1,464.60	-1,477.48	14,436,817.14	1,684,919.50	39.75295908	-80.84165937	
5,900.00	38.72	232.77	5,192.75	-1,502.44	-1,527.29	14,436,779.29	1,684,869.70	39.75285537	-80.84183681	
6,000.00	38.72	232.77	5,270.76	-1,540.29	-1,577.09	14,436,741.44	1,684,819.89	39.75275167	-80.84201426	
6,100.00	38.72	232.77	5,348.78	-1,578.14	-1,626.90	14,436,703.59	1,684,770.09	39.75264796	-80.84219170	
6,200.00	38.72	232.77	5,426.80	-1,615.99	-1,676.71	14,436,665.74	1,684,720.28	39.75254426	-80.84236914	
6,300.00	38.72	232.77	5,504.82	-1,653.84	-1,726.51	14,436,627.89	1,684,670.48	39.75244055	-80.84254658	
6,400.00	38.72	232.77	5,582.84	-1,691.69	-1,776.32	14,436,590.04	1,684,620.67	39.75233685	-80.84272402	
6,500.00	38.72	232.77	5,660.86	-1,729.54	-1,826.12	14,436,552.19	1,684,570.87	39.75223314	-80.84290146	
6,600.00	38.72	232.77	5,738.87	-1,767.39	-1,875.93	14,436,514.34	1,684,521.06	39.75212943	-80.84307891	
6,700.00	38.72	232.77	5,816.89	-1,805.24	-1,925.73	14,436,476.49	1,684,471.26	39.75202573	-80.84325634	
6,800.00	38.72	232.77	5,894.91	-1,843.09	-1,975.54	14,436,438.65	1,684,421.45	39.75192202	-80.84343378	
6,806.77	38.72	232.77	5,900.19	-1,845.65	-1,978.91	14,436,436.08	1,684,418.08	39.75191500	-80.84344580	
Begin 10°/100' build/turn										
6,900.00	38.86	247.67	5,973.02	-1,874.47	-2,029.29	14,436,407.26	1,684,367.69	39.75183609	-80.84362524	
7,000.00	41.05	262.90	6,049.85	-1,890.49	-2,091.06	14,436,391.24	1,684,305.93	39.75179239	-80.84384509	
7,100.00	45.03	276.37	6,123.08	-1,890.63	-2,158.97	14,436,391.10	1,684,238.02	39.75179234	-80.84408672	
7,200.00	50.37	287.82	6,190.47	-1,874.88	-2,230.97	14,436,406.85	1,684,166.01	39.75183593	-80.84434280	
7,300.00	56.67	297.50	6,249.99	-1,843.73	-2,304.88	14,436,438.01	1,684,092.11	39.75192184	-80.84460555	
7,400.00	63.61	305.82	6,299.82	-1,798.11	-2,378.43	14,436,483.62	1,684,018.55	39.75204746	-80.84486698	
7,500.00	70.97	313.16	6,338.45	-1,739.42	-2,449.41	14,436,542.31	1,683,947.58	39.75220898	-80.84511916	
7,600.00	78.60	319.87	6,364.71	-1,669.44	-2,515.65	14,436,612.29	1,683,881.33	39.75240149	-80.84535441	
7,700.00	86.37	326.22	6,377.79	-1,590.29	-2,575.14	14,436,691.44	1,683,821.84	39.75261913	-80.84556559	
7,759.21	91.00	329.91	6,379.15	-1,540.08	-2,606.44	14,436,741.65	1,683,790.55	39.75275718	-80.84567664	
Begin 91.00° lateral section										
7,800.00	91.00	329.91	6,378.44	-1,504.79	-2,626.89	14,436,776.94	1,683,770.10	39.75285418	-80.84574917	
7,900.00	91.00	329.91	6,376.69	-1,418.28	-2,677.02	14,436,863.45	1,683,719.97	39.75309201	-80.84592700	
8,000.00	91.00	329.91	6,374.95	-1,331.77	-2,727.15	14,436,949.96	1,683,669.84	39.75332983	-80.84610483	
8,100.00	91.00	329.91	6,373.20	-1,245.26	-2,777.27	14,437,036.47	1,683,619.71	39.75356765	-80.84628265	
8,200.00	91.00	329.91	6,371.46	-1,158.75	-2,827.40	14,437,122.98	1,683,569.58	39.75380547	-80.84646048	
8,300.00	91.00	329.91	6,369.71	-1,072.24	-2,877.53	14,437,209.49	1,683,519.46	39.75404329	-80.84663831	
8,400.00	91.00	329.91	6,367.96	-985.73	-2,927.66	14,437,296.01	1,683,469.33	39.75428111	-80.84681615	
8,500.00	91.00	329.91	6,366.22	-899.22	-2,977.79	14,437,382.52	1,683,419.20	39.75451893	-80.84699398	
8,600.00	91.00	329.91	6,364.47	-812.71	-3,027.92	14,437,469.03	1,683,369.07	39.75475675	-80.84717181	
8,700.00	91.00	329.91	6,362.73	-726.20	-3,078.04	14,437,555.54	1,683,318.94	39.75499457	-80.84734965	
8,800.00	91.00	329.91	6,360.98	-639.69	-3,128.17	14,437,642.05	1,683,268.81	39.75523239	-80.84752749	
8,900.00	91.00	329.91	6,359.24	-553.18	-3,178.30	14,437,728.56	1,683,218.69	39.75547020	-80.84770533	
9,000.00	91.00	329.91	6,357.49	-466.67	-3,228.43	14,437,815.07	1,683,168.56	39.75570802	-80.84788316	
9,100.00	91.00	329.91	6,355.75	-380.15	-3,278.56	14,437,901.58	1,683,118.43	39.75594584	-80.84806101	
9,200.00	91.00	329.91	6,354.00	-293.64	-3,328.69	14,437,988.09	1,683,068.30	39.75618366	-80.84823885	
9,300.00	91.00	329.91	6,352.26	-207.13	-3,378.81	14,438,074.60	1,683,018.17	39.75642148	-80.84841669	
9,400.00	91.00	329.91	6,350.51	-120.62	-3,428.94	14,438,161.11	1,682,968.04	39.75665929	-80.84859453	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Site Greer Unit N
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1251+26 @ 1277.00usft (Nabors B28)
Project:	Marshall County, West Virginia	MD Reference:	RKB=1251+26 @ 1277.00usft (Nabors B28)
Site:	Greer Unit N	North Reference:	Grid
Well:	Greer 1W-13HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,500.00	91.00	329.91	6,348.77	-34.11	-3,479.07	14,438,247.62	1,682,917.92	39.75689711	-80.84877238	
9,600.00	91.00	329.91	6,347.02	52.40	-3,529.20	14,438,334.13	1,682,867.79	39.75713493	-80.84895023	
9,700.00	91.00	329.91	6,345.28	138.91	-3,579.33	14,438,420.64	1,682,817.66	39.75737274	-80.84912807	
9,800.00	91.00	329.91	6,343.53	225.42	-3,629.46	14,438,507.16	1,682,767.53	39.75761056	-80.84930592	
9,900.00	91.00	329.91	6,341.79	311.93	-3,679.58	14,438,593.67	1,682,717.40	39.75784837	-80.84948377	
10,000.00	91.00	329.91	6,340.04	398.44	-3,729.71	14,438,680.18	1,682,667.27	39.75808619	-80.84966163	
10,100.00	91.00	329.91	6,338.30	484.95	-3,779.84	14,438,766.69	1,682,617.15	39.75832400	-80.84983948	
10,200.00	91.00	329.91	6,336.55	571.46	-3,829.97	14,438,853.20	1,682,567.02	39.75856182	-80.85001733	
10,300.00	91.00	329.91	6,334.80	657.97	-3,880.10	14,438,939.71	1,682,516.89	39.75879963	-80.85019519	
10,400.00	91.00	329.91	6,333.06	744.48	-3,930.23	14,439,026.22	1,682,466.76	39.75903745	-80.85037304	
10,500.00	91.00	329.91	6,331.31	831.00	-3,980.35	14,439,112.73	1,682,416.63	39.75927526	-80.85055090	
10,600.00	91.00	329.91	6,329.57	917.51	-4,030.48	14,439,199.24	1,682,366.50	39.75951308	-80.85072876	
10,700.00	91.00	329.91	6,327.82	1,004.02	-4,080.61	14,439,285.75	1,682,316.38	39.75975089	-80.85090662	
10,800.00	91.00	329.91	6,326.08	1,090.53	-4,130.74	14,439,372.26	1,682,266.25	39.75998870	-80.85108448	
10,900.00	91.00	329.91	6,324.33	1,177.04	-4,180.87	14,439,458.77	1,682,216.12	39.76022652	-80.85126234	
11,000.00	91.00	329.91	6,322.59	1,263.55	-4,231.00	14,439,545.28	1,682,165.99	39.76046433	-80.85144021	
11,100.00	91.00	329.91	6,320.84	1,350.06	-4,281.12	14,439,631.79	1,682,115.86	39.76070214	-80.85161807	
11,200.00	91.00	329.91	6,319.10	1,436.57	-4,331.25	14,439,718.31	1,682,065.73	39.76093995	-80.85179594	
11,300.00	91.00	329.91	6,317.35	1,523.08	-4,381.38	14,439,804.82	1,682,015.61	39.76117776	-80.85197381	
11,400.00	91.00	329.91	6,315.61	1,609.59	-4,431.51	14,439,891.33	1,681,965.48	39.76141558	-80.85215168	
11,500.00	91.00	329.91	6,313.86	1,696.10	-4,481.64	14,439,977.84	1,681,915.35	39.76165339	-80.85232955	
11,600.00	91.00	329.91	6,312.12	1,782.61	-4,531.77	14,440,064.35	1,681,865.22	39.76189120	-80.85250742	
11,700.00	91.00	329.91	6,310.37	1,869.12	-4,581.89	14,440,150.86	1,681,815.09	39.76212901	-80.85268529	
11,800.00	91.00	329.91	6,308.63	1,955.63	-4,632.02	14,440,237.37	1,681,764.96	39.76236682	-80.85286316	
11,900.00	91.00	329.91	6,306.88	2,042.15	-4,682.15	14,440,323.88	1,681,714.84	39.76260463	-80.85304104	
12,000.00	91.00	329.91	6,305.14	2,128.66	-4,732.28	14,440,410.39	1,681,664.71	39.76284244	-80.85321891	
12,100.00	91.00	329.91	6,303.39	2,215.17	-4,782.41	14,440,496.90	1,681,614.58	39.76308025	-80.85339679	
12,200.00	91.00	329.91	6,301.65	2,301.68	-4,832.54	14,440,583.41	1,681,564.45	39.76331806	-80.85357467	
12,300.00	91.00	329.91	6,299.90	2,388.19	-4,882.66	14,440,669.92	1,681,514.32	39.76355587	-80.85375255	
12,400.00	91.00	329.91	6,298.15	2,474.70	-4,932.79	14,440,756.43	1,681,464.19	39.76379368	-80.85393043	
12,500.00	91.00	329.91	6,296.41	2,561.21	-4,982.92	14,440,842.94	1,681,414.07	39.76403148	-80.85410831	
12,600.00	91.00	329.91	6,294.66	2,647.72	-5,033.05	14,440,929.46	1,681,363.94	39.76426929	-80.85428620	
12,700.00	91.00	329.91	6,292.92	2,734.23	-5,083.18	14,441,015.97	1,681,313.81	39.76450710	-80.85446408	
12,800.00	91.00	329.91	6,291.17	2,820.74	-5,133.31	14,441,102.48	1,681,263.68	39.76474491	-80.85464197	
12,900.00	91.00	329.91	6,289.43	2,907.25	-5,183.43	14,441,188.99	1,681,213.55	39.76498272	-80.85481985	
13,000.00	91.00	329.91	6,287.68	2,993.76	-5,233.56	14,441,275.50	1,681,163.42	39.76522052	-80.85499774	
13,100.00	91.00	329.91	6,285.94	3,080.27	-5,283.69	14,441,362.01	1,681,113.30	39.76545833	-80.85517563	
13,200.00	91.00	329.91	6,284.19	3,166.78	-5,333.82	14,441,448.52	1,681,063.17	39.76569614	-80.85535352	
13,300.00	91.00	329.91	6,282.45	3,253.30	-5,383.95	14,441,535.03	1,681,013.04	39.76593394	-80.85553141	
13,400.00	91.00	329.91	6,280.70	3,339.81	-5,434.08	14,441,621.54	1,680,962.91	39.76617175	-80.85570931	
13,500.00	91.00	329.91	6,278.96	3,426.32	-5,484.20	14,441,708.05	1,680,912.78	39.76640955	-80.85588720	
13,600.00	91.00	329.91	6,277.21	3,512.83	-5,534.33	14,441,794.56	1,680,862.65	39.76664736	-80.85606510	
13,700.00	91.00	329.91	6,275.47	3,599.34	-5,584.46	14,441,881.07	1,680,812.53	39.76688516	-80.85624299	
13,800.00	91.00	329.91	6,273.72	3,685.85	-5,634.59	14,441,967.58	1,680,762.40	39.76712279	-80.85642089	
13,900.00	91.00	329.91	6,271.98	3,772.36	-5,684.72	14,442,054.09	1,680,712.27	39.76736077	-80.85659879	
14,000.00	91.00	329.91	6,270.23	3,858.87	-5,734.85	14,442,140.61	1,680,662.14	39.76759858	-80.85677669	
14,100.00	91.00	329.91	6,268.49	3,945.38	-5,784.97	14,442,227.12	1,680,612.01	39.76783638	-80.85695459	
14,200.00	91.00	329.91	6,266.74	4,031.89	-5,835.10	14,442,313.63	1,680,561.88	39.76807418	-80.85713249	
14,300.00	91.00	329.91	6,265.00	4,118.40	-5,885.23	14,442,400.14	1,680,511.76	39.76831199	-80.85731040	
14,400.00	91.00	329.91	6,263.25	4,204.91	-5,935.36	14,442,486.65	1,680,461.63	39.76854979	-80.85748830	
14,500.00	91.00	329.91	6,261.50	4,291.42	-5,985.49	14,442,573.16	1,680,411.50	39.76878759	-80.85766621	
14,600.00	91.00	329.91	6,259.76	4,377.93	-6,035.62	14,442,659.67	1,680,361.37	39.76902540	-80.85784412	
14,700.00	91.00	329.91	6,258.01	4,464.45	-6,085.74	14,442,746.18	1,680,311.24	39.76926320	-80.85802203	
14,800.00	91.00	329.91	6,256.27	4,550.96	-6,135.87	14,442,832.69	1,680,261.11	39.76950100	-80.85819994	
14,900.00	91.00	329.91	6,254.52	4,637.47	-6,186.00	14,442,919.20	1,680,210.99	39.76973880	-80.85837785	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Site Greer Unit N
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1251+26 @ 1277.00usft (Nabors B28)
Project:	Marshall County, West Virginia	MD Reference:	RKB=1251+26 @ 1277.00usft (Nabors B28)
Site:	Greer Unit N	North Reference:	Grid
Well:	Greer 1W-13HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
15,000.00	91.00	329.91	6,252.78	4,723.98	-6,236.13	14,443,005.71	1,680,160.86	39.76997660	-80.85855576	
15,100.00	91.00	329.91	6,251.03	4,810.49	-6,286.26	14,443,092.22	1,680,110.73	39.77021441	-80.85873368	
15,159.20	91.00	329.91	6,250.00	4,861.70	-6,315.93	14,443,143.44	1,680,081.05	39.77035518	-80.85883900	
PBHL/TD 15159.20 MD/6250.00 TVD										
15,159.21	91.00	329.91	6,250.00	4,861.71	-6,315.94	14,443,143.44	1,680,081.05	39.77035520	-80.85883901	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
PBHL Greer 1W-13HM r - hit/miss target - Shape - Point	0.00	0.00	6,250.00	4,861.71	-6,315.94	14,443,143.44	1,680,081.05	39.77035520	-80.85883901	
LP Greer 1W-13HM r1 - plan misses target center by 130.28usft at 7400.00usft MD (6299.82 TVD, -1798.11 N, -2378.43 E) - Point	0.00	0.00	6,386.00	-1,892.73	-2,402.81	14,436,389.00	1,683,994.18	39.75178773	-80.84495428	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,200.00	1,200.00	46.12	74.21	KOP Begin 3°/100' build	
1,533.33	1,531.64	17.21	71.68	Begin 3°/100' build/turn	
1,833.33	1,822.34	-53.42	53.70	Begin 18.35° tangent	
2,758.01	2,700.00	-328.01	-42.93	Begin 6°/100' build/turn	
3,177.72	3,068.87	-472.08	-171.45	Begin 38.72° tangent	
6,806.77	5,900.19	-1,845.65	-1,978.91	Begin 10°/100' build/turn	
7,759.21	6,379.15	-1,540.08	-2,606.44	Begin 91.00° lateral section	
15,159.20	6,250.00	4,861.70	-6,315.93	PBHL/TD 15159.20 MD/6250.00 TVD	

