



west virginia department of environmental protection

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

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

Monday, January 30, 2017  
WELL WORK PERMIT  
Horizontal 6A / New Drill

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

FORT WORTH , TX 76107

Re: Permit approval for GREER 1N-5HU  
47-051-01893-00-00

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 1N-5HU  
Farm Name: PPG INDUSTRIES, INC.  
U.S. WELL NUMBER: 47-051-01893-00-00  
Horizontal 6A / New Drill  
Date Issued: 1/30/2017

Promoting a healthy environment.

02/03/2017

# PERMIT CONDITIONS

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

## CONDITIONS

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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](mailto:DEPOOGNotify@wv.gov).



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west virginia department of environmental protection

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

Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
dep.wv.org

January 17, 2017

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

RE: Application for Deep Well Permit – API #47-051-01893

COMPANY: Tug Hill Operating, LLC

FARM: PPG Industries Inc. - Greer 1N-5HU

COUNTY: Marshall DISTRICT: Franklin QUAD: Powhatan Point

The deep well review of the application for the above company is **APPROVED TO DRILL TO TRENTON FOR POINT PLESANT COMPLETION.**

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

1. Comments to Notice of Deviation filed? none
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners; yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells, well name, and the name and address of the operator; none
4. Provided a plat showing that the proposed location is a distance of 400 feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

A handwritten signature in blue ink that reads 'Cindy Raines'.

Cindy Raines  
Program Administrator



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 1N-5HU 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: 1278' Elevation, proposed post-construction: 1251'

5) Well Type (a) Gas  Oil  Underground Storage

Other

(b) If Gas Shallow  Deep

Horizontal

*JL* 1/22/17

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Point Pleasant is the target formation at a depth of 10,891' - 11,011', thickness of 120' and anticipated pressure of approx. 7,500 psi

8) Proposed Total Vertical Depth: 11,161'

9) Formation at Total Vertical Depth: Trenton

10) Proposed Total Measured Depth: 18,832'

11) Proposed Horizontal Leg Length: 6,930'

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: 1740'

15) Approximate Coal Seam Depths: Sewickly Coal - 756' and Pittsburgh Coal - 850'

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: \_\_\_\_\_

WW-6B  
(04/15)

API NO. 47- 051 - 01893  
 OPERATOR WELL NO. Greer 1N-5HU  
 Well Pad Name: Greer

18)

**CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	125'	120'	259FT^3(CTS)
Fresh Water	20"	NEW	J55	106.5#	1,020'	1,010'	1,629ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2,886'	2,876'	2,034ft^3(CTS)
Intermediate	9 5/8"	NEW	HPP110	47#	10,285'	10,275'	3,361ft^3(CTS)
Production	5 1/2"	NEW	P110	23#	18,842'	18,832'	4,338ft^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		11,102'	
Liners							

*1/27/17*

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	20"	26"	.5	2,410	1,928	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.38	2,740	2,192	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.472	10,730	6,968	SEE#24	1.33
Production	5 1/2"	8 1/2"	.415	13,580	10,864	SEE#24	1.17/1.19
Tubing	2 7/8"			14,530	11,624		
Liners							

**PACKERS**

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

WW-6B  
(10/14)

API NO. 47-051 - 01893  
OPERATOR WELL NO. Greer 1N-5HU  
Well Pad Name: Groer

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

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

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

Well to be completed with approximately 21,000,000 lb proppant and 393,701 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 strings will have 1 centralizer every other joint. Production casing will have one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

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

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

*Jan 1/27/17*

25) Proposed borehole conditioning procedures:

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

\*Note: Attach additional sheets as needed.

GREER 1N-5HU WW6B Attachment to #24. (REV 01/27/17)

**Conductor and Surface Casing Cement:**

*Premium NE-1 + 2% CaCl*

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

**Intermediate Casing:**

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

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

**Intermediate Casing (13-3/8", 9-5/8"):**

Lead: *Premium NE-1 + 5% BA-90 + .85% R-3 + 3% KCl + .75 gals/100sk FP-13L + 1% MPA-170*

Tail: *Premium NE-1 + .1% R-3 + 5% KCl + 1% CD-32 + .4% FL-52 + .2% ASA-301 + .6% Sodium Metasilicate*

- Premium NE-1 – Class A Portland API spec
- BA-90 – Gas Migration Mitigator
- R-3 – Cement Retarder
- KCl – Potassium Chloride
- FP-13L – Anti-Foaming Agent
- MPA-170 – Gelling Agent
- CD-32 – Dispersant
- FL-52 – Fluid Loss Agent
- ASA-301 – Free Water Control Agent
- Sodium Metasilicate – Extending Agent

*RC  
1/27/17*

**Kick Off Plug:**

*Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L*

- CD-32 – Dispersant
- Sodium Metasilicate – Extending Agent
- R-3 – Cement Retarder
- FP-13L – Anti-Foaming Agent

**Production Casing Cement:**

Lead: *50:50 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .75 gal/100sk FP-13L*

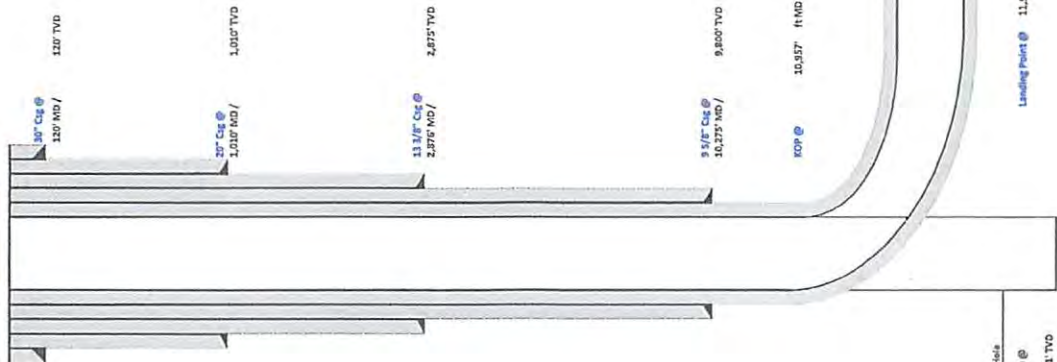
Tail: *25:75 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .375 gal/100sk FP-13L*

- R-3 – Cement Retarder
- MPA-250 – Gelling Agent
- FP-13L – Anti-Foaming Agent





WELL NAME: Greer 2M-SHU  
 STATE: WY COUNTY: Marshall  
 DISTRICT:  
 DE Elev: 1276 ft QLElev: 1251 ft  
 TD: 10,140'  
 TN Latitude: 39.75709272  
 TN Longitude: -80.83627951  
 BH Latitude: 39.75433064  
 BH Longitude: -80.84421198



Formation	Depth TVD
Marechal	6,350'
Onondaga (lg. lims)	6,405'
Oriskany	6,625'
Helderberg	6,724'
Salina	7,679'
Lockport/Newburg	8,078'
Rose Hill	8,426'
Packer Shell	8,685'
Clinton/Medina	8,800'
Quecton	8,891'
Reedsville	9,258'
Ulca	10,714'
Point Pleasant	10,891'
Landing Point	10,921'
Tremem	11,011'

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'	120'	BW	Surface
Surface	26	20	1,010'	1,010'	196.5	J55	Surface
Intermediate 1	17 1/2	13 3/8	2,875'	2,875'	58.5	J55	Surface
Intermediate 2	12 3/4	9 5/8	10,275'	9,800'	47	HPP110	Surface
Production	8 1/2	5 1/2	10,832'	10,921'	23	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Stcks	Csuz	Density	Fluid Type	Centralizer Notes	
Conductor	338	A	15.6	None	
Surface	1,758	A	15.6	3 Centralizers at equal distance	
Intermediate 1	2,802	A	15	1 Centralizer every other ft	
Intermediate 2	1,920	A	14.5	1 Centralizer every other ft	
Production	3,765	A	15	1 every other joint in lateral; 1 per joint in core; 1 every other ft to d/c	

*Handwritten signature and date: 6/1/2011*

PH TO @ 11,611' TVD  
 Landing Point @ 11,502' MD / 10,921' TVD  
 15,832' ft MD  
 10,965' ft TVD

### Area of Review

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

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

#### Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, [dducoeur@dpslandservices.com](mailto:dducoeur@dpslandservices.com) DPS GIS (7/15/2016) 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

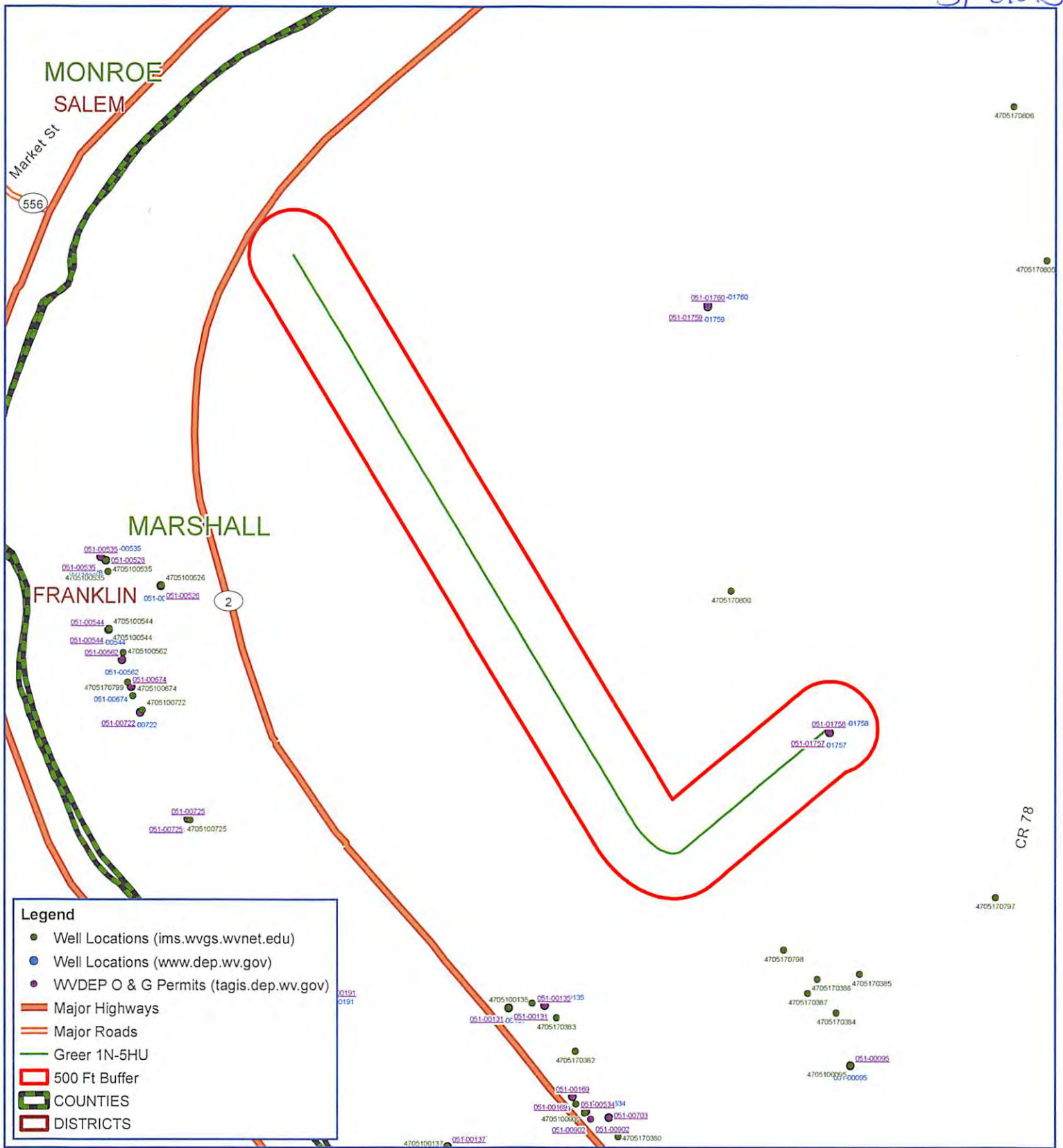
Permit well - Greer 1N-5HU  
Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	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	14668' MD	Marcellus	None	Yes	This is an offset planned Marcellus well. This well will be drilled and fracture stimulated contemporaneously with the Greer 1N-5HU
4705101758	Tug Hill Operating	14420' MD	Marcellus	None	Yes	This is an offset planned Marcellus well. This well will be drilled and fracture stimulated contemporaneously with the Greer 1N-5HU

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





# Greer 1N-5HU Franklin District Marshall County, WV



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

Map Created: September 13, 2016  
Map Current As Of: September 13, 2016

RECEIVED  
Office of Oil and Gas

NOV 14 2016  
Map Prepared by:

WV Department of Environmental Protection  
Page 3 of 3

LAND SERVICES

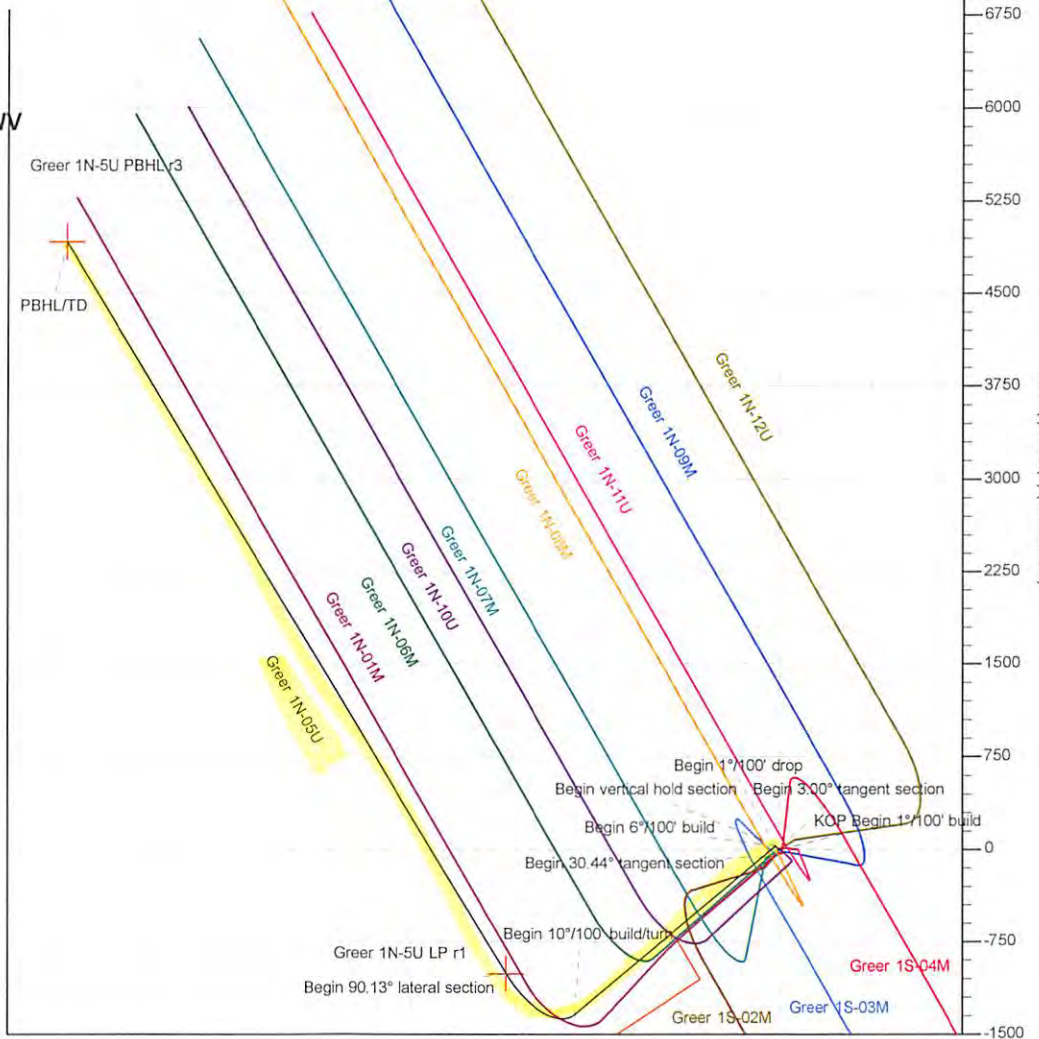
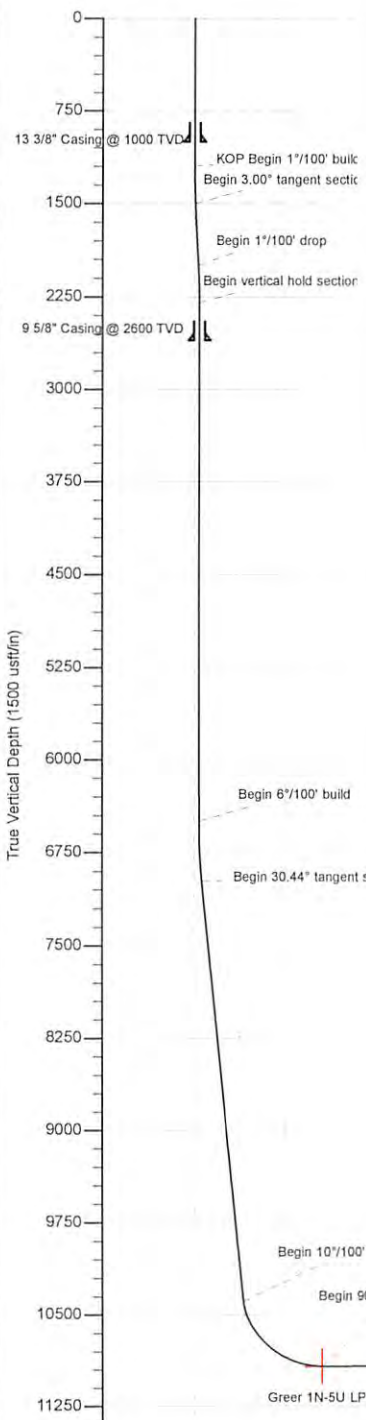
02/03/2017



# TUG HILL OPERATING

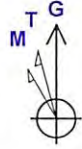
Tug Hill Operating LLC  
 Well: Greer 1N-05U  
 Site: Greer Unit N  
 Project: Marshall County, WV  
 Design: rev3

West(-)/East(+) (1500 usft/in)



### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 1°/100' build
3	1500.00	3.00	315.00	1499.86	5.55	-5.55	1.00	315.00	7.82	Begin 3.00° tangent section
4	2000.00	3.00	315.00	1999.18	24.06	-24.06	0.00	0.00	33.90	Begin 1°/100' drop
5	2300.00	0.00	315.00	2299.04	29.61	-29.61	1.00	180.00	41.73	Begin vertical hold section
6	6500.96	0.00	315.00	6500.00	29.61	-29.61	0.00	315.00	41.73	Begin 6°/100' build
7	7008.37	30.44	230.10	6983.87	-54.85	-130.62	6.00	230.10	64.36	Begin 30.44° tangent section
8	10958.95	30.44	230.10	10388.01	-1338.32	-1665.49	0.00	0.00	408.26	Begin 10°/100' build/turn
9	11901.95	90.13	328.79	10921.00	-1009.70	-2227.62	10.00	97.44	1049.73	Begin 90.13° lateral section
10	18832.37	90.13	328.79	10905.76	4917.52	-5819.09	0.00	0.00	7618.65	PBHL/TD



Azimuths to Grid North  
 True North: -0.10°  
 Magnetic North: -8.73°  
 Magnetic Field  
 Strength: 52281.7snT  
 Dip Angle: 66.98°  
 Date: 7/23/2016  
 Model: IGRF2010

Surface Location: GL @ 1251.00usft  
 Universal Transverse Mercator (US Survey Feet)  
 Zone 17N (84 W to 78 W)  
 Northing: 14438325.00  
 Easting: 1686428.83  
 Latitude: 39.75709256  
 Longitude: -80.83627944

Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Subtract 8.73°

RECEIVED  
 Office of **N-ZONE**

PBHL/TD  
 NOV 14 2016

WV Department of  
 Environmental Protection





Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Greer 1N-05U
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1251.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL @ 1251.00usft
<b>Site:</b>	Greer Unit N	<b>North Reference:</b>	Grid
<b>Well:</b>	Greer 1N-05U	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

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

<b>Site</b>	Greer Unit N				
<b>Site Position:</b>		<b>Northing:</b>	14,438,281.73 usft	<b>Latitude:</b>	39.75697400
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,686,396.99 usft	<b>Longitude:</b>	-80.83639300
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.10 °

<b>Well</b>	Greer 1N-05U					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,438,325.00 usft	<b>Latitude:</b>	39.75709266
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,686,428.82 usft	<b>Longitude:</b>	-80.83627944
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	0.00 usft	<b>Ground Level:</b>	1,251.00 usft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	7/23/2016	-8.63	66.98	52,282

<b>Design</b>	rev3			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	310.20

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	3.00	315.00	1,499.86	5.55	-5.55	1.00	1.00	0.00	315.00	
2,000.00	3.00	315.00	1,999.18	24.06	-24.06	0.00	0.00	0.00	0.00	
2,300.00	0.00	315.00	2,299.04	29.61	-29.61	1.00	-1.00	0.00	180.00	
6,500.96	0.00	315.00	6,500.00	29.61	-29.61	0.00	0.00	0.00	315.00	
7,008.37	30.44	230.10	6,983.87	-54.85	-130.62	6.00	6.00	0.00	230.10	
10,956.95	30.44	230.10	10,388.01	-1,338.32	-1,665.49	0.00	0.00	0.00	0.00	
11,901.95	90.13	328.79	10,921.00	-1,009.70	-2,227.62	10.00	6.32	0.00	0.00	
18,832.37	90.13	328.79	10,905.76	4,917.52	-5,819.09	0.00	0.00	0.00	0.00	

