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west virginia department of environmental protection

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

Austin Caperton , Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Wednesday, February 07, 2018  
WELL WORK PERMIT  
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC  
1320 SOUTH UNIVERSITY DRIVE, SUITE 500

FORT WORTH , TX 76107

Re: Permit approval for BRYAN S-9HM  
47-051-01980-00-00

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: BRYAN S-9HM  
Farm Name: CNX LAND RESOURCES, INC.  
U.S. WELL NUMBER: 47-051-01980-00-00  
Horizontal 6A / New Drill  
Date Issued: 2/7/2018

Promoting a healthy environment.

02/09/2018

# PERMIT CONDITIONS 4705101980

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

## CONDITIONS

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

# PERMIT CONDITIONS 4705101980

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).

4705101980 57-01980

WW-6B  
(04/15)

API NO. 47-051  
OPERATOR WELL NO. Bryan S-9HM  
Well Pad Name: Bryan

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  
Operator ID      County      District      Quadrangle

2) Operator's Well Number: Bryan S-9HM      Well Pad Name: Bryan

3) Farm Name/Surface Owner: CNX Land Resources, Inc.      Public Road Access: Rines Ridge Rd

4) Elevation, current ground: 1191'      Elevation, proposed post-construction: 1191'

5) Well Type (a) Gas  Oil \_\_\_\_\_ Underground Storage \_\_\_\_\_

Other \_\_\_\_\_

(b) If Gas Shallow  Deep \_\_\_\_\_

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus is the target formation at a depth of 6443' - 6497', thickness of 54' and anticipated pressure of approximately 3800 psi.

8) Proposed Total Vertical Depth: 6,596'

9) Formation at Total Vertical Depth: Onondoga

10) Proposed Total Measured Depth: 14,264'

11) Proposed Horizontal Leg Length: 7,128'

12) Approximate Fresh Water Strata Depths: 803'

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: 2040'

15) Approximate Coal Seam Depths: Sewickly Coal - 701' and Pittsburgh Coal - 796'

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: \_\_\_\_\_

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4705101900

WW-6B  
(04/15)

API NO. 47-051  
OPERATOR WELL NO. Bryan S-9HM  
Well Pad Name: Bryan

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	105'	100'	216FT^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	963'	953'	954ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	963'	953'	954ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,612'	2,602'	862ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	14,264'	14,254'	3645ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,979'	
Liners	N/A						

*Jan 11/10/18*

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 1/2"	.33	2,740	2,192	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.33	2,740	2,192	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE#24	1.19
Production	5 1/2"	8 7/8_8 3/4	.361	12,640	8,000	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners	N/A						

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PACKERS

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

WW-6B  
(10/14)

4705101980  
API NO. 47-051 -  
OPERATOR WELL NO. Bryan S-9HM  
Well Pad Name: Bryan

*JW*  
*1/10/18*

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

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

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

Well to be completed with approximately 17,820,000 lb proppant and 275,510 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.14

22) Area to be disturbed for well pad only, less access road (acres): 5.98

23) Describe centralizer placement for each casing string:

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

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

\*See Attached

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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.

**Conductor, Coal and Fresh Water Casing Cement:**

*Premium NE-1 + 2% CaCl*

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

**Intermediate Casing:**

*Premium NE-1 + 2% bwoc CaCl<sub>2</sub> + 46.5% Fresh Water*

- Premium NE-1 – Class A Portland API spec
- CaCl<sub>2</sub> – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

**Kick Off Plug:**

*Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L + 38% Fresh Water*

- Class H – Increased Compressive Strength Cement
- Sodium Metasilicate – Free Water Control; Early Strength Additive
- R-3 – Cement Retarder
- FP-13L – Anti-Foaming Agent
- CaCl<sub>2</sub> – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

**Production Casing Cement:**

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

Tail: *Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L*

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

4705101980



**Tug Hill Operating, LLC Casing and Cement Program**

**Bryan S-9HM**

**Casing**

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	100'	CTS
Surface	13 3/8"	J55	17 1/2"	953'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,602'	CTS
Production	5 1/2"	P110	8 7/8 x 8 3/4"	14,254'	CTS

**Cement**

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

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**WELL NAME** Bryan S-9HM  
**STATE:** West Virginia **COUNTY:** Marshall  
**DISTRICT:** Franklin  
**DF Elev:** 1,191' **GLE Elev:** 1,191'  
**TD:** 14,254'  
**TH Latitude:** 39.77573187  
**TH Longitude:** 80.77664087  
**BH Latitude:** 39.76006899  
**BH Longitude:** 80.75900284

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	803
Sewickley Coal	701
Pittsburgh Coal	796
Big Lime	1970
Weir	2324
Berea	2519
Gordon	2864
Rhinestreet	5837
Genesee/Burkett	6327
Tully	6362
Hamilton	6397
Marcellus	6443
Landing Depth	6495
Onondaga	6496
Pilot Hole Depth	6596

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	100'	100'	BW	BW	Surface
Surface	17.5	13 3/8	953'	953'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,602'	2,600'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	14,254'	6,620'	20	P110	Surface

CEMENT SUMMARY			DRILLING DETAILS		
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	291	A	15.6	Air	None
Surface	972	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	847	A	15	Air	1 Centralizer every other joint
Production	3,216	A	14.5	Air / SOB	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



Landing Point @ 7,126' MD / 6,495' TVD  
 PH TD @ 6,596' TVD  
 PH TVD = 100' below Onondaga Top

Lateral TD @ 14,254' MD  
 6,620' ft TVD

*Jan 1/10/18*

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Planning Report - Geographic



<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan S-09HM (slot I)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1191 @ 1191.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1191 @ 1191.00usft
<b>Site:</b>	Bryan Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Bryan S-09HM (slot I)	<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>	Bryan Pad		
<b>Site Position:</b>	<b>Northing:</b>	14,445,110.80 usft	<b>Latitude:</b> 39.77562900
<b>From:</b> Lat/Long	<b>Easting:</b>	1,703,181.57 usft	<b>Longitude:</b> -80.77660992
<b>Position Uncertainty:</b> 0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> 0.14 °

<b>Well</b>	Bryan S-09HM (slot I)		
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b> 14,445,148.23 usft
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b> 1,703,172.79 usft
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	<b>Ground Level:</b> 1,191.00 usft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	8/18/2017	-8.64	66.94	52,156.84953828

<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	138.86

<b>Plan Survey Tool Program</b>	<b>Date</b>	12/9/2017		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	14,254.39 rev3 (Original Hole)	MWD	MWD - Standard

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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	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,550.00	3.00	47.32	1,549.93	2.66	2.89	2.00	2.00	0.00	47.32	
3,002.06	3.00	47.32	3,000.00	54.18	58.75	0.00	0.00	0.00	0.00	
4,159.43	26.15	47.36	4,112.53	250.14	271.50	2.00	2.00	0.00	0.04	
6,178.86	26.15	47.36	5,925.30	853.02	926.11	0.00	0.00	0.00	0.00	
7,126.31	89.00	150.27	6,495.00	498.39	1,436.55	10.00	6.83	10.86	102.07	LP Bryan S-09HM r3
14,254.39	89.00	150.27	6,620.00	-5,690.42	4,971.02	0.00	0.00	0.00	0.00	BHL Bryan S-09HM r3



Planning Report - Geographic

4705101980



Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Bryan Pad  
 Well: Bryan S-09HM (slot I)  
 Wellbore: Original Hole  
 Design: rev3

Local Co-ordinate Reference:  
 TVD Reference:  
 MD Reference:  
 North Reference:  
 Survey Calculation Method:

Well Bryan S-09HM (slot I)  
 GL=1191 @ 1191.00usft  
 GL=1191 @ 1191.00usft  
 Grid  
 Minimum Curvature

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Planned Survey WV Department of Environmental Protection