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Greer 1W-13HM

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 - Ohio River (Undefined) Quadrangle Powhatan Point 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfil (SWF-1021 / WV0109185)

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

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

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

Company Official Signature _____
Company Official (Typed Name) Sean Gasser
Company Official Title Engineer

RECEIVED
Office of Oil and Gas

JUL 28 2017

Subscribed and sworn before me this 26 day of July, 20 17

Kaitlin McCawley Kaitlin McCawley
Notary Public

My commission expires 5/8/2021

WV Department of
Environmental Protection



Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 17.78 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
Rye Grain	140

Seed Type	lbs/acre
Tall Fescue	40
Ladino Clover	5

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 Medley*

Comments: _____

RECEIVED
Office of Oil and Gas
JUL 28 2017

WV Department of
Environmental Protection

Title: Oil & Gas Inspector Date: 7/27/17

Field Reviewed? () Yes () No



TM 20 - PAR. 27
PPG INDUSTRIES, INC.
119.83 ACRES

TM 21 - PAR. 24
PPG INDUSTRIES, INC.
132.5 ACRES

TM 21 - PAR. 24
PPG INDUSTRIES, INC.
132.5 ACRES

TM 21 - PAR. 24
PPG INDUSTRIES, INC.
132.5 ACRES

TM 21 - PAR. 24
PPG INDUSTRIES, INC.
132.5 ACRES

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.