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Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Greer 1N-05U
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1251.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL @ 1251.00usft
<b>Site:</b>	Greer Unit N	<b>North Reference:</b>	Grid
<b>Well:</b>	Greer 1N-05U	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
100.00	0.00	0.00	100.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
200.00	0.00	0.00	200.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
300.00	0.00	0.00	300.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
400.00	0.00	0.00	400.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
500.00	0.00	0.00	500.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
600.00	0.00	0.00	600.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
700.00	0.00	0.00	700.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
800.00	0.00	0.00	800.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
900.00	0.00	0.00	900.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,438,325.00	1,686,428.82	39.75709266	-80.83627944	
<b>KOP Begin 1°/100' build</b>										
1,300.00	1.00	315.00	1,299.99	0.62	-0.62	14,438,325.62	1,686,428.21	39.75709436	-80.83628163	
1,400.00	2.00	315.00	1,399.96	2.47	-2.47	14,438,327.47	1,686,426.36	39.75709945	-80.83628821	
1,500.00	3.00	315.00	1,499.86	5.55	-5.55	14,438,330.55	1,686,423.27	39.75710794	-80.83629916	
<b>Begin 3.00° tangent section</b>										
1,600.00	3.00	315.00	1,599.73	9.25	-9.25	14,438,334.25	1,686,419.57	39.75711812	-80.83631231	
1,700.00	3.00	315.00	1,699.59	12.95	-12.95	14,438,337.95	1,686,415.87	39.75712830	-80.83632545	
1,800.00	3.00	315.00	1,799.45	16.65	-16.65	14,438,341.65	1,686,412.17	39.75713848	-80.83633859	
1,900.00	3.00	315.00	1,899.31	20.36	-20.36	14,438,345.36	1,686,408.47	39.75714867	-80.83635174	
2,000.00	3.00	315.00	1,999.18	24.06	-24.06	14,438,349.06	1,686,404.77	39.75715885	-80.83636488	
<b>Begin 1°/100' drop</b>										
2,100.00	2.00	315.00	2,099.08	27.14	-27.14	14,438,352.14	1,686,401.68	39.75716733	-80.83637583	
2,200.00	1.00	315.00	2,199.05	28.99	-28.99	14,438,353.99	1,686,399.83	39.75717243	-80.83638241	
2,300.00	0.00	315.00	2,299.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
<b>Begin vertical hold section</b>										
2,400.00	0.00	0.00	2,399.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
2,500.00	0.00	0.00	2,499.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
2,600.00	0.00	0.00	2,599.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
2,700.00	0.00	0.00	2,699.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
2,800.00	0.00	0.00	2,799.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
2,900.00	0.00	0.00	2,899.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
3,000.00	0.00	0.00	2,999.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
3,100.00	0.00	0.00	3,099.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
3,200.00	0.00	0.00	3,199.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
3,300.00	0.00	0.00	3,299.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
3,400.00	0.00	0.00	3,399.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
3,500.00	0.00	0.00	3,499.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
3,600.00	0.00	0.00	3,599.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
3,700.00	0.00	0.00	3,699.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
3,800.00	0.00	0.00	3,799.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
3,900.00	0.00	0.00	3,899.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
4,000.00	0.00	0.00	3,999.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
4,100.00	0.00	0.00	4,099.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
4,200.00	0.00	0.00	4,199.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
4,300.00	0.00	0.00	4,299.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
4,400.00	0.00	0.00	4,399.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
4,500.00	0.00	0.00	4,499.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
4,600.00	0.00	0.00	4,599.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
4,700.00	0.00	0.00	4,699.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
4,800.00	0.00	0.00	4,799.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
4,900.00	0.00	0.00	4,899.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	

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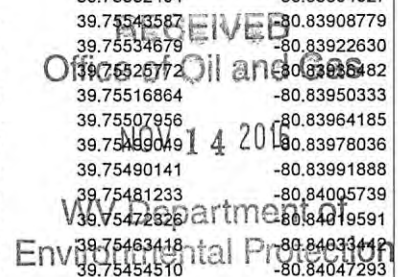




Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Greer 1N-05U
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1251.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL @ 1251.00usft
<b>Site:</b>	Greer Unit N	<b>North Reference:</b>	Grid
<b>Well:</b>	Greer 1N-05U	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,000.00	0.00	0.00	4,999.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
5,100.00	0.00	0.00	5,099.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
5,200.00	0.00	0.00	5,199.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
5,300.00	0.00	0.00	5,299.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
5,400.00	0.00	0.00	5,399.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
5,500.00	0.00	0.00	5,499.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
5,600.00	0.00	0.00	5,599.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
5,700.00	0.00	0.00	5,699.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
5,800.00	0.00	0.00	5,799.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
5,900.00	0.00	0.00	5,899.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
6,000.00	0.00	0.00	5,999.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
6,100.00	0.00	0.00	6,099.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
6,200.00	0.00	0.00	6,199.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
6,300.00	0.00	0.00	6,299.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
6,400.00	0.00	0.00	6,399.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
6,500.00	0.00	0.00	6,499.04	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
6,500.96	0.00	0.00	6,500.00	29.61	-29.61	14,438,354.61	1,686,399.22	39.75717412	-80.83638460	
<b>Begin 6°/100' build</b>										
6,600.00	5.94	230.10	6,598.86	26.32	-33.54	14,438,351.32	1,686,395.28	39.75716510	-80.83639863	
6,700.00	11.94	230.10	6,697.60	16.35	-45.46	14,438,341.35	1,686,383.36	39.75713779	-80.83644110	
6,800.00	17.94	230.10	6,794.18	-0.18	-65.24	14,438,324.82	1,686,363.59	39.75709249	-80.83651156	
6,900.00	23.94	230.10	6,887.53	-23.10	-92.64	14,438,301.90	1,686,336.18	39.75702968	-80.83660923	
7,000.00	29.94	230.10	6,976.63	-52.15	-127.39	14,438,272.85	1,686,301.44	39.75695007	-80.83673304	
7,008.37	30.44	230.10	6,983.87	-54.85	-130.62	14,438,270.15	1,686,298.21	39.75694267	-80.83674455	
<b>Begin 30.44° tangent section</b>										
7,100.00	30.44	230.10	7,062.86	-84.64	-166.23	14,438,240.36	1,686,262.59	39.75686105	-80.83687148	
7,200.00	30.44	230.10	7,149.08	-117.14	-205.10	14,438,207.86	1,686,223.72	39.75677198	-80.83701000	
7,300.00	30.44	230.10	7,235.29	-149.65	-243.98	14,438,175.35	1,686,184.85	39.75668291	-80.83714852	
7,400.00	30.44	230.10	7,321.50	-182.15	-282.85	14,438,142.85	1,686,145.98	39.75659383	-80.83728704	
7,500.00	30.44	230.10	7,407.71	-214.66	-321.72	14,438,110.34	1,686,107.11	39.75650476	-80.83742556	
7,600.00	30.44	230.10	7,493.92	-247.16	-360.59	14,438,077.84	1,686,068.23	39.75641569	-80.83756408	
7,700.00	30.44	230.10	7,580.13	-279.67	-399.46	14,438,045.33	1,686,029.36	39.75632661	-80.83770260	
7,800.00	30.44	230.10	7,666.35	-312.17	-438.33	14,438,012.83	1,685,990.49	39.75623754	-80.83784112	
7,900.00	30.44	230.10	7,752.56	-344.67	-477.20	14,437,980.33	1,685,951.62	39.75614847	-80.83797964	
8,000.00	30.44	230.10	7,838.77	-377.18	-516.08	14,437,947.82	1,685,912.75	39.75605939	-80.83811816	
8,100.00	30.44	230.10	7,924.98	-409.68	-554.95	14,437,915.32	1,685,873.88	39.75597032	-80.83825668	
8,200.00	30.44	230.10	8,011.19	-442.19	-593.82	14,437,882.81	1,685,835.00	39.75588124	-80.83839520	
8,300.00	30.44	230.10	8,097.40	-474.69	-632.69	14,437,850.31	1,685,796.13	39.75579217	-80.83853372	
8,400.00	30.44	230.10	8,183.62	-507.20	-671.56	14,437,817.80	1,685,757.26	39.75570309	-80.83867223	
8,500.00	30.44	230.10	8,269.83	-539.70	-710.43	14,437,785.30	1,685,718.39	39.75561402	-80.83881075	
8,600.00	30.44	230.10	8,356.04	-572.21	-749.30	14,437,752.79	1,685,679.52	39.75552494	-80.83894927	
8,700.00	30.44	230.10	8,442.25	-604.71	-788.18	14,437,720.29	1,685,640.65	39.75543587	-80.83908779	
8,800.00	30.44	230.10	8,528.46	-637.22	-827.05	14,437,687.78	1,685,601.78	39.75534679	-80.83922630	
8,900.00	30.44	230.10	8,614.67	-669.72	-865.92	14,437,655.28	1,685,562.90	39.75525772	-80.83936482	
9,000.00	30.44	230.10	8,700.89	-702.22	-904.79	14,437,622.78	1,685,524.03	39.75516864	-80.83950333	
9,100.00	30.44	230.10	8,787.10	-734.73	-943.66	14,437,590.27	1,685,485.16	39.75507956	-80.83964185	
9,200.00	30.44	230.10	8,873.31	-767.23	-982.53	14,437,557.77	1,685,446.29	39.75499049	-80.83978036	
9,300.00	30.44	230.10	8,959.52	-799.74	-1,021.41	14,437,525.26	1,685,407.42	39.75490141	-80.83991888	
9,400.00	30.44	230.10	9,045.73	-832.24	-1,060.28	14,437,492.76	1,685,368.55	39.75481233	-80.84005739	
9,500.00	30.44	230.10	9,131.95	-864.75	-1,099.15	14,437,460.25	1,685,329.68	39.75472325	-80.84019591	
9,600.00	30.44	230.10	9,218.16	-897.25	-1,138.02	14,437,427.75	1,685,290.80	39.75463418	-80.84033442	
9,700.00	30.44	230.10	9,304.37	-929.76	-1,176.89	14,437,395.24	1,685,251.93	39.75454510	-80.84047293	
9,800.00	30.44	230.10	9,390.58	-962.26	-1,215.76	14,437,362.74	1,685,213.06	39.75445603	-80.84061145	
9,900.00	30.44	230.10	9,476.79	-994.77	-1,254.63	14,437,330.23	1,685,174.19	39.75436695	-80.84074996	



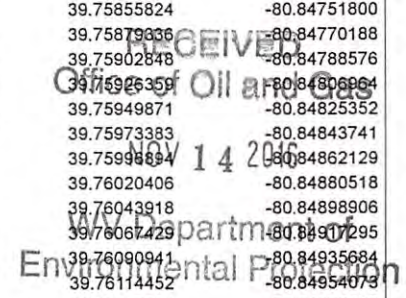




Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Greer 1N-05U
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1251.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL @ 1251.00usft
<b>Site:</b>	Greer Unit N	<b>North Reference:</b>	Grid
<b>Well:</b>	Greer 1N-05U	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,000.00	30.44	230.10	9,563.00	-1,027.27	-1,293.51	14,437,297.73	1,685,135.32	39.75427787	-80.84088847	
10,100.00	30.44	230.10	9,649.22	-1,059.77	-1,332.38	14,437,265.23	1,685,096.45	39.75418879	-80.84102698	
10,200.00	30.44	230.10	9,735.43	-1,092.28	-1,371.25	14,437,232.72	1,685,057.57	39.75409972	-80.84116549	
10,300.00	30.44	230.10	9,821.64	-1,124.78	-1,410.12	14,437,200.22	1,685,018.70	39.75401064	-80.84130401	
10,400.00	30.44	230.10	9,907.85	-1,157.29	-1,448.99	14,437,167.71	1,684,979.83	39.75392156	-80.84144252	
10,500.00	30.44	230.10	9,994.06	-1,189.79	-1,487.86	14,437,135.21	1,684,940.96	39.75383248	-80.84158103	
10,600.00	30.44	230.10	10,080.27	-1,222.30	-1,526.73	14,437,102.70	1,684,902.09	39.75374340	-80.84171954	
10,700.00	30.44	230.10	10,166.49	-1,254.80	-1,565.61	14,437,070.20	1,684,863.22	39.75365432	-80.84185805	
10,800.00	30.44	230.10	10,252.70	-1,287.31	-1,604.48	14,437,037.69	1,684,824.35	39.75356524	-80.84199656	
10,900.00	30.44	230.10	10,338.91	-1,319.81	-1,643.35	14,437,005.19	1,684,785.47	39.75347616	-80.84213506	
10,956.95	30.44	230.10	10,388.01	-1,338.32	-1,665.49	14,436,986.68	1,684,763.34	39.75342543	-80.84221395	
<b>Begin 10°/100' build/turn</b>										
11,000.00	30.16	238.62	10,425.19	-1,350.96	-1,683.09	14,436,974.04	1,684,745.73	39.75339082	-80.84227667	
11,100.00	31.61	257.96	10,511.22	-1,369.55	-1,730.29	14,436,955.45	1,684,698.53	39.75333998	-80.84244473	
11,200.00	35.64	274.56	10,594.65	-1,372.71	-1,785.11	14,436,952.29	1,684,643.72	39.75333157	-80.84263977	
11,300.00	41.48	287.63	10,672.94	-1,360.33	-1,845.87	14,436,964.67	1,684,582.96	39.75336586	-80.84285587	
11,400.00	48.49	297.76	10,743.72	-1,332.80	-1,910.73	14,436,992.20	1,684,518.10	39.75344179	-80.84308648	
11,500.00	56.20	305.82	10,804.83	-1,290.94	-1,977.72	14,437,034.06	1,684,451.10	39.75355707	-80.84332458	
11,600.00	64.35	312.51	10,854.42	-1,236.03	-2,044.81	14,437,088.97	1,684,384.02	39.75370818	-80.84356293	
11,700.00	72.76	318.32	10,890.98	-1,169.74	-2,109.95	14,437,155.26	1,684,318.87	39.75389054	-80.84379430	
11,800.00	81.32	323.63	10,913.40	-1,094.09	-2,171.17	14,437,230.91	1,684,257.65	39.75409861	-80.84401166	
11,900.00	89.96	328.69	10,921.00	-1,011.36	-2,226.61	14,437,313.64	1,684,202.21	39.75432607	-80.84420840	
11,901.95	90.13	328.79	10,921.00	-1,009.70	-2,227.62	14,437,315.30	1,684,201.20	39.75433064	-80.84421198	
<b>Begin 90.13° lateral section</b>										
12,000.00	90.13	328.79	10,920.78	-925.84	-2,278.43	14,437,399.16	1,684,150.39	39.75456119	-80.84439226	
12,100.00	90.13	328.79	10,920.56	-840.31	-2,330.25	14,437,484.69	1,684,098.57	39.75476631	-80.84457612	
12,200.00	90.13	328.79	10,920.34	-754.79	-2,382.08	14,437,570.21	1,684,046.75	39.75503143	-80.84475997	
12,300.00	90.13	328.79	10,920.13	-669.26	-2,433.90	14,437,655.74	1,683,994.93	39.75526656	-80.84494383	
12,400.00	90.13	328.79	10,919.91	-583.74	-2,485.72	14,437,741.26	1,683,943.10	39.75550168	-80.84512769	
12,500.00	90.13	328.79	10,919.69	-498.21	-2,537.54	14,437,826.79	1,683,891.28	39.75573680	-80.84531156	
12,600.00	90.13	328.79	10,919.47	-412.69	-2,589.36	14,437,912.31	1,683,839.46	39.75597192	-80.84549542	
12,700.00	90.13	328.79	10,919.25	-327.17	-2,641.19	14,437,997.83	1,683,787.64	39.75620704	-80.84567929	
12,800.00	90.13	328.79	10,919.03	-241.64	-2,693.01	14,438,083.36	1,683,735.82	39.75644216	-80.84586315	
12,900.00	90.13	328.79	10,918.81	-156.12	-2,744.83	14,438,168.88	1,683,683.99	39.75667729	-80.84604702	
13,000.00	90.13	328.79	10,918.59	-70.59	-2,796.65	14,438,254.41	1,683,632.17	39.75691241	-80.84623089	
13,100.00	90.13	328.79	10,918.37	14.93	-2,848.47	14,438,339.93	1,683,580.35	39.75714753	-80.84641476	
13,200.00	90.13	328.79	10,918.15	100.46	-2,900.29	14,438,425.46	1,683,528.53	39.75738265	-80.84659863	
13,300.00	90.13	328.79	10,917.93	185.98	-2,952.12	14,438,510.98	1,683,476.71	39.75761777	-80.84678250	
13,400.00	90.13	328.79	10,917.71	271.51	-3,003.94	14,438,596.51	1,683,424.89	39.75785288	-80.84696637	
13,500.00	90.13	328.79	10,917.49	357.03	-3,055.76	14,438,682.03	1,683,373.06	39.75808800	-80.84715025	
13,600.00	90.13	328.79	10,917.27	442.56	-3,107.58	14,438,767.56	1,683,321.24	39.75832312	-80.84733412	
13,700.00	90.13	328.79	10,917.05	528.08	-3,159.40	14,438,853.08	1,683,269.42	39.75855824	-80.84751800	
13,800.00	90.13	328.79	10,916.83	613.61	-3,211.23	14,438,938.61	1,683,217.60	39.75879336	-80.84770188	
13,900.00	90.13	328.79	10,916.61	699.13	-3,263.05	14,439,024.13	1,683,165.78	39.75902848	-80.84788576	
14,000.00	90.13	328.79	10,916.39	784.65	-3,314.87	14,439,109.65	1,683,113.95	39.75926359	-80.84806964	
14,100.00	90.13	328.79	10,916.17	870.18	-3,366.69	14,439,195.18	1,683,062.13	39.75949871	-80.84825352	
14,200.00	90.13	328.79	10,915.95	955.70	-3,418.51	14,439,280.70	1,683,010.31	39.75973383	-80.84843741	
14,300.00	90.13	328.79	10,915.73	1,041.23	-3,470.33	14,439,366.23	1,682,958.49	39.75996894	-80.84862129	
14,400.00	90.13	328.79	10,915.51	1,126.75	-3,522.16	14,439,451.75	1,682,906.67	39.76020406	-80.84880518	
14,500.00	90.13	328.79	10,915.29	1,212.28	-3,573.98	14,439,537.28	1,682,854.84	39.76043918	-80.84898906	
14,600.00	90.13	328.79	10,915.07	1,297.80	-3,625.80	14,439,622.80	1,682,803.02	39.76067429	-80.84917295	
14,700.00	90.13	328.79	10,914.85	1,383.33	-3,677.62	14,439,708.33	1,682,751.20	39.76090941	-80.84935684	
14,800.00	90.13	328.79	10,914.63	1,468.85	-3,729.44	14,439,793.85	1,682,699.38	39.76114452	-80.84954073	
14,900.00	90.13	328.79	10,914.41	1,554.38	-3,781.27	14,439,879.38	1,682,647.56	39.76137964	-80.84972463	







Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Greer 1N-05U
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1251.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL @ 1251.00usft
<b>Site:</b>	Greer Unit N	<b>North Reference:</b>	Grid
<b>Well:</b>	Greer 1N-05U	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

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	90.13	328.79	10,914.19	1,639.90	-3,833.09	14,439,964.90	1,682,595.74	39.76161475	-80.84990852	
15,100.00	90.13	328.79	10,913.97	1,725.42	-3,884.91	14,440,050.42	1,682,543.91	39.76184987	-80.85009241	
15,200.00	90.13	328.79	10,913.75	1,810.95	-3,936.73	14,440,135.95	1,682,492.09	39.76208498	-80.85027631	
15,300.00	90.13	328.79	10,913.53	1,896.47	-3,988.55	14,440,221.47	1,682,440.27	39.76232009	-80.85046021	
15,400.00	90.13	328.79	10,913.31	1,982.00	-4,040.38	14,440,307.00	1,682,388.45	39.76255521	-80.85064411	
15,500.00	90.13	328.79	10,913.09	2,067.52	-4,092.20	14,440,392.52	1,682,336.63	39.76279032	-80.85082801	
15,600.00	90.13	328.79	10,912.87	2,153.05	-4,144.02	14,440,478.05	1,682,284.80	39.76302543	-80.85101191	
15,700.00	90.13	328.79	10,912.65	2,238.57	-4,195.84	14,440,563.57	1,682,232.98	39.76326054	-80.85119581	
15,800.00	90.13	328.79	10,912.43	2,324.10	-4,247.66	14,440,649.10	1,682,181.16	39.76349566	-80.85137971	
15,900.00	90.13	328.79	10,912.21	2,409.62	-4,299.48	14,440,734.62	1,682,129.34	39.76373077	-80.85156362	
16,000.00	90.13	328.79	10,911.99	2,495.15	-4,351.31	14,440,820.15	1,682,077.52	39.76396588	-80.85174752	
16,100.00	90.13	328.79	10,911.77	2,580.67	-4,403.13	14,440,905.67	1,682,025.70	39.76420099	-80.85193143	
16,200.00	90.13	328.79	10,911.55	2,666.19	-4,454.95	14,440,991.19	1,681,973.87	39.76443610	-80.85211534	
16,300.00	90.13	328.79	10,911.33	2,751.72	-4,506.77	14,441,076.72	1,681,922.05	39.76467121	-80.85229925	
16,400.00	90.13	328.79	10,911.11	2,837.24	-4,558.59	14,441,162.24	1,681,870.23	39.76490632	-80.85248316	
16,500.00	90.13	328.79	10,910.89	2,922.77	-4,610.42	14,441,247.77	1,681,818.41	39.76514143	-80.85266707	
16,600.00	90.13	328.79	10,910.67	3,008.29	-4,662.24	14,441,333.29	1,681,766.59	39.76537654	-80.85285099	
16,700.00	90.13	328.79	10,910.45	3,093.82	-4,714.06	14,441,418.82	1,681,714.76	39.76561165	-80.85303490	
16,800.00	90.13	328.79	10,910.23	3,179.34	-4,765.88	14,441,504.34	1,681,662.94	39.76584676	-80.85321882	
16,900.00	90.13	328.79	10,910.01	3,264.87	-4,817.70	14,441,589.87	1,681,611.12	39.76608187	-80.85340273	
17,000.00	90.13	328.79	10,909.79	3,350.39	-4,869.52	14,441,675.39	1,681,559.30	39.76631698	-80.85358665	
17,100.00	90.13	328.79	10,909.57	3,435.92	-4,921.35	14,441,760.92	1,681,507.48	39.76655209	-80.85377057	
17,200.00	90.13	328.79	10,909.35	3,521.44	-4,973.17	14,441,846.44	1,681,455.66	39.76678719	-80.85395449	
17,300.00	90.13	328.79	10,909.13	3,606.96	-5,024.99	14,441,931.96	1,681,403.83	39.76702230	-80.85413841	
17,400.00	90.13	328.79	10,908.91	3,692.49	-5,076.81	14,442,017.49	1,681,352.01	39.76725741	-80.85432234	
17,500.00	90.13	328.79	10,908.69	3,778.01	-5,128.63	14,442,103.01	1,681,300.19	39.76749252	-80.85450626	
17,600.00	90.13	328.79	10,908.47	3,863.54	-5,180.46	14,442,188.54	1,681,248.37	39.76772762	-80.85469019	
17,700.00	90.13	328.79	10,908.25	3,949.06	-5,232.28	14,442,274.06	1,681,196.55	39.76796273	-80.85487412	
17,800.00	90.13	328.79	10,908.03	4,034.59	-5,284.10	14,442,359.59	1,681,144.72	39.76819783	-80.85505804	
17,900.00	90.13	328.79	10,907.81	4,120.11	-5,335.92	14,442,445.11	1,681,092.90	39.76843294	-80.85524197	
18,000.00	90.13	328.79	10,907.59	4,205.64	-5,387.74	14,442,530.64	1,681,041.08	39.76866805	-80.85542591	
18,100.00	90.13	328.79	10,907.37	4,291.16	-5,439.56	14,442,616.16	1,680,989.26	39.76890315	-80.85560984	
18,200.00	90.13	328.79	10,907.15	4,376.69	-5,491.39	14,442,701.69	1,680,937.44	39.76913826	-80.85579377	
18,300.00	90.13	328.79	10,906.93	4,462.21	-5,543.21	14,442,787.21	1,680,885.62	39.76937336	-80.85597771	
18,400.00	90.13	328.79	10,906.71	4,547.73	-5,595.03	14,442,872.73	1,680,833.79	39.76960847	-80.85616164	
18,500.00	90.13	328.79	10,906.49	4,633.26	-5,646.85	14,442,958.26	1,680,781.97	39.76984357	-80.85634558	
18,600.00	90.13	328.79	10,906.27	4,718.78	-5,698.67	14,443,043.78	1,680,730.15	39.77007867	-80.85652952	
18,700.00	90.13	328.79	10,906.05	4,804.31	-5,750.50	14,443,129.31	1,680,678.33	39.77031378	-80.85671346	
18,800.00	90.13	328.79	10,905.83	4,889.83	-5,802.32	14,443,214.83	1,680,626.51	39.77054888	-80.85689740	
18,832.37	90.13	328.79	10,905.76	4,917.52	-5,819.09	14,443,242.52	1,680,609.73	39.77062498	-80.85695694	
PBHL/TD										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Greer 1N-5U PBHL r3	0.00	0.01	10,905.76	4,918.03	-5,818.66	14,443,243.03	1,680,610.17	39.77062639	-80.85695538	
- plan misses target center by 0.67usft at 18832.37usft MD (10905.76 TVD, 4917.52 N, -5819.09 E)										
- Point										
Greer 1N-5U LP r1	0.00	0.01	10,921.00	-1,009.70	-2,227.62	14,437,315.30	1,684,201.20	39.75433064	-80.84421198	
- plan hits target center										
- Point										





Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Greer 1N-05U
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1251.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL @ 1251.00usft
<b>Site:</b>	Greer Unit N	<b>North Reference:</b>	Grid
<b>Well:</b>	Greer 1N-05U	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,000.00	1,000.00	13 3/8" Casing @ 1000 TVD	13-3/8	17-1/2	
2,600.96	2,600.00	9 5/8" Casing @ 2600 TVD	9-5/8	12-1/4	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,200.00	1,200.00	0.00	0.00	KOP Begin 1°/100' build	
1,500.00	1,499.86	5.55	-5.55	Begin 3.00° tangent section	
2,000.00	1,999.18	24.06	-24.06	Begin 1°/100' drop	
2,300.00	2,299.04	29.61	-29.61	Begin vertical hold section	
6,500.96	6,500.00	29.61	-29.61	Begin 6°/100' build	
7,008.37	6,983.87	-54.85	-130.62	Begin 30.44° tangent section	
10,956.95	10,388.01	-1,338.32	-1,665.49	Begin 10°/100' build/turn	
11,901.95	10,921.00	-1,009.70	-2,227.62	Begin 90.13° lateral section	
18,832.37	10,905.76	4,917.52	-5,819.09	PBHL/TD	

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 Office of Oil and Gas  
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 WV Department of  
 Environmental Protection

SI-01893



global environmental solutions

# Well Site Safety Plan

## Tug Hill Operating, LLC

*SLR*  
11/9/16

**Well Name:** Greer 1N-5HU

**Pad Location:** Greer Pad  
Marshall County, West Virginia

**UTM (meters), NAD83, Zone 17:**  
Northing – 4,400,810.30  
Easting – 514,024.50

SLR Ref: 116.01631.00005

RECEIVED  
Office of ~~October 2016~~

NOV 14 2016

WV Department of  
Environmental Protection



02/03/2017



WW-9  
(4/16)

API Number 47 - 051 - 01893  
Operator's Well No. Greer 1N-5HU

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 Landfill (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 [Signature]

Company Official (Typed Name) David Patterson

Company Official Title Senior Vice President, Operations

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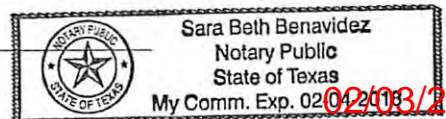
WV Department of  
Environmental Protection

Subscribed and sworn before me this 2nd day of November, 20 16

Sara Beth Benavidez

Notary Public

My commission expires 2-4-18



SI-01893

Form WW-9

Operator's Well No. Greer 1N-5HU

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	Seed Type	lbs/acre
Rye Grain	140	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 Nicholas

Comments:

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WV Department of Environmental Protection

Title: Oil & Gas Inspector Date: 11/9/16

Field Reviewed? (X) Yes ( ) No

WW-9

# PROPOSED GREER 1 N-5HU

SUPPLEMENT PG 1-A



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

MATCH LINE "A"

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

TO ST. RT. 2

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

DOM. TL-377

508' @ 6-10% GRADE

91' @ 12-16% GRADE

105' @ 2-6% GRADE

232' @ 10-14% GRADE

376' @ 2-6% GRADE

201' @ 12-16% GRADE

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

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

MATCH LINE "A"

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.

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© - Denotes install 18" PVC culvert and apply appropriate sediment outlet control (Rip Rap splash pad).

----- Silt Fence and/or Sediment and Erosion Control Measure.

DATE: 10/26/16

PROJECT NO: W0120319

DRAWN BY: J.N.W.

02/03/2017



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.

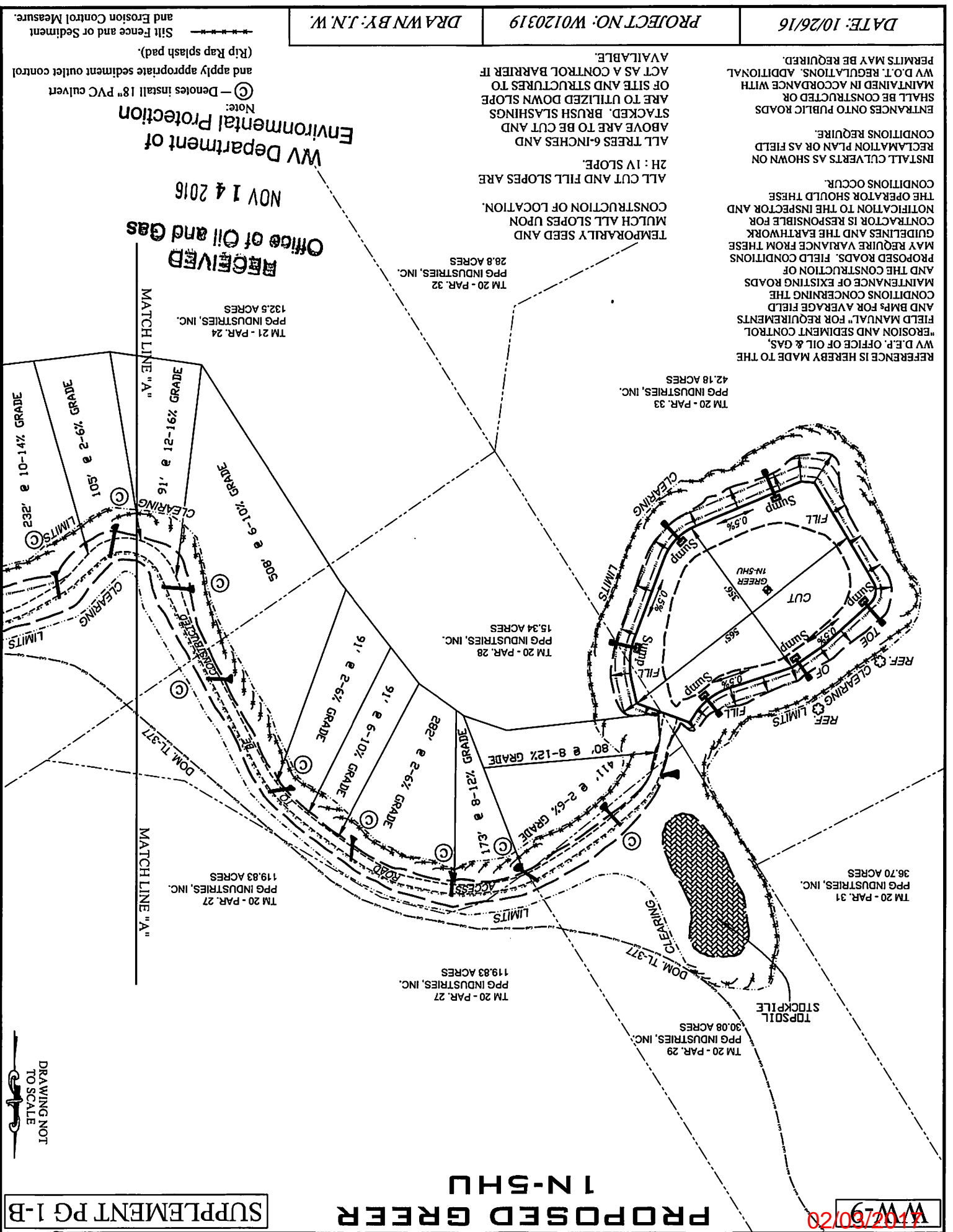
ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.

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.

WV Department of Environmental Protection

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



**PROPOSED GREER 1N-5SHU**

SUPPLEMENT PG 1-B

10/26/2016

DRAWING NOT TO SCALE

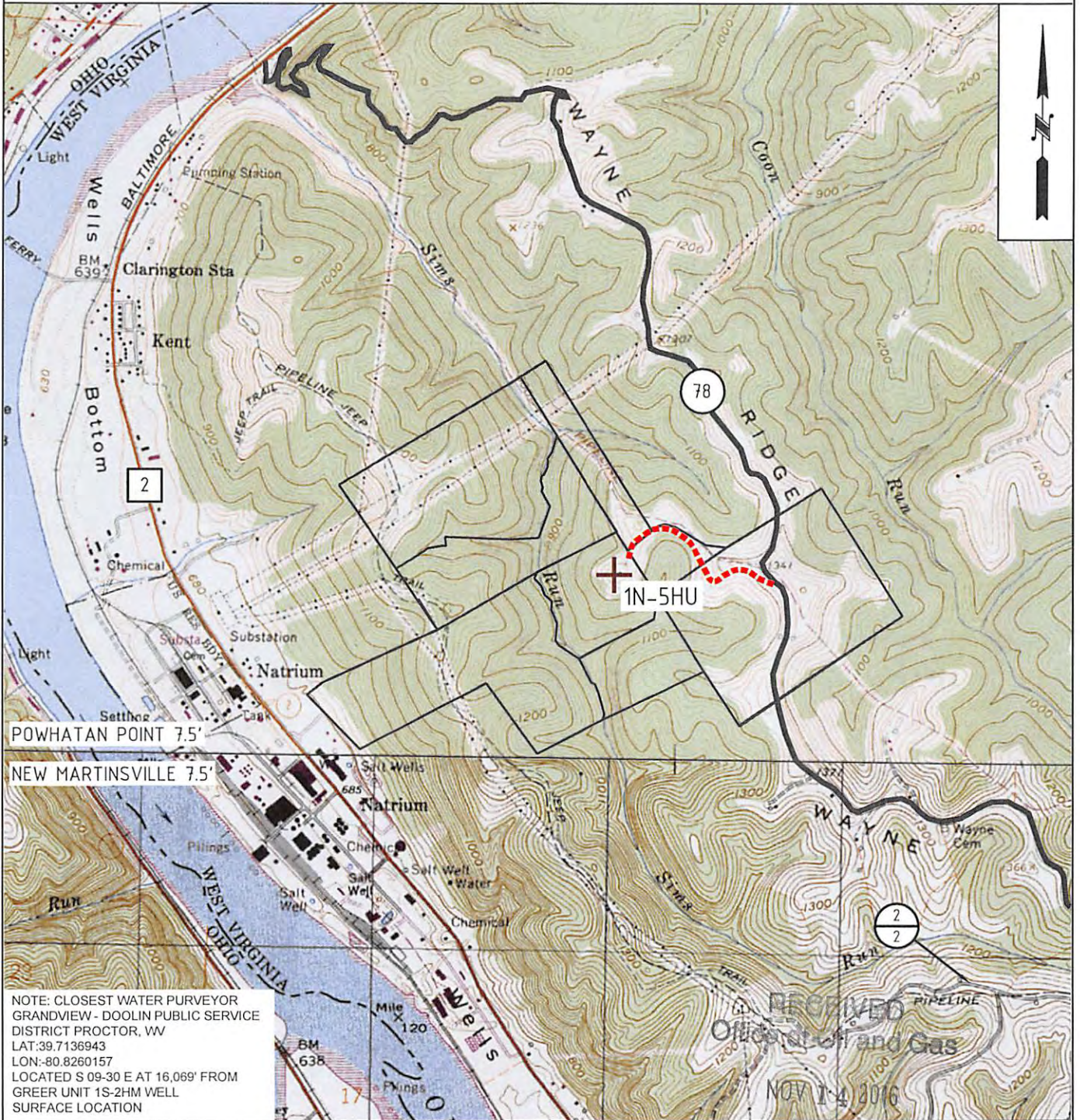
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WW-9

# PROPOSED GREER 1N-5HU

SUPPLEMENT PG 2



POWHATAN POINT 7.5'

NEW MARTINSVILLE 7.5'

NOTE: CLOSEST WATER PURVEYOR  
GRANDVIEW - DOOLIN PUBLIC SERVICE  
DISTRICT PROCTOR, WV  
LAT: 39.7136943  
LON: -80.8260157  
LOCATED S 09-30 E AT 16.069' FROM  
GREER UNIT 1S-2HM WELL  
SURFACE LOCATION



OPERATOR	163-697(CEC)	TOPO SECTION	WV Department of Environmental Protection	LEASE NAME
TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT		Greer
SCALE:		DATE:		
1" = 2000'		DATE: 10/20/16		



WW-6A1  
(5/13)

Operator's Well No. Greer 1N-5HU

**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
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See Attached

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

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

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

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

Well Operator: Tug Hill Operating, LLC

By: Jonathan White

Its: Regulatory Analyst- Appalachia Region

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Page 1 of 19

02/03/2017



SI-01893

WW-6A1 SUPPLEMENT

OPERATOR'S WELL NO. GREEN-N-SHU

Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14316	A	5-20-33	ANDREW GERST	GASTAR EXPLORATION USA, INC	1/8+	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*16358	A	5-20-33	Anne Marie Kramer	TH Exploration, LLC	1/8+	903	648	N/A	N/A
10*15763	A	5-20-33	Bonnie J. Selders	TH Exploration, LLC	1/8+	904	34	N/A	N/A
10*15761	A	5-20-33	Cameron Cemetery Association	TH Exploration, LLC	1/8+	903	642	N/A	N/A
10*14402	A	5-20-33	CAROL F WILSON AND RICHARD WILSON	GASTAR EXPLORATION INC	1/8+	860	446	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14362	A	5-20-33	CAROLYN STARKEY	GASTAR EXPLORATION INC	1/8+	827	226	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14331	A	5-20-33	CHRISTINA JEAN RIOUX	GASTAR EXPLORATION USA, INC	1/8+	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*14400	A	5-20-33	COLEEN SLAGLE AND FRANKLIN SLAGLE	GASTAR EXPLORATION INC	1/8+	860	440	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14419	A	5-20-33	CROSSROAD CHILD AND FAMILY SERVICES, INC., AN INDIANA NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	887	105	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*16356	A	5-20-33	Daryl S. Bucknor	TH Exploration, LLC	1/8+	904	31	N/A	N/A
10*15762	A	5-20-33	Dawn Petrovich	TH Exploration, LLC	1/8+	904	4	N/A	N/A
10*14333	A	5-20-33	DEAN ROTHENBUHLER	GASTAR EXPLORATION USA, INC	1/8+	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*16357	A	5-20-33	Deanna M. Campbell, a single woman	TH Exploration, LLC	1/8+	904	1	N/A	N/A
10*14355	A	5-20-33	DEWAYNE STARKEY	GASTAR EXPLORATION USA, INC	1/8+	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*15760	A	5-20-33	Diedre Winger	TH Exploration, LLC	1/8+	903	645	N/A	N/A
10*14404	A	5-20-33	DON FORGRAVES	GASTAR EXPLORATION INC	1/8+	862	426	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14356	A	5-20-33	FREDRIC RICHTER & BETTY RICHTER	GASTAR EXPLORATION USA, INC	1/8+	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*15734	A	5-20-33	Genevieve L Long, a widow	TH Exploration, LLC	1/8+	904	13	N/A	N/A
10*14317	A	5-20-33	HAROLD BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14410	A	5-20-33	HENRY T LONG	GASTAR EXPLORATION INC	1/8+	867	385	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14321	A	5-20-33	HERBERT BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14401	A	5-20-33	IMELDA J SCURLOCK	GASTAR EXPLORATION INC	1/8+	860	443	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A

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 WV Department of Environmental Protection

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WW-6A1 SUPPLEMENT

OPERATOR'S WELL NO. GREER 1N-5HU

Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14388	A	5-20-33	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO, AN OHIO NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	849	513	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14319	A	5-20-33	JACK J. PFALZGRAF	GASTAR EXPLORATION USA, INC	1/8+	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*14409	A	5-20-33	JAMES C LONG AND PATTI LONG	GASTAR EXPLORATION INC	1/8+	864	326	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15764	A	5-20-33	James E. Bucknor	TH Exploration, LLC	1/8+	904	28	N/A	N/A
10*16355	A	5-20-33	James P. Long and Linda L. Long	TH Exploration, LLC	1/8+	904	10	N/A	N/A
10*14312	A	5-20-33	JAMIE LU BENSON	GASTAR EXPLORATION USA, INC	1/8+	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*14398	A	5-20-33	JAN KAFFENBERGER	GASTAR EXPLORATION INC	1/8+	860	434	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15765	A	5-20-33	John A. Bucknor	TH Exploration, LLC	1/8+	904	16	N/A	N/A
10*14387	A	5-20-33	JOHN F LONG AND PAM LONG	GASTAR EXPLORATION INC	1/8+	849	542	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15766	A	5-20-33	John J. Pozenel, a widower	TH Exploration, LLC	1/8+	904	7	N/A	N/A
10*14405	A	5-20-33	JOHN WHITE	GASTAR EXPLORATION INC	1/8+	862	423	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14377	A	5-20-33	JOSEPH A LONG	GASTAR EXPLORATION INC	1/8+	849	519	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14368	A	5-20-33	JOSEPH LONG	GASTAR EXPLORATION INC	1/8+	836	106	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14413	A	5-20-33	JUANITA SANDIFER	GASTAR EXPLORATION INC	1/8+	872	206	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14416	A	5-20-33	KATHERINE ANN WILLIAMS COTHRAN	GASTAR EXPLORATION INC	1/8+	879	1	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14394	A	5-20-33	LESLIE F BUCKNOR	GASTAR EXPLORATION INC	1/8+	862	419	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14322	A	5-20-33	LOIS KAY MORFORD	GASTAR EXPLORATION USA, INC	1/8+	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*14408	A	5-20-33	LORNA M LONG MORGAN	GASTAR EXPLORATION INC	1/8+	864	323	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14315	A	5-20-33	MARGARET ROSS	GASTAR EXPLORATION USA, INC	1/8+	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

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OPERATOR'S WELL NO. GREER 1N-SHU

Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14318	A	5-20-33	MARTHA BLACHLY-CROSS	GASTAR EXPLORATION USA, INC	1/8+	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*14332	A	5-20-33	MICHAEL EDWARD BARTH	GASTAR EXPLORATION USA, INC	1/8+	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*14418	A	5-20-33	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14328	A	5-20-33	RAE ELLEN STUART	GASTAR EXPLORATION USA, INC	1/8+	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*14314	A	5-20-33	RALPH BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14399	A	5-20-33	RITA ANN DOEBERT AND RONALD DOEBERT	GASTAR EXPLORATION INC	1/8+	860	437	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14327	A	5-20-33	ROBERT D. OKEY	GASTAR EXPLORATION USA, INC	1/8+	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
10*14320	A	5-20-33	SANDRA CHEYNEY	GASTAR EXPLORATION USA, INC	1/8+	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*14403	A	5-20-33	SUE WHITE	GASTAR EXPLORATION INC	1/8+	862	429	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14313	A	5-20-33	TERRI JEAN GODDARD	GASTAR EXPLORATION USA, INC	1/8+	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*16230	A	5-20-33	TH Exploration, LLC	TH Exploration, LLC	1/8+	900	134	N/A	N/A
10*14412	A	5-20-33	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO, AN OHIO CORPORATION	GASTAR EXPLORATION INC	1/8+	872	203	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14371	A	5-20-33	THOMAS F LONG AND JENNIFER LONG	GASTAR EXPLORATION INC	1/8+	842	398	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14411	A	5-20-33	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER, ON BEHALF OF JOHN EDWARD HARRIS, JR., MARION LUCILLE ROBINSON, REVEREND FATHER J.F. BEAVER, ELOISE CARTER, EVALENA SCHAEFFER, ELEANOR SHUTT, HELEN MARTIN, MARGERY MOORE, CHARLES LONG, TILLIE ISCHY, LELIA TAYLOR, GERTRUDE URPMAN, IRENE STEWART, HELENA M. WILSON, EDNA SCHRAMM, TOM YOHO, RETTA YOHO, AND DAISY WARD, OR THEIR HEIRS, UNKNOWN HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES.	GASTAR EXPLORATION INC	1/8+	870	34	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A

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 WV Department of Environmental Protection

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WW-6A1 SUPPLEMENT

OPERATOR'S WELL NO. GREER 1N-5HU

Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14329	A	5-20-33	TONDA ROTHENBUHLER	GASTAR EXPLORATION USA, INC	1/8+	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*14372	A	5-20-33	UNITED CHURCH HOMES INC., AN OHIO NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	846	408	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14381	A	5-20-33	WILLIAM LONG	GASTAR EXPLORATION USA, INC	1/8+	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*14395	A	5-20-33	WILLIAM V BUCKNOR	GASTAR EXPLORATION INC	1/8+	862	421	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14325	B	5-20-29	ELIZABETH ANN STRAUSBAUGH	GASTAR EXPLORATION USA, INC	1/8+	792	104	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14326	B	5-20-29	JANET LEA BLANKENSHIP	GASTAR EXPLORATION USA, INC	1/8+	792	580	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14310	B	5-20-29	JEAN C. THOMAS	GASTAR EXPLORATION USA, INC	1/8+	781	614	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14308	B	5-20-29	MARY E. BASSETT	GASTAR EXPLORATION USA, INC	1/8+	779	492	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14418	B	5-20-29	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14309	B	5-20-29	ROBERT B. THOMAS	GASTAR EXPLORATION USA, INC	1/8+	779	484	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14324	B	5-20-29	RUTH E. BASSETT MEADOWS	GASTAR EXPLORATION USA, INC	1/8+	792	100	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14307	B	5-20-29	SALLY CYNTHIA HOPKINS	GASTAR EXPLORATION USA, INC	1/8+	777	572	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14325	C	5-20-28	ELIZABETH ANN STRAUSBAUGH	GASTAR EXPLORATION USA, INC	1/8+	792	104	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14326	C	5-20-28	JANET LEA BLANKENSHIP	GASTAR EXPLORATION USA, INC	1/8+	792	580	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14310	C	5-20-28	JEAN C. THOMAS	GASTAR EXPLORATION USA, INC	1/8+	781	614	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14308	C	5-20-28	MARY E. BASSETT	GASTAR EXPLORATION USA, INC	1/8+	779	492	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14418	C	5-20-28	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A