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	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
100.00	0.00	0.00	100.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
200.00	0.00	0.00	200.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
300.00	0.00	0.00	300.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
400.00	0.00	0.00	400.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
500.00	0.00	0.00	500.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
600.00	0.00	0.00	600.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
700.00	0.00	0.00	700.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
800.00	0.00	0.00	800.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
900.00	0.00	0.00	900.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,445,148.23	1,703,172.79	39.77573187	-80.77664087
<b>KOP Begin 2°/100' build</b>									
1,500.00	2.00	47.32	1,499.98	1.18	1.28	14,445,149.42	1,703,174.07	39.77573511	-80.77663629
1,550.00	3.00	47.32	1,549.93	2.66	2.89	14,445,150.80	1,703,175.67	39.77573916	-80.77663057
<b>Begin 3.00° tangent</b>									
1,600.00	3.00	47.32	1,599.86	4.44	4.81	14,445,152.67	1,703,177.60	39.77574402	-80.77662371
1,700.00	3.00	47.32	1,699.73	7.98	8.66	14,445,156.22	1,703,181.44	39.77575374	-80.77660996
1,800.00	3.00	47.32	1,799.59	11.53	12.50	14,445,159.76	1,703,185.29	39.77576345	-80.77659626
1,900.00	3.00	47.32	1,899.45	15.08	16.35	14,445,163.31	1,703,189.14	39.77577317	-80.77658254
2,000.00	3.00	47.32	1,999.31	18.63	20.20	14,445,166.86	1,703,192.99	39.77578289	-80.77656881
2,100.00	3.00	47.32	2,099.18	22.17	24.05	14,445,170.41	1,703,196.83	39.77579261	-80.77655509
2,200.00	3.00	47.32	2,199.04	25.72	27.89	14,445,173.96	1,703,200.68	39.77580232	-80.77654136
2,300.00	3.00	47.32	2,298.90	29.27	31.74	14,445,177.50	1,703,204.53	39.77581204	-80.77652764
2,400.00	3.00	47.32	2,398.77	32.82	35.58	14,445,181.05	1,703,208.38	39.77582176	-80.77651391
2,500.00	3.00	47.32	2,498.63	36.37	39.44	14,445,184.60	1,703,212.22	39.77583147	-80.77650018
2,600.00	3.00	47.32	2,598.49	39.91	43.28	14,445,188.15	1,703,216.07	39.77584119	-80.77648646
2,700.00	3.00	47.32	2,698.36	43.46	47.13	14,445,191.70	1,703,219.92	39.77585091	-80.77647273
2,800.00	3.00	47.32	2,798.22	47.01	50.98	14,445,195.24	1,703,223.77	39.77586062	-80.77645901
2,900.00	3.00	47.32	2,898.08	50.56	54.83	14,445,198.79	1,703,227.61	39.77587034	-80.77644528
3,000.00	3.00	47.32	2,997.94	54.11	58.67	14,445,202.34	1,703,231.46	39.77588006	-80.77643156
3,002.06	3.00	47.32	3,000.00	54.18	58.75	14,445,202.41	1,703,231.54	39.77588026	-80.77643126
<b>Begin 2°/100' build/tum</b>									
3,100.00	4.98	47.34	3,097.70	58.79	63.75	14,445,207.02	1,703,236.54	39.77589268	-80.77641345
3,200.00	6.98	47.34	3,197.16	65.82	71.39	14,445,214.05	1,703,244.17	39.77591214	-80.77638622
3,300.00	8.98	47.35	3,296.19	75.20	81.57	14,445,223.43	1,703,254.35	39.77593784	-80.77634989
3,400.00	10.98	47.35	3,394.68	86.92	94.29	14,445,235.15	1,703,267.07	39.77596993	-80.77630452
3,500.00	12.98	47.35	3,492.50	100.96	109.53	14,445,249.19	1,703,282.31	39.77600837	-80.77625015
3,600.00	14.98	47.35	3,589.54	117.30	127.27	14,445,265.53	1,703,300.05	39.77605313	-80.77618686
3,700.00	16.98	47.35	3,685.88	135.92	147.49	14,445,284.18	1,703,320.28	39.77610415	-80.77611472
3,800.00	18.98	47.35	3,780.81	156.81	170.17	14,445,305.05	1,703,342.95	39.77616135	-80.77603382
3,900.00	20.98	47.35	3,874.80	179.94	195.28	14,445,328.17	1,703,368.06	39.77622469	-80.77594426
4,000.00	22.98	47.35	3,967.54	205.27	222.78	14,445,353.50	1,703,395.56	39.77629407	-80.77584814
4,100.00	24.98	47.38	4,058.91	232.78	252.65	14,445,381.01	1,703,425.43	39.77636941	-80.77573959
4,159.43	26.15	47.35	4,112.53	250.14	271.50	14,445,398.38	1,703,444.29	39.77641897	-80.77567232
<b>Begin 26.15° tangent</b>									
4,200.00	26.15	47.38	4,148.95	282.25	284.65	14,445,410.49	1,703,457.44	39.77645014	-80.77562541
4,300.00	26.15	47.36	4,238.72	292.11	317.07	14,445,440.34	1,703,489.86	39.77653190	-80.77550977
4,400.00	26.15	47.38	4,328.48	321.96	349.49	14,445,470.19	1,703,522.27	39.77661367	-80.77539413
4,500.00	26.15	47.36	4,418.25	351.82	381.90	14,445,500.05	1,703,554.69	39.77669543	-80.77527849
4,600.00	26.15	47.38	4,508.01	381.67	414.32	14,445,529.90	1,703,587.10	39.77677718	-80.77516285

4705101980



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Bryan S-09HM (slot I)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1191 @ 1191.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1191 @ 1191.00usft
Site:	Bryan Pad	North Reference:	Grid
Well:	Bryan S-09HM (slot I)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

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Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,700.00	26.15	47.36	4,597.78	411.52	446.73	14,445,559.76	1,703,619.52	39.77885896	-80.77504721	
4,800.00	26.15	47.36	4,687.55	441.38	479.15	14,445,589.61	1,703,651.93	39.77694072	-80.77493158	
4,900.00	26.15	47.36	4,777.31	471.23	511.58	14,445,619.46	1,703,684.35	39.77702248	-80.77481594	
5,000.00	26.15	47.36	4,867.08	501.08	543.98	14,445,649.32	1,703,716.78	39.77710425	-80.77470030	
5,100.00	26.15	47.36	4,956.85	530.94	576.39	14,445,679.17	1,703,749.18	39.77718601	-80.77458466	
5,200.00	26.15	47.36	5,046.61	560.79	608.81	14,445,709.02	1,703,781.59	39.77726777	-80.77446901	
5,300.00	26.15	47.36	5,136.38	590.65	641.22	14,445,738.88	1,703,814.01	39.77734953	-80.77435337	
5,400.00	26.15	47.36	5,226.15	620.50	673.64	14,445,768.73	1,703,846.42	39.77743130	-80.77423773	
5,500.00	26.15	47.36	5,315.91	650.35	706.05	14,445,798.59	1,703,878.84	39.77751306	-80.77412209	
5,600.00	26.15	47.36	5,405.68	680.21	738.47	14,445,828.44	1,703,911.25	39.77759482	-80.77400845	
5,700.00	26.15	47.36	5,495.44	710.06	770.88	14,445,858.29	1,703,943.67	39.77767658	-80.77389081	
5,800.00	26.15	47.36	5,585.21	739.91	803.30	14,445,888.15	1,703,976.09	39.77775834	-80.77377517	
5,900.00	26.15	47.36	5,674.98	769.77	835.72	14,445,918.00	1,704,008.50	39.77784011	-80.77365952	
6,000.00	26.15	47.36	5,764.74	799.62	868.13	14,445,947.85	1,704,040.92	39.77792187	-80.77354388	
6,100.00	26.15	47.36	5,854.51	829.48	900.55	14,445,977.71	1,704,073.33	39.77800363	-80.77342824	
6,178.86	26.15	47.36	5,925.30	853.02	926.11	14,446,001.25	1,704,098.89	39.77806811	-80.77333704	
<b>Begin 10°/100' build/turn</b>										
6,200.00	25.78	52.11	5,944.31	859.00	933.16	14,446,007.23	1,704,105.95	39.77808448	-80.77331187	
6,300.00	26.23	75.02	6,034.41	878.11	971.78	14,446,026.35	1,704,144.56	39.77813871	-80.77317427	
6,400.00	29.97	94.83	6,122.80	881.73	1,016.13	14,446,029.97	1,704,190.92	39.77814632	-80.77300925	
6,500.00	35.97	109.61	6,206.79	869.74	1,070.82	14,446,017.98	1,704,243.61	39.77811303	-80.77282182	
6,600.00	43.31	120.31	6,283.83	842.51	1,128.24	14,445,990.74	1,704,301.03	39.77803784	-80.77261769	
6,700.00	51.40	128.33	6,351.59	800.86	1,188.65	14,445,949.09	1,704,381.44	39.77792304	-80.77240304	
6,800.00	59.92	134.69	6,407.99	746.06	1,250.22	14,445,894.29	1,704,423.00	39.77777211	-80.77218442	
6,900.00	68.69	140.01	6,451.33	679.77	1,311.07	14,445,828.01	1,704,483.85	39.77758964	-80.77196845	
7,000.00	77.62	144.73	6,480.29	604.02	1,369.35	14,445,752.25	1,704,542.13	39.77738118	-80.77176170	
7,100.00	86.62	149.13	6,493.99	521.09	1,423.29	14,445,669.32	1,704,596.08	39.77715308	-80.77157046	
7,128.31	89.00	150.27	6,495.00	498.39	1,436.55	14,445,646.62	1,704,609.34	39.77709064	-80.77152346	
<b>Begin 89.00° lateral section</b>										
7,200.00	89.00	150.27	6,498.29	434.41	1,473.09	14,445,582.64	1,704,645.88	39.77691467	-80.77139399	
7,300.00	89.00	150.27	6,498.05	347.59	1,522.68	14,445,495.82	1,704,695.46	39.77687589	-80.77121830	
7,400.00	89.00	150.27	6,499.80	260.76	1,572.26	14,445,409.00	1,704,745.05	39.77684371	-80.77104261	
7,500.00	89.00	150.27	6,501.55	173.94	1,621.85	14,445,322.17	1,704,794.63	39.77681983	-80.77086691	
7,600.00	89.00	150.27	6,503.31	87.12	1,671.43	14,445,235.35	1,704,844.22	39.77595952	-80.77069122	
7,700.00	89.00	150.27	6,505.06	0.29	1,721.02	14,445,148.53	1,704,893.80	39.77572073	-80.77051553	
7,800.00	89.00	150.27	6,508.81	-88.53	1,770.60	14,445,061.71	1,704,943.39	39.77548194	-80.77033985	
7,900.00	89.00	150.27	6,508.57	-173.35	1,820.19	14,444,974.88	1,704,992.97	39.77524315	-80.77016416	
8,000.00	89.00	150.27	6,510.32	-260.17	1,869.77	14,444,888.06	1,705,042.56	39.77500436	-80.76998847	
8,100.00	89.00	150.27	6,512.08	-347.00	1,919.36	14,444,801.24	1,705,092.14	39.77476557	-80.76981279	
8,200.00	89.00	150.27	6,513.83	-433.82	1,968.94	14,444,714.41	1,705,141.73	39.77452678	-80.76963711	
8,300.00	89.00	150.27	6,515.58	-520.64	2,018.53	14,444,627.59	1,705,191.31	39.77428799	-80.76946143	
8,400.00	89.00	150.27	6,517.34	-607.47	2,068.11	14,444,540.77	1,705,240.90	39.77404920	-80.76928575	
8,500.00	89.00	150.27	6,519.09	-694.29	2,117.70	14,444,453.94	1,705,290.48	39.77381041	-80.76911007	
8,600.00	89.00	150.27	6,520.84	-781.11	2,167.28	14,444,367.12	1,705,340.07	39.77357162	-80.76893439	
8,700.00	89.00	150.27	6,522.60	-867.94	2,216.87	14,444,280.30	1,705,389.66	39.77333283	-80.76875871	
8,800.00	89.00	150.27	6,524.35	-954.76	2,266.45	14,444,193.48	1,705,439.24	39.77309404	-80.76858304	
8,900.00	89.00	150.27	6,526.10	-1,041.58	2,316.04	14,444,106.65	1,705,488.83	39.77285524	-80.76840736	
9,000.00	89.00	150.27	6,527.86	-1,128.40	2,365.63	14,444,019.83	1,705,538.41	39.77261645	-80.76823169	
9,100.00	89.00	150.27	6,529.61	-1,215.23	2,415.21	14,443,933.01	1,705,588.00	39.77237766	-80.76805602	
9,200.00	89.00	150.27	6,531.36	-1,302.05	2,464.80	14,443,846.18	1,705,637.58	39.77213886	-80.76788034	
9,300.00	89.00	150.27	6,533.12	-1,388.87	2,514.38	14,443,759.36	1,705,687.17	39.77190007	-80.76770468	
9,400.00	89.00	150.27	6,534.87	-1,475.70	2,563.97	14,443,672.54	1,705,736.75	39.77166128	-80.76752901	
9,500.00	89.00	150.27	6,536.63	-1,562.52	2,613.55	14,443,585.71	1,705,786.34	39.77142248	-80.76735334	
9,600.00	89.00	150.27	6,538.38	-1,649.34	2,663.14	14,443,498.89	1,705,835.92	39.77118369	-80.76717767	