RECEIVED
Office of Oil and Gas
JUL 28 2017

WV Department of
Environmental Protection
Note:
© - Denotes existing 18" PVC culvert with appropriate sediment outlet control (Rip Rap splash pad).

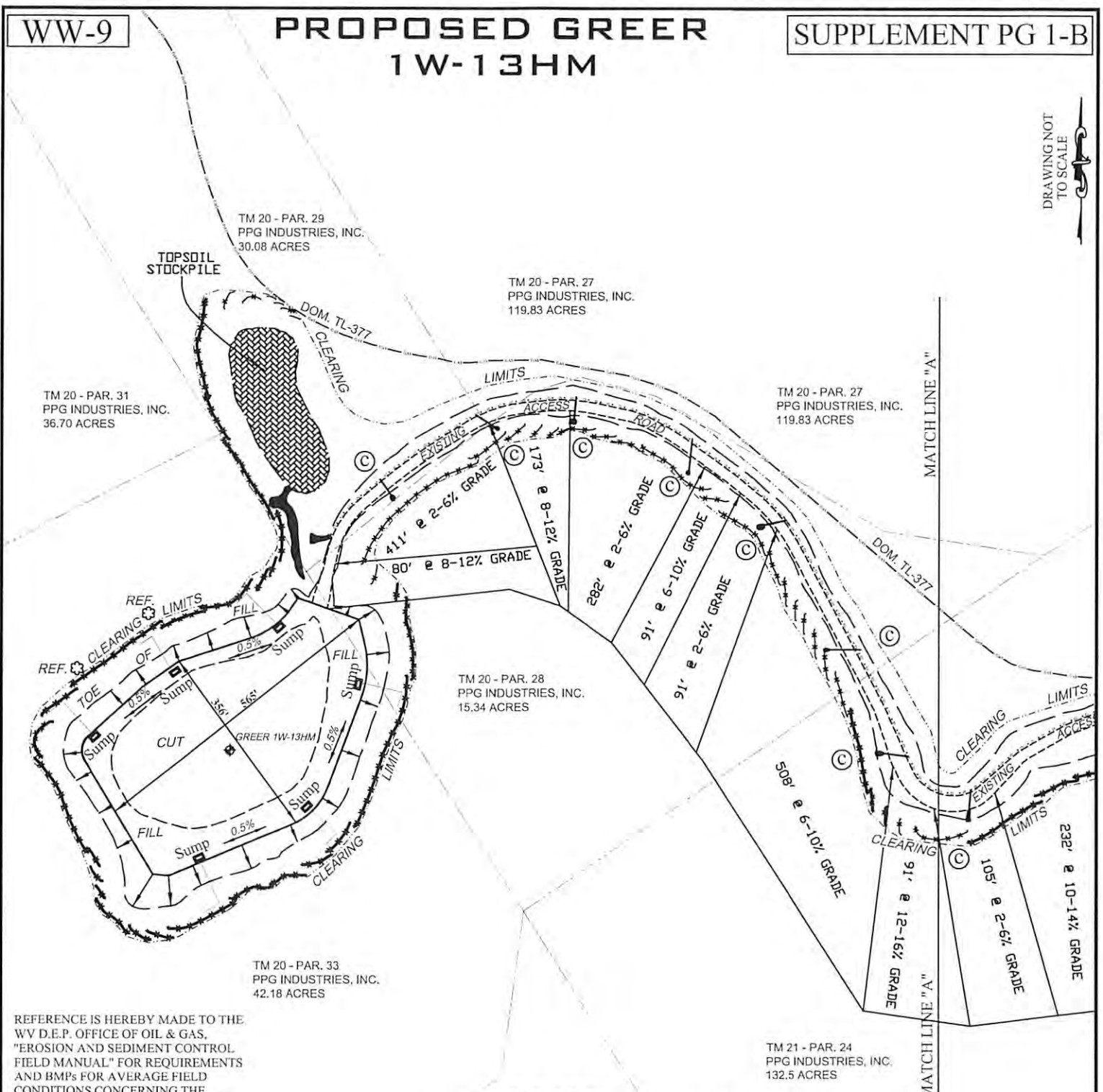
Existing Silt Fence and or Sediment and Erosion Control Measure. (Note Site has Archived 70% Vegetation and E&S can be Removed)

DATE: 07-19-17

PROJECT NO: W0120319

DRAWN BY: J.N.W.

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.

RECEIVED
Office of Oil and Gas

JUL 28 2017

WV Department of
Environmental Protection

Ⓢ Denotes existing 18" PVC culvert with appropriate sediment outlet control (Rip Rap splash pad).

***** Existing Silt Fence and or Sediment and Erosion Control Measure. (Note Site has Archived 70% Vegetation and E&S can be Removed)



Well Site Safety Plan
Tug Hill Operating, LLC *7/27/17*

Well Name: Greer 1W-13HM

Pad Location: Greer Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:
Northing -4,400,811.13
Easting -514,037.45

July 2017

RECEIVED
Office of Oil and Gas

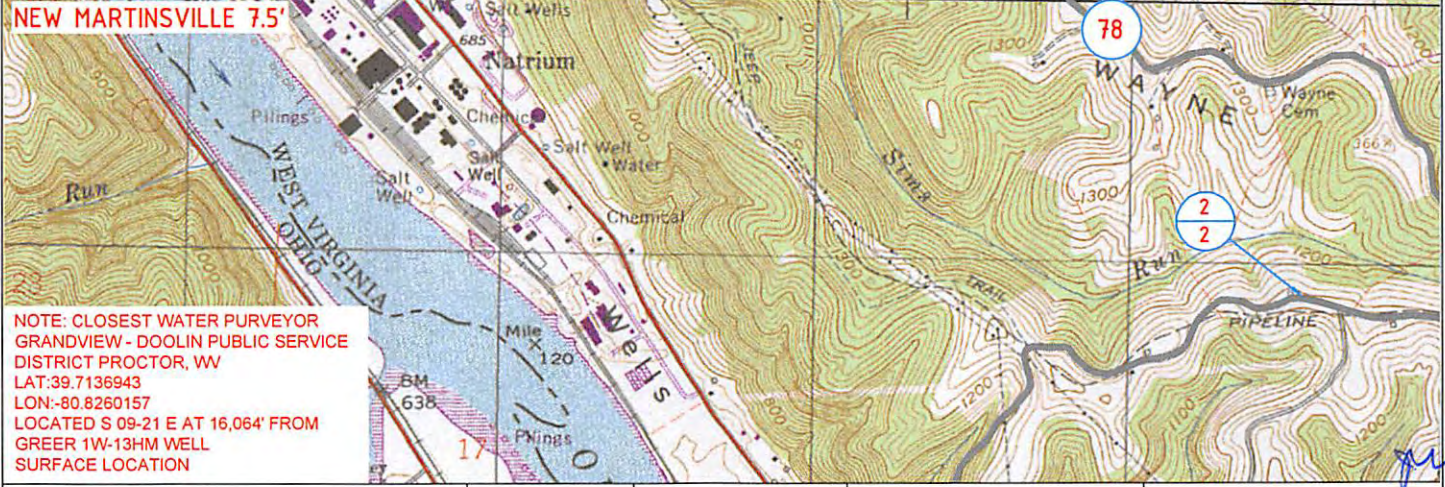
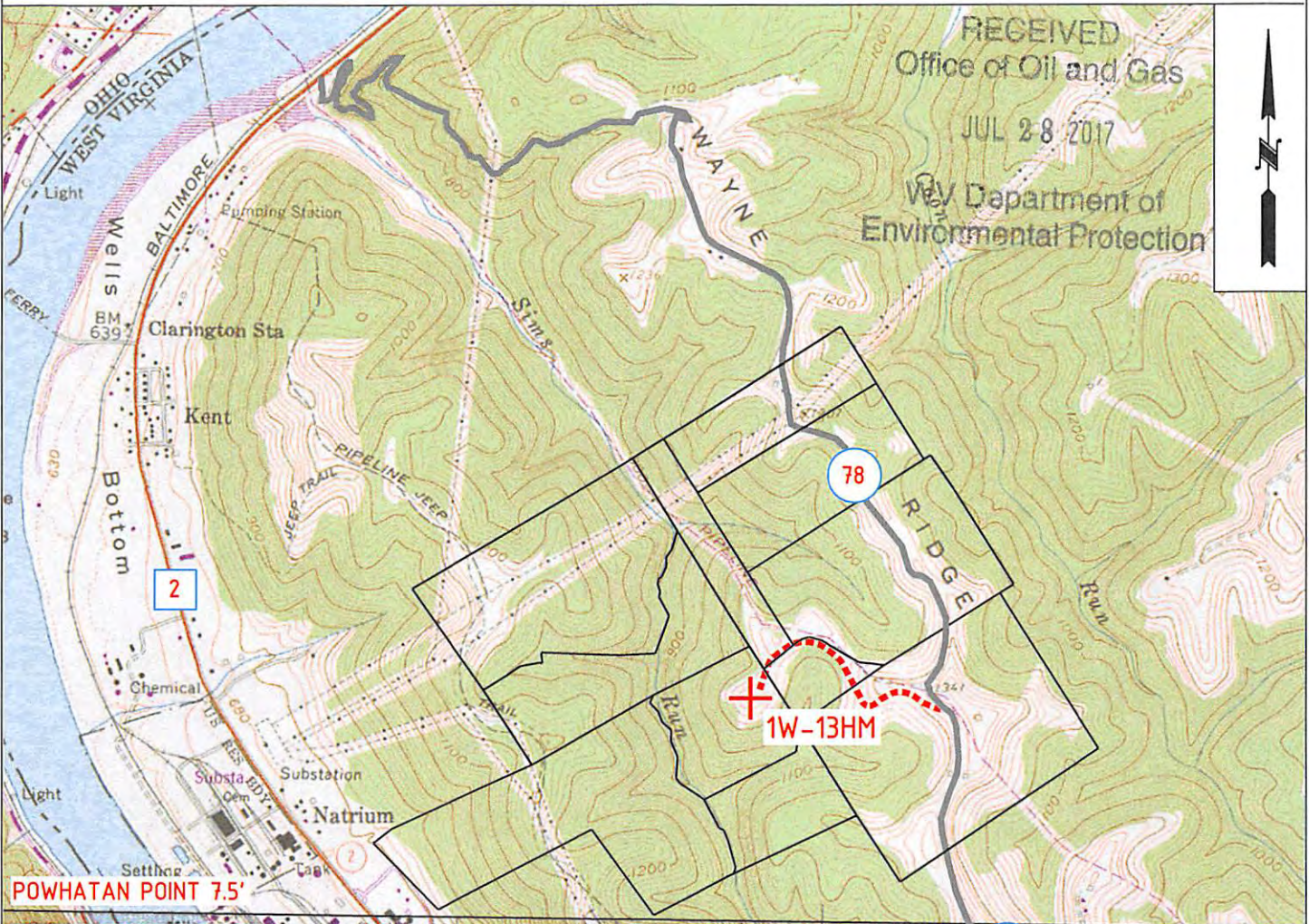
JUL 28 2017