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10*14309	C	5-20-28	ROBERT B. THOMAS	GASTAR EXPLORATION USA, INC	1/8+	779	484	21/41 Cert. of Merger GASTAR Exploration USA, Inc to GASTAR Exploration Inc	36/009 GASTAR Exploration Inc to TH Exploration II, LLC
10*14324	C	5-20-28	RUTH E. BASSETT MEADOWS	GASTAR EXPLORATION USA, INC	1/8+	792	100	21/41 Cert. of Merger GASTAR Exploration USA, Inc to GASTAR Exploration Inc	36/009 GASTAR Exploration Inc to TH Exploration II, LLC
10*14307	C	5-20-28	SALLY CYNTHIA HOPKINS	GASTAR EXPLORATION USA, INC	1/8+	777	572	21/41 Cert. of Merger GASTAR Exploration USA, Inc to GASTAR Exploration Inc	36/009 GASTAR Exploration Inc to TH Exploration II, LLC
10*14418	D	5-20-32	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14418	E	5-21-3	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14418	F	5-20-34	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14418	G	5-20-31	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14418	H	5-20-35	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14418	I	5-20-36	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14418	J	5-20-37	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14703	K	5-20-38	WHEELING POWER COMPANY	GASTAR EXPLORATION USA, INC	1/8+	786	303	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	L	5-20-39	WHEELING POWER COMPANY	GASTAR EXPLORATION USA, INC	1/8+	786	303	21/41 Cert. of Merger GASTAR Exploration USA, Inc to GASTAR Exploration Inc	36/009 GASTAR Exploration Inc to TH Exploration II, LLC
10*14418	M	5-20-40	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14360	N	5-20-30	ALLEN D. MASON	GASTAR EXPLORATION INC	1/8+	827	276	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14343	N	5-20-30	BARBARA METZNER	GASTAR EXPLORATION USA, INC	1/8+	799	459	21/41 Cert. of Merger GASTAR Exploration USA, Inc to GASTAR Exploration Inc	36/009 GASTAR Exploration Inc to TH Exploration II, LLC
10*14352	N	5-20-30	BRIAN K. MARMIE & CAROL L. MARMIE	GASTAR EXPLORATION USA, INC	1/8+	805	76	21/41 Cert. of Merger GASTAR Exploration USA, Inc to GASTAR Exploration Inc	36/009 GASTAR Exploration Inc to TH Exploration II, LLC

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10*14366	N	5-20-30	CARRIE E METZGER FKA CARRIE ELLIZABETH CHAMBERS, A MARRIED WOMAN DEALING IN HER SOLE AND SEPARATE PROPERTY	GASTAR EXPLORATION INC	1/8+	833	527	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14358	N	5-20-30	CHRIS H. STEVENSON	GASTAR EXPLORATION INC	1/8+	827	282	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14367	N	5-20-30	CHRISTINA CHAMBERS	GASTAR EXPLORATION INC	1/8+	836	123	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14363	N	5-20-30	CHRISTINA I. CHILCOTE	GASTAR EXPLORATION INC	1/8+	827	525	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14311	N	5-20-30	COLLIN A. WILLISON III	GASTAR EXPLORATION USA, INC	1/8+	789	577	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14365	N	5-20-30	DAN J. SWOVELAND	GASTAR EXPLORATION INC	1/8+	827	523	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14414	N	5-20-30	DAVID C WHITE, ESQ., SPECIAL COMMISSIONER, ON BEHALF OF D.W. CHESSE, OR HIS HEIRS, UNKNOWN HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES	GASTAR EXPLORATION INC	1/8+	872	217	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14364	N	5-20-30	DAWN M. LAEMMIE	GASTAR EXPLORATION INC	1/8+	827	521	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14342	N	5-20-30	FLORENCE L. MYERS	GASTAR EXPLORATION USA, INC	1/8+	799	457	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14348	N	5-20-30	GEORGEANN TIPPY	GASTAR EXPLORATION USA, INC	1/8+	803	152	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14349	N	5-20-30	HOWARD A. BROWN	GASTAR EXPLORATION USA, INC	1/8+	805	98	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14339	N	5-20-30	JOANN FRAZIER	GASTAR EXPLORATION USA, INC	1/8+	799	59	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14323	N	5-20-30	JODY ELIZONDO	GASTAR EXPLORATION USA, INC	1/8+	792	93	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14357	N	5-20-30	JORLENE POST	GASTAR EXPLORATION INC	1/8+	827	280	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14340	N	5-20-30	JOSEPH CHAMBERS	GASTAR EXPLORATION USA, INC	1/8+	799	450	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14353	N	5-20-30	KARI B. MARMIE	GASTAR EXPLORATION USA, INC	1/8+	809	515	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14346	N	5-20-30	LAURA GLASSNER	GASTAR EXPLORATION USA, INC	1/8+	800	406	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC

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10*14330	N	5-20-30	LETITIA TEMPLE	GASTAR EXPLORATION USA, INC	1/8+	799	465	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14338	N	5-20-30	LOIS JEAN MYERS	GASTAR EXPLORATION USA, INC	1/8+	797	189	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14359	N	5-20-30	LUCYBELLE WELDON	GASTAR EXPLORATION INC	1/8+	827	278	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14344	N	5-20-30	LYNNETTE L. KUGLER	GASTAR EXPLORATION USA, INC	1/8+	799	461	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14336	N	5-20-30	MARSHA L. SCHON	GASTAR EXPLORATION USA, INC	1/8+	797	198	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14335	N	5-20-30	MARY C. JOSEPH	GASTAR EXPLORATION USA, INC	1/8+	797	196	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14351	N	5-20-30	NORA WEBB	GASTAR EXPLORATION USA, INC	1/8+	805	78	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14418	N	5-20-30	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14350	N	5-20-30	RAE JEAN NAMETH	GASTAR EXPLORATION USA, INC	1/8+	805	80	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14341	N	5-20-30	ROBERT MARMIE	GASTAR EXPLORATION USA, INC	1/8+	799	455	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14361	N	5-20-30	RODNEY K. CHAMBERS	GASTAR EXPLORATION INC	1/8+	827	271	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14345	N	5-20-30	SHARON D. GREEN	GASTAR EXPLORATION USA, INC	1/8+	799	463	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14334	N	5-20-30	STANLEY RICHMOND	GASTAR EXPLORATION USA, INC	1/8+	796	62	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14347	N	5-20-30	TERRY I. CHAMBERS	GASTAR EXPLORATION USA, INC	1/8+	800	404	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14354	N	5-20-30	TRAVIS D. MARMIE	GASTAR EXPLORATION USA, INC	1/8+	808	491	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14337	N	5-20-30	WILLIAM M. DOYLE	GASTAR EXPLORATION USA, INC	1/8+	797	187	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14418	O	5-20-22	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A

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10*14922	O	5-20-22	ROGER R WEESE, SPECIAL COMMISSIONER, ON BEHALF OF EMMA W. STANDIFORD, MARY WILSON CRAMER, JANE TAYLOR, MAY BRIDENBECKER, ROSEBERRY L. WILSON, ANNIE WILSON, BEATRICE WILSON KERLIN, COURTNEY T. WILSON, GUY WILSON, CALLIE WILSON GATES, JAMES C. WILSON, H.L. WILSON, FRED WILSON, RAY WILSON, WILLIS WILSON, ELIZABETH WILSON BALDWIN, GERTRUDE B. SMITH, ALVIN BALDWIN, I.M. GARRETT, LUCILLE B. WENTZ, C.C. BALDWIN, SARAH WILSON COLEMAN, JOHN WILSON, LYDIA WILSON SHAW, AND MARTHA WILSON, OR THEIR HEIRS, UNKNOWN HEIRS, SUCCESSORS, ASSIGNS, DEWISEES, OR DISTRIBUTEES	GASTAR EXPLORATION INC	1/8+	836	488	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14418	P	5-20-21	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14418	Q	5-13-2	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*47051.324.2	R	5-13-36	JACK L MASON	GASTAR EXPLORATION INC	1/8+	737	229	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14370	R	5-13-36	JAMES SLAWINSKI	GASTAR EXPLORATION INC	1/8+	842	370	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*47051.324.1	R	5-13-36	MARILYN SUE BUMER	GASTAR EXPLORATION INC	1/8+	739	413	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14418	R	5-13-36	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15756	R	5-13-36	STEVEN A BOHRER ET UX	TH Exploration, LLC	1/8+	904	20	N/A	N/A
10*14369	R	5-13-36	TIMOTHY B MILLER	GASTAR EXPLORATION INC	1/8+	844	87	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14418	S	5-13-5	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14663	T	5-13-8	PAUL F. SPOTTS	GASTAR EXPLORATION USA, INC	1/8+	779	482	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	U	5-13-22	ANDREW GERST	GASTAR EXPLORATION USA, INC	1/8+	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*16358	U	5-13-22	Anne Marie Kramer	TH Exploration, LLC	1/8+	903	648	N/A	N/A
10*15763	U	5-13-22	Bonnie J. Selders	TH Exploration, LLC	1/8+	904	34	N/A	N/A
10*15761	U	5-13-22	Cameron Cemetery Association	TH Exploration, LLC	1/8+	903	642	N/A	N/A
10*14402	U	5-13-22	CAROL F WILSON AND RICHARD WILSON	GASTAR EXPLORATION INC	1/8+	860	446	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A

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10*14362	U	5-13-22	CAROLYN STARKEY	GASTAR EXPLORATION INC	1/8+	827	226	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14331	U	5-13-22	CHRISTINA JEAN RIOUX	GASTAR EXPLORATION USA, INC	1/8+	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*14400	U	5-13-22	COLEEN SLAGLE AND FRANKLIN SLAGLE	GASTAR EXPLORATION INC	1/8+	860	440	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14419	U	5-13-22	CROSSROAD CHILD AND FAMILY SERVICES, INC., AN INDIANA NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	887	105	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*16356	U	5-13-22	Daryl S. Bucknor, married	TH Exploration, LLC	1/8+	904	31	N/A	N/A
10*15762	U	5-13-22	Dawn Petrovich	TH Exploration, LLC	1/8+	904	4	N/A	N/A
10*14333	U	5-13-22	DEAN ROTHENBUHLER	GASTAR EXPLORATION USA, INC	1/8+	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*16357	U	5-13-22	Deanna M. Campbell, a single woman	TH Exploration, LLC	1/8+	904	1	N/A	N/A
10*14355	U	5-13-22	DEWAYNE STARKEY	GASTAR EXPLORATION USA, INC	1/8+	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*15760	U	5-13-22	Diedre Winger	TH Exploration, LLC	1/8+	903	645	N/A	N/A
10*14404	U	5-13-22	DON FORGRAVES	GASTAR EXPLORATION INC	1/8+	862	426	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14356	U	5-13-22	FREDRIC RICHTER & BETTY RICHTER	GASTAR EXPLORATION USA, INC	1/8+	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*15734	U	5-13-22	Genevieve L. Long, a widow	TH Exploration, LLC	1/8+	904	13	N/A	N/A
10*14317	U	5-13-22	HAROLD BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14410	U	5-13-22	HENRY T LONG	GASTAR EXPLORATION INC	1/8+	867	385	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14321	U	5-13-22	HERBERT BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14401	U	5-13-22	IMELDA J SCURLOCK	GASTAR EXPLORATION INC	1/8+	860	443	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14388	U	5-13-22	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO, AN OHIO NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	849	513	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14319	U	5-13-22	JACK J. PFALZGRAF	GASTAR EXPLORATION USA, INC	1/8+	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*14409	U	5-13-22	JAMES C LONG AND PATTI LONG	GASTAR EXPLORATION INC	1/8+	864	326	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15764	U	5-13-22	James E. Bucknor	TH Exploration, LLC	1/8+	904	28	N/A	N/A

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10*16355	U	5-13-22	James P. Long and Linda L. Long	TH Exploration, LLC	1/8+	904	10	N/A	N/A
10*14312	U	5-13-22	JAMIE LU BENSON	GASTAR EXPLORATION USA, INC	1/8+	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*14398	U	5-13-22	JAN KAFFENBERGER	GASTAR EXPLORATION INC	1/8+	860	434	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15765	U	5-13-22	John A. Bucknor	TH Exploration, LLC	1/8+	904	16	N/A	N/A
10*14387	U	5-13-22	JOHN F LONG AND PAM LONG	GASTAR EXPLORATION INC	1/8+	849	542	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15766	U	5-13-22	John J. Pozenel, a widower	TH Exploration, LLC	1/8+	904	7	N/A	N/A
10*14405	U	5-13-22	JOHN WHITE	GASTAR EXPLORATION INC	1/8+	862	423	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14377	U	5-13-22	JOSEPH A LONG	GASTAR EXPLORATION INC	1/8+	849	519	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14368	U	5-13-22	JOSEPH LONG	GASTAR EXPLORATION INC	1/8+	836	106	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14413	U	5-13-22	JUANITA SANDIFER	GASTAR EXPLORATION INC	1/8+	872	206	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14416	U	5-13-22	KATHERINE ANN WILLIAMS COTHRAN	GASTAR EXPLORATION INC	1/8+	879	1	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14394	U	5-13-22	LESLIE F BUCKNOR	GASTAR EXPLORATION INC	1/8+	862	419	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14322	U	5-13-22	LOIS KAY MORFORD	GASTAR EXPLORATION USA, INC	1/8+	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*14408	U	5-13-22	LORNA M LONG MORGAN	GASTAR EXPLORATION INC	1/8+	864	323	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14315	U	5-13-22	MARGARET ROSS	GASTAR EXPLORATION USA, INC	1/8+	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*14318	U	5-13-22	MARTHA BLACHLY-CROSS	GASTAR EXPLORATION USA, INC	1/8+	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*14332	U	5-13-22	MICHAEL EDWARD BARTH	GASTAR EXPLORATION USA, INC	1/8+	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*14418	U	5-13-22	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14328	U	5-13-22	RAE ELLEN STUART	GASTAR EXPLORATION USA, INC	1/8+	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*14314	U	5-13-22	RALPH BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14399	U	5-13-22	RITA ANN DOEBERT AND RONALD DOEBERT	GASTAR EXPLORATION INC	1/8+	860	437	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A

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OPERATOR'S WELL NO. GREER 1N-5HU

Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14327	U	5-13-22	ROBERT D. OKEY	GASTAR EXPLORATION USA, INC	1/8+	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
10*14320	U	5-13-22	SANDRA CHEYNEY	GASTAR EXPLORATION USA, INC	1/8+	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*14403	U	5-13-22	SUE WHITE	GASTAR EXPLORATION INC	1/8+	862	429	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14313	U	5-13-22	TERRI JEAN GODDARD	GASTAR EXPLORATION USA, INC	1/8+	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*16230	U	5-13-22	TH Exploration, LLC	TH Exploration, LLC	1/8+	900	134	N/A	N/A
10*14412	U	5-13-22	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO, AN OHIO CORPORATION	GASTAR EXPLORATION INC	1/8+	872	203	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14371	U	5-13-22	THOMAS F LONG AND JENNIFER LONG	GASTAR EXPLORATION INC	1/8+	842	398	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14411	U	5-13-22	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER, ON BEHALF OF JOHN EDWARD HARRIS, JR., MARION LUCILLE ROBINSON, REVEREND FATHER J.F. BEAVER, ELOISE CARTER, EVALENA SCHAEFFER, ELEANOR SHUTT, HELEN MARTIN, MARGERY MOORE, CHARLES LONG, TILLIE ISCHY, LELIA TAYLOR, GERTRUDE URPMAN, IRENE STEWART, HELENA M. WILSON, EDNA SCHRAMM, TOM YOHO, RETTA YOHO, AND DAISY WARD, OR THEIR HEIRS, UNKNOWN HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES	GASTAR EXPLORATION INC	1/8+	870	34	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14329	U	5-13-22	TONDA ROTHENBUHLER	GASTAR EXPLORATION USA, INC	1/8+	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*14372	U	5-13-22	UNITED CHURCH HOMES INC., AN OHIO NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	846	408	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14395	U	5-13-22	WILLIAM V BUCKNOR	GASTAR EXPLORATION INC	1/8+	862	421	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14316	V	5-13-22.1	ANDREW GERST	GASTAR EXPLORATION USA, INC	1/8+	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*16358	V	5-13-22.1	Anne Marie Kramer	TH Exploration, LLC	1/8+	903	648	N/A	N/A
10*15763	V	5-13-22.1	Bonnie J. Selders	TH Exploration, LLC	1/8+	904	34	N/A	N/A
10*15761	V	5-13-22.1	Cameron Cemetery Association	TH Exploration, LLC	1/8+	903	642	N/A	N/A
10*14402	V	5-13-22.1	CAROL F WILSON AND RICHARD WILSON	GASTAR EXPLORATION INC	1/8+	860	446	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A

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OPERATOR'S WELL NO. GREER 1N-5HU

Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14362	V	5-13-22.1	CAROLYN STARKEY	GASTAR EXPLORATION INC	1/8+	827	226	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14331	V	5-13-22.1	CHRISTINA JEAN RIOUX	GASTAR EXPLORATION USA, INC	1/8+	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*14400	V	5-13-22.1	COLEEN SLAGLE AND FRANKLIN SLAGLE	GASTAR EXPLORATION INC	1/8+	860	440	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14419	V	5-13-22.1	CROSSROAD CHILD AND FAMILY SERVICES, INC., AN INDIANA NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	887	105	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*16356	V	5-13-22.1	Daryl S. Bucknor, married	TH Exploration, LLC	1/8+	904	31	N/A	
10*15762	V	5-13-22.1	Dawn Petrovich	TH Exploration, LLC	1/8+	904	4	N/A	
10*14333	V	5-13-22.1	DEAN ROTHENBUHLER	GASTAR EXPLORATION USA, INC	1/8+	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*16357	V	5-13-22.1	Deanna M. Campbell, a single woman	TH Exploration, LLC	1/8+	904	1	N/A	
10*14355	V	5-13-22.1	DEWAYNE STARKEY	GASTAR EXPLORATION USA, INC	1/8+	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*15760	V	5-13-22.1	Diedre Winger	TH Exploration, LLC	1/8+	903	645	N/A	N/A
10*14404	V	5-13-22.1	DON FORGRAVES	GASTAR EXPLORATION INC	1/8+	862	426	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14356	V	5-13-22.1	FREDRIC RICHTER & BETTY RICHTER	GASTAR EXPLORATION USA, INC	1/8+	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*15734	V	5-13-22.1	Genevieve L. Long, a widow	TH Exploration, LLC	1/8+	904	13	N/A	N/A
10*14317	V	5-13-22.1	HAROLD BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14410	V	5-13-22.1	HENRY T LONG	GASTAR EXPLORATION INC	1/8+	867	385	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14321	V	5-13-22.1	HERBERT BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14401	V	5-13-22.1	IMELDA J SCURLOCK	GASTAR EXPLORATION INC	1/8+	860	443	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14388	V	5-13-22.1	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO, AN OHIO NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	849	513	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14319	V	5-13-22.1	JACK J. PFALZGRAF	GASTAR EXPLORATION USA, INC	1/8+	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

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OPERATOR'S WELL NO. GREER 1N-SHU

Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14409	V	5-13-22.1	JAMES C LONG AND PATTI LONG	GASTAR EXPLORATION INC	1/8+	864	326	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15764	V	5-13-22.1	James E. Bucknor	TH Exploration, LLC	1/8+	904	28	N/A	N/A
10*16355	V	5-13-22.1	James P. Long and Linda L. Long	TH Exploration, LLC	1/8+	904	10	N/A	N/A
10*14312	V	5-13-22.1	JAMIE LU BENSON	GASTAR EXPLORATION USA, INC	1/8+	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*14398	V	5-13-22.1	JAN KAFFENBERGER	GASTAR EXPLORATION INC	1/8+	860	434	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15765	V	5-13-22.1	John A. Bucknor	TH Exploration, LLC	1/8+	904	16	N/A	N/A
10*14387	V	5-13-22.1	JOHN F LONG AND PAM LONG	GASTAR EXPLORATION INC	1/8+	849	542	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15766	V	5-13-22.1	John J. Pozenel, a widower	TH Exploration, LLC	1/8+	904	7	N/A	N/A
10*14405	V	5-13-22.1	JOHN WHITE	GASTAR EXPLORATION INC	1/8+	862	423	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14377	V	5-13-22.1	JOSEPH A LONG	GASTAR EXPLORATION INC	1/8+	849	519	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14368	V	5-13-22.1	JOSEPH LONG	GASTAR EXPLORATION INC	1/8+	836	106	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14413	V	5-13-22.1	JUANITA SANDIFER	GASTAR EXPLORATION INC	1/8+	872	206	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14416	V	5-13-22.1	KATHERINE ANN WILLIAMS COTHRAN	GASTAR EXPLORATION INC	1/8+	879	1	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14394	V	5-13-22.1	LESLIE F BUCKNOR	GASTAR EXPLORATION INC	1/8+	862	419	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14322	V	5-13-22.1	LOIS KAY MORFORD	GASTAR EXPLORATION USA, INC	1/8+	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*14408	V	5-13-22.1	LORNA M LONG MORGAN	GASTAR EXPLORATION INC	1/8+	864	323	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14315	V	5-13-22.1	MARGARET ROSS	GASTAR EXPLORATION USA, INC	1/8+	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*14318	V	5-13-22.1	MARTHA BLACHLY-CROSS	GASTAR EXPLORATION USA, INC	1/8+	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*14332	V	5-13-22.1	MICHAEL EDWARD BARTH	GASTAR EXPLORATION USA, INC	1/8+	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

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OPERATOR'S WELL NO. GREER 1N-5HU

Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14418	V	5-13-22.1	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14328	V	5-13-22.1	RAE ELLEN STUART	GASTAR EXPLORATION USA, INC	1/8+	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*14314	V	5-13-22.1	RALPH BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14399	V	5-13-22.1	RITA ANN DOEBERT AND RONALD DOEBERT	GASTAR EXPLORATION INC	1/8+	860	437	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14327	V	5-13-22.1	ROBERT D. OKEY	GASTAR EXPLORATION USA, INC	1/8+	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
10*14320	V	5-13-22.1	SANDRA CHEYNEY	GASTAR EXPLORATION USA, INC	1/8+	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*14403	V	5-13-22.1	SUE WHITE	GASTAR EXPLORATION INC	1/8+	862	429	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14313	V	5-13-22.1	TERRI JEAN GODDARD	GASTAR EXPLORATION USA, INC	1/8+	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*16230	V	5-13-22.1	TH Exploration, LLC	TH Exploration, LLC	1/8+	900	134	N/A	N/A
10*14412	V	5-13-22.1	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO, AN OHIO CORPORATION	GASTAR EXPLORATION INC	1/8+	872	203	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14371	V	5-13-22.1	THOMAS F LONG AND JENNIFER LONG	GASTAR EXPLORATION INC	1/8+	842	398	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14411	V	5-13-22.1	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER, ON BEHALF OF JOHN EDWARD HARRIS, JR., MARION LUCILLE ROBINSON, REVEREND FATHER J.F. BEAVER, ELOISE CARTER, EVALENA SCHAEFFER, ELEANOR SHUTT, HELEN MARTIN, MARGERY MOORE, CHARLES LONG, TILLIE ISCHY, LELIA TAYLOR, GERTRUDE URPMAN, IRENE STEWART, HELENA M. WILSON, EDNA SCHRAMM, TOM YOHO, RETTA YOHO, AND DAISY WARD, OR THEIR HEIRS, UNKNOWN HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES	GASTAR EXPLORATION INC	1/8+	870	34	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A
10*14329	V	5-13-22.1	TONDA ROTHENBUHLER	GASTAR EXPLORATION USA, INC	1/8+	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*14372	V	5-13-22.1	UNITED CHURCH HOMES INC., AN OHIO NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	846	408	36/009 GASTAR Exploration Inc to TH Exploration II, LLC	N/A