WV Department of Environmental Protection



Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Bryan Pad  
 Well: Bryan S-09HM (slot I)  
 Wellbore: Original Hole  
 Design: rev3

Local Co-ordinate Reference: Well Bryan S-09HM (slot I)  
 TVD Reference: GL=1191 @ 1191.00usft  
 MD Reference: GL=1191 @ 1191.00usft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

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**Planned Survey**

WV Department of Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,700.00	89.00	150.27	8,540.13	-1,736.17	2,712.72	14,443,412.07	1,705,885.51	39.77094490	-80.76700201
9,800.00	89.00	150.27	8,541.89	-1,822.99	2,762.31	14,443,325.24	1,705,935.09	39.77070610	-80.76682635
9,900.00	89.00	150.27	8,543.64	-1,909.81	2,811.89	14,443,238.42	1,705,984.68	39.77046731	-80.76665068
10,000.00	89.00	150.27	8,545.39	-1,996.63	2,861.48	14,443,151.60	1,706,034.26	39.77022851	-80.76647502
10,100.00	89.00	150.27	8,547.15	-2,083.46	2,911.06	14,443,064.78	1,706,083.85	39.76998972	-80.76629936
10,200.00	89.00	150.27	8,548.90	-2,170.28	2,960.65	14,442,977.95	1,706,133.43	39.76975092	-80.76612370
10,300.00	89.00	150.27	8,550.65	-2,257.10	3,010.23	14,442,891.13	1,706,183.02	39.76951212	-80.76594805
10,400.00	89.00	150.27	8,552.41	-2,343.93	3,059.82	14,442,804.31	1,706,232.60	39.76927333	-80.76577239
10,500.00	89.00	150.27	8,554.16	-2,430.75	3,109.40	14,442,717.48	1,706,282.19	39.76903453	-80.76559673
10,600.00	89.00	150.27	8,555.92	-2,517.57	3,158.99	14,442,630.66	1,706,331.77	39.76879573	-80.76542108
10,700.00	89.00	150.27	8,557.67	-2,604.40	3,208.57	14,442,543.84	1,706,381.36	39.76855694	-80.76524543
10,800.00	89.00	150.27	8,559.42	-2,691.22	3,258.16	14,442,457.01	1,706,430.94	39.76831814	-80.76506978
10,900.00	89.00	150.27	8,561.18	-2,778.04	3,307.74	14,442,370.19	1,706,480.53	39.76807934	-80.76489413
11,000.00	89.00	150.27	8,562.93	-2,864.86	3,357.33	14,442,283.37	1,706,530.11	39.76784054	-80.76471848
11,100.00	89.00	150.27	8,564.68	-2,951.69	3,406.91	14,442,196.55	1,706,579.70	39.76760175	-80.76454283
11,200.00	89.00	150.27	8,566.44	-3,038.51	3,456.50	14,442,109.72	1,706,629.28	39.76736295	-80.76436718
11,300.00	89.00	150.27	8,568.19	-3,125.33	3,506.08	14,442,022.90	1,706,678.87	39.76712415	-80.76419154
11,400.00	89.00	150.27	8,569.94	-3,212.16	3,555.67	14,441,936.08	1,706,728.45	39.76688535	-80.76401589
11,500.00	89.00	150.27	8,571.70	-3,298.98	3,605.25	14,441,849.25	1,706,778.04	39.76664655	-80.76384025
11,600.00	89.00	150.27	8,573.45	-3,385.80	3,654.84	14,441,762.43	1,706,827.63	39.76640775	-80.76366461
11,700.00	89.00	150.27	8,575.21	-3,472.63	3,704.43	14,441,675.61	1,706,877.21	39.76616895	-80.76348897
11,800.00	89.00	150.27	8,576.96	-3,559.45	3,754.01	14,441,588.78	1,706,926.80	39.76593015	-80.76331333
11,900.00	89.00	150.27	8,578.71	-3,646.27	3,803.60	14,441,501.96	1,706,976.38	39.76569135	-80.76313769
12,000.00	89.00	150.27	8,580.47	-3,733.09	3,853.18	14,441,415.14	1,707,025.97	39.76545255	-80.76296205
12,100.00	89.00	150.27	8,582.22	-3,819.92	3,902.77	14,441,328.32	1,707,075.55	39.76521375	-80.76278642
12,200.00	89.00	150.27	8,583.97	-3,906.74	3,952.35	14,441,241.49	1,707,125.14	39.76497495	-80.76261078
12,300.00	89.00	150.27	8,585.73	-3,993.56	4,001.94	14,441,154.67	1,707,174.72	39.76473615	-80.76243515
12,400.00	89.00	150.27	8,587.48	-4,080.39	4,051.52	14,441,067.85	1,707,224.31	39.76449734	-80.76225952
12,500.00	89.00	150.27	8,589.23	-4,167.21	4,101.11	14,440,981.02	1,707,273.89	39.76425854	-80.76208388
12,600.00	89.00	150.27	8,590.99	-4,254.03	4,150.69	14,440,894.20	1,707,323.48	39.76401974	-80.76190826
12,700.00	89.00	150.27	8,592.74	-4,340.86	4,200.28	14,440,807.38	1,707,373.06	39.76378094	-80.76173263
12,800.00	89.00	150.27	8,594.50	-4,427.68	4,249.86	14,440,720.55	1,707,422.65	39.76354214	-80.76155700
12,900.00	89.00	150.27	8,596.25	-4,514.50	4,299.45	14,440,633.73	1,707,472.23	39.76330333	-80.76138137
13,000.00	89.00	150.27	8,598.00	-4,601.32	4,349.03	14,440,546.91	1,707,521.82	39.76306453	-80.76120575
13,100.00	89.00	150.27	8,599.76	-4,688.15	4,398.62	14,440,460.09	1,707,571.40	39.76282573	-80.76103013
13,200.00	89.00	150.27	8,601.51	-4,774.97	4,448.20	14,440,373.26	1,707,620.99	39.76258692	-80.76085450
13,300.00	89.00	150.27	8,603.26	-4,861.79	4,497.79	14,440,286.44	1,707,670.57	39.76234812	-80.76067886
13,400.00	89.00	150.27	8,605.02	-4,948.62	4,547.37	14,440,199.62	1,707,720.16	39.76210931	-80.76050326
13,500.00	89.00	150.27	8,606.77	-5,035.44	4,596.96	14,440,112.79	1,707,769.74	39.76187051	-80.76032764
13,600.00	89.00	150.27	8,608.52	-5,122.26	4,646.54	14,440,025.97	1,707,819.33	39.76163170	-80.76015203
13,700.00	89.00	150.27	8,610.28	-5,209.09	4,696.13	14,439,939.15	1,707,868.91	39.76139290	-80.75997641
13,800.00	89.00	150.27	8,612.03	-5,295.91	4,745.71	14,439,852.32	1,707,918.50	39.76115409	-80.75980079
13,900.00	89.00	150.27	8,613.79	-5,382.73	4,795.30	14,439,765.50	1,707,968.08	39.76091529	-80.75962518
14,000.00	89.00	150.27	8,615.54	-5,469.55	4,844.88	14,439,678.68	1,708,017.67	39.76067648	-80.75944957
14,100.00	89.00	150.27	8,617.29	-5,556.38	4,894.47	14,439,591.86	1,708,067.25	39.76043767	-80.75927396
14,200.00	89.00	150.27	8,619.05	-5,643.20	4,944.05	14,439,505.03	1,708,116.84	39.76019887	-80.75909835
14,254.38	89.00	150.27	8,620.00	-5,690.42	4,971.02	14,439,457.82	1,708,143.80	39.76006900	-80.75900285
<b>PBHL/TD 14254.38 MD/6620.00 TVD</b>									
14,254.38	89.00	150.27	8,620.00	-5,690.42	4,971.02	14,439,457.81	1,708,143.81	39.76006899	-80.75900284



4705101980



Planning Report - Geographic



<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan S-09HM (slot I)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1191 @ 1191.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1191 @ 1191.00usft
<b>Site:</b>	Bryan Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Bryan S-09HM (slot I)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

RECEIVED  
Office of Oil and Gas

Design Targets

JAN 18 2018  
WV Department of Environmental Protection

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LP Bryan S-09HM r3 - plan hits target center - Point	0.00	0.00	6,495.00	498.39	1,436.55	14,445,646.62	1,704,609.34	39.77709063	-80.77152346
BHL Bryan S-09HM r3 - plan hits target center - Point	0.00	0.01	6,620.00	-5,690.42	4,971.02	14,439,457.81	1,706,143.81	39.76006899	-80.75900284

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,400.00	1,400.00	0.00	0.00	KOP Begin 2°/100' build
1,550.00	1,549.93	2.66	2.89	Begin 3.00° tangent
3,002.06	3,000.00	54.18	58.75	Begin 2°/100' build/turn
4,159.43	4,112.53	250.14	271.50	Begin 26.15° tangent
6,178.86	5,925.30	853.02	926.11	Begin 10°/100' build/turn
7,126.31	6,495.00	498.39	1,436.55	Begin 89.00° lateral section
14,254.38	6,620.00	-5,690.42	4,971.02	PBHL/TD 14254.38 MD/6820.00 TVD



4705101980

WW-9  
(4/16)