WV Department of
Environmental Protection

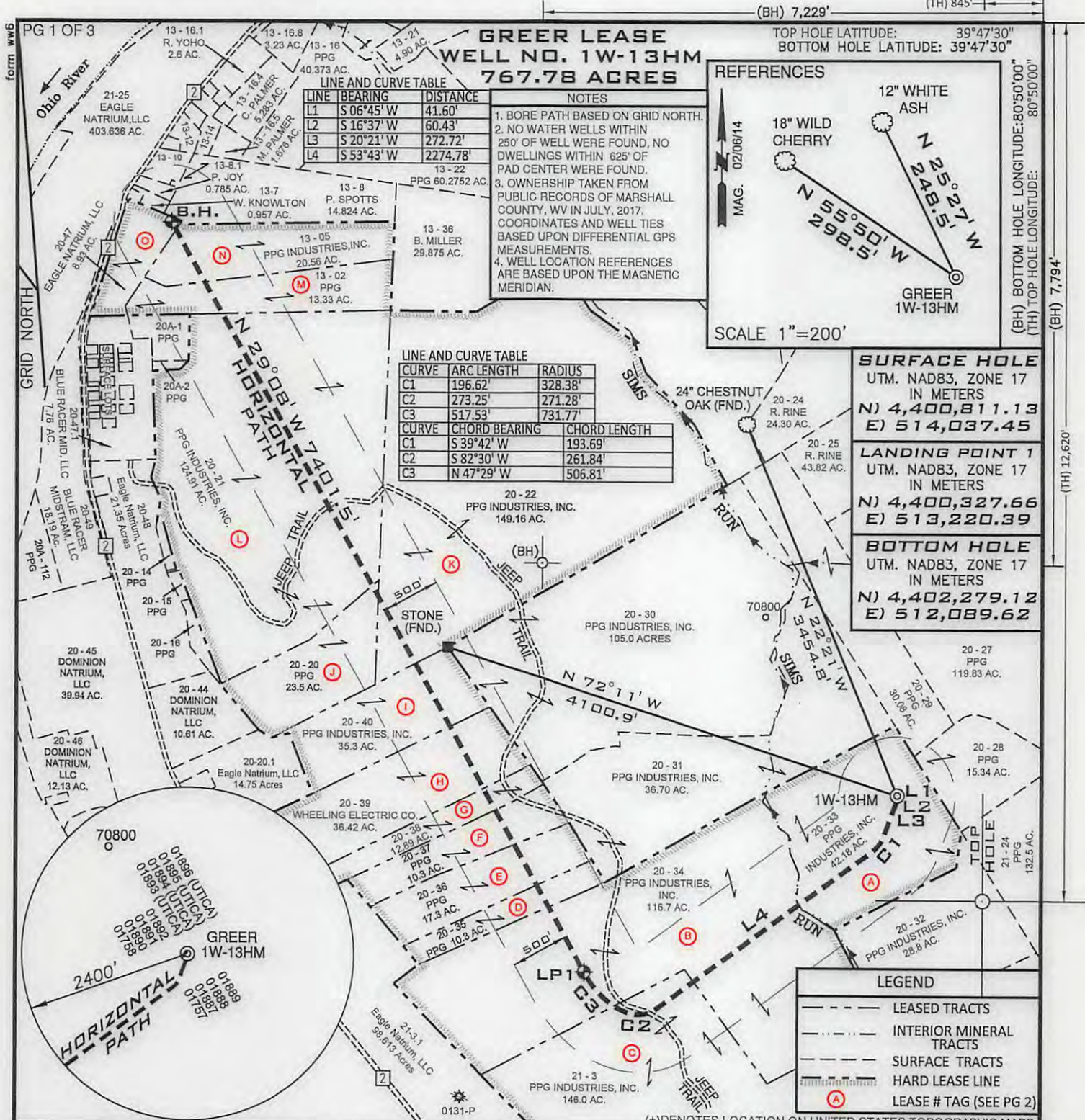
WW-9

PROPOSED GREER 1W-13HM

SUPPLEMENT PG 2



OPERATOR	163-697(CEC)	TOPO SECTION	LEASE NAME
TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWATAN POINT 7.5'	GREER
		SCALE:	DATE:
		1" = 2000'	DATE: 07/19/17



LINE AND CURVE TABLE

LINE	BEARING	DISTANCE
L1	S 06°45' W	41.60'
L2	S 16°37' W	60.43'
L3	S 20°21' W	272.72'
L4	S 53°43' W	2274.78'

NOTES

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 JULY, 2017. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
4. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

LINE AND CURVE TABLE

CURVE	ARC LENGTH	RADIUS
C1	196.62'	328.38'
C2	273.25'	271.28'
C3	517.53'	731.77'

CURVE	CHORD BEARING	CHORD LENGTH
C1	S 39°42' W	193.69'
C2	S 82°30' W	261.84'
C3	N 47°29' W	506.81'

REFERENCES

TOP HOLE LATITUDE: 39°47'30"
 BOTTOM HOLE LATITUDE: 39°47'30"

12" WHITE ASH
 N 25°27' W
 248.5'

18" WILD CHERRY
 N 55°50' W
 298.5'

GREER 1W-13HM

MAG. 02/06/14

SCALE 1"=200'

SURFACE HOLE
 UTM. NAD83, ZONE 17
 IN METERS
 N) 4,400,811.13
 E) 514,037.45

LANDING POINT 1
 UTM. NAD83, ZONE 17
 IN METERS
 N) 4,400,327.66
 E) 513,220.39

BOTTOM HOLE
 UTM. NAD83, ZONE 17
 IN METERS
 N) 4,402,279.12
 E) 512,089.62

LEGEND

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

FILE NUMBER W0120319 (WB1-76)

DRAWING NUMBER GREER_WP_1W-13HM

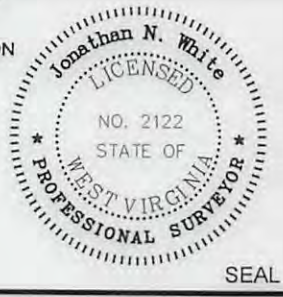
SCALE 1" = 1200'

MINIMUM DEGREE OF ACCURACY 1/2500

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING
GRADE GPS

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

P.S. 2122 *Jonathan N. White*



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

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

LOCATION ELEVATION 1254' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER (UNDEFINED)

DISTRICT FRANKLIN COUNTY MARSHALL

QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER SEE ATTACHED PG 2 THROUGH 3

SURFACE OWNER PPG INDUSTRIES, INC. ACREAGE 42.18

OIL & GAS ROYALTY OWNER PPG INDUSTRIES, INC., ET AL LEASE ACREAGE 767.78

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 PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
 ESTIMATED DEPTH TVD: 6,527' TMD: 15,169'