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10*14395	V	5-13-22.1	WILLIAM V BUCKNOR	GASTAR EXPLORATION INC	1/8+	862	421	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14418	W	5-13-16	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14418	X	5-13-16.8	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14316	Y	5-13-21	ANDREW GERST	GASTAR EXPLORATION USA, INC	1/8+	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*16358	Y	5-13-21	Anne Marie Kramer	TH Exploration, LLC	1/8+	903	648	N/A	N/A
10*15763	Y	5-13-21	Bonnie J. Selders	TH Exploration, LLC	1/8+	904	34	N/A	N/A
10*15761	Y	5-13-21	Cameron Cemetery Association	TH Exploration, LLC	1/8+	903	642	N/A	N/A
10*14402	Y	5-13-21	CAROL F WILSON AND RICHARD WILSON	GASTAR EXPLORATION INC	1/8+	860	446	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14362	Y	5-13-21	CAROLYN STARKEY	GASTAR EXPLORATION INC	1/8+	827	226	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14331	Y	5-13-21	CHRISTINA JEAN RIOUX	GASTAR EXPLORATION USA, INC	1/8+	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*14400	Y	5-13-21	COLEEN SLAGLE AND FRANKLIN SLAGLE	GASTAR EXPLORATION INC	1/8+	860	440	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14419	Y	5-13-21	CROSSROAD CHILD AND FAMILY SERVICES, INC., AN INDIANA NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	887	105	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*16356	Y	5-13-21	Daryl S. Bucknor, married	TH Exploration, LLC	1/8+	904	31	N/A	N/A
10*15762	Y	5-13-21	Dawn Petrovich	TH Exploration, LLC	1/8+	904	4	N/A	N/A
10*14333	Y	5-13-21	DEAN ROTHENBUHLER	GASTAR EXPLORATION USA, INC	1/8+	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*16357	Y	5-13-21	Deanna M. Campbell, a single woman	TH Exploration, LLC	1/8+	904	1	N/A	N/A
10*14355	Y	5-13-21	DEWAYNE STARKEY	GASTAR EXPLORATION USA, INC	1/8+	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*15760	Y	5-13-21	Diedre Winger	TH Exploration, LLC	1/8+	903	645	N/A	N/A
10*14404	Y	5-13-21	DON FORGRAVES	GASTAR EXPLORATION INC	1/8+	862	426	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14356	Y	5-13-21	FREDRIC RICHTER & BETTY RICHTER	GASTAR EXPLORATION USA, INC	1/8+	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*15734	Y	5-13-21	Genevieve L. Long, a widow	TH Exploration, LLC	1/8+	904	13	N/A	N/A
10*14317	Y	5-13-21	HAROLD BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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

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Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14410	Y	5-13-21	HENRY T LONG	GASTAR EXPLORATION INC	1/8+	867	385	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14321	Y	5-13-21	HERBERT BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14401	Y	5-13-21	IMELDA J SCURLOCK	GASTAR EXPLORATION INC	1/8+	860	443	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14388	Y	5-13-21	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO, AN OHIO NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	849	513	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14319	Y	5-13-21	JACK J. PFALZGRAF	GASTAR EXPLORATION USA, INC	1/8+	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*14409	Y	5-13-21	JAMES C LONG AND PATTI LONG	GASTAR EXPLORATION INC	1/8+	864	326	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15764	Y	5-13-21	James E. Bucknor	TH Exploration, LLC	1/8+	904	28	N/A	N/A
10*16355	Y	5-13-21	James P. Long and Linda L. Long	TH Exploration, LLC	1/8+	904	10	N/A	N/A
10*14312	Y	5-13-21	JAMIE LU BENSON	GASTAR EXPLORATION USA, INC	1/8+	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*14398	Y	5-13-21	JAN KAFFENBERGER	GASTAR EXPLORATION INC	1/8+	860	434	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15765	Y	5-13-21	John A. Bucknor	TH Exploration, LLC	1/8+	904	16	N/A	N/A
10*14387	Y	5-13-21	JOHN F LONG AND PAM LONG	GASTAR EXPLORATION INC	1/8+	849	542	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*15766	Y	5-13-21	John J. Pozenel, a widower	TH Exploration, LLC	1/8+	904	7	N/A	N/A
10*14405	Y	5-13-21	JOHN WHITE	GASTAR EXPLORATION INC	1/8+	862	423	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14377	Y	5-13-21	JOSEPH A LONG	GASTAR EXPLORATION INC	1/8+	849	519	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14368	Y	5-13-21	JOSEPH LONG	GASTAR EXPLORATION INC	1/8+	836	106	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14413	Y	5-13-21	JUANITA SANDIFER	GASTAR EXPLORATION INC	1/8+	872	206	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14416	Y	5-13-21	KATHERINE ANN WILLIAMS COTHRAN	GASTAR EXPLORATION INC	1/8+	879	1	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14394	Y	5-13-21	LESLIE F BUCKNOR	GASTAR EXPLORATION INC	1/8+	862	419	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14322	Y	5-13-21	LOIS KAY MORFORD	GASTAR EXPLORATION USA, INC	1/8+	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

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51-01893

WW-6A1 SUPPLEMENT

OPERATOR'S WELL NO. GREER 1N-5HU

Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14408	Y	5-13-21	LORNA M LONG MORGAN	GASTAR EXPLORATION INC	1/8+	864	323	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14315	Y	5-13-21	MARGARET ROSS	GASTAR EXPLORATION USA, INC	1/8+	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*14318	Y	5-13-21	MARTHA BLACHLY-CROSS	GASTAR EXPLORATION USA, INC	1/8+	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*14332	Y	5-13-21	MICHAEL EDWARD BARTH	GASTAR EXPLORATION USA, INC	1/8+	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*14328	Y	5-13-21	RAE ELLEN STUART	GASTAR EXPLORATION USA, INC	1/8+	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*14314	Y	5-13-21	RALPH BLACHLY	GASTAR EXPLORATION USA, INC	1/8+	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*14399	Y	5-13-21	RITA ANN DOEBERT AND RONALD DOEBERT	GASTAR EXPLORATION INC	1/8+	860	437	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14327	Y	5-13-21	ROBERT D. OKEY	GASTAR EXPLORATION USA, INC	1/8+	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
10*14320	Y	5-13-21	SANDRA CHEYNEY	GASTAR EXPLORATION USA, INC	1/8+	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*14403	Y	5-13-21	SUE WHITE	GASTAR EXPLORATION INC	1/8+	862	429	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14313	Y	5-13-21	TERRI JEAN GODDARD	GASTAR EXPLORATION USA, INC	1/8+	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*16230	Y	5-13-21	TH Exploration, LLC	TH Exploration, LLC	1/8+	900	134	N/A	N/A
10*14412	Y	5-13-21	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO, AN OHIO CORPORATION	GASTAR EXPLORATION INC	1/8+	872	203	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14371	Y	5-13-21	THOMAS F LONG AND JENNIFER LONG	GASTAR EXPLORATION INC	1/8+	842	398	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A

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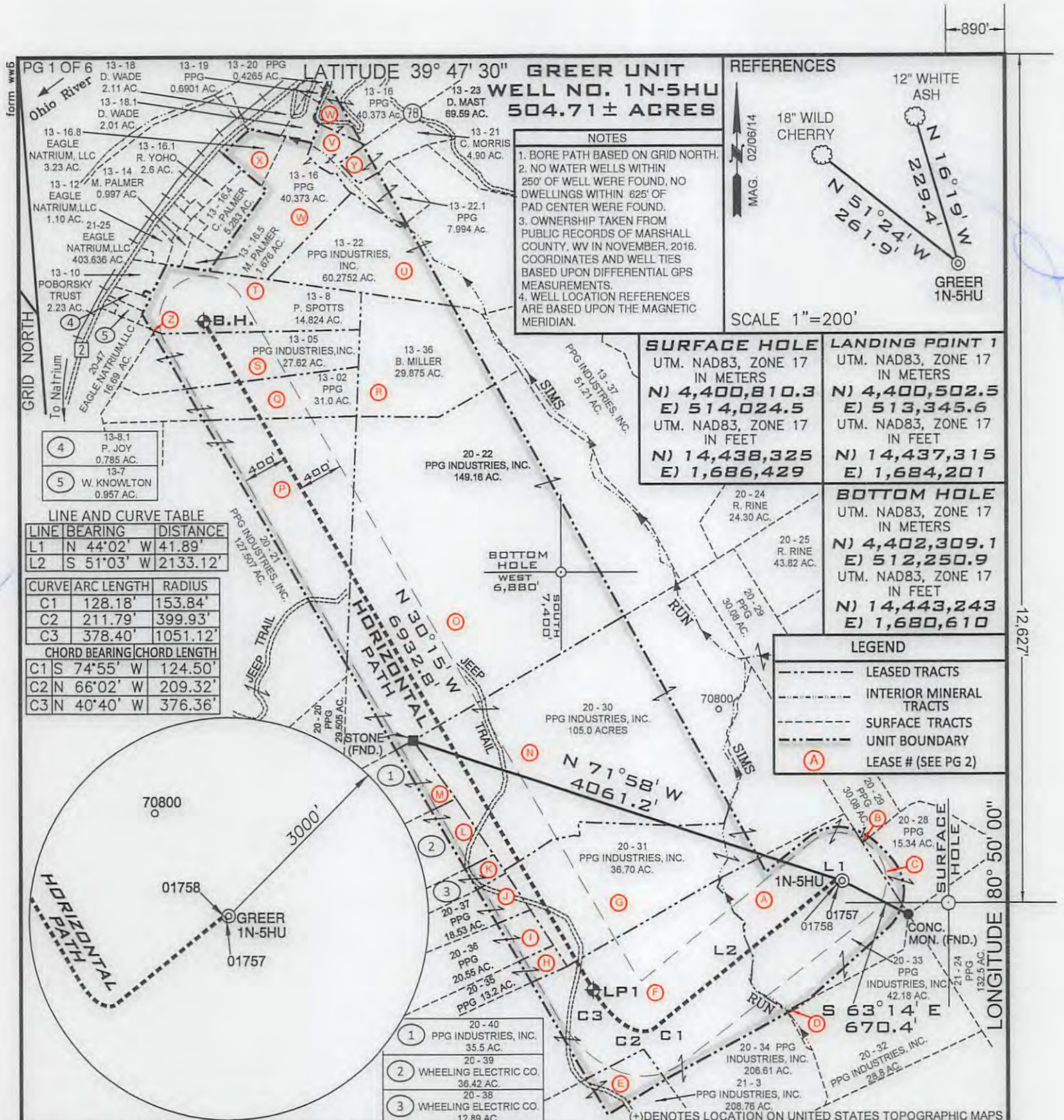
WW-6A1 SUPPLEMENT

OPERATOR'S WELL NO. GREER 1N-5HU

Lease No.	Tag	Parcel	GRANTOR, LESSOR, ECT.	GRANTEE, LESSEE, ECT.	ROYALTY	Book	Pg	Assignment	Assignment
10*14411	Y	5-13-21	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER, ON BEHALF OF JOHN EDWARD HARRIS, JR., MARION LUCILLE ROBINSON, REVEREND FATHER J.F. BEAVER, ELOISE CARTER, EVALENA SCHAEFFER, ELEANOR SHUTT, HELEN MARTIN, MARGERY MOORE, CHARLES LONG, TILLIE ISCHY, LELIA TAYLOR, GERTRUDE URPMAN, IRENE STEWART, HELENA M. WILSON, EDNA SCHRAMM, TOM YOHO, RETTA YOHO, AND DAISY WARD, OR THEIR HEIRS, UNKNOWN HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES	GASTAR EXPLORATION INC	1/8+	870	34	36/009 Gastar Exploration Inc to TH Exploration II, LLC	
10*14329	Y	5-13-21	TONDA ROTHENBUHLER	GASTAR EXPLORATION USA, INC	1/8+	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*14372	Y	5-13-21	UNITED CHURCH HOMES INC., AN OHIO NON-PROFIT CORPORATION	GASTAR EXPLORATION INC	1/8+	846	408	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14395	Y	5-13-21	WILLIAM V BUCKNOR	GASTAR EXPLORATION INC	1/8+	862	421	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14418	Z	5-20-47	PPG INDUSTRIES, INC.	GASTAR EXPLORATION INC	1/8+	878	610	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A

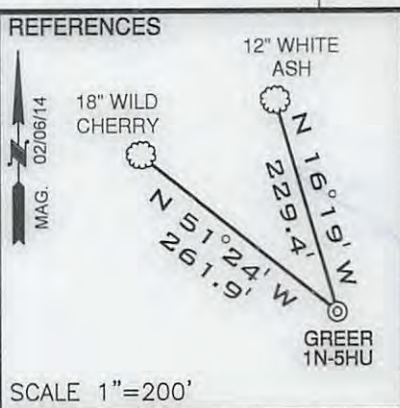
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**NOTES**

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 NOVEMBER, 2016. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
4. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.



**LINE AND CURVE TABLE**

LINE	BEARING	DISTANCE
L1	N 44° 02' W	41.89'
L2	S 51° 03' W	2133.12'

CURVE	ARC LENGTH	RADIUS
C1	128.18'	153.84'
C2	211.79'	399.93'
C3	378.40'	1051.12'

CHORD BEARING	CHORD LENGTH
C1 S 74° 55' W	124.50'
C2 N 66° 02' W	209.32'
C3 N 40° 40' W	376.36'

SURFACE HOLE	LANDING POINT 1
UTM. NAD83, ZONE 17 IN METERS N) 4,400,810.3 E) 514,024.5	UTM. NAD83, ZONE 17 IN METERS N) 4,400,502.5 E) 513,345.6
UTM. NAD83, ZONE 17 IN FEET N) 14,438,325 E) 1,686,429	UTM. NAD83, ZONE 17 IN FEET N) 14,437,315 E) 1,684,201

BOTTOM HOLE
UTM. NAD83, ZONE 17 IN METERS N) 4,402,309.1 E) 512,250.9
UTM. NAD83, ZONE 17 IN FEET N) 14,443,243 E) 1,680,610

**LEGEND**

- LEASED TRACTS
- INTERIOR MINERAL TRACTS
- SURFACE TRACTS
- UNIT BOUNDARY
- (A) LEASE # (SEE PG 2)

FILE NUMBER W0120319 (WB1-76)

DRAWING NUMBER GREER\_WP\_1N-5HU

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. Jonathan N. White  
2122



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

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL

(IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION ELEVATION 1251' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER (UNDEFINED)

DISTRICT FRANKLIN COUNTY MARSHALL

QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER SEE ATTACHED PG 2 THROUGH 6

SURFACE OWNER PPG INDUSTRIES, INC. ACREAGE 42.18

OIL & GAS ROYALTY OWNER PPG INDUSTRIES, INC., ET AL LEASE ACREAGE 504.71

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

PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_\_\_

PLUG & ABANDON  CLEAN OUT & REPLUG

TARGET FORMATION POINT PLEASANT ESTIMATED DEPTH TVD: 11,161' TMD: 18,832'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER  
CT CORPORATION SYSTEM

ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD  
FORT WORTH, TX 76107 CHARLESTON, WV 25313

02/03/2017

COUNTY NAME  
PERMIT



**GREER WELL NO. 1N-5HU  
WELL PLAT LEASE INFORMATION**

Lease No	Tag	Parcel	Oil & Gas Royalty Owner	Book	Pg
10*14316	A	5-20-33	ANDREW GERST	791	645
10*16358	A	5-20-33	Anne Marie Kramer	903	648
10*15763	A	5-20-33	Bonnie J. Selders	904	34
10*15761	A	5-20-33	Cameron Cemetery Association	903	642
10*14402	A	5-20-33	CAROL F WILSON AND RICHARD WILSON	860	446
10*14362	A	5-20-33	CAROLYN STARKEY	827	226
10*14331	A	5-20-33	CHRISTINA JEAN RIOUX	796	70
10*14400	A	5-20-33	COLEEN SLAGLE AND FRANKLIN SLAGLE	860	440
10*14419	A	5-20-33	CROSSROAD CHILD AND FAMILY SERVICES, INC., AN INDIANA NON-PROFIT CORPORATION	887	105
10*16356	A	5-20-33	Daryl S. Bucknor	904	31
10*15762	A	5-20-33	Dawn Petrovlch	904	4
10*14333	A	5-20-33	DEAN ROTHENBUHLER	796	42
10*16357	A	5-20-33	Deanna M. Campbell, a single woman	904	1
10*14355	A	5-20-33	DEWAYNE STARKEY	815	228
10*15760	A	5-20-33	Diedre Winger	903	645
10*14404	A	5-20-33	DON FORGRAVES	862	426
10*14356	A	5-20-33	FREDRIC RICHTER & BETTY RICHTER	822	270
10*15734	A	5-20-33	Genevieve L. Long, a widow	904	13
10*14317	A	5-20-33	HAROLD BLACHLY	791	643
10*14410	A	5-20-33	HENRY T LONG	867	385
10*14321	A	5-20-33	HERBERT BLACHLY	792	102
10*14401	A	5-20-33	IMELDA J SCURLOCK	860	443
10*14388	A	5-20-33	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO, AN OHIO NON-PROFIT CORPORATION	849	513
10*14319	A	5-20-33	JACK J. PFALZGRAF	792	118
10*14409	A	5-20-33	JAMES C LONG AND PATTI LONG	864	326
10*15764	A	5-20-33	James E. Bucknor	904	28
10*16355	A	5-20-33	James P. Long and Linda L. Long	904	10
10*14312	A	5-20-33	JAMIE LU BENSON	790	531
10*14398	A	5-20-33	JAN KAFFENBERGER	860	434
10*15765	A	5-20-33	John A. Bucknor	904	16
10*14387	A	5-20-33	JOHN F LONG AND PAM LONG	849	542
10*15766	A	5-20-33	John J. Pozenel, a widower	904	7
10*14405	A	5-20-33	JOHN WHITE	862	423
10*14377	A	5-20-33	JOSEPH A LONG	849	519
10*14368	A	5-20-33	JOSEPH LONG	836	106
10*14413	A	5-20-33	JUANITA SANDIFER	872	206
10*14416	A	5-20-33	KATHERINE ANN WILLIAMS COTHRAN	879	1
10*14394	A	5-20-33	LESLIE F BUCKNOR	862	419
10*14322	A	5-20-33	LOIS KAY MORFORD	792	110
10*14408	A	5-20-33	LORNA M LONG MORGAN	864	323
10*14315	A	5-20-33	MARGARET ROSS	790	527
10*14318	A	5-20-33	MARTHA BLACHLY-CROSS	792	112
10*14332	A	5-20-33	MICHAEL EDWARD BARTH	796	68
10*14418	A	5-20-33	PPG INDUSTRIES, INC.	878	610
10*14328	A	5-20-33	RAE ELLEN STUART	796	38
10*14314	A	5-20-33	RALPH BLACHLY	790	529
10*14399	A	5-20-33	RITA ANN DOEBERT AND RONALD DOEBERT	860	437
10*14327	A	5-20-33	ROBERT D. OKEY	792	646
10*14320	A	5-20-33	SANDRA CHEYNEY	792	91
10*14403	A	5-20-33	SUE WHITE	862	429
10*14313	A	5-20-33	TERRI JEAN GODDARD	790	585
10*16230	A	5-20-33	TH Exploration, LLC	900	134
10*14412	A	5-20-33	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO, AN OHIO CORPORATION	872	203
10*14371	A	5-20-33	THOMAS F LONG AND JENNIFER LONG	842	398
10*14411	A	5-20-33	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER, ON BEHALF OF JOHN EDWARD HARRIS, JR., MARION LUCILLE ROBINSON, REVEREND FATHER J.F. BEAVER, ELOISE CARTER, EVALENA SCHAEFFER, ELEANOR SHUTT, HELEN MARTIN, MARGERY MOORE, CHARLES LONG, TILLIE ISCHY, LELIA TAYLOR, GERTRUDE URPMAN, IRENE STEWART, HELENA M. WILSON, EDNA SCHRAMM, TOM YOHO, RETTA YOHO, AND DAISY WARD, OR THEIR HEIRS, UNKNOWN HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES.	870	34
10*14329	A	5-20-33	TONDA ROTHENBUHLER	796	40
10*14372	A	5-20-33	UNITED CHURCH HOMES INC., AN OHIO NON-PROFIT CORPORATION	846	408
10*14381	A	5-20-33	WILLIAM LONG	792	95
10*14395	A	5-20-33	WILLIAM V BUCKNOR	862	421
10*14325	B	5-20-29	ELIZABETH ANN STRAUSBAUGH	792	104
10*14326	B	5-20-29	JANET LEA BLANKENSHIP	792	580
10*14310	B	5-20-29	JEAN C. THOMAS	782/0351017	
10*14308	B	5-20-29	MARY E. BASSETT	779	492
10*14418	B	5-20-29	PPG INDUSTRIES, INC.	878	610
10*14309	B	5-20-29	ROBERT B. THOMAS	779	484
10*14324	B	5-20-29	RUTH E. BASSETT MEADOWS	792	100
10*14307	B	5-20-29	SALLY CYNTHIA HOPKINS	777	572

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. 1N-5HU  
WELL PLAT LEASE INFORMATION**