API Number 47 - 051  
Operator's Well No. Bryan S-9HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

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

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

Will a pit be used? Yes  No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

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

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

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

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

Company Official Signature \_\_\_\_\_

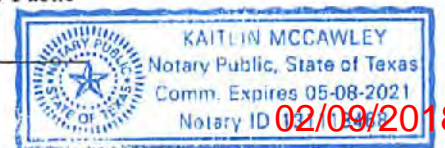
Company Official (Typed Name) Sean Gasser

Company Official Title Engineer

Subscribed and sworn before me this 2 day of October, 2017

Kaitlin McCawley Kaitlin McCawley Notary Public

My commission expires 5/8/2021



4705101980

Form WW-9

Operator's Well No. Bryan S-9HM

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 18.43 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

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

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Jim Anderson

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Title: Oil & Gas Inspector Date: 10/5/17

Field Reviewed?  Yes  No

WW-9

**PROPOSED BRYAN S-9HM**

SUPPLEMENT PG 1

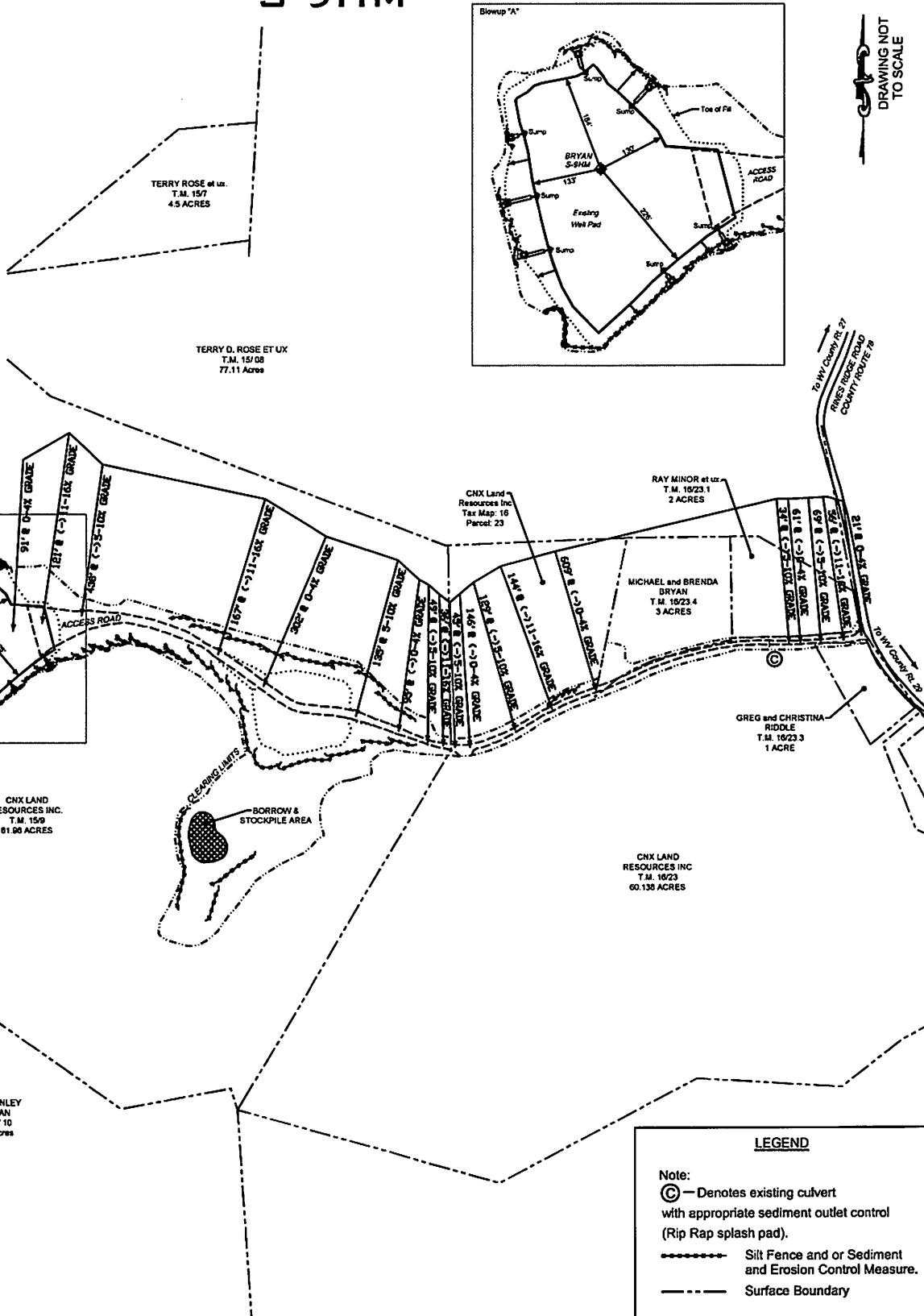
REFERENCE IS HEREBY MADE TO THE WW D.E.P. OFFICE OF OIL & GAS "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND SHAPES FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES 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 WW 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 SIX 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.



DATE: 10/03/17      PROJECT NO: 494510851      DRAWN BY: J.A.H.

4705101980



**Well Site Safety Plan**  
**Tug Hill Operating, LLC**

*ju*  
*1/10/18*

Well Name: Bryan S-9HM

Pad Location: Bryan Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,402,889.99

Easting: 519,128.10

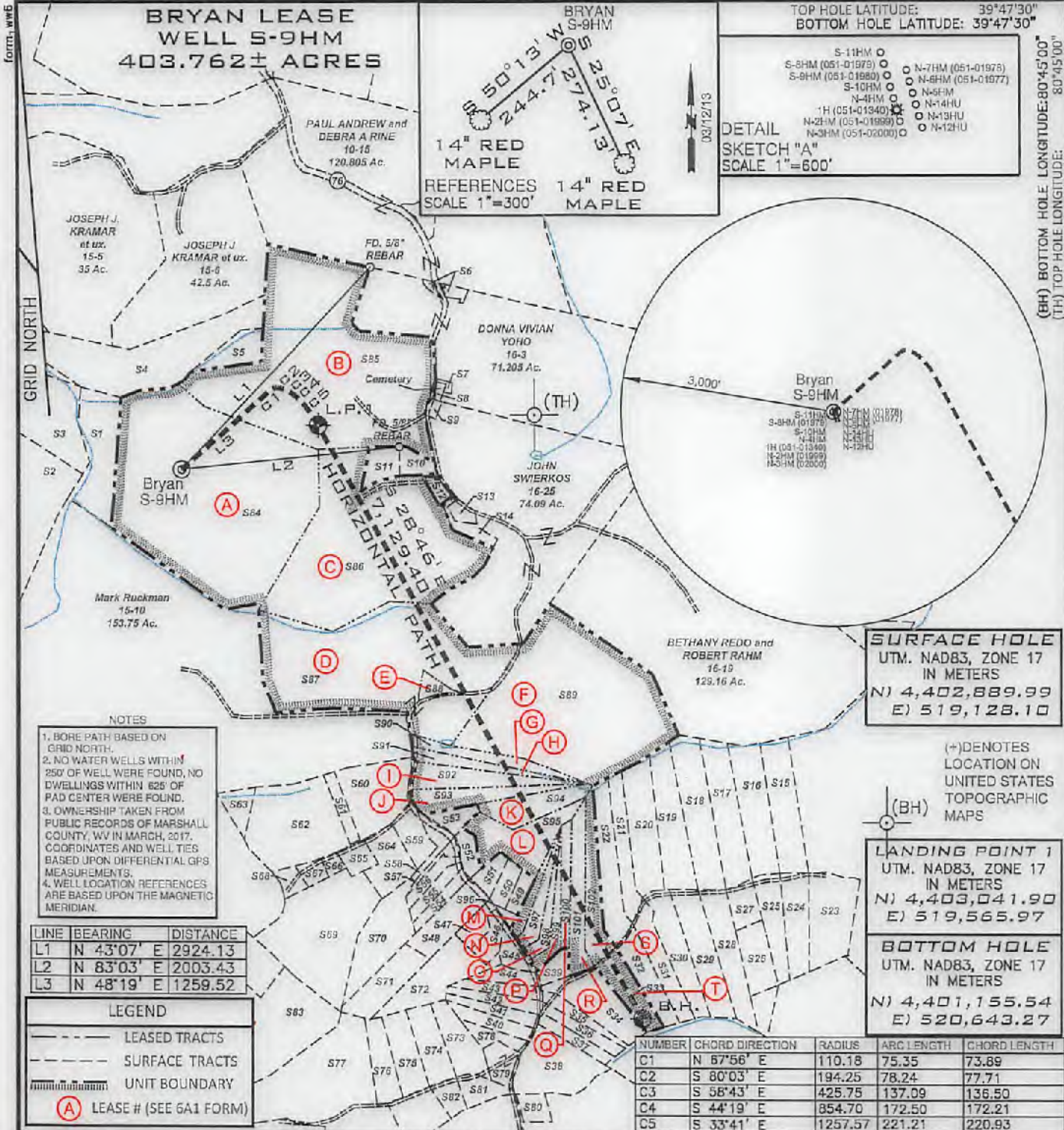
RECEIVED  
Office of Oil and Gas

JAN 18 2018

WV Department of  
Environmental Protection

January 2018

02/09/2018



FILE NUMBER \_\_\_\_\_  
 DRAWING NUMBER BRYAN\_WP\_S-9HM  
 SCALE 1" = 1500'  
 MINIMUM DEGREE OF ACCURACY 1/200  
 PROVEN SOURCE OF ELEVATION SUBMETER MAPPING  
GRADE GPS

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

P.S. 708  
*David L Jackson*



JACKSON SURVEYING INC  
 P.O. Box 1480  
 Clarksburg, WV 26302  
 304-623-5951



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

WELL TYPE: OIL \_\_\_ GAS X LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
 (IF "GAS") PRODUCTION X STORAGE \_\_\_ DEEP \_\_\_ SHALLOW X  
 LOCATION ELEVATION 1191.0' WATERSHED (HUC 10) Fish Creek

DISTRICT Franklin COUNTY Marshall  
 QUADRANGLE Powhatan Point 7.5' LEASE NUMBER SEE WW-6A1 Form