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

COUNTY NAME
 PERMIT

**GREER WELL NO. 1W-13HM
WELL PLAT LEASE INFORMATION**

LEASE NO.	TAG	PARCEL	OIL & GAS ROYALTY OWNER	BOOK	PAGE
10*14300	A	5-20-33	PPG INDUSTRIES, INC.	725	123
10*14312	A	5-20-33	JAMIE LU BENSON	790	531
10*14313	A	5-20-33	TERRI JEAN GODDARD	790	585
10*14314	A	5-20-33	RALPH BLACHLY	790	529
10*14315	A	5-20-33	MARGARET ROSS	790	527
10*14316	A	5-20-33	ANDREW GERST	791	645
10*14317	A	5-20-33	HAROLD BLACHLY	791	643
10*14318	A	5-20-33	MARTHA BLACHLY-CROSS	792	112
10*14319	A	5-20-33	JACK J. PFALZGRAF	792	118
10*14320	A	5-20-33	SANDRA CHEYNEY	792	91
10*14321	A	5-20-33	HERBERT BLACHLY	792	102
10*14322	A	5-20-33	LOIS KAY MORFORD	792	110
10*14327	A	5-20-33	ROBERT D. OKEY	792	646
10*14328	A	5-20-33	RAE ELLEN STUART	796	38
10*14329	A	5-20-33	TONDA ROTHENBUHLER	796	40
10*14331	A	5-20-33	CHRISTINA JEAN RIOUX	796	70
10*14332	A	5-20-33	MICHAEL EDWARD BARTH	796	68
10*14333	A	5-20-33	DEAN ROTHENBUHLER	796	42
10*14355	A	5-20-33	DEWAYNE STARKEY	815	228
10*14356	A	5-20-33	FREDRIC RICHTER & BETTY RICHTER	822	270
10*14362	A	5-20-33	CAROLYN STARKEY	827	226
10*14368	A	5-20-33	JOSEPH LONG	836	106
10*14371	A	5-20-33	THOMAS F LONG AND JENNIFER LONG	842	398
10*14372	A	5-20-33	UNITED CHURCH HOMES INC	846	408
10*14377	A	5-20-33	JOSEPH A LONG	849	519
10*14387	A	5-20-33	JOHN F LONG AND PAM LONG	849	542
10*14388	A	5-20-33	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO	849	513
10*14398	A	5-20-33	JAN KAFFENBERGER	860	434
10*14399	A	5-20-33	RITA ANN DOEBERT AND RONALD DOLBERT	860	437
10*14400	A	5-20-33	COLEEN SLAGLE AND FRANKLIN SLAGLE JR	860	440
10*14401	A	5-20-33	IMELDA J SCURLOCK	860	443
10*14402	A	5-20-33	CAROL F WILSON AND RICHARD WILSON	860	446
10*14403	A	5-20-33	SUE WHITE	862	429
10*14404	A	5-20-33	DON FORGRAVES	862	426
10*14405	A	5-20-33	JOHN WHITE	862	423
10*14406	A	5-20-33	WILLIAM V BUCKNOR	862	421
10*14407	A	5-20-33	LESLIE F BUCKNOR	862	419
10*14408	A	5-20-33	LORNA M LONG MORGAN	864	323
10*14409	A	5-20-33	JAMES C LONG AND PATTI LONG	864	326
10*14410	A	5-20-33	HENRY T LONG	867	385
10*14411	A	5-20-33	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER	870	34

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

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

**GREER WELL NO. 1W-13HM
WELL PLAT LEASE INFORMATION**

LEASE NO.	TAG	PARCEL	OIL & GAS ROYALTY OWNER	BOOK	PAGE
10*14412	A	5-20-33	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO	872	203
10*14413	A	5-20-33	JUANITA SANDIFER	872	206
10*14416	A	5-20-33	KATHERINE ANN WILLIAMS COTHRAN	879	1
10*14419	A	5-20-33	CROSSROAD CHILD AND FAMILY SERVICES INC	887	105
10*15734	A	5-20-33	GENEVIEVE L LONG	904	13
10*15760	A	5-20-33	DEIRDRE L WINGER AND DANIEL W WINGER	903	645
10*15761	A	5-20-33	CAMERON CEMETERY ASSOCIATION INC	903	642
10*15762	A	5-20-33	DAWN PETROVICH	904	4
10*15763	A	5-20-33	BONNIE J SELDERS	904	34
10*15764	A	5-20-33	JAMES E BUCKNOR	904	28
10*15765	A	5-20-33	JOHN A BUCKNOR AND RHONDA BUCKNOR	904	16
10*15766	A	5-20-33	JOHN J POZENEL	904	7
10*16220	A	5-20-33	WILLIAM LONG	792	95
10*16230	A	5-20-33	JAMES BRIAN YOHO	900	134
10*16355	A	5-20-33	JAMES P LONG AND LINDA L LONG	904	10
10*16356	A	5-20-33	DARYL S BUCKNOR AND JOYCE T BUCKNOR	904	31
10*16357	A	5-20-33	DEANNA M CAMPBELL	904	1
10*16358	A	5-20-33	ANNE MARIE KRAMER AND CHRISTOPHER E CUEVAS	903	648
10*16454	A	5-20-33	CHURCH OF CHRIST OF CAMERON OHIO	900	128
10*14300	B	5-20-34	PPG INDUSTRIES, INC.	725	123
10*14300	B	5-20-34	PPG INDUSTRIES, INC.	725	123
10*14300	C	5-21-3	PPG INDUSTRIES, INC.	725	123
10*14300	C	5-21-3	PPG INDUSTRIES, INC.	725	123
10*14300	D	5-20-35	PPG INDUSTRIES, INC.	725	123
10*14300	E	5-20-36	PPG INDUSTRIES, INC.	725	123
10*14300	F	5-20-37	PPG INDUSTRIES, INC.	725	123
10*14703	G	5-20-38	WHEELING POWER COMPANY AKA WHEELING ELECTRIC COMPANY	786	383
10*14703	H	5-20-39	WHEELING POWER COMPANY AKA WHEELING ELECTRIC COMPANY	786	383
10*14300	I	5-20-40	PPG INDUSTRIES, INC.	725	123
10*14300	J	5-20-20	PPG INDUSTRIES, INC.	725	123
10*14300	K	5-20-22	PPG INDUSTRIES, INC.	725	123
10*14922	K	5-20-22	ROGER R WEESE, SPECIAL COMMISSIONER	836	488
10*14300	L	5-20-21	PPG INDUSTRIES, INC.	725	123
10*14300	M	5-13-2	PPG INDUSTRIES, INC.	725	123
10*14300	N	5-13-5	PPG INDUSTRIES, INC.	725	123
10*14300	O	5-20-47	PPG INDUSTRIES, INC.	725	123

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

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

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

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

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

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

*see attached pages

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

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

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

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

Well Operator: Tug Hill Operating, LLC

By: Amy L. Miller *Amy Miller*

Its: Permitting Specialist - Appalachia Region

Lease Number	TAG	Tax Map/Parcel	LESSOR	ROYALTY	LESSEE	BOOK	PAGE	ASSIGNMENT	ASSIGNMENT	
10*14328	A	5-20-33	RAE ELLEN STUART	1/8+	GASTAR EXPLORATION USA INC	796	38	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14329	A	5-20-33	TONDA ROTHENBUHLER	1/8+	GASTAR EXPLORATON USA INC	796	40	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14331	A	5-20-33	CHRISTINA JEAN RIOUX	1/8+	GASTAR EXPLORATION USA	796	70	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14332	A	5-20-33	MICHAEL EDWARD BARTH	1/8+	GASTAR EXPLORATION USA INC	796	68	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14333	A	5-20-33	DEAN ROTHENBUHLER	1/8+	GASTAR EXPLORATION USA INC	796	42	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14355	A	5-20-33	DEWAYNE STARKEY	1/8+	GASTAR EXPLORATION USA INC	815	228	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14356	A	5-20-33	FREDRIC RICHTER & BETTY RICHTER	1/8+	GASTAR EXPLORATION USA INC	822	270	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14362	A	5-20-33	CAROLYN STARKEY	1/8+	GASTAR EXPLORATION INC	827	226	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14368	A	5-20-33	JOSEPH LONG	1/8+	GASTAR EXPLORATION INC	836	106	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14371	A	5-20-33	THOMAS F LONG AND JENNIFER LONG	1/8+	GASTAR EXPLORATION INC	842	398	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14372	A	5-20-33	UNITED CHURCH HOMES INC	1/8+	GASTAR EXPLORATION INC	846	408	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14377	A	5-20-33	JOSEPH A LONG	1/8+	GASTAR EXPLORATION INC	849	519	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14387	A	5-20-33	JOHN F LONG AND PAM LONG	1/8+	GASTAR EXPLORATION INC	849	542	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14388	A	5-20-33	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO	1/8+	GASTAR EXPLORATION INC	849	513	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14398	A	5-20-33	JAN KAFFENBERGER	1/8+	GASTAR EXPLORATION INC	860	434	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14399	A	5-20-33	RITA ANN DOEBERT AND RONALD DOLBERT	1/8+	GASTAR EXPLORATION INC	860	437	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14400	A	5-20-33	COLEEN SLAGLE AND FRANKLIN SLAGLE JR	1/8+	GASTAR EXPLORATION INC	860	440	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14401	A	5-20-33	IMELDA J SCURLOCK	1/8+	GASTAR EXPLORATION INC	860	443	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14402	A	5-20-33	CAROL F WILSON AND RICHARD WILSON	1/8+	GASTAR EXPLORATION INC	860	446	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14403	A	5-20-33	SUE WHITE	1/8+	GASTAR EXPLORATION INC	862	429	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14404	A	5-20-33	DON FORGRAVES	1/8+	GASTAR EXPLORATION INC	862	426	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC	