Lease No	Tag	Parcel	Oil & Gas Royalty Owner	Book	Pg
10*14325	C	5-20-28	ELIZABETH ANN STRAUSBAUGH	792	104
10*14326	C	5-20-28	JANET LEA BLANKENSHIP	792	580
10*14310	C	5-20-28	JEAN C. THOMAS	781	614
10*14308	C	5-20-28	MARY E. BASSETT	779	492
10*14418	C	5-20-28	PPG INDUSTRIES, INC.	878	610
10*14309	C	5-20-28	ROBERT B. THOMAS	779	484
10*14324	C	5-20-28	RUTH E. BASSETT MEADOWS	792	100
10*14307	C	5-20-28	SALLY CYNTHIA HOPKINS	777	572
10*14418	D	5-20-32	PPG INDUSTRIES, INC.	878	610
10*14418	E	5-21-3	PPG INDUSTRIES, INC.	878	610
10*14418	F	5-20-34	PPG INDUSTRIES, INC.	878	610
10*14418	G	5-20-31	PPG INDUSTRIES, INC.	878	610
10*14418	H	5-20-35	PPG INDUSTRIES, INC.	878	610
10*14418	I	5-20-36	PPG INDUSTRIES, INC.	878	610
10*14418	J	5-20-37	PPG INDUSTRIES, INC.	878	610
10*14703	K	5-20-38	WHEELING POWER COMPANY	786	303
10*14703	L	5-20-39	WHEELING POWER COMPANY	786	303
10*14418	M	5-20-40	PPG INDUSTRIES, INC.	878	610
10*14360	N	5-20-30	ALLEN D. MASON	827	276
10*14343	N	5-20-30	BARBARA METZNER	799	459
10*14352	N	5-20-30	BRIAN K. MARMIE & CAROL L. MARMIE	805	76
10*14366	N	5-20-30	CARRIE E METZGER FKA CARRIE ELIZABETH CHAMBERS, A MARRIED WOMAN DEALING IN HER SOLE AND SEPARATE PROPERTY	833	527
10*14358	N	5-20-30	CHRIS H. STEVENSON	827	282
10*14367	N	5-20-30	CHRISTINA CHAMBERS	836	123
10*14363	N	5-20-30	CHRISTINA I. CHILCOTE	827	525
10*14311	N	5-20-30	COLLIN A. WILLISON III	789	577
10*14365	N	5-20-30	DAN J. SVOVELAND	827	523
10*14414	N	5-20-30	DAVID C WHITE, ESQ., SPECIAL COMMISSIONER, ON BEHALF OF D.W. CHESS, OR HIS HEIRS, UNKNOWN HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES	872	217
10*14364	N	5-20-30	DAWN M. LAEMMIE	827	521
10*14342	N	5-20-30	FLORENCE L. MYERS	799	457
10*14348	N	5-20-30	GEORGEANN TIPPY	803	152
10*14349	N	5-20-30	HOWARD A. BROWN	805	98
10*14339	N	5-20-30	JOANN FRAZIER	799	59
10*14323	N	5-20-30	JODY ELIZONDO	792	93
10*14357	N	5-20-30	JORLENE POST	827	280
10*14340	N	5-20-30	JOSEPH CHAMBERS	799	450
10*14353	N	5-20-30	KARI B. MARMIE	809	515
10*14346	N	5-20-30	LAURA GLASSNER	800	406
10*14330	N	5-20-30	LETTITIA TEMPLE	799	465
10*14338	N	5-20-30	LOIS JEAN MYERS	797	189
10*14359	N	5-20-30	LUCYBELLE WELDON	827	278
10*14344	N	5-20-30	LYNNETTE L. KUGLER	799	461
10*14336	N	5-20-30	MARSHA L. SCHON	797	198
10*14335	N	5-20-30	MARY C. JOSEPH	797	196
10*14351	N	5-20-30	NORA WEBB	805	78
10*14418	N	5-20-30	PPG INDUSTRIES, INC.	878	610
10*14350	N	5-20-30	RAE JEAN NAMETH	805	80
10*14341	N	5-20-30	ROBERT MARMIE	799	455
10*14361	N	5-20-30	RODNEY K. CHAMBERS	827	271
10*14345	N	5-20-30	SHARON D. GREEN	799	463
10*14334	N	5-20-30	STANLEY RICHMOND	796	62
10*14347	N	5-20-30	TERRY I. CHAMBERS	800	404
10*14354	N	5-20-30	TRAVIS D. MARMIE	808	491
10*14337	N	5-20-30	WILLIAM M. DOYLE	797	187
10*14418	O	5-20-22	PPG INDUSTRIES, INC.	878	610
10*14922	O	5-20-22	ROGER R WEESE, SPECIAL COMMISSIONER, ON BEHALF OF EMMA W. STANDIFORD, MARY WILSON CRAMER, JANE TAYLOR, MAY BRIDENBECKER, ROSEBERRY L. WILSON, ANNIE WILSON, BEATRICE WILSON KERLIN, COURTNEY T. WILSON, GUY WILSON, CALLIE WILSON GATES, JAMES C. WILSON, H.L. WILSON, FRED WILSON, RAY WILSON, WILLIS WILSON, ELIZABETH WILSON BALDWIN, GERTRUDE B. SMITH, ALVIN BALDWIN, I.M. GARRETT, LUCILLE B. WENTZ, C.C. BALDWIN, SARAH WILSON COLEMAN, JOHN WILSON, LYDIA WILSON SHAW, AND MARTHA WILSON, OR THEIR HEIRS, UNKNOWN HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES	836	488
10*14418	P	5-20-21	PPG INDUSTRIES, INC.	878	610
10*14418	Q	5-13-2	PPG INDUSTRIES, INC.	878	610
10*47051.324.2	R	5-13-36	JACK L MASON	737	229
10*14370	R	5-13-36	JAMES SLAWINSKI	842	370
10*47051.324.1	R	5-13-36	MARILYN SUE BUMER	739	412
10*14418	R	5-13-36	PPG INDUSTRIES, INC.	878	610
10*15756	R	5-13-36	STEVEN A BOHRER ET UX	904	20
10*14369	R	5-13-36	TIMOTHY B MILLER	844	87
10*14418	S	5-13-5	PPG INDUSTRIES, INC.	878	610
10*14663	T	5-13-8	PAUL F. SPOTTS	779	482

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

02/03/2017

**GREER WELL NO. 1N-5H  
WELL PLAT LEASE INFORMATION**

Lease No	Tag	Parcel	Oil & Gas Royalty Owner	Book	Pg
10*14316	U	5-13-22	ANDREW GERST	791	645
10*16358	U	5-13-22	Anne Marie Kramer	903	648
10*15763	U	5-13-22	Bonnie J. Selders	904	34
10*15761	U	5-13-22	Cameron Cemetery Association	903	642
10*14402	U	5-13-22	CAROL F WILSON AND RICHARD WILSON	860	446
10*14362	U	5-13-22	CAROLYN STARKEY	827	226
10*14331	U	5-13-22	CHRISTINA JEAN RIOUX	796	70
10*14400	U	5-13-22	COLEEN SLAGLE AND FRANKLIN SLAGLE	860	440
10*14419	U	5-13-22	CROSSROAD CHILD AND FAMILY SERVICES, INC., AN INDIANA NON-PROFIT CORPORATION	887	105
10*16356	U	5-13-22	Daryl S. Bucknor, married	904	31
10*15762	U	5-13-22	Dawn Petrovich	904	4
10*14333	U	5-13-22	DEAN ROTHENBUHLER	796	42
10*16357	U	5-13-22	Deanna M. Campbell, a single woman	904	1
10*14355	U	5-13-22	DEWAYNE STARKEY	815	228
10*15760	U	5-13-22	Diedre Winger	903	645
10*14404	U	5-13-22	DON FORGRAVES	862	426
10*14356	U	5-13-22	FREDRIC RICHTER & BETTY RICHTER	822	270
10*15734	U	5-13-22	Genevieve L. Long, a widow	904	13
10*14317	U	5-13-22	HAROLD BLACHLY	791	643
10*14410	U	5-13-22	HENRY T LONG	867	385
10*14321	U	5-13-22	HERBERT BLACHLY	792	102
10*14401	U	5-13-22	IMELDA J SCURLOCK	860	443
10*14388	U	5-13-22	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO, AN OHIO NON-PROFIT CORPORATION	849	513
10*14319	U	5-13-22	JACK J. PFALZGRAF	792	118
10*14409	U	5-13-22	JAMES C LONG AND PATTI LONG	864	326
10*15764	U	5-13-22	James E. Bucknor	904	28
10*16355	U	5-13-22	James P. Long and Linda L. Long	904	10
10*14312	U	5-13-22	JAMIE LU BENSON	790	531
10*14398	U	5-13-22	JAN KAFFENBERGER	860	434
10*15765	U	5-13-22	John A. Bucknor	904	16
10*14387	U	5-13-22	JOHN F LONG AND PAM LONG	849	542
10*15766	U	5-13-22	John J. Pozenel, a widower	904	7
10*14405	U	5-13-22	JOHN WHITE	862	423
10*14377	U	5-13-22	JOSEPH A LONG	849	519
10*14368	U	5-13-22	JOSEPH LONG	836	106
10*14413	U	5-13-22	JUANITA SANDIFER	872	206
10*14416	U	5-13-22	KATHERINE ANN WILLIAMS COTHRAN	879	1
10*14394	U	5-13-22	LESLIE F BUCKNOR	862	419
10*14322	U	5-13-22	LOIS KAY MORFORD	792	110
10*14408	U	5-13-22	LORNA M LONG MORGAN	864	323
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10*14318	U	5-13-22	MARTHA BLACHLY-CROSS	792	112
10*14332	U	5-13-22	MICHAEL EDWARD BARTH	796	68
10*14418	U	5-13-22	PPG INDUSTRIES, INC.	878	610
10*14328	U	5-13-22	RAE ELLEN STUART	796	38
10*14314	U	5-13-22	RALPH BLACHLY	790	529
10*14399	U	5-13-22	RITA ANN DOEBERT AND RONALD DOEBERT	860	437
10*14327	U	5-13-22	ROBERT D. OKEY	792	646
10*14320	U	5-13-22	SANDRA CHEYNEY	792	91
10*14403	U	5-13-22	SUE WHITE	862	429
10*14313	U	5-13-22	TERRI JEAN GODDARD	790	585
10*16230	U	5-13-22	TH Exploration, LLC	900	134
10*14412	U	5-13-22	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO, AN OHIO CORPORATION	872	203
10*14371	U	5-13-22	THOMAS F LONG AND JENNIFER LONG	842	398
10*14411	U	5-13-22	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER, ON BEHALF OF JOHN EDWARD HARRIS, JR., MARION LUCILLE ROBINSON, REVEREND FATHER J.F. BEAVER, ELOISE CARTER, EVALENA SCHAEFFER, ELEANOR SHUTT, HELEN MARTIN, MARGERY MOORE, CHARLES LONG, TILLIE ISCHY, LELIA TAYLOR, GERTRUDE URPMAN, IRENE STEWART, HELENA M. WILSON, EDNA SCHRAMM, TOM YOHO, RETTA YOHO, AND DAISY WARD, OR THEIR HEIRS, UNKNOWN HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES	870	34
10*14329	U	5-13-22	TONDA ROTHENBUHLER	796	40
10*14372	U	5-13-22	UNITED CHURCH HOMES INC., AN OHIO NON-PROFIT CORPORATION	846	408
10*14395	U	5-13-22	WILLIAM V BUCKNOR	862	421
10*14316	V	5-13-22.1	ANDREW GERST	791	645
10*16358	V	5-13-22.1	Anne Marie Kramer	903	648
10*15763	V	5-13-22.1	Bonnie J. Selders	904	34
10*15761	V	5-13-22.1	Cameron Cemetery Association	903	642
10*14402	V	5-13-22.1	CAROL F WILSON AND RICHARD WILSON	860	446
10*14362	V	5-13-22.1	CAROLYN STARKEY	827	226
10*14331	V	5-13-22.1	CHRISTINA JEAN RIOUX	796	70
10*14400	V	5-13-22.1	COLEEN SLAGLE AND FRANKLIN SLAGLE	860	440
10*14419	V	5-13-22.1	CROSSROAD CHILD AND FAMILY SERVICES, INC., AN INDIANA NON-PROFIT CORPORATION	887	105

WELL OPERATOR TUG HILL OPERATING, LLC  
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DESIGNATED AGENT DIANNA STAMPER  
CT CORPORATION SYSTEM  
ADDRESS 5400 D BIG TYLER ROAD  
CHARLESTON WV, 25313

02/03/2017



**GREER WELL NO. 1N-5HU  
WELL PLAT LEASE INFORMATION**

Lease No	Tag	Parcel	Oil & Gas Royalty Owner	Book	Pg
10*16356	V	5-13-22.1	Daryl S. Bucknor, married	904	31
10*15762	V	5-13-22.1	Dawn Petrovich	904	4
10*14333	V	5-13-22.1	DEAN ROTHENBUHLER	796	42
10*16357	V	5-13-22.1	Deanna M. Campbell, a single woman	904	1
10*14355	V	5-13-22.1	DEWAYNE STARKEY	815	228
10*15760	V	5-13-22.1	Diedre Winger	903	645
10*14404	V	5-13-22.1	DON FORGRAVES	862	426
10*14356	V	5-13-22.1	FREDRIC RICHTER & BETTY RICHTER	822	270
10*15734	V	5-13-22.1	Genevieve L. Long, a widow	904	13
10*14317	V	5-13-22.1	HAROLD BLACHLY	791	643
10*14410	V	5-13-22.1	HENRY T LONG	867	385
10*14321	V	5-13-22.1	HERBERT BLACHLY	792	102
10*14401	V	5-13-22.1	IMELDA J SCURLOCK	860	443
10*14388	V	5-13-22.1	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO, AN OHIO NON-PROFIT CORPORATION	849	513
10*14319	V	5-13-22.1	JACK J. PFALZGRAF	792	118
10*14409	V	5-13-22.1	JAMES C LONG AND PATTI LONG	864	326
10*15764	V	5-13-22.1	James E. Bucknor	904	28
10*16355	V	5-13-22.1	James P. Long and Linda L. Long	904	10
10*14312	V	5-13-22.1	JAMIE LU BENSON	790	531
10*14398	V	5-13-22.1	JAN KAFFENBERGER	860	434
10*15765	V	5-13-22.1	John A. Bucknor	904	16
10*14387	V	5-13-22.1	JOHN F LONG AND PAM LONG	849	542
10*15766	V	5-13-22.1	John J. Pozenel, a widower	904	7
10*14405	V	5-13-22.1	JOHN WHITE	862	423
10*14377	V	5-13-22.1	JOSEPH A LONG	849	519
10*14368	V	5-13-22.1	JOSEPH LONG	836	106
10*14413	V	5-13-22.1	JUANITA SANDIFER	872	206
10*14416	V	5-13-22.1	KATHERINE ANN WILLIAMS COTHRAN	879	1
10*14394	V	5-13-22.1	LESLIE F BUCKNOR	862	419
10*14322	V	5-13-22.1	LOIS KAY MORFORD	792	110
10*14408	V	5-13-22.1	LORNA M LONG MORGAN	864	323
10*14315	V	5-13-22.1	MARGARET ROSS	790	527
10*14318	V	5-13-22.1	MARTHA BLACHLY-CROSS	792	112
10*14332	V	5-13-22.1	MICHAEL EDWARD BARTH	796	68
10*14418	V	5-13-22.1	PPG INDUSTRIES, INC.	878	610
10*14328	V	5-13-22.1	RAE ELLEN STUART	796	38
10*14314	V	5-13-22.1	RALPH BLACHLY	790	529
10*14399	V	5-13-22.1	RITA ANN DOEBERT AND RONALD DOEBERT	860	437
10*14327	V	5-13-22.1	ROBERT D. OKEY	792	646
10*14320	V	5-13-22.1	SANDRA CHEYNEY	792	91
10*14403	V	5-13-22.1	SUE WHITE	862	429
10*14313	V	5-13-22.1	TERRI JEAN GODDARD	790	585
10*16230	V	5-13-22.1	TH Exploration, LLC	900	134
10*14412	V	5-13-22.1	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO, AN OHIO CORPORATION	872	203
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10*14372	V	5-13-22.1	UNITED CHURCH HOMES INC., AN OHIO NON-PROFIT CORPORATION	846	408
10*14395	V	5-13-22.1	WILLIAM V BUCKNOR	862	421
10*14418	W	5-13-16	PPG INDUSTRIES, INC.	878	610
10*14418	X	5-13-16.8	PPG INDUSTRIES, INC.	878	610
10*14316	Y	5-13-21	ANDREW GERST	791	645
10*16358	Y	5-13-21	Anne Marie Kramer	903	648
10*15763	Y	5-13-21	Bonnie J. Selders	904	34
10*15761	Y	5-13-21	Cameron Cemetery Association	903	642
10*14402	Y	5-13-21	CAROL F WILSON AND RICHARD WILSON	860	446
10*14362	Y	5-13-21	CAROLYN STARKEY	827	226
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10*15762	Y	5-13-21	Dawn Petrovich	904	4
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10*16357	Y	5-13-21	Deanna M. Campbell, a single woman	904	1
10*14355	Y	5-13-21	DEWAYNE STARKEY	815	228
10*15760	Y	5-13-21	Diedre Winger	903	645
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WELL OPERATOR TUG HILL OPERATING, LLC  
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CT CORPORATION SYSTEM  
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CHARLESTON WV, 25313

02/03/2017

**GREER WELL NO. 1N-5HJ  
WELL PLAT LEASE INFORMATION**

Lease No	Tag	Parcel	Oil & Gas Royalty Owner	Book	Pg
10*14356	Y	5-13-21	FREDRIC RICHTER & BETTY RICHTER	822	270
10*15734	Y	5-13-21	Genevieve L. Long, a widow	904	13
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10*14312	Y	5-13-21	JAMIE LU BENSON	790	531
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10*15766	Y	5-13-21	John J. Pozenel, a widower	904	7
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10*14394	Y	5-13-21	LESLIE F BUCKNOR	862	419
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10*14408	Y	5-13-21	LORNA M LONG MORGAN	864	323
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10*14372	Y	5-13-21	UNITED CHURCH HOMES INC., AN OHIO NON-PROFIT CORPORATION	846	408
10*14395	Y	5-13-21	WILLIAM V BUCKNOR	862	421
10*14418	Z	5-20-47	PPG INDUSTRIES, INC.	878	610

02/03/2017

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



November 01, 2016

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

RE: Greer 1N-5HU

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 1N-5HU 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 304-689-7676, or by email at [Jwhite@tug-hilop.com](mailto:Jwhite@tug-hilop.com).

Sincerely,

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

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

RECEIVED  
Office of Oil and Gas

NOV 14 2016



AFFIDAVIT

COPY  
51-01893

STATE OF TEXAS §  
§ SS  
COUNTY OF TARRANT §

On this 18<sup>th</sup> 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 18<sup>th</sup> day of October, 2016.

David D. Kalish  
Affiant: David D. Kalish

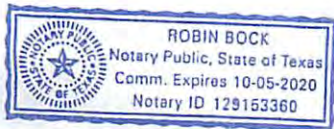
JURAT

Jan Pest  
MARSHALL County 03:44:28 PM  
Instrument No 1416299  
Date Recorded 10/19/2016  
Document Type MIS  
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 18<sup>th</sup> day of October, 2016, by David D. Kalish

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



My Commission Expires: RECEIVED  
Signature/Notary Public: Robin Bock  
Name/Notary Public (Print) Robin Bock

WV Department of  
Environmental Protection

02/03/2017



December 1, 2016

WV Department of Environmental Protection  
Office of Oil & Gas  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304  
Attention: Cindy Raines

RE: Greer 1N-5HU

Subject: Proposed Voluntary Pooling and Unitization

Dear Cindy:

Tug Hill Operating, LLC is authorized through, either lease or other agreement, to unitize and pool all lands falling within the boundaries of the proposed voluntary unit included with this submission.

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact Jonathan White directly at 304-689-7676, or by email at [Jwhite@tug-hillop.com](mailto:Jwhite@tug-hillop.com).

Sincerely,

A handwritten signature in blue ink, appearing to read "B. Irwin", is written over a light blue circular stamp.

**Benjamin J. Irwin**  
Senior Landman  
Tug Hill Operating

AFFIDAVIT

STATE OF TEXAS §
COUNTY OF TARRANT § SS

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

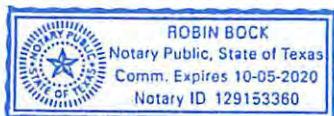
JURAT

Vertical stamp: Carol S. Haught, METZEL County 10-29-27 AM, Instrument No 212095, Date Recorded 10/20/2016, Document Type Affidavit, Pages Recorded 1, Book-Page 119-291, Recording Fee \$5.00, Additional \$6.00

STATE OF TEXAS §
COUNTY OF TARRANT § SS

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



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

Date of Notice Certification: 11/10/2016

API No. 47- 051 - 01893  
Operator's Well No. Greer 1N-5HU  
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>514,024.5</u>
County: <u>Marshall</u>	Northing: <u>4,400,810.3</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 (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.

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 100px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p><b>OOG OFFICE USE ONLY</b></p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><b>RECEIVED</b> <b>Office of Oil and Gas</b></p> <p><b>NOV 14 2016</b></p> <p><input type="checkbox"/> RECEIVED</p> <p><b>WV Department of Environmental Protection</b></p> <p><input type="checkbox"/> RECEIVED</p>
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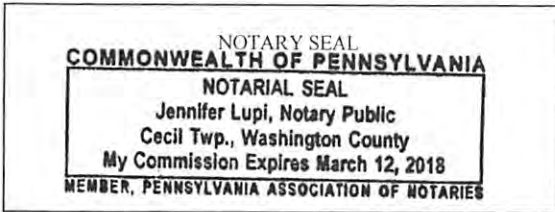
**Required Attachments:**

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

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



Subscribed and sworn before me this 10<sup>th</sup> day of Nov 2016.

Jennifer Lupi Notary Public

My Commission Expires March 12, 2018

**Oil and Gas Privacy Notice:**

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

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Office of Oil and Gas  
NOV 14 2016  
WV Department of  
Environmental Protection



**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:** 11/10/2016 **Date Permit Application Filed:** 11/11/2016

**Notice of:**

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

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

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

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

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

SURFACE OWNER(s)  
Name: PPG INDUSTRIES, INC.  
Address: 1 PPG PLACE  
PITTSBURGH, PA 15272  
Name: \_\_\_\_\_  
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(s) (Road and/or Other Disturbance)  
Name: Same as above surface owner  
Address: \_\_\_\_\_  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

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

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

OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
Name: None  
Address: \_\_\_\_\_

\*Please attach additional forms if necessary

**RECEIVED**  
**Office of Oil and Gas**  
**NOV 14 2016**  
**WV Department of Environmental Protection**



**Notice is hereby given:**

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

**This Notice Shall Include:**

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

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

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

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

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

**Well Location Restrictions**

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



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

**Water Well Testing:**

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

**Water Testing Laboratories:**

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

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

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

**Written Comment:**

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

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

Office of Oil and Gas  
NOV 14 2016  
WV Department of  
Environmental Protection

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

### **Time Limits and Methods for Filing Comments.**

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

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

### **Comment Requirements**

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

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

### **Permit Denial or Condition**

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

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

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

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

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NOV 14 2016  
WV Department of  
Environmental Protection



WW-6A  
(8-13)

API NO. 47- 051 - 01893  
OPERATOR WELL NO. Greer 1N-5HU  
Well Pad Name: Greer

**Notice is hereby given by:**

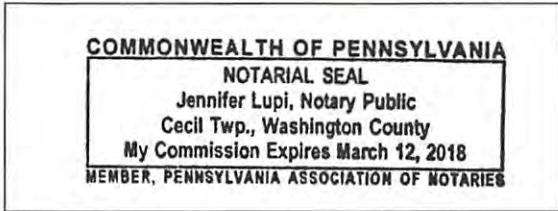
Well Operator: Tug Hill Operating, LLC  
Telephone: 724-338-2026  
Email: jwhite@tug-hillcp.com

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

**Oil and Gas Privacy Notice:**

*Jonathan White*

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



Subscribed and sworn before me this 10<sup>th</sup> day of Nov., 2016.

Jennifer Lupi Notary Public

My Commission Expires March 12, 2018

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Office of Oil and Gas  
NOV 14 2016  
WV Department of  
Environmental Protection

02/03/2017

8773

*[Faint handwritten signature]*

MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES  
 My Commission Expires March 12, 2018  
 Cecil Twp., Washington County  
 Jennifer Lujt, Notary Public  
 NOTARIAL SEAL  
 COMMONWEALTH OF PENNSYLVANIA



SI-01893

WW-6A

Supplement Pg. 1A

November 01, 2016  
Tug Hill Operating, LLC  
380 Southpointe Blvd.,  
Southpointe Plaza II, Suite 200  
Canonsburg, PA 15317

## WATER WELL REPORT

Well: Greer 1N-5HU  
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.