SURFACE OWNER CNX LAND RESOURCES, INC. ACREAGE 81.98  
 OIL & GAS ROYALTY OWNER MICHAEL R. BRYAN - SEE WW 6A1 LEASE ACREAGE 81.98  
 PROPOSED WORK: DRILL X CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION \_\_\_  
 PERFORATE NEW FORMATION \_\_\_ OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_\_\_

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD: 6,596' TMD: 14,264'

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

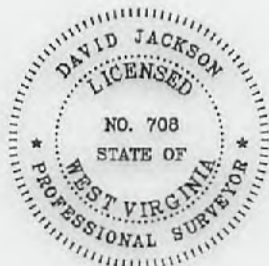
02/09/2018

COUNTY NAME PERMIT

**BRYAN LEASE  
WELL S-9HM  
403.762± ACRES**

GRID NORTH

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES	S52	18-49	Tanner Butler	2.023
S1	15-13	CNX Land Resources Inc.	11.0	S53	18-50	Steven Barisford	2.170
S2	15-12	John David Petrock Et Ux	150.23	S54	18-45	Michael Fincham & Kezia Winters	2.07
S3	15-14	John David Petrock Et Ux	25.0	S55	18-46	Dale W. & Patricia Gardner	2.030
S4	15-6.1	Joseph J. Kramer Et Ux	39.40	S56	18-47	Robert Pelley II & Susan Briggs	2.010
S5	15-7	Terry D. Rose Et Ux	4.5	S57	18-13.5	Wesley Bryan	1.023
S6	16-3.2	Jimmy Ostrander Sr. Et Ux	1.435	S58	18-36	Ruth Mulligan Est.	2.030
S7	16-3.1	Dennis Jackson Et Ux	0.27	S59	18-15.2	Edward Burge	4.171
S8	16-2	Fredonia Christian Church	0.19	S60	18-11	Benjamin Robinson	1.023
S9	16-1	Fredonia Christian Church	0.50	S61	18-11.2	Edward Lee Burge Jr.	2.0
S10	16-23.1	Ray E. Minor Et Ux	2.0	S62	18-11.1	Edward Lee Burge Jr.	18.0
S11	16-23.4	Michael R. & Brenda K. Bryen	3.0	S63	18-15	Edward Lee Burge Jr.	2.495
S12	16-23.3	Greg & Christina Riddle	1.0	S64	18-15.1	Jason Blair	5.948
S13	16-24	Alan M. Beyser Et Ux	1.083	S65	18-12	William Wayne Et Ux	2.27
S14	16-23.2	Alan M. Beyser Et Ux	1.726	S66	18-10	David & Nancy Anderson	0.907
S15	17-16	Glen A. Gunto	9.702	S67	18-10.2	David Anderson Et Ux	1.377
S16	16-15.1	Glen A. Gunto	10.17	S68	18-10.1	David Anderson Et Ux	1.65
S17	17-15	Glen A. Gunto	10.22	S69	18-15.5	Darrell & Teresa Boley	23.547
S18	18-13	Southern Country Farms Inc.	11.415	S70	18-13.3	Robert Closteman	9.813
S19	18-13.9	Roy & Renee Butler	9.603	S71	18-17	Michael S. Fincham & Kezia M. Winters	6.555
S20	18-13.4	Renee D. Straight	9.938	S72	18-13.1	Betty Tagg Est.	9.248
S21	18-13.12	Charles A. & Mary Nice	5.969	S73	18-13.7	Victor W. Woods Jr. & Jessica L. Woods	5.255
S22	18-13	Southern Country Farms Inc.	8.037	S74	18-13.6	Glenn Eugene Whisler Et Ux	5.384
S23	17-3.1	Wilbur L. Riddle Et Ux	10.148	S75	18-13.13	Glenn E. & Sandra K. Whisler	5.59
S24	17-1.6	Lola M. Slaughter	6.347	S76	18-34	Jodi A. & Gary A. Hall	5.002
S25	17-1.5	Donnie R. & Lola M. Slaughter	5.607	S77	18-13	Southern Country Farms Inc.	24.724
S26	17-1.3	Jody & Michelle Anderson	5.0	S78	18-57	Marvin D. Roberts	2.228
S27	17-1.2	Donnie R. & Lola M. Slaughter	5.073	S79	18-18	Linda Coen	3.0
S28	17-1.1	Donnie R. & Lola M. Slaughter	8.078	S80	17-10.4	Ron Murrin Et Al	2.01
S29	17-1.4	Donnie R. & Lola M. Slaughter	8.844	S81	18-48	Marvin Dean Roberts Et Al	2.920
S30	17-14	Southern Country Farms Inc.	7.314	S82	18-13.14	Glenn & Sandra Whisler	2.116
S31	17-13	Roy E. & Renee Butler	5.433	S83	18-16	Charles Yeater	17.768
S32	17-1.7	Roy E. & Renee Butler	5.22	S84	15-09	CNX Land Resources Inc.	81.98
S33	17-1	Southern Country Farms Inc.	5.030	S85	15-08	Terry D. Rose et ux	77.11
S34	18-13	Southern Country Farms Inc.	8.743	S86	16-23	CNX Land Resources Inc.	60.138
S35	18-58	Kevin W. Roberts	2.435	S87	16-22	James M. Ruckman et ux	54.605
S36	18-35	Mary Anderson	2.635	S88	16-22.1	Heather A. Burgy	1.465
S37	18-42	Roger Howard Hall	2.383	S89	16-21	James M. Ruckman et ux	60.75
S38	18-19	Roger Howard Hall Jr.	10.0	S90	18-56	William O'Hara	3.965
S39	18-53	Christopher M. Previtera	2.0	S91	18-55	William O'Hara	3.202
S40	18-61	Roger White Jr.	2.984	S92	18-28	Dotson Harrison	6.36
S41	18-52	Roger Hall	2.536	S93	18-28.1	Carol Helmick	5.696
S42	18-51	Roger Hall	2.505	S94	18-13.2	Steven Barisford	6.023
S43	18-43	Roy E. & Renee Butler	2.532	S95	18-13	Southern Country Farms, Inc.	11.054
S44	18-44	Renee Straight Butler	2.133	S96	18-27.1	Marlon R. Conner	2.003
S45	18-25	Charles & Maria Rayl	2.133	S97	18-27.2	Linda L. Moore	3.009
S46	18-41	Cory A. Holt	2.308	S98	18-27	Linda L. Moore	2.447
S47	18-40	Cory A. Holt	2.237	S99	18-26	Linda L. Moore	2.624
S48	18-14	Michael Fincham & Kezia Winters	6.386	S100	18-13.11	Linda L. Moore	3.156
S49	18-39	Marlon R. Conner	2.001	S101	18-53.1	Christopher M. Previtera	6.283
S50	18-38	Marlon R. Conner	2.231	S102	18-60	Christopher M. Previtera	6.297
S51	18-37	John W. Wetzel	2.064				



P.S. 708 *David L Jackson*

02/09/2018



**TUG HILL  
OPERATING**

OPERATOR'S  
WELL #: Bryan S-9HM  
DISTRICT: Franklin  
COUNTY: Marshall  
STATE: WV

**WELL PLAT**  
PAGE 2 OF 2  
DATE: 10/03/2017  
REVISED: 01/08/2018

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

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

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

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

\*See attached pages

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

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

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

RECEIVED  
Office of Oil and Gas  
JAN 18 2018  
WV Department of  
Environmental Protection

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

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

4705101980

WW-6A1  
(5/13)

Operator's Well No. Bryan S-9HM

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\*See attached pages

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RECEIVED  
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Well Operator: Tug Hill Operating, LLC  
 By: Amy L. Miller *Amy Miller*  
 Its: Permit Specialist



Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19294	A	5-15-9	BRENDA K BRYAN	TRIENERGY INC	1/8*	741	78	20/348 TriEnergy Inc to AB Resources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	685/643 Chief Exploration & Development LLC and Radler 2000 Limited Partnership to Enerplus Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19340	B	5-15-8	DONNA V YOHO	GASTAR EXPLORATION USA INC	1/8*	665	407	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	23/617 Gatar Exploration USA Inc and Atinum Marcellus I LLC to AB Resources LLC	24/319 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	40/57 Chevron USA Inc. to TH Exploration LLC
10*19166	C	5-16-23	BRENDA K BRYAN	TRIENERGY INC	1/8*	741	78	20/348 TriEnergy Inc to AB Resources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	685/643 Chief Exploration & Development LLC and Radler 2000 Limited Partnership to Enerplus Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19338	D	5-16-22	JAMES M AND KIMBERLY L RUCKMAN	TRIENERGY INC	1/8*	741	72	20/348 TriEnergy Inc to AB Resources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	685/643 Chief Exploration & Development LLC and Radler 2000 Limited Partnership to Enerplus Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*16614	E	5-16-22.1	CHARLES RICHARD AND HEATHER A DAVIS	TH EXPLORATION LLC	1/8*	940	441	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19338	F	5-16-21	JAMES M AND KIMBERLY L RUCKMAN	TRIENERGY INC	1/8*	741	72	20/348 TriEnergy Inc to AB Resources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	685/643 Chief Exploration & Development LLC and Radler 2000 Limited Partnership to Enerplus Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc. to TH Exploration LLC
10*14099	G	5-18-56	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8*	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gatar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gatar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14099	H	5-18-55	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8*	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gatar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gatar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*47051.104.0	I	5-18-28	DOTSON GALE AND DOLLY MARIE HARRISON	TH EXPLORATION LLC	1/8*	873	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*14099	J	5-18-28.1	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8*	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gatar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gatar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14099	K	5-18-13.2	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8*	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gatar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gatar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14099	L	5-18-13	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8*	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gatar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gatar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*17643	M	5-18-27.1	DONALD R SLAUGHTER AND LOLA SLAUGHTER	TH EXPLORATION LLC	1/8*	940	445	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17639	N	5-18-27.2	LINDA L MOORE	TH EXPLORATION LLC	1/8*	940	445	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17639	O	5-18-27	LINDA L MOORE	TH EXPLORATION LLC	1/8*	940	443	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17639	P	5-18-26	LINDA L MOORE	TH EXPLORATION LLC	1/8*	940	443	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17639	Q	5-18-13.11	LINDA L MOORE	TH EXPLORATION LLC	1/8*	940	443	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*14099	R	5-18-53.1	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8*	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gatar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gatar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14099	S	5-18-60	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8*	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gatar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gatar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*17826	S	5-18-60	ALLDALE MINERALS II, LP	TH EXPLORATION, LLC	1/8*	940	439	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17812	S	5-18-60	POTOMAC MINERAL GROUP, LLC	TH EXPLORATION, LLC	1/8*	940	437	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21465	S	5-18-60	MOLLY D. ASTON, ET VIR	TH EXPLORATION, LLC	1/8*	954	134	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21462	S	5-18-60	MAGGY D. ASTON, ET VIR	TH EXPLORATION, LLC	1/8*	954	125	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*14915	S	5-18-60	CHESTNUT HOLDINGS, INC.	GASTAR EXPLORATION INC	1/8*	827	552	N/A	N/A	N/A	N/A	N/A	36/9 Gatar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC	
10*17826	T	5-17-1	ALLDALE MINERALS II, LP	TH EXPLORATION, LLC	1/8*	940	439	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Lease No.	Tag#	Parcel	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*17812	T	5-17-1	POTOMAC MINERAL GROUP, LLC	1/8+	940	437	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21465	T	5-17-1	MOLLY D. ASTON, ET VIR	1/8+	554	134	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21462	T	5-17-1	MAGGY D. ASTON, ET VIR	1/8+	554	125	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*14915	T	5-17-1	CHESTNUT HOLDINGS, INC.	1/8+	827	552	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			GASTAR EXPLORATION INC															