Lease Number	TAG	Tax Map/Parcel	LESSOR	ROYALTY	LESSEE	BOOK	PAGE	ASSIGNMENT	ASSIGNMENT	
10*14300	A	5-20-33	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14312	A	5-20-33	JAMIE LU BENSON	1/8+	GASTAR EXPLORATION USA INC	790	531	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14313	A	5-20-33	TERRI JEAN GODDARD	1/8+	GASTAR EXPLORATION USA INC	790	585	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14314	A	5-20-33	RALPH BLACHLY	1/8+	GASTAR EXPLORATION USA INC	790	529	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14315	A	5-20-33	MARGARET ROSS	1/8+	GASTAR EXPLORATION USA INC	790	527	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14316	A	5-20-33	ANDREW GERST	1/8+	GASTAR EXPLORATION USA INC	791	645	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14317	A	5-20-33	HAROLD BLACHLY	1/8+	GASTAR EXPLORATION USA INC	791	643	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14318	A	5-20-33	MARTHA BLACHLY-CROSS	1/8+	GASTAR EXPLORATION USA INC	792	112	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14319	A	5-20-33	JACK J. PFALZGRAF	1/8+	GASTAR EXPLORATION USA INC	792	118	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14320	A	5-20-33	SANDRA CHEYNEY	1/8+	GASTAR EXPLORATION USA INC	792	91	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14321	A	5-20-33	HERBERT BLACHLY	1/8+	GASTAR EXPLORATION USA INC	792	102	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14322	A	5-20-33	LOIS KAY MORFORD	1/8+	GASTAR EXPLORATION USA INC	792	110	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14327	A	5-20-33	ROBERT D. OKEY	1/8+	GASTAR EXPLORATION USA INC	792	646	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	

Lease Number	TAG	Tax Map/Parcel	LESSOR	ROYALTY	LESSEE	BOOK	PAGE	ASSIGNMENT	ASSIGNMENT
10*14405	A	5-20-33	JOHN WHITE	1/8+	GASTAR EXPLORATION INC	862	423	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14406	A	5-20-33	WILLIAM V BUCKNOR	1/8+	GASTAR EXPLORATION INC	862	421	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14407	A	5-20-33	LESLIE F BUCKNOR	1/8+	GASTAR EXPLORATION INC	862	419	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14408	A	5-20-33	LORNA M LONG MORGAN	1/8+	GASTAR EXPLORATION INC	864	323	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14409	A	5-20-33	JAMES C LONG AND PATTI LONG	1/8+	GASTAR EXPLORATION INC	864	326	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14410	A	5-20-33	HENRY T LONG	1/8+	GASTAR EXPLORATION INC	867	385	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14411	A	5-20-33	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER	1/8+	GASTAR EXPLORATION INC	870	34	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14412	A	5-20-33	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO	1/8+	GASTAR EXPLORATION INC	872	203	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14413	A	5-20-33	JUANITA SANDIFER	1/8+	GASTAR EXPLORATION INC	872	206	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14416	A	5-20-33	KATHERINE ANN WILLIAMS COTHRAN	1/8+	GASTAR EXPLORATION INC	879	1	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14419	A	5-20-33	CROSSROAD CHILD AND FAMILY SERVICES INC	1/8+	GASTAR EXPLORATION INC	887	105	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*15734	A	5-20-33	GENEVIEVE L LONG	1/8+	TH EXPLORATION LLC	904	13	N/A	N/A
10*15760	A	5-20-33	DEIRDRE L WINGER AND DANIEL W WINGER	1/8+	TH EXPLORATION LLC	903	645	N/A	N/A
10*15761	A	5-20-33	CAMERON CEMETERY ASSOCIATION INC	1/8+	TH EXPLORATION LLC	903	642	N/A	N/A
10*15762	A	5-20-33	DAWN PETROVICH	1/8+	TH EXPLORATION LLC	904	4	N/A	N/A
10*15763	A	5-20-33	BONNIE J SELDERS	1/8+	TH EXPLORATION LLC	904	34	N/A	N/A
10*15764	A	5-20-33	JAMES E BUCKNOR	1/8+	TH EXPLORATION LLC	904	28	N/A	N/A
10*15765	A	5-20-33	JOHN A BUCKNOR AND RHONDA BUCKNOR	1/8+	TH EXPLORATION LLC	904	16	N/A	N/A
10*15766	A	5-20-33	JOHN J POZENEL	1/8+	TH EXPLORATION LLC	904	7	N/A	N/A
10*16220	A	5-20-33	WILLIAM LONG	1/8+	GASTAR EXPLORATION USA INC	792	95	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*16230	A	5-20-33	JAMES BRIAN YOHO	1/8+	TH EXPLORATION LLC	900	134	N/A	N/A
10*16355	A	5-20-33	JAMES P LONG AND LINDA L LONG	1/8+	TH EXPLORATION LLC	904	10	N/A	N/A
10*16356	A	5-20-33	DARYL S BUCKNOR AND JOYCE	1/8+	TH EXPLORATION LLC	904	31	N/A	N/A
10*16357	A	5-20-33	DEANNA M CAMPBELL	1/8+	TH EXPLORATION LLC	904	1	N/A	N/A
10*16358	A	5-20-33	ANNE MARIE KRAMER AND CHRISTOPHER E CUEVAS	1/8+	TH EXPLORATION LLC	903	648	N/A	N/A
10*16454	A	5-20-33	CHURCH OF CHRIST OF CAMERON OHIO	1/8+	TH EXPLORATION LLC	900	128	N/A	N/A
10*14300	B	5-20-34	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC

Lease Number	TAG	Tax Map/Parcel	LESSOR	ROYALTY	LESSEE	BOOK	PAGE	ASSIGNMENT	ASSIGNMENT
10*14300	B	5-20-34	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	C	5-21-3	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	C	5-21-3	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	D	5-20-35	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	E	5-20-36	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	F	5-20-37	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14703	G	5-20-38	WHEELING POWER COMPANY AKA WHEELING ELECTRIC COMPANY	1/8+	GASTAR EXPLORATION USA INC	786	383	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14703	H	5-20-39	WHEELING POWER COMPANY AKA WHEELING ELECTRIC COMPANY	1/8+	GASTAR EXPLORATION USA INC	786	383	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	I	5-20-40	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	J	5-20-20	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	K	5-20-22	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14922	K	5-20-22	ROGER R WEESE, SPECIAL COMMISSIONER	1/8+	GASTAR EXPLORATION INC	836	488	N/A	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	L	5-20-21	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	M	5-13-2	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14300	N	5-13-5	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC

WW-6A1 Supplement

Operator's Well No. Greer 1W-13HM

Lease Number	TAG	Tax Map/Parcel	LESSOR	ROYALTY	LESSEE	BOOK	PAGE	ASSIGNMENT	ASSIGNMENT	
10*14300	O	5-20-47	PPG INDUSTRIES, INC.	1/8+	GASTAR EXPLORATION USA, INC.	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	

AFFIDAVIT

COPY

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

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

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

FURTHER, AFFIANT SAITH NOT.

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

David D. Kalish
Affiant: David D. Kalish

JURAT

Jan Pest
MARSHALL County 03:44:28 PM
Instrument No 1416299
Date Recorded 10/19/2016
Document Type HIS
Pages Recorded 1
Book-Page 28-62
Recording Fee \$5.00
Additional \$6.00

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

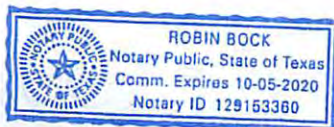
Sworn and subscribed to (or affirmed) before me on this, the 18th day of October, 2016, by David D. Kalish

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

My Commission Expires: 10-05-2020

Signature/Notary Public: Robin Bock

Name/Notary Public (Print): Robin Bock





July 25, 2017

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

RE: Greer 1W-13HM

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Greer 1W-13HM well plat.

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,

A handwritten signature in blue ink that reads "Amy L. Miller". The signature is fluid and cursive, with the first name being the most prominent.