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Office of Oil and Gas  
NOV 14 2016  
WV Department of  
Environmental Protection

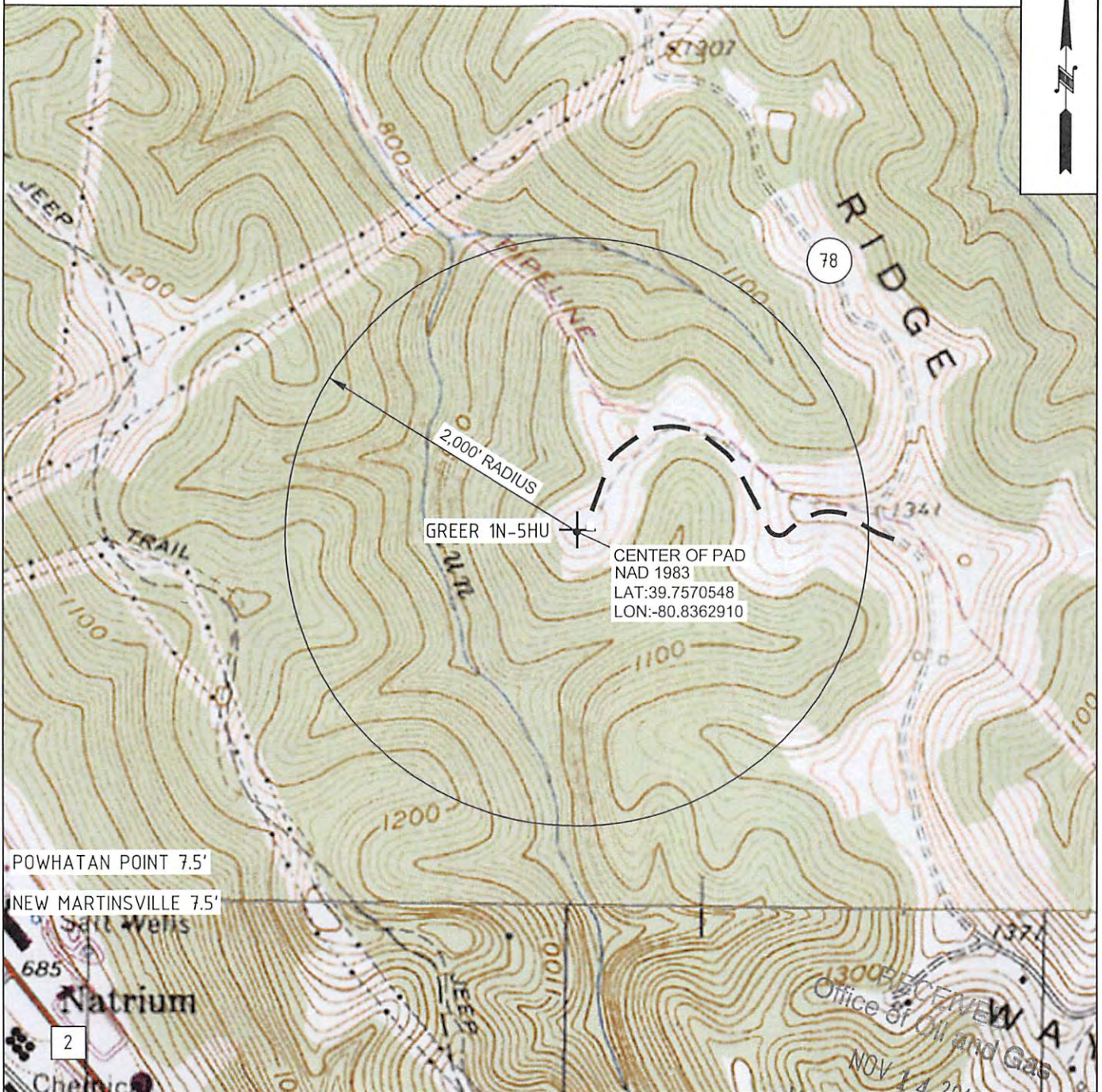
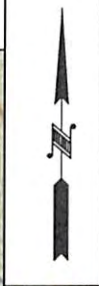
02/03/2017

WW-6A

# PROPOSED GREER 1N-5HU

SUPPLEMENT PG 1B

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



POWHATAN POINT 7.5'

NEW MARTINSVILLE 7.5'

2

 <b>TUG HILL OPERATING</b>	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: 10/18/16



Operator Well No. Greer Unit 1N-5HU

## 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

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

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

**Date of Notice:** SEPTEMBER 26, 2016    **Date of Planned Entry:** OCTOBER 3, 2016

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

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

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

**Notice is hereby provided to:**

SURFACE OWNER(s)

Name: PPG INDUSTRIES, INC.

Address: 1 PPG PLACE  
PITTSBURGH, PA 15272

Name: None

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

Name: None

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

COAL OWNER OR LESSEE

Name: PPG INDUSTRIES, INC.

Address: 1 PPG PLACE  
PITTSBURGH, PA 15272    \*See Supplement Page

MINERAL OWNER(s)

Name: PPG INDUSTRIES, INC.

Address: 1 PPG PLACE  
PITTSBURGH, PA 15272    \*See Supplement Page

\*please attach additional forms if necessary

**Notice is hereby given:**

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

State: <u>WEST VIRGINIA</u>	Approx. Latitude & Longitude: <u>LAT: 39.75709272, LONG: -80.83627951</u>
County: <u>MARSHALL</u>	Public Road Access: <u>WAYNE RIDGE ROAD (COUNTY ROUTE 78)</u>
District: <u>FRANKLIN</u>	Watershed: <u>HUC 10- FRENCH CREEK- OHIO RIVER</u>
Quadrangle: <u>POWHATAN POINT</u>	Generally used farm name: <u>PPG INDUSTRIES, INC.</u>

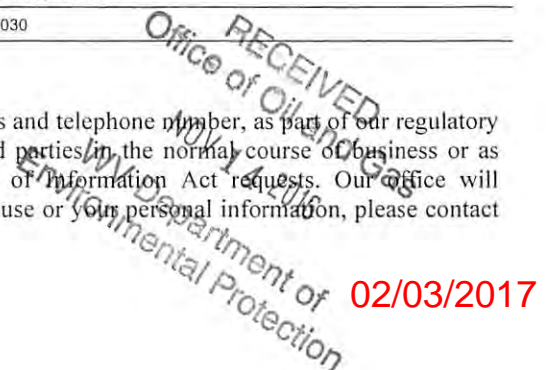
Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450).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

**Notice is hereby given by:**

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>JWHITE@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](mailto:depprivacyofficer@wv.gov).





**WW-6A3 Notice of Entry for Plat Survey  
Supplement**

Operator Well No. Greer Unit 1N-5HU

**Mineral Owner(s):**

**Name:** PPG Industries, Inc.

**Address:** 1 PPG Place  
Pittsburgh, PA 15272

**Name:** Cynthia P. Hopkins and John T. Hopkins, Co-Trustees of the Cynthia P. Hopkins  
Revocable Trust U/T/A

**Address:** 1244 Arbor Road Box 528  
Winston- Salem, NC 27104

**Name:** AMP Acquisition, LLC

**Address:** 225 Ross Street, Suite 301  
Pittsburgh, PA 15219

**Name:** Daniel M. Thomas

**Address:** 2549 Starlite Lane  
Port Charlotte, FL 33952

**Name:** Elizabeth Ann Strausbaugh

**Address:** 11387 Couny Road 550  
Chillicothe, OH 45601

**Name:** Janet Lea Blankenship

**Address:** 1 Cheves Creek Ct.  
North Augusta, SC 29860

**Name:** Daniel Lee Meadows

**Address:** 8109 Maryland Avenue  
Marmet, WV 25315

**Name:** Mary E. Bassett

**Address:** 35475 Hartshorn Ridge Road,  
Graysville, OH 45734

**Name:** Carolyn Starkey

**Address:** HC 60, Box 16  
New Martinsville, WV 26155

**Name:** Dewayne Starkey

**Address:** HC 60, Box 16  
New Martinsville, WV 26155

**Name:** Fredric Richter and Betty Richter

**Address:** 9200 NW 73rd Street  
Tamarac, FL 33321



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**WW-6A3 Notice of Entry for Plat Survey  
Supplement**

Operator Well No. Greer Unit 1N-5HU

**Mineral Owner(s):**

**Name:** Jamie Lu Benson  
**Address:** 530 N. Main St.  
New Martinsville, WV 26155

**Name:** Lois Kay Morford  
**Address:** 2211 35th St.  
Parkersburg, WV 26104

**Name:** Terri Jean Goddard  
**Address:** 628 4th St.  
New Martinsville, WV 26155

**Name:** Rae Ellen Stuart  
**Address:** 642 N. Main St.  
New Martinsville, WV 26155

**Name:** Michael Edward Barth  
**Address:** 328 Clark St.  
New Martinsville, WV 26155

**Name:** Christina Jean Rioux  
**Address:** 555 North Avenue #16K  
Fort Lee, NJ 07024

**Name:** Immanuel Church of United Church of Christ  
**Address:** 124 Shepherd Place  
Clarington, OH 43915

**Name:** United Church Homes, Inc.  
**Address:** 170 E. Center St.  
Marion, OH 43302

**Name:** Crossroad Child & Family Services, Inc.  
**Address:** 2525 Lake Avenue  
Fort Wayne, IN 46805

**Name:** The Village Network  
**Address:** 2000 Noble Drive  
Wooster, OH 44691

**Name:** Hilary Mae Long  
**Address:** 351 McConnell Ave.  
Zanesville, OH 43701

**Name:** Andrew Gerst  
**Address:** 3352 Meadowood Dr. Apt. 3C  
Zanesville, OH 43701



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**WW-6A3 Notice of Entry for Plat Survey  
Supplement**

Operator Well No. Greer Unit 1N-5HU

**Mineral Owner(s):**

**Name:** Thomas Long & Jennifer Long  
**Address:** 1153 Paulins Hill Road  
Middleport, OH 45760

**Name:** Joseph A. Long  
**Address:** 577 Schaum Ave.  
Zainesville, OH 43701

**Name:** James P. Long  
**Address:** 5919 Nicolet Ct.  
Crozet VA 22932

**Name:** Dawn Petrovich  
**Address:** 13351 Lehmann Ct.  
Gulfport, MS 39503

**Name:** Deanna Campbell  
**Address:** 4757 Barcelona Ridge Ct.  
Las Vegas, NV 89129

**Name:** Diedre Winger Brown  
**Address:** 23488 Sharon Dr.  
North Olmsted, OH 44070

**Name:** Ana Marie Kramer  
**Address:** 2730 3rd. Avenue  
Sacramento, CA 95818

**Name:** Genevieve Long  
**Address:** 4535 Boggs Rd.  
Zanesville, OH 43701

**Name:** Cameron Cemetery Association  
**Address:** 47126 Sunfish Creek Rd.  
Beallsville, OH 43716

**Name:** Dean Rothenbuhler  
**Address:** 48090 Main St.  
Cameron, OH 43914

**Name:** Tonda Rothenbuhler  
**Address:** 48090 Main St.  
Cameron, OH 43914



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**WW-6A3 Notice of Entry for Plat Survey  
Supplement**

Operator Well No. Greer Unit 1N-5HU

**Mineral Owner(s):**

**Name:** Sandra Cheyney  
**Address:** 1119 Wales Rd. NE  
Massillon, OH 44646

**Name:** Robert D. Okey  
**Address:** 4716 Strouble Drive NW  
Canton, OH 44718

**Name:** Jack J. Pfalzgraf  
**Address:** 33067 Firehouse Rd.  
Lewisville, OH 43754

**Name:** Ralph Blachly  
**Address:** 1705 Wiltshire Rd.  
Akron, OH 44313

**Name:** Margaret Ross  
**Address:** 11371 Stausser St. NW  
Canal Fulton, OH 44614

**Name:** Harold Blachly  
**Address:** 3723 Lincoln St. E  
Canton, OH 44707

**Name:** Martha Blachy-Cross  
**Address:** 3487 Colletta Lane  
Cleveland, OH 44111

**Name:** Herbert Blachly  
**Address:** 13866 Warwick Dr. NW  
Canal Fulton, OH 44614

**Name:** Bonnie J. Selders  
**Address:** 772 Renninger Rd  
New Franklin, OH 44319

**Name:** Carol F. Wilson and Richard Wilson  
**Address:** 419 S. Patterson St.  
Carey, OH 43316

**Name:** Rita Ann Doebert and Ronald Doebert  
**Address:** 316 Buerger St.  
Marysville, OH 43040



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**WW-6A3 Notice of Entry for Plat Survey  
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Operator Well No. Greer Unit 1N-5HU

**Mineral Owner(s):**

**Name:** Coleen Slagle and Franklin Slagle, Jr.  
**Address:** 7402 Brownsville Rd.  
Glenford, OH 43739

**Name:** Juanita Sandifer  
**Address:** 957 Shadow Lake Dr.  
Ridgeland, MS 39157

**Name:** Daryl S. Bucknor  
**Address:** 129 Park Avenue  
Lock Haven, PA 17745

**Name:** Leslie F. Bucknor  
**Address:** 7630 Palmer Rd.  
Pataskala, OH 43062

**Name:** William V. Bucknor  
**Address:** 6620 Kitzmiller Rd.  
New Albany, OH 43054

**Name:** John A. Bucknor  
**Address:** 150 Summer Pond Trl.  
Lawrenceville, GA 30046

**Name:** James E. Bucknor  
**Address:** 871 Terrace Trce  
Lawrenceville, GA 30044

**Name:** Katherine Ann Williams Cothran  
**Address:** 1649 Quail Run Road  
Royston, GA 30662

**Name:** John White  
**Address:** 13833 Mount Perry Rd.  
Mount Perry, OH 43760

**Name:** Jan Kaffenberger aka Mary Jeanette Kaffenberger  
**Address:** P.O. Box 141  
Glenford, OH 43739

**Name:** Sue White  
**Address:** 134 North Main St.  
Roseville, OH 43777



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**WW-6A3 Notice of Entry for Plat Survey  
Supplement**

Operator Well No. Greer Unit 1N-5HU

**Mineral Owner(s):**

**Name:** Lorna M. Long Morgan  
**Address:** 1529 S. Hunters Dr.  
Newark, OH 43055

**Name:** Henry T. Long  
**Address:** 651 Garden Rd.  
Zanesville, OH 43701

**Name:** James C. Long and Patti Long  
**Address:** 706 Redfox Rd.  
Findlay, OH 45840

**Name:** Joseph B. Long  
**Address:** 5555 Clay Pike  
Chandlersville, OH 43727

**Name:** John F. Long and Pam Long  
**Address:** 116 Wallace Road  
Brunswick, GA 31520

**Name:** Don Forgraves  
**Address:** 4255 Township Rd 121 NW  
Somerset, OH 43783

**Name:** Imelda J. Scurlock  
**Address:** 3445 US Highway 22 NE  
Somerset, OH 43783

**Name:** John J. Pozenel  
**Address:** 3831 S. Susannah Dr.  
Yuma, AZ 85365

**Name:** Charles Long, heirs, et al  
(Thomas White, Esq.)  
**Address:** 604 Sixth Street  
Moundsville, WV 26041



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**WW-6A3 Notice of Entry for Plat Survey  
Supplement**

Operator Well No. Greer Unit 1N-5HU

**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:** CNX Gas Co.

**Address:** 1000 Consol Energy Dr.  
Canonsburg, PA 15317

**Name:** Harry W. Moore, Sr.

**Address:** 1300 Fifth Street  
Moundsville, WV 26041-1917

**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:** 11/10/2016      **Date Permit Application Filed:** 11/11/2016

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

- CERTIFIED MAIL                                       HAND
- RETURN RECEIPT REQUESTED                                      DELIVERY

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

**Notice is hereby provided to the SURFACE OWNER(s)**  
(at the address listed in the records of the sheriff at the time of notice):

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

**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>514,024.5</u>
County: <u>Marshall</u>		Northing: <u>4,400,810.3</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 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

Well Operator: <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>jwhite@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](mailto:depprivacyofficer@wv.gov).

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02/03/2017



SI-01893

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
Division of Highways

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

Earl Ray Tomblin  
Governor

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

September 29, 2016

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

Subject: DOH 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		

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

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

WV Department of  
Environmental Protection





TUG HILL

SI-01893

PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Greer 1N-5HU

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

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## Greer Site Design

Site Design, Construction Plan, &  
Erosion and Sediment Control Plans  
Tug Hill Operating  
Marshall County  
Franklin District  
Latitude 39.757055°  
Longitude -80.836291°  
Stillhouse Run - Ohio River Watershed

**APPROVED  
WVDEP OOG**

1/10/2017

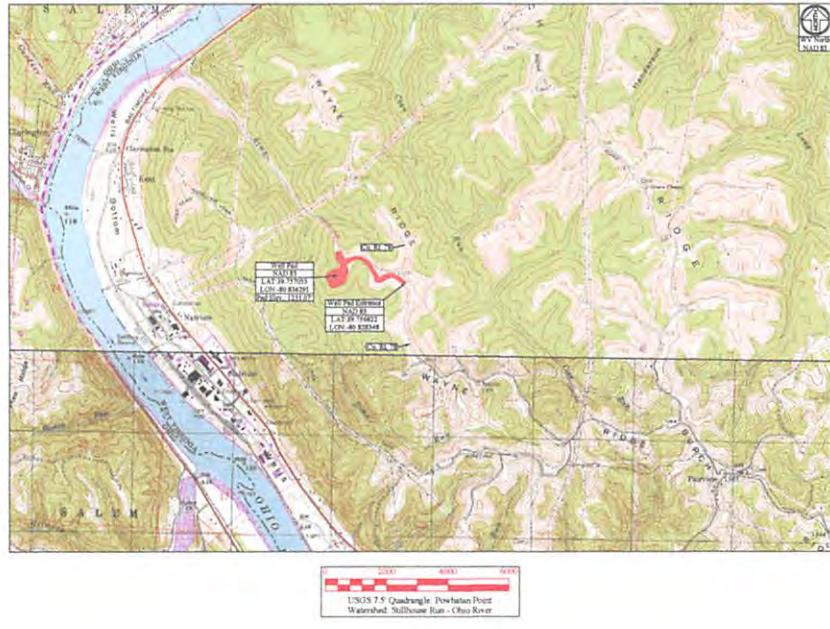
**Pertinent Site Information**  
Greer Well Site  
Emergency Number: 304-845-1920  
Marshall County Emergency 911 (Moundsville)  
Watershed: Stillhouse Run - Ohio River Watershed  
Tug Hill Contact Number: 1-817-632-3400

### Exhibit A: Final Design: Issue for Permitting

West Pad Easement	Center of Well Pad
WV-N NAD 83 N 46074.10	WV-N NAD 83 N 46074.10
WV-N NAD 83 E 139564.20	WV-N NAD 83 E 139564.20
WV-N NAD 27 N 46068.21	WV-N NAD 27 N 46068.21
WV-N NAD 27 E 142086.81	WV-N NAD 27 E 142086.81
L.W. NAD 83 W 74322.22	L.W. NAD 83 W 74322.22
L.W. NAD 83 E 463204.91	L.W. NAD 83 E 463204.91
UTM 17 NAD 83 N 46070.31	UTM 17 NAD 83 N 46070.31
UTM 17 NAD 83 E 31704.10	UTM 17 NAD 83 E 31704.10
Pad Elev: 1251.87	

West Pad Easement	Center of Well Pad
WV-N NAD 83 N 46074.10	WV-N NAD 83 N 46074.10
WV-N NAD 83 E 139564.20	WV-N NAD 83 E 139564.20
WV-N NAD 27 N 46068.21	WV-N NAD 27 N 46068.21
WV-N NAD 27 E 142086.81	WV-N NAD 27 E 142086.81
L.W. NAD 83 W 74322.22	L.W. NAD 83 W 74322.22
L.W. NAD 83 E 463204.91	L.W. NAD 83 E 463204.91
UTM 17 NAD 83 N 46070.31	UTM 17 NAD 83 N 46070.31
UTM 17 NAD 83 E 31704.10	UTM 17 NAD 83 E 31704.10
Pad Elev: 1251.87	



WV State Plane Coordinate System  
North Zone, NAD 83  
Elevation based on NAVD83  
Established by Survey Grade GPS  
and GPS Peak Processing

Parcel	TM	Period	MOF PAD	Access Road	Disturbed Area	Add. Changes	Total Disturbed
PP01 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP02 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP03 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP04 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP05 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
Site Total (Ac):							10.8

Parcel Owner	TM	Period	MOF PAD	Access Road	Disturbed Area	Add. Changes	Total Disturbed
PP01 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP02 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP03 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP04 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP05 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
Site Total (Ac):							10.8

Parcel Owner	TM	Period	MOF PAD	Access Road	Disturbed Area	Add. Changes	Total Disturbed
PP01 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP02 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP03 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP04 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
PP05 Industrial, Inc.	20-28	0-30	0-30	0-30	0-30	2-11	1-31
Site Total (Ac):							10.8

Category	Quantity	Unit	Material	Material	Material	Material	Material
Well Pad	1	Sq Ft	1000	1000	1000	1000	1000
Access Road	1	Sq Ft	1000	1000	1000	1000	1000
Disturbed Area	10.8	Sq Ft	1000	1000	1000	1000	1000
Total	12.8	Sq Ft	1000	1000	1000	1000	1000

**Project Contacts**

**Tug Hill Operating**  
Jonathan White, Regulatory Advisor  
724-482-2000 ext. 304-486-2474  
Jeff Kolar, V.P. Production  
817-632-3506 ext.

**Marshall County**  
Kathleen Kelly  
304-278-0700 ext.

**Franklin District**  
John P. Lee  
304-442-6221 ext.

**WVDEP**  
J. Kelly Summersfield  
304-278-0700 ext.

**WVDEP**  
Kurt Pfeil  
304-345-4277 ext.

**Tug Hill Operating, LLC**  
380 Sandpointe Blvd.  
Sandpointe Plaza 200  
Cammery, PA 15311

**WVDEP**  
380 Sandpointe Blvd.  
Sandpointe Plaza 200  
Cammery, PA 15311

**WVDEP**  
380 Sandpointe Blvd.  
Sandpointe Plaza 200  
Cammery, PA 15311

**WVDEP**  
380 Sandpointe Blvd.  
Sandpointe Plaza 200  
Cammery, PA 15311

**Approach Routes:**

From the intersection of WV Rt 2 and OH Rt 7 in New Martinsville, WV, travel North on WV Rt 2 for 6.0 mi. Turn right onto Co Rd 22 (Wells Hill Road). Follow Co Rd 22 for 2.4 mi. Turn left onto Co Rd 78 (Waynes Ridge Road). Follow Co Rd 78 for 1.8 mi. The site entrance will be on the Left (West) side of the road.

**Well Location Restrictions:**

All Pad construction complies with the following restrictions:

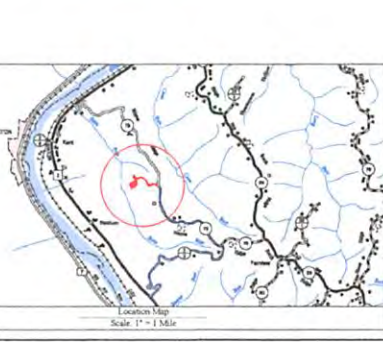
- \*10' from an existing well or developed spring used for human or domestic animals
- \*10' from an unsealed cesspool or farm grease tank 2,500 SF used for poultry or dairy operations from the corner of the pad.
- \*10' from the edge of disturbance to wetlands, perennial streams, seasonal or artificial lake, pond or reservoir
- \*10' from the edge of disturbance to a naturally reproducing trout stream.
- \*100' of a surface or ground water intake to a public water supply.