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STATE OF TEXAS §
COUNTY OF TARRANT §

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

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

FURTHER, AFFIANT SAITH NOT.

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

David D. Kalish
Affiant: David D. Kalish

JURAT

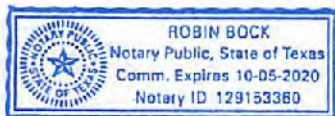
Carol S Haught
WENZEL County 10-09-27 AM
Instrument No 212093
Date Recorded 10/20/2016
Document Type AFFID
Pages Recorded 1
Book-Page 119-291
Recording Fee \$5.00
Additional \$5.00

STATE OF TEXAS §
COUNTY OF TARRANT §

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

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

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



STATE OF WEST VIRGINIA §  
§  
COUNTY OF MARSHALL §

ASSIGNMENT AND BILL OF SALE

This ASSIGNMENT AND BILL OF SALE (this "Assignment") dated as of August 1, 2017 (the "Signing Date"), but effective from and after 7:00 a.m., Eastern Standard Time on August 2, 2017 being the day immediately following the Signing Date (the "Effective Date"), is made by Chevron U.S.A. Inc., a Pennsylvania corporation, with an address at 700 Cherrington Parkway, Coraopolis, PA 15108 ("Chevron" or "Assignor") to TH Exploration II, LLC and TH Exploration, LLC, Texas limited liability companies, with an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (collectively "Assignee") and is accepted by Assignee upon the following terms and conditions.

RECITALS

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

1. DEFINITIONS

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

"Acreage Trade Agreement" means that certain Acreage Trade Agreement by and between Chevron U.S.A. Inc. and TH Exploration, LLC with an Effective Date of August 1, 2017 to be contemporaneously executed with this Assignment.

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

"Affiliate" means any legal entity which controls, is controlled by, or is under common control with, another legal entity. An entity is deemed to "control" another if it owns directly or indirectly at least fifty percent of either of the following: (A) the shares entitled to vote at a general election of directors of such other entity or (B) the voting interest in such other entity if such entity does not have either shares or directors.

"Applicable Law(s)" means all laws, principles of common law, regulations, statutes, codes, rules, orders, ordinances, permits, enforceable policies, licenses, certifications, decrees, constitutions, standards or other requirements with similar effect of any Government Entity and any binding interpretations of the foregoing.

"Assets" has the meaning given to such term in Section 2.1 of this Assignment.

"Assigned Hydrocarbons" means all Hydrocarbons produced and severed from, or allocable, after severance, to the Leases, Units, and Wells on and after the Effective Date.

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MICHAEL MORRIS  
BRIGHTON RESOURCES  
5851 ELLSWORTH AVENUE, #1  
PITTSBURGH PA 15232-1707

BOOK 040 PAGE 0127

STATE OF WEST VIRGINIA §  
§  
COUNTY OF MARSHALL §

Marshall County  
Jan Pest, Clerk  
Instrument 1428355  
08/16/2017 @ 12:08:49 PM  
ASSIGNMENTS  
Book 40 @ Page 127  
Pages Recorded 25  
Recording Cost \$ 33.00

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this day of AUGUST, 2017 (the "Effective Date"), by and between CHEVRON U.S.A. INC. (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated the 1st day of August, 2017 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit "A", attached hereto and made a part hereof (hereinafter the "Leases"), less and except certain overriding royalty interests and exclusions; and

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases as described below, subject to certain overriding royalty interests and less and except certain exclusions.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and subject to the limited warranties, restrictions and conditions hereinafter mentioned, the parties hereto, intending to be legally bound, do covenant and agree as follows:

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon, except that Assignor excepts and reserves from this Assignment the following:

A. The Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia, and

B. As to each of the Leases and all oil, gas, and associated hydrocarbons produced, saved and sold thereunder, an overriding royalty interest equal to the difference between 82% and the

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**ASSIGNMENT OF OIL AND GAS LEASES**

This ASSIGNMENT OF OIL AND GAS LEASES (the "Assignment") is made and entered into this 29th day of November, 2017 (the "Effective Date"), from TH Exploration II, LLC, a Texas limited liability company, having an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "Assignor"), and TH Exploration, LLC, a Texas limited liability company, having an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "Assignee").

WITNESSETH:

WHEREAS, Assignor is the owner of the right, title, and interest in those certain Oil and Gas Leases situated in Marshall County, West Virginia, which are described in Exhibit "A" and Exhibit "A-1" attached hereto and made a part hereof (hereinafter the "Leases"); and

WHEREAS, subject to the exceptions and reservations herein contained, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and subject to the limited warranties, restrictions and conditions hereinafter mentioned, the parties hereto, intending to be legally bound, do covenant and agree as follows:

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, subject to the terms, reservations, waivers and provisions as hereinafter set forth, an undivided interest of all of Assignor's right, title and interest in and to the Leases and all oil, natural gas, natural gas liquids, condensate, casinghead gas and other liquefied or gaseous hydrocarbons or products ("Hydrocarbons") thereby held, in any and all depths and formations ("Assigned Formations"), together with any and all other rights that are reasonably necessary or convenient to explore for and produce Hydrocarbons from the Assigned Formations, including, but not limited to, the right of surface access, use and occupancy, the right of ingress and egress, the right to conduct geophysical and other exploratory activities, the right to lay pipeline, the right to drill through, but not perforate or stimulate, all other depths and formations necessary for the purpose of reaching the Assigned Formations and to conduct operations therein.

TO HAVE AND TO HOLD such right, title and interest in and to the Leases unto Assignees or their designee, and their respective successors and assigns, forever, in accordance with the provisions of this Assignment.

2. Representations and Warranties. Assignor represents and warrants that such Assignor has not conveyed or otherwise encumbered its interest in the Leases since the time that Assignor obtained its interests in the Leases.

Assignor represents and warrants that, as to its interests in the Leases, Assignor has paid all royalties, overriding royalties, and other payments required by the Leases which were due for the period in which Assignor held its interests in the Leases, including, but not limited to, the interests assigned hereunder, and that Assignor has fully performed all conditions necessary to maintain the Leases in full force and effect during such period.

Assignor represents and warrants that, as to its interests in the Leases, Assignor shall not, by virtue of this Assignment or otherwise, retain any interest in the Assigned Formations, including, without limitation, any overriding royalty interest or working interest therein or with respect thereto.

3. Successors and Assigns. The terms of this Assignment shall be binding upon and inure to the benefit of the parties hereto and each of their respective successors

DFS LAND SERVICES CORP-JESSICA LEMOH  
6000 TOWN CENTER BLVD, SUITE 145  
CANDLERBURG PA 15317-5070

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TUG HILL

4705101980

October 6, 2017

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

RE: Bryan S-9HM

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 Bryan S-9HMwell plat.

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

Sincerely,

Amy L. Miller  
Permitting Specialist – Appalachia Region

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

Date of Notice Certification: 10/06/2017

API No. 47- 051 -  
Operator's Well No. Bryan S-9HM  
Well Pad Name: Bryan

**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>519,128.10</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,889.99</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>CNX Land Resources, Inc.</u>	
Watershed:	<u>Fish Creek (HUC-10)</u>			

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

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

**Required Attachments:**

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



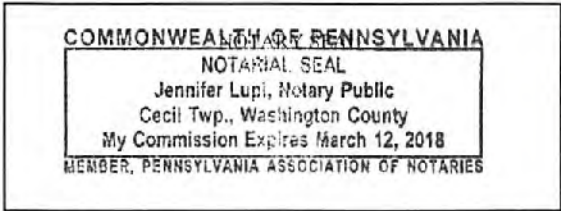
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**Certification of Notice is hereby given:**

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

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

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



Subscribed and sworn before me this 6<sup>th</sup> day of Oct. 2017.  
Jennifer Lupi Notary Public  
My Commission Expires March 12, 2018

**Oil and Gas Privacy Notice:**

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

**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:** 10/6/2017 **Date Permit Application Filed:** 10/6/2017

**Notice of:**

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

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

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

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

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

SURFACE OWNER(s)  
 Name: CNX Land Resources, Inc. (Pat)  
 Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317

Name: Greg and Christina Riddle (Road)  
 Address: 4205 Rines Ridge Road  
Proctor, WV 26055

SURFACE OWNER(s) (Road and/or Other Disturbance)  
 Name: Ray E. and Katherine L. Minor  
 Address: 4193 Rines Ridge Road  
Proctor, WV 26055  
 Name: Michael R. and Brenda K. Bryan  
 Address: 195 Isaiah Drive  
Proctor, WV 26055