Amy L. Miller
Permitting Specialist – Appalachia Region

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

Date of Notice Certification: 07/27/2017

API No. 47- _____ - _____
Operator's Well No. Greer 1W-13HM
Well Pad Name: Greer

Notice has been given:

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

State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>514,037.45</u>
County: <u>Marshall</u>	Northing: <u>4,400,811.13</u>
District: <u>Franklin</u>	Public Road Access: <u>Waynes Ridge Road - County Route 78</u>
Quadrangle: <u>Powhatan Point 7.5'</u>	Generally used farm name: <u>PPG Industries, Inc.</u>
Watershed: <u>(HUC-10): French Creek - Ohio River (undefined)</u>	

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

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

Required Attachments:

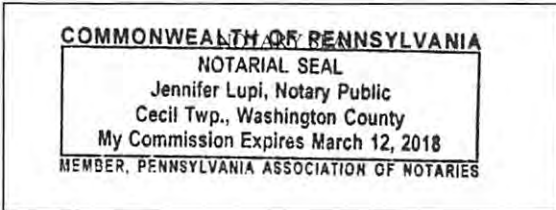
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

Certification of Notice is hereby given:

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

Well Operator: Tug Hill Operating, LLC
By: Amy L. Miller
Its: Permitting Specialist - Appalachia Region
Telephone: 724-749-8388

Address: 380 Southpointe Blvd., Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030
Email: amiller@tug-hill.com



Subscribed and sworn before me this 27th day of July 2017
Jennifer Lupi Notary Public
My Commission Expires March 12, 2018

Oil and Gas Privacy Notice:

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

WW-6A
(9-13)

API NO. 47- 051 -
OPERATOR WELL NO. Greer 1W-13HM
Well Pad Name: Greer

**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: 7/27/2017 **Date Permit Application Filed:** 7/28/2017

Notice of:

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

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

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

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

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

SURFACE OWNER(s)
Name: PPG INDUSTRIES, INC.
Address: 1 PPG PLACE
PITTSBURGH, PA 15272

Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: Same as above surface owner
Address: _____

Name: _____
Address: _____

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

COAL OWNER OR LESSEE
Name: CNX Gas Co.
Address: 1000 Consol Energy Dr.
Canonsburg, PA 15317 *See supplement page

COAL OPERATOR
Name: None
Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: None
Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: None
Address: _____

*Please attach additional forms if necessary

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

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.

WW-6A
(8-13)

API NO. 47- 051 -
OPERATOR WELL NO. Greer 1W-13HM
Well Pad Name: Greer

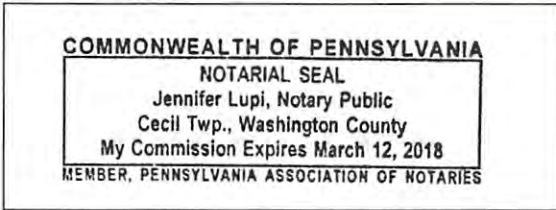
Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC
Telephone: 724-338-2026
Email: amiller@tug-hilltop.com *amy miller*

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 26th day of July 2017.
Jennifer Lupi Notary Public
My Commission Expires March 12, 2018

WW-6A Notice of Application

Supplement Page

Coal Owner(s):

Name: PPG Industries, Inc.
Address: 1 PPG Place
Pittsburgh, PA 15272

Name: Appalachian Power Co. ✓
Address: 1 Riverside Place
Columbus, OH 43215

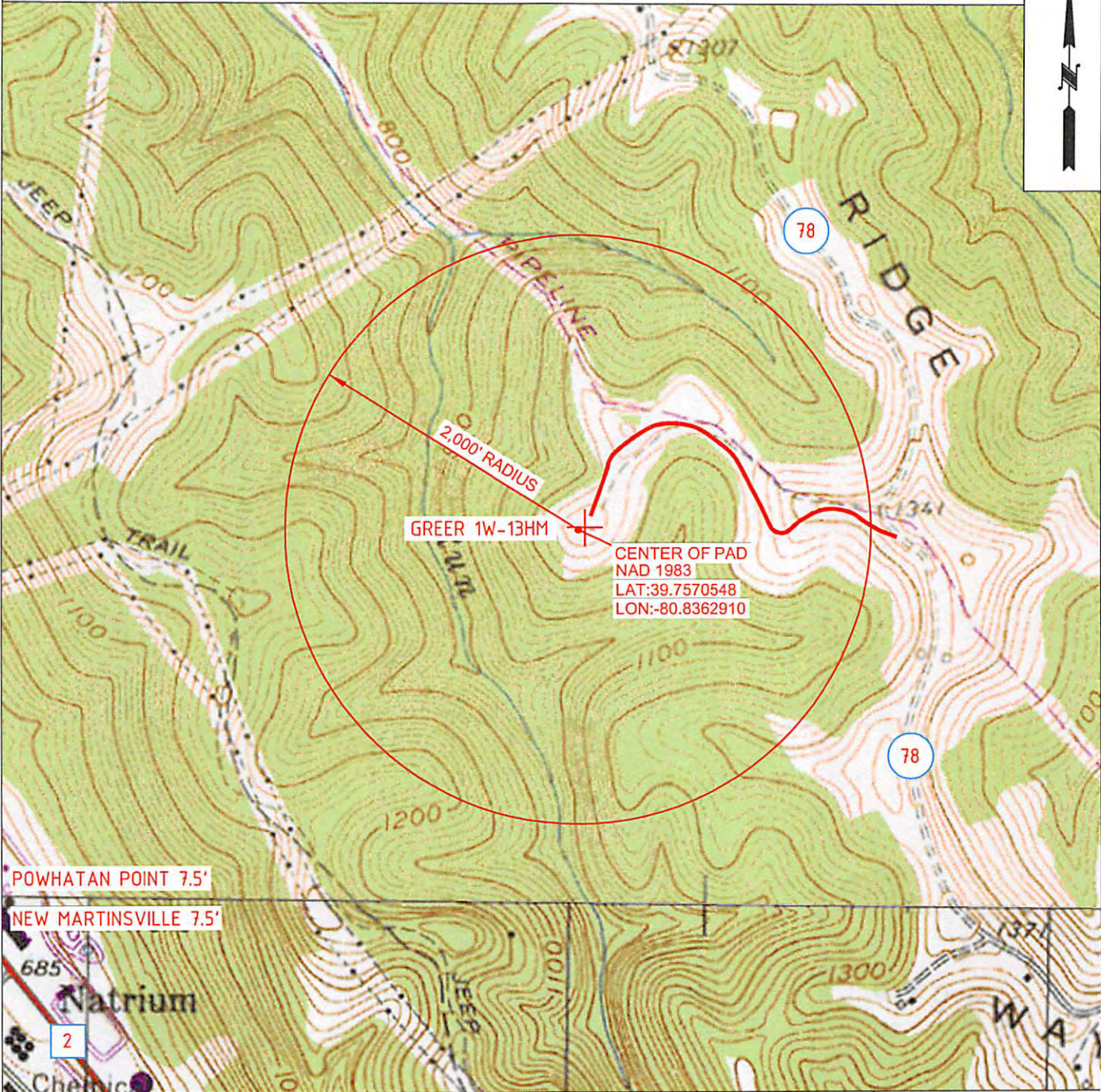
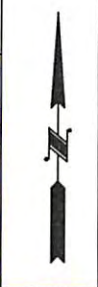
Name: Harry W. Moore, Sr. ✓
Address: 1300 Fifth Street
Moundsville, WV 26041-1917

WW-6A

PROPOSED GREER 1W-13HM

SUPPLEMENT PG 1B

There appears to be NO (0) possible water sources within 2,000'.



 TUG HILL OPERATING	OPERATOR	163-697(CEC)	TOPO SECTION	LEASE NAME
	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	GREER
			SCALE: 1" = 1000'	DATE: DATE: 07/19/17

WW-6A

Supplement Pg. 1A

July 19, 2017
Tug Hill Operating, LLC
380 Southpointe Blvd.,
Southpointe Plaza II, Suite 200
Canonsburg, PA 15317

WATER WELL REPORT

Well: Greer 1W-14HM
District: Franklin
County: Marshall
State: WV

There appears to be No (0) possible water sources within 2,000 feet of the above referenced well location.

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF INTENT TO DRILL

Pursuant to W. Va. Code § 22-6A-16(b), the Notice of Intent to Drill is only required if the notice requirements of W. Va. Code § 22-6A-10(a) have NOT been met or if the Notice of Intent to Drill requirement has NOT been waived in writing by the surface owner.

Notice Time Requirement: Notice shall be provided at least **TEN (10)** days prior to filing a permit application.

Date of Notice: 07/18/2017 **Date Permit Application Filed:** 07/28/2017

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

HAND DELIVERY CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Pursuant to W. Va. Code § 22-6A-16(b), at least ten days prior to filing a permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner notice of its intent to enter upon the surface owner's land for the purpose of drilling a horizontal well: *Provided*, That notice given pursuant to subsection (a), section ten of this article satisfies the requirements of this subsection as of the date the notice was provided to the surface owner: *Provided, however*, That the notice requirements of this subsection may be waived in writing by the surface owner. The notice, if required, shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative.

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

Name: PPG INDUSTRIES, INC.
Address: 1 PPG PLACE
PITTSBURGH, PA 15272

Name: _____
Address: _____

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-16(b), notice is hereby given that the undersigned well operator has an intent to enter upon 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>514,037.45</u>
County:	<u>MARSHALL</u>		Northing:	<u>4,400,811.13</u>
District:	<u>FRANKLIN</u>	Public Road Access:	<u>WAYNE RIDGE ROAD (COUNTY ROUTE 78)</u>	
Quadrangle:	<u>POWHATAN POINT</u>	Generally used farm name:	<u>PPG INDUSTRIES, INC.</u>	
Watershed:	<u>(HUC 10) FRENCH CREEK-OHIO RIVER (UNDEFINED)</u>			

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(b), this notice shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative. 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.