**Well Location Restrictions of WV Code 22A-12:**

Tug Hill Operating will obtain an Encroachment Permit (Form MM-109) from the WV Department of Transportation, Division of Highways, prior to the commencement of any construction activities.

The WV Mines Website was consulted. Previous (Current) in mining activities are (XXXXXX) within the ACE.

WVDEP Website files show that there are XXX active and/or abandoned gas wells within the ACE.



**Seal of the State of West Virginia**  
JOHN P. LEE  
GOVERNOR  
JANUARY 15, 2017

**Seal of the State of West Virginia**  
KURT PFEIL  
COMMISSIONER  
JANUARY 15, 2017

**Seal of the State of West Virginia**  
J. KELLY SUMMERSFIELD  
DIRECTOR  
JANUARY 15, 2017

Sheet	Description
1	Cover Sheet
1-1	Schedule of Quantities
1-2	Site Notes
2	Proposed Construction Site Conditions
3	Channeling Exhibit
4	Overall Plan View
5	EAS Plan View
6	Top Key Exhibit
6-7	Plan View
6-8	Cross Sections - Well Pad
6-9	Cross Sections - Access Road
6-10	Geotechnical Details
6-11	Landowner Disturbed Area Exhibit
6-12	Site Location
6-13	Production Details
6-14	Soils
6-15	Flow and Sediment Control Details
6-16	Access Road Details
6-17	Pad Details

TUG HILL OPERATING  
 Franklin District  
 Marshall County, WV  
 1-817-632-3400  
 380 Sandpointe Blvd.  
 Sandpointe Plaza 200  
 Cammery, PA 15311



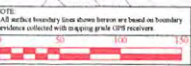
**APPROVED**  
**WVDEP OOG**  
1/10/2017

**Greer Site Design**  
**Tug Hill Operating**  
Exhibit A: Final Design: Issue for Permitting



Legend		Disturbed Areas		Access Road		NOTE
	Original Ground 2' Contour		12' Waste		24' Proposed Filter Sock	All surface boundary lines shown herein are based on boundary evidence collected with ranging grade GPS receivers.
	Pad Design 2' Contour		18' Waste		Super Silt Fence	
	Pad Design 10' Contour		Clearing Limits		Erosion Control	
	Access Road Design 2' Contour		Area of Disturbance		Erosion Control	
	Access Road Design 10' Contour		Existing Chute Line		Existing Chute Pad Line	
	Well Pad		Rock Land Drain		Erosion Control Blanket Land Drain	
	Well Pad Access Road Moundable Berms Detail		PFM W/Outlet		PFM W/Outlet	
			PFM W/Outlet		PFM W/Outlet	
			PFM W/Outlet		PFM W/Outlet	
			PFM W/Outlet		PFM W/Outlet	
			PFM W/Outlet		PFM W/Outlet	
			PFM W/Outlet		PFM W/Outlet	

Access Road	Area (sq ft)	Permit	Notes
Well Pad Access Road	1,518	21	New Access Road Construction
Access Road Construction	1,518	21	New Access Road Construction
Access Road Construction	1,518	21	New Access Road Construction
Access Road Construction	1,518	21	New Access Road Construction
Access Road Construction	1,518	21	New Access Road Construction
Access Road Construction	1,518	21	New Access Road Construction



Drawn: **Wendy Layton**  
Design: **Robert Ward Layton**  
Project: **Greer Site Design**  
Scale: **As Shown**

PPD Industries, Inc.  
Tug Hill  
Parcel 11

PPD Industries, Inc.  
Tug Hill  
Parcel 19

PPD Industries, Inc.  
Tug Hill  
Parcel 20

PPD Industries, Inc.  
Tug Hill  
Parcel 21

PPD Industries, Inc.  
Tug Hill  
Parcel 27

**TUG HILL**  
**OPERATING**

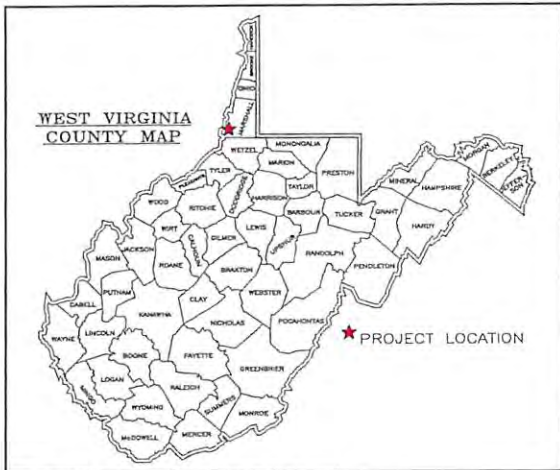
THIS DOCUMENT  
PREPARED FOR  
**TUG HILL  
OPERATING**

**K+S** Surveyors  
INCORPORATED  
SURVEYORS

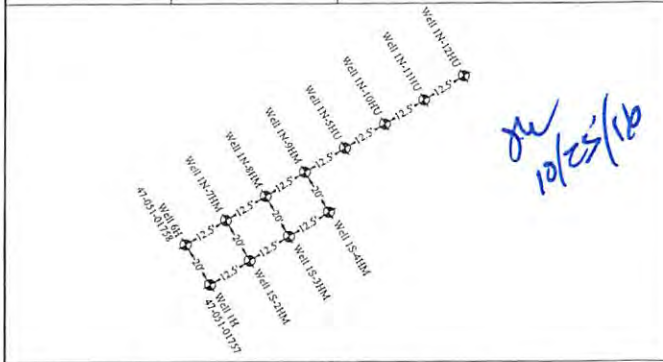
Site Plan  
**Greer Site Design**  
Franklin District  
Marshall County, WV

Date: 10/4/2016  
Scale: As Shown  
Designed by: JS  
File No:  
Sheet 11 of 13

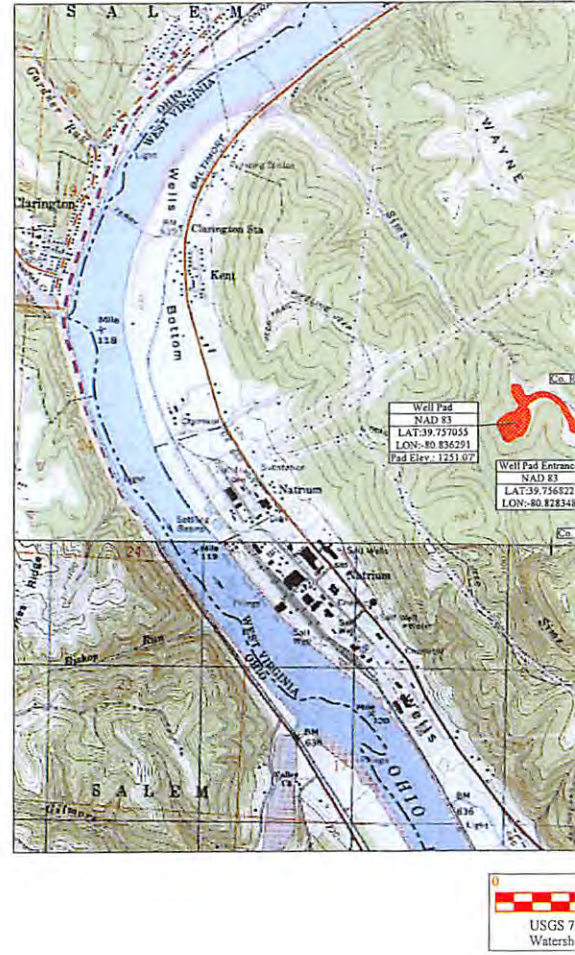




<b>Well Pad Entrance</b> WV-N NAD 83 N: 460534.10 WV-N NAD 83 E: 1595064.00 WV-N NAD 27 N: 460498.23 WV-N NAD 27 E: 1626501.88 Lat. NAD 83: 39.756822 Lon. NAD 83: -80.828348 UTM 17 NAD 83 N: 4400781.53 UTM 17 NAD 83 E: 514704.01	<b>Center of Well Pad</b> WV-N NAD 83 N: 460651.90 WV-N NAD 83 E: 1592832.45 WV-N NAD 27 N: 460616.09 WV-N NAD 27 E: 1624270.37 Lat. NAD 83: 39.757055 Lon. NAD 83: -80.836291 UTM 17 NAD 83 N: 4400806.06 UTM 17 NAD 83 E: 514023.55 Pad Elev.: 1251.67
--	---



Well 1N-12HU	Well 1N-11HU	Well 1N-10HU	Well 1N-9HU
WV-N NAD 83 N: 460654.92 WV-N NAD 83 E: 1592868.03 WV-N NAD 27 N: 460664.11 WV-N NAD 27 E: 1624305.95 Lat. NAD 83: 39.75714694 Lon. NAD 83: -80.81616617 Lat. NAD 27: 39.75707071 Lon. NAD 27: -80.81635961 UTM 17 NAD 83 N: 4400816.30 UTM 17 NAD 83 E: 514034.23	WV-N NAD 83 N: 460678.49 WV-N NAD 83 E: 1592837.31 WV-N NAD 27 N: 460642.68 WV-N NAD 27 E: 1624293.23 Lat. NAD 83: 39.75712884 Lon. NAD 83: -80.83620394 Lat. NAD 27: 39.75705811 Lon. NAD 27: -80.83638839 UTM 17 NAD 83 N: 4400814.29 UTM 17 NAD 83 E: 514030.99	WV-N NAD 83 N: 460672.06 WV-N NAD 83 E: 1592846.59 WV-N NAD 27 N: 460636.24 WV-N NAD 27 E: 1624284.52 Lat. NAD 83: 39.75711074 Lon. NAD 83: -80.83624172 Lat. NAD 27: 39.75703451 Lon. NAD 27: -80.83642616 UTM 17 NAD 83 N: 4400812.27 UTM 17 NAD 83 E: 514027.76	WV-N NAD 83 N: 460665.62 WV-N NAD 83 E: 1592835.87 WV-N NAD 27 N: 460629.91 WV-N NAD 27 E: 1624273.80 Lat. NAD 83: 39.75709265 Lon. NAD 83: -80.83627950 Lat. NAD 27: 39.75701642 Lon. NAD 27: -80.83646394 UTM 17 NAD 83 N: 4400810.26 UTM 17 NAD 83 E: 514024.53



**Project Contacts**

**Tug Hill Operating**  
Jonathan White - Regulatory Analyst  
724-485-2000 OFF. 304-689-7676 Cell  
Geoff Radler - V.P. Production  
817-632-5200 OFF.

**Survey and Engineer**  
Kenneth Kelly  
304-338-6985 OFF.  
John P. See  
304-442-0220 OFF.  
Zackary Summerfield  
304-338-6987 OFF.

**Geotechnical Engineer**  
American Geotech, Inc.  
Kanti Patel  
304-340-4277 OFF.

**Environmental:**  
An environmental study was not provided for the purpose of this design

**Topographic Information:**  
The topographic information shown herein is based on aerial photography by Blue Mountain Aerial Mapping, Burton, WV

MISS UTILITY OF WEST VIRGINIA  
1-800-245-4848  
West Virginia State Law  
Section XIV, Chapter 24-C requires  
that you call before you dig  
before you dig in the state of West Virginia.  
IT'S THE LAW

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

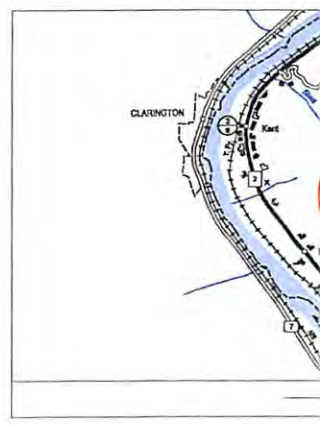
**Approach Routes:**  
From the intersection of WV Rt 2 and OH Rt 7 in New Martinsville, WV, travel North on WV Rt 2 for 6.0 mi. Turn right onto Co Rt 2/2 (Wells Hill Road). Follow Co Rt 2/2 for 2.4 mi. Turn Left onto Co Rt 78 (Waynes Ridge Road). Follow Co Rt 78 for 1.8 mi. The site entrance will be on the Left (West) side of the road.

**Well Location Restrictions**  
All Pad construction complies with the following restrictions.  
\*250' from an existing well or developed spring used for human or domestic animals.  
\*625' from an occupied dwelling or barn greater than 2,500 SF used for poultry or dairy measured from the center of the pad.  
\*100' from the edge of disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir.  
\*300' from the edge of disturbance to a naturally reproducing trout stream.  
\*1,000' of a surface or ground water intake to a public water supply.  
(Well Location Restrictions of WV Code 22-6A-12)

Tug Hill Operating will obtain an Encroachment Permit (Form MM-109) from the WV Department of Transportation, Division of Highways, prior to the commencement of any construction activities  
The WV Mines Website was consulted. Previous (Current) mining activities are (XXXXXX) within the AOI.  
WVDEP Website files show that there are XXX active and/or abandoned gas wells within the AOI

**Floodplain Conditions**

Do site construction activities take place in a floodplain:	NO
Forma needed from county floodplain coordinator:	NO
Flood Hazard Zone:	XIV
HEC-RAS Study completed:	N/A
Floodplain shown on drawings:	N/A
FIRM Map Number(s) for site:	54031C 0140E
Address of construction in floodplain:	N/A





51-01893

# Site Design

Construction Plan, &  
 Sediment Control Plans  
 for an Operating  
 Well in  
 Hancock County  
 Clinch District  
 39.757055°  
 -80.836291°  
 Ohio River Watershed

**Pertinent Site Information**  
 Greer Well Site  
 Emergency Number: 304-845-1920  
 Marshall County Emergency 911 (Moundsville)  
 Watershed: Stillhouse Run - Ohio River Watershed  
 Tug Hill Contact Number: 1-817-632-3400

**Design: Issue for Permitting**



WV State Plane Coordinate System  
 North Zone, NAD 83  
 Elevations Based on NAV88  
 Established By Survey Grade GPS  
 and OPUS Post Processing

**Property Owner Information - Greer Site Design**

Owner	TM - Parcel	Well Pad	Access Road	Topsoil/Excess	Add. Clearing	Total Disturbed
PFG Industries, Inc	21-24	0.00	1.81	0.00	2.03	3.84
PFG Industries, Inc	20-28	0.20	0.59	0.00	2.12	3.31
PFG Industries, Inc	20-27	0.00	0.07	0.00	0.09	0.16
PFG Industries, Inc	20-29	0.00	0.40	0.81	1.85	3.06
PFG Industries, Inc	20-33	5.18	0.01	0.00	2.22	7.41
<b>Site Totals (Ac)</b>		<b>5.38</b>	<b>3.28</b>	<b>0.81</b>	<b>8.31</b>	<b>17.78</b>

**Access Road**

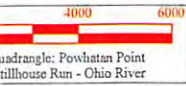
Surface Owner	TM - Parcel	Road Length	Type
PFG Industries, Inc	21-24	1,210.38'	New Access Road Construction
PFG Industries, Inc	20-28	1,009.88'	New Access Road Construction
PFG Industries, Inc	20-27	47.39'	New Access Road Construction
PFG Industries, Inc	20-29	382.14'	New Access Road Construction
PFG Industries, Inc	20-33	58.45'	New Access Road Construction

**Disturbed Area**

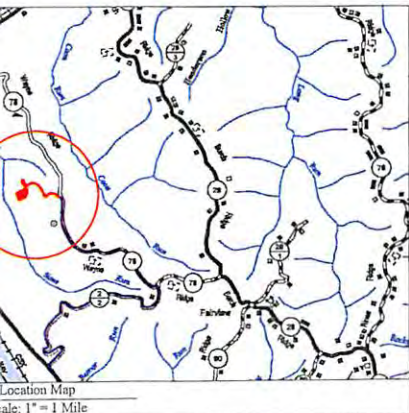
Well Pad Construction	5.38 Ac
Access Road Construction	3.28 Ac
Topsoil / Excess Material	0.81 Ac
Additional Clearing	8.31 Ac
<b>Total Disturbed Area</b>	<b>17.78 Ac</b>
<b>Additional Information</b>	
Total Wooded Acres Disturbed	17.50 Ac
Total Linear Feet of Access Road	2,708.74'

**Greer Site Design Quantities**

Description	Cut (CY)	Fill (CY)	Spill (CY)	Borrow (CY)	Max. Slope	Length of Slope
Well Pad	38,107.02	29,107.08	8,999.94	N/A	N/A	N/A
Well Pad Access Road	5,376.54	5,315.81	60.73	N/A	14.00%	196.26'
Topsoil/Excess Material Stockpile	0.00	10,000.03		10,000.03	N/A	N/A
<b>Totals</b>	<b>43,483.56</b>	<b>44,422.92</b>	<b>9,060.67</b>	<b>10,000.03</b>		
		Total Spill (CY) = -939.36		(Excess Spill Capacity)		



Quadrangle: Powhatan Point  
 Stillhouse Run - Ohio River



Scale: 1" = 1 Mile



**Design Certification**  
 The drawings, construction notes and reference diagrams attached hereto have been prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection, Office of Oil and Gas 33CSR08.  
 All Plans, Sheets, and/or Reference Diagrams included in this design constitute a complete set of plans. A complete set of plans is necessary to construct the site in accordance with the design.  
 John P. See RPE 6051; Kelly Surveying PLLC; COA: 094235-00 Date: 08-22-2016

**Sheet**

1	Cover Sheet
V1	Schedule of Quantities
N1-N3	Site Construction Site Conditions
2	Clearing Exhibit
3	Overall Plan View
4	E&S Plan View
5-7	Toe Key Exhibit
8	Plan View
9-11	Cross Sections - Well Pad
12	Cross Sections - Access Road
13	Geotechnical Details
G1-G2	Landowner Disturbed Area Exhibit
L1	Site Reclamation
S1	Erosion and Sediment Control Details
D1-D2	Access Road Details
R1	Pad Details
P1	Pad Details

RECEIVED  
 Office of Oil and Gas  
 NOV 14 2016

West Virginia Department of Environmental Protection

Revision  
 Design  
 Design: Revised Well Layout  
 Design: Revised Well Layout

Date  
 08-22-2016  
 10-10-2016  
 10-24-2016

**TUG HILL OPERATING**



THIS DOCUMENT PREPARED FOR TUG HILL OPERATING

**Kelly Surveying**  
 P.O. Box 234  
 Fairley, WV 26039  
 (304)538-0985

Cover Sheet  
 Greer Site Design  
 Franklin District  
 Marshall County, WV

Date: 10/24/2016  
 Scale: As Shown  
 Designed By: ZS  
 File No.  
 Sheet 1 of 13

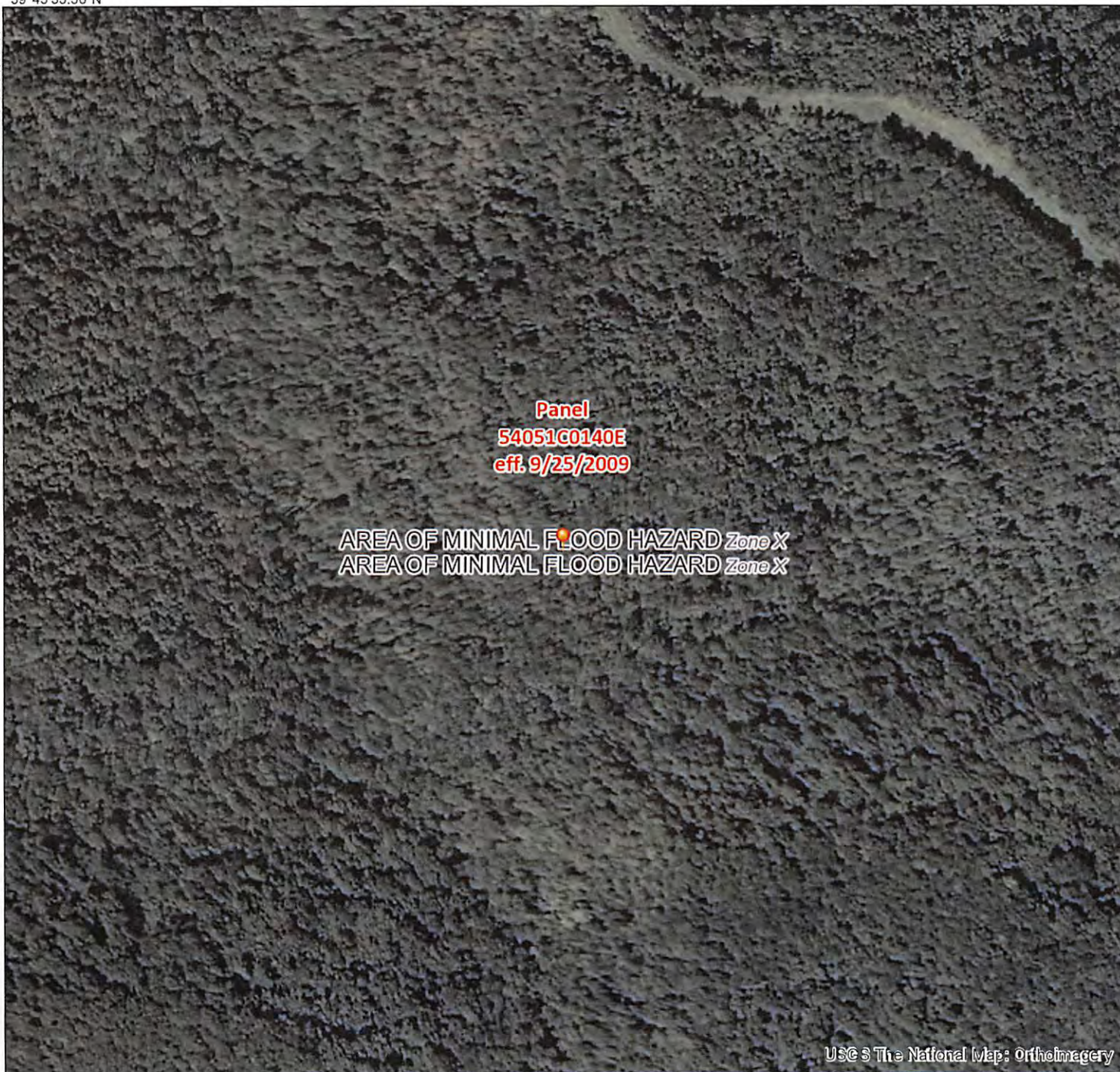
02/03/2017



# National Flood Hazard Layer FIRMette

39°45'35.56"N

80°50'31.83"W



AREA OF MINIMAL FLOOD HAZARD Zone X  
 AREA OF MINIMAL FLOOD HAZARD Zone X

Panel  
 54051C0140E  
 eff. 9/25/2009

USCS The National Map: Orthorectified

39°45'6.71"N

## Legend

- Cross-Sections
  - ~ Base Flood Elevations
- Flood Hazard Zones**
- 1% Annual Chance Flood
  - Regulatory Floodway
  - Special Floodway
  - Area of Undetermined Flood Hazard
  - 0.2% Annual Chance Flood
  - Future Conditions 1% Annual Chance Flood Hazard
  - Area with Reduced Risk Due to Levee



## LOMRs

- Effective

## Map Panels

- Digital Data
- Unmodernized Maps
- Unmapped

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

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

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

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

SI-01893



# FEMA