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

COAL OWNER OR LESSEE  
 Name: Leatherwood, Inc.  
 Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317-6506

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

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

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

\*Please attach additional forms if necessary

**Notice is hereby given:**

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

**This Notice Shall Include:**

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

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

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

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

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

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(8-13)

API NO. **4705101980**  
OPERATOR WELL NO. Bryan S-8HM  
Well Pad Name: Bryan

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

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.**

02/09/2018

**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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(8-13)

4705101980  
API NO. 47-  
OPERATOR WELL NO. Bryan S-8HM  
Well Pad Name: Bryan

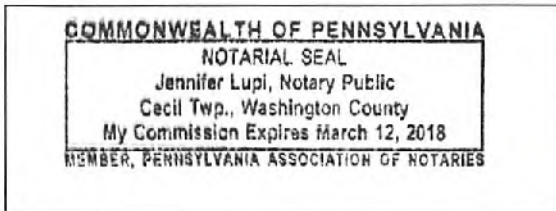
**Notice is hereby given by:**

Well Operator: Tug Hill Operating, LLC  
Telephone: 724-749-8388  
Email: amiller@tug-hill-op.com *amy miller*

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

**Oil and Gas Privacy Notice:**

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



Subscribed and sworn before me this 6<sup>th</sup> day of Oct, 2017.  
Jennifer Lupi Notary Public  
My Commission Expires March 12, 2018

WW-6A

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

**WATER WELL REPORT**

Well: BRYAN No. S-9HM  
 District: Franklin  
 County: Marshall  
 State: WV

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

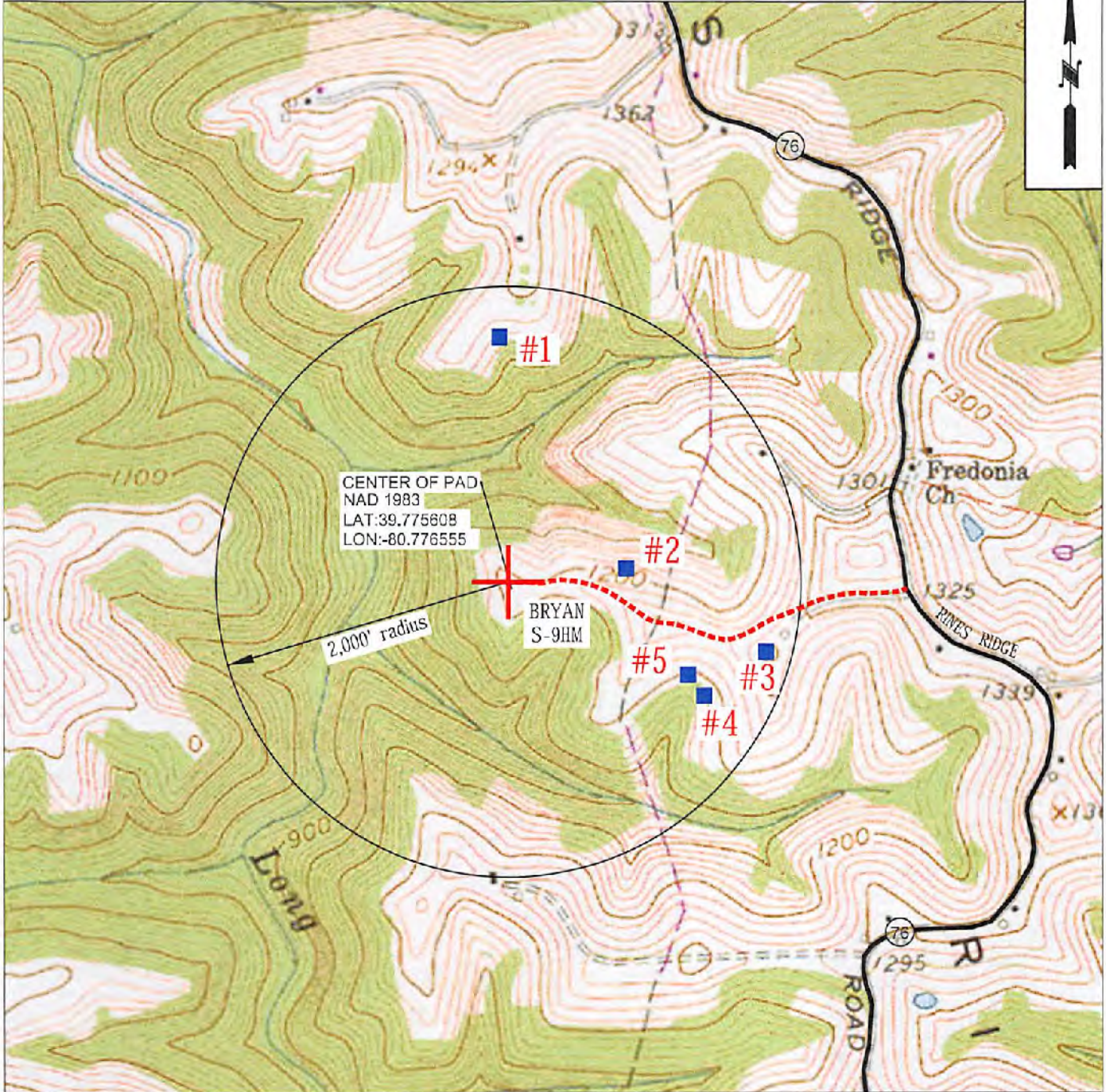
Topo spot #1 (Possible Spring) TM 15 Par.6 Joseph & Joann Kramer 304-845-0896 3303 Rines Ridge Rd. Proctor, WV 26055	Topo Spot # 2 (Spring) TM 15 Par. 9 CNX Land Resources, LLC 724-485-4000, 713-893-4476 1000 Consol Energy Dr. Canonsburg, PA 15317	Topo Spot # 3 (Water Well) TM 16 Par. 23 CNX Land Resources, LLC 724-485-4000, 713-893-4476 1000 Consol Energy Dr. Canonsburg, PA 15317
Topo Spot # 4 (Water Trough) TM 16 Par. 23 CNX Land Resources, LLC 724-485-4000, 713-893-4476 1000 Consol Energy Dr. Canonsburg, PA 15317	Topo Spot # 5 (Water Trough) TM 15 Par. 9 CNX Land Resources, LLC 724-485-4000, 713-893-4476 1000 Consol Energy Dr. Canonsburg, PA 15317	

WW-6A

*PROPOSED  
BRYAN S-9HM*

SUPPLEMENT PG 1

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



<b>OPERATOR</b>	494510851	<b>TOPO SECTION</b>	<b>LEASE NAME</b>
TUG HILL OPERATING, LLC 380 SOUTHPONTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	BRYAN
		<b>SCALE:</b>	<b>DATE:</b>
		1" = 1000'	DATE: 10/03/17



**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:** 8/10/2017      **Date of Planned Entry:** 8/17/2017

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

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

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

**Notice is hereby provided to:**

SURFACE OWNER(s)

Name: CNX Land Resources, Inc.  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317  
Name: Ray E. and Katherine L. Minor  
Address: 4193 Rines Ridge Road  
Proctor, WV 26055  
Name: Michael R. and Brenda K. Bryan  
Address: 195 Isaiah Drive  
Proctor, WV 26055 \*See Attachment

COAL OWNER OR LESSEE

Name: Leatherwood, Inc.  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317-6506

MINERAL OWNER(s)

Name: Greg and Christina Riddle  
Address: 4205 Rines Ridge Road  
Proctor, WV 26055

\*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>39.7756312; -80.7766011</u>
County:	<u>Marshall</u>	Public Road Access:	<u>Rines Ridge Road (County Route 76)</u>
District:	<u>Franklin</u>	Watershed:	<u>(HUC-10) Fish Creek</u>
Quadrangle:	<u>Powhatan Pcint</u>	Generally used farm name:	<u>Michael and Brenda Bryan</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 Boulevard, Plaza II, Suite 200</u>
Telephone:	<u>724-749-8388</u>		<u>Canonsburg, PA 15317</u>
Email:	<u>amiller@tug-hill-op.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).

4705101980

Operator Well No. Bryan S-9HM

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

**Attachment 1 of 1**

**Surface Owner(s):**

**Name:** Greg and Christina Riddle  
**Address:** 4205 Rines Ridge Road  
Proctor, WV 26055

**Mineral Owner(s):**

**Name:** Ray E. and Katherine L. Minor  
**Address:** 4193 Rines Ridge Road  
Proctor, WV 26055

**Name:** Brenda K. Bryan  
**Address:** 1971 Rines Ridge Road  
Proctor, WV 26055

**Name:** Wesley Russell Bryan II  
**Address:** P.O. Box 1107  
Sunbury, OH 43074

**Name:** Appalachian Energy Holdings I, LP  
**Address:** 14 Dunmoyle Place  
Pittsburgh, PA 15217

02/09/2018

WW-6A5  
(1/12)

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

**Notice Time Requirement:** notice shall be provided no later than the **filing date of permit application.**

**Date of Notice:** 10/06/2017      **Date Permit Application Filed:** 10/06/2017

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

- CERTIFIED MAIL                                       HAND  
RETURN RECEIPT REQUESTED                                      DELIVERY

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

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

Name: CNX Land Resources, Inc.  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317

Name: Ray E. and Katherine L. Minor  
Address: 4193 Rines Ridge Road  
Proctor, WV 26055      \*See attached sheet

**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>519,128.10</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,889.99</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>CNX Land Resources, Inc.</u>	
Watershed:	<u>Fish Creek (HUC-10)</u>			

**This Notice Shall Include:**

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

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

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

**Oil and Gas Privacy Notice:**

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

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Operator Well No. Bryan N-9HM

**WW-6A5 NOTICE OF PLANNED OPERATION**

**ATTACHMENT 1 OF 1**

**Surface Owner(s):**

Greg and Christina Riddle  
4205 Rines Ridge Road  
Proctor, WV 26055

Michael R. and Brenda K. Bryan  
195 Isaiah Drive  
Proctor, WV 26055

02/09/2018



4705101980

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

**Division of Highways**

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

Jim Justice  
Governor

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

September 7, 2017

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

Subject: DOH Permit for the Bryan Pad, Marshall County  
Bryan S-9HM Well site

47-051-01980

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2017-0528 which has been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off of Marshall County Route 76 SLS.