Notice is hereby given by:

Well Operator: TUG HILL OPERATING, LLC.
Address: 380 SOUTHPOINTE BLVD., PLAZA II, SUITE 200
CANONSBURG, PA 15317
Telephone: 724-749-8388
Email: amiller@tug-hillop.com
Facsimile: 724-338-2030

Authorized Representative: AMY L. MILLER - PERMIT SPECIALIST
Address: 380 SOUTHPOINTE BLVD., PLAZA II, SUITE 200
CANONSBURG, PA 15317
Telephone: 304-376-0111
Email: amiller@tug-hillop.com
Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

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

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: 07/24/2017 **Date Permit Application Filed:** 07/28/2017

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

- CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

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

Notice is hereby provided to the SURFACE OWNER(s)

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

Name: <u>PPG Industries, Inc.</u>	Name: <u>None</u>
Address: <u>One PPG Place</u> <u>Pittsburgh, PA 15272</u>	Address: _____

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>514,037.45</u>
County: <u>Marshall</u>		Northing: <u>4,400,811.13</u>
District: <u>Franklin</u>	Public Road Access: <u>Wayne Ridge Road (County Route 78)</u>	
Quadrangle: <u>Powhatan Point 7.5'</u>	Generally used farm name: <u>PPG Industries, Inc.</u>	
Watershed: <u>(HUC 10) French Creek - Ohio River (UNDEFINDED)</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: <u>Tug Hill Operating, LLC</u>	Address: <u>380 Southpointe Blvd, Southpointe Plaza II, Suite 200</u>
Telephone: <u>724-338-2026</u>	<u>Canonsburg, PA 15317</u>
Email: <u>amiller@tug-hillop.com</u>	Facsimile: <u>724-338-2030</u>

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.



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways

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

Jim Justice
Governor

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

July 24, 2017

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

Subject: DOH Permits for the Greer Well Pad, Marshall County

Greer 1S-2HM Well	Greer 1S-3HM Well	Greer 1S-4HM Well
Greer 1N-5HU Well	Greer 1N-7HM Well	Greer 1N-8HM Well
Greer 1N-9HM Well	Greer 1N-10HU Well	Greer 1N-11HU Well
Greer 1N-12HU Well	Greer 1W-13HM Well	Greer 1W-14HM Well

47-051-01953

Dear Mr. Martin,

This well site will be accessed from Permit #06-2014-0151 transferred to Tug Hill Operating for access to the State Road for a well site located off of Marshall County Route 78 SLS.

The 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 January 3, 2012.

Very Truly Yours,

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

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



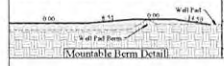
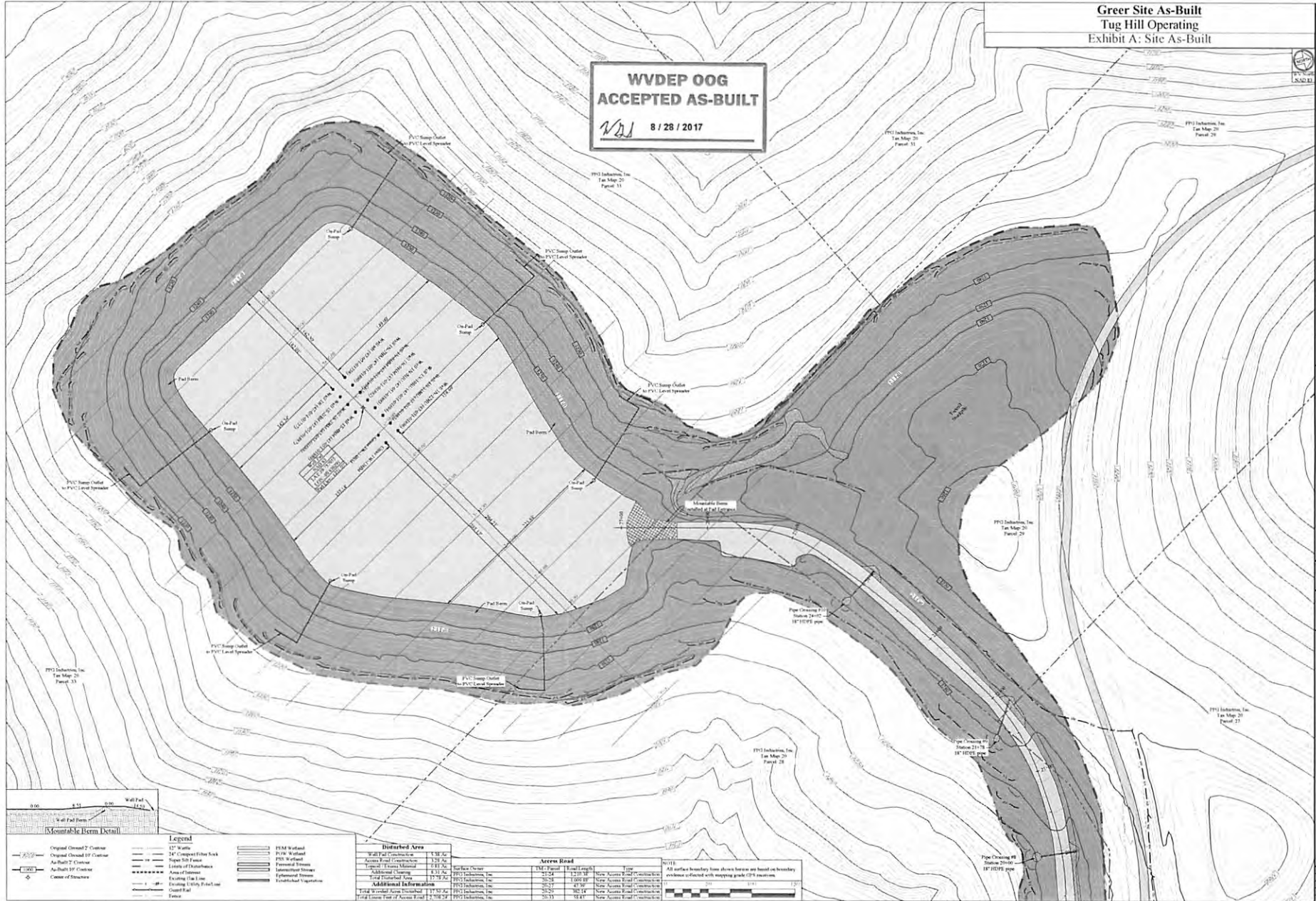
PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Greer 1W-13HM

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

Greer Site As-Built
Tug Hill Operating
Exhibit A: Site As-Built

WVDEP OOG
ACCEPTED AS-BUILT
WJ 8 / 28 / 2017



Legend

Original Contour 2' Contour	12" Waste	15M Wetland
Original Contour 10' Contour	24" Compact Filter Sock	PVC Wetland
As-Built 2' Contour	Super 50 Fabric	PVC Wetland
As-Built 10' Contour	Layers of Disturbance	Perennial Stream
Center of Structure	Area of Disturbance	Intermittent Stream
	Existing (in Line)	Enhanced Stream
	Existing Utility, Pre-1980	Established Vegetation
	Gravel Pad	
	Fence	

Disturbed Area

Wall Pad Construction	538 Sq. Ft.
Access Road Construction	1,239 Sq. Ft.
Layers of Disturbance	1,811 Sq. Ft.
Additional Clearing	8,719 Sq. Ft.
Total Disturbed Area	12,307 Sq. Ft.

Access Road

Access Road	TMU Point	Start Length	Type
PP13 Inclusion, Inc	2124	120.00'	New Access Road Construction
PP13 Inclusion, Inc	2625	1,000.00'	New Access Road Construction
PP13 Inclusion, Inc	2625	47.00'	New Access Road Construction
PP13 Inclusion, Inc	2625	182.00'	New Access Road Construction
PP13 Inclusion, Inc	2625	184'	New Access Road Construction

Additional Information

15M Wetland Area Enclosed	1,112.52 Sq. Ft.
Total Linear Feet of Access Road	2,108.00'

NOTE: All surface boundary lines shown herein are based on boundary evidence collected with survey grade GPS receivers.

Scale: AS SHOWN

DATE: 07/19/2017

DESIGNED BY: ZS

SHEET NO. 11

SHEET 11 OF 13

Site Plan
Greer Site As-Built
 Franklin District
 Marshall County, WV

TUG HILL OPERATING

THIS DOCUMENT PREPARED FOR TUG HILL OPERATING.

KityS Surveying
 1000 1/2 W. Main Street
 Morgantown, WV 26501

DATE: 08/22/2017
 TIME: 10:58:58 AM
 PROJECT: 100000017
 DRAWING: 100000017-01

APP: 100000017-01
 DATE: 08/22/2017
 TIME: 10:58:58 AM

DESIGNED BY: ZS
 CHECKED BY: ZS
 DRAWN BY: ZS
 PROJECT: 100000017