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

Very Truly Yours,

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

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



TUG HILL

4705101980

PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Bryan S-9HM

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



**WVDEP O&G**  
**ACCEPTED AS-BUILT**

*WJL* 10/31/2017

**Bryan Well Pad Site**  
 Site Design, Construction Plan, &  
 Erosion and Sediment Control Plans  
 Tug Hill Operating  
 Marshall County  
 Franklin District  
 Latitude 39.77560812°  
 Longitude -80.77655533°  
 Lower Fish Creek Watershed

**Pertinent Site Information**  
 Bryan Well Pad Site  
 Emergency Number: 304-245-1920  
 Franklin District, Marshall County, WV  
 Watershed: Lower Fish Creek Watershed  
 Tug Hill Control Number: 1817-623-3400

**Property Owner Information - Bryan Well Pad Site**

Owner	100' Buffer	100' Buffer	100' Buffer	100' Buffer	100' Buffer	100' Buffer	100' Buffer
Tug Hill	100'	100'	100'	100'	100'	100'	100'
Marshall County	100'	100'	100'	100'	100'	100'	100'
Franklin District	100'	100'	100'	100'	100'	100'	100'
Lower Fish Creek Watershed	100'	100'	100'	100'	100'	100'	100'

Exhibit A: Final Design: Issue for Permitting



**Access Road**

Access Road	Width	Length	Area
Access Road 1	12'	100'	1200'
Access Road 2	12'	100'	1200'
Access Road 3	12'	100'	1200'
Access Road 4	12'	100'	1200'
Access Road 5	12'	100'	1200'

**Distributed Area**

Area	Area	Area
Well Pad	100'	100'
Access Road	1200'	1200'
Other	1200'	1200'

Well Pad	Well Pad	Well Pad	Well Pad	Well Pad	Well Pad
Well Pad 1 100' x 100' 10000'	Well Pad 2 100' x 100' 10000'	Well Pad 3 100' x 100' 10000'	Well Pad 4 100' x 100' 10000'	Well Pad 5 100' x 100' 10000'	Well Pad 6 100' x 100' 10000'
Well Pad 7 100' x 100' 10000'	Well Pad 8 100' x 100' 10000'	Well Pad 9 100' x 100' 10000'	Well Pad 10 100' x 100' 10000'	Well Pad 11 100' x 100' 10000'	Well Pad 12 100' x 100' 10000'
Well Pad 13 100' x 100' 10000'	Well Pad 14 100' x 100' 10000'	Well Pad 15 100' x 100' 10000'	Well Pad 16 100' x 100' 10000'	Well Pad 17 100' x 100' 10000'	Well Pad 18 100' x 100' 10000'
Well Pad 19 100' x 100' 10000'	Well Pad 20 100' x 100' 10000'	Well Pad 21 100' x 100' 10000'	Well Pad 22 100' x 100' 10000'	Well Pad 23 100' x 100' 10000'	Well Pad 24 100' x 100' 10000'

**Bryan Well Pad Site Quantities**

Item	Quantity	Unit
Well Pad Area	10000	Sq. Ft.
Access Road Area	12000	Sq. Ft.
Other Area	12000	Sq. Ft.
Total Area	34000	Sq. Ft.

**Project Contacts**

**Client/Owner:** Tug Hill Operating, Inc.  
 10000 Tug Hill Road  
 Tug Hill, WV 26104

**Design:** J. C. [Name]  
 [Address]

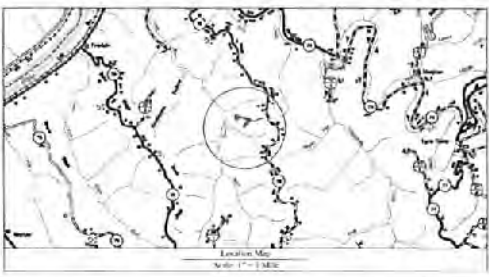
**Construction:** [Name]  
 [Address]

**Site Location (NAD 83)**

**Site Location (NAD 83)**

**Approach Notes:**

This site is located on the right side of the road, near the intersection of the road and the creek. The site is situated on a slight slope, and the terrain is relatively flat. The site is located near the creek, and the terrain is relatively flat. The site is located near the creek, and the terrain is relatively flat.



**Professional Engineer**  
 J. C. [Name]  
 State of West Virginia

Sheet	Description
1	Overall Site Plan
2	Well Pad Layout
3	Access Road Layout
4	Erosion Control Details
5	Site Location Map
6	Site Location Map
7	Site Location Map
8	Site Location Map
9	Site Location Map
10	Site Location Map
11	Site Location Map
12	Site Location Map
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16	Site Location Map
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29	Site Location Map
30	Site Location Map

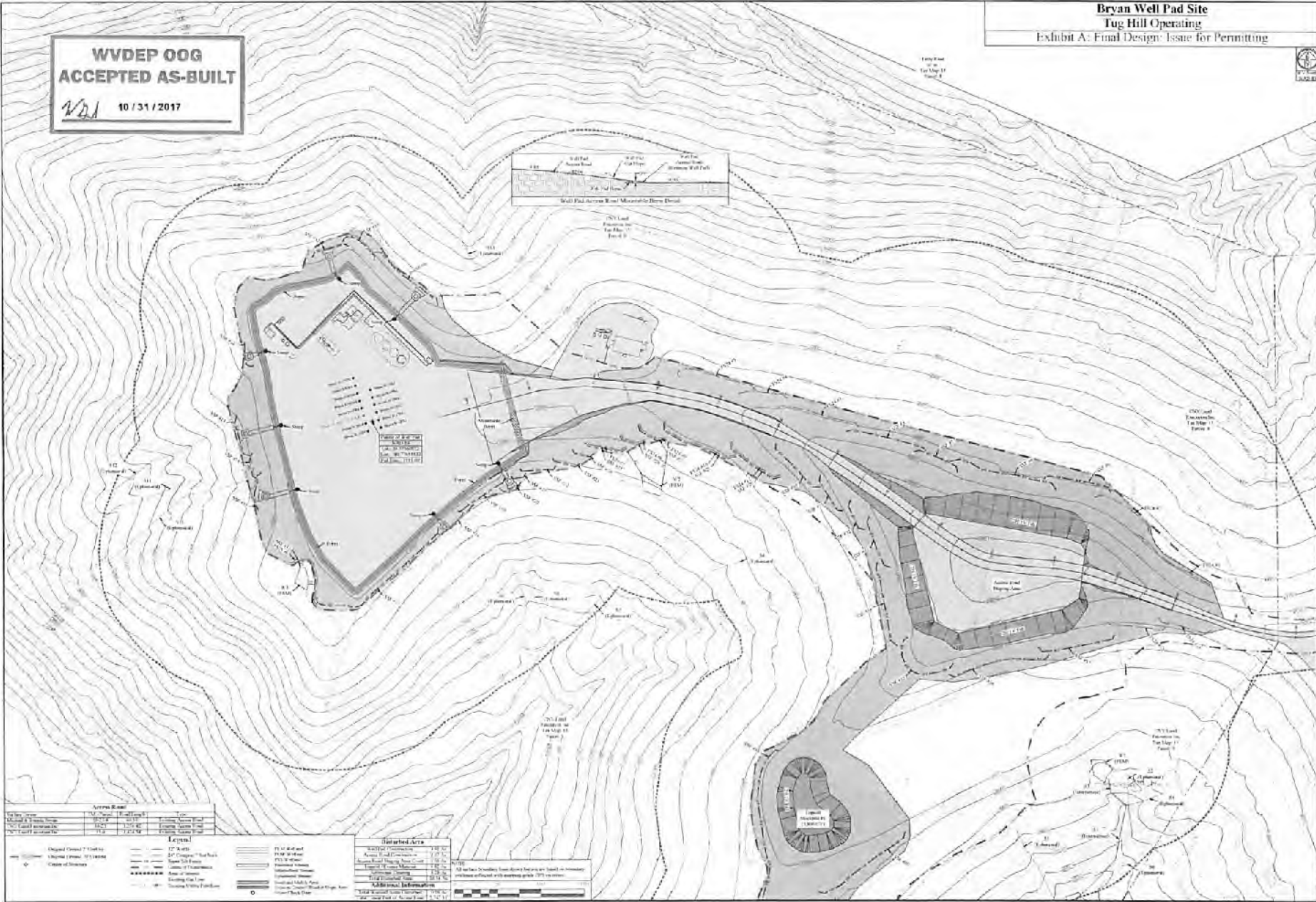


**Bryan Well Pad Site**  
 Franklin District  
 Marshall County, WV

4705101979

**Bryan Well Pad Site**  
**Tug Hill Operating**  
 Exhibit A: Final Design: Issue for Permitting

**WVDEP OOG**  
**ACCEPTED AS-BUILT**  
*WJA* 10/31/2017



WVDEP OOG  
 ACCEPTED AS-BUILT  
 10/31/2017

**TUG HILL**  
**OPERATING**



THIS DOCUMENT  
 PREPARED FOR  
 TUG HILL  
 OPERATING



Franklin and Southeast Counties, West Virginia  
**Bryan Well Pad Site**  
 Franklin District of  
 Randolph County, WV.

SYMBOL		DESCRIPTION
(Symbol)	WVDEP OOG	WVDEP OOG
(Symbol)	ACCEPTED AS-BUILT	ACCEPTED AS-BUILT
(Symbol)	10/31/2017	10/31/2017

LEGEND	
(Symbol)	WVDEP OOG
(Symbol)	ACCEPTED AS-BUILT
(Symbol)	10/31/2017

Hatched Area	
(Symbol)	WVDEP OOG
(Symbol)	ACCEPTED AS-BUILT
(Symbol)	10/31/2017

Additional Information	
(Symbol)	WVDEP OOG
(Symbol)	ACCEPTED AS-BUILT
(Symbol)	10/31/2017

Sheet 1 of 1  
 Date: 10/31/2017  
 Drawn By: WJA  
 Checked By: WJA  
 Scale: 1" = 100'