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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-8HM  
47-051-01979-00-00

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-8HM  
Farm Name: CNX LAND RESOURCES, INC.  
U.S. WELL NUMBER: 47-051-01979-00-00  
Horizontal 6A / New Drill  
Date Issued: 2/7/2018

Promoting a healthy environment.

# PERMIT CONDITIONS

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

## CONDITIONS

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

**PERMIT CONDITIONS 4705101979**

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).

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

1) Well Operator: Tug Hill Operating, LLC

<u>494510851</u>	<u>Marshall</u>	<u>Franklin</u>	<u>Powhatan Point</u>
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Operator ID      County      District      Quadrangle

2) Operator's Well Number: Bryan S-8HM      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  \_\_\_\_\_

*JW*  
*1/10/18*

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' - 6496', thickness of 54' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,596'

9) Formation at Total Vertical Depth: Onondoga

10) Proposed Total Measured Depth: 13,692'

11) Proposed Horizontal Leg Length: 6,808'

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

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(a) If Yes, provide Mine Info:      Name: \_\_\_\_\_  
Depth: \_\_\_\_\_  
Seam: \_\_\_\_\_  
Owner: \_\_\_\_\_

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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#	2,614'	2,604'	863ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	13,702'	13,692'	3500ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,737'	
Liners	N/A						

*Ju*  
1/10/18

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						

**PACKERS**

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

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WW-6B  
(10/14)

API NO. 47-051 **4705101979**

OPERATOR WELL NO. Bryan S-8HM

Well Pad Name: Bryan

*Ju*  
*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 17,020,000 lb proppant and 263,142 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

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

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\*Note: Attach additional sheets as needed.

WW-6B Attachment to #24

**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



## Tug Hill Operating, LLC Casing and Cement Program

### Bryan S-8HM

#### 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"	2,604'	CTS
Production	5 1/2"	P110	8 7/8 x 8 3/4"	13,692'	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

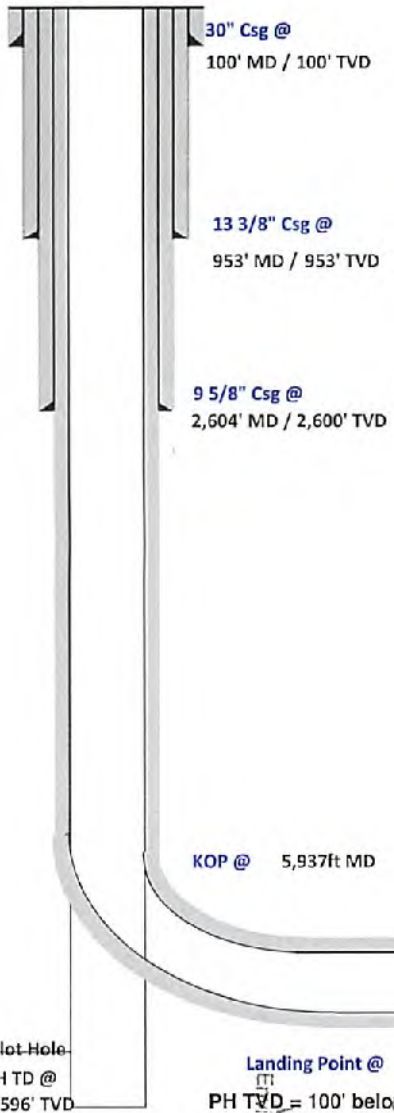
Production: 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.19

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WELL NAME: Bryan S-8HM  
 STATE: West Virginia COUNTY: Marshall  
 DISTRICT: Franklin  
 DF Elev: 1,191' GL Elev: 1,191'  
 TD: 13,692'  
 TH Latitude: 39.77576483  
 TH Longitude: 80.77665329  
 BH Latitude: 39.75980246  
 BH Longitude: 80.76189249



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
Geneseo/Burkett	6327
Tully	6362
Hamilton	6397
Marcellus	6443
Landing Depth	6490
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	2,604'	2,600'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	13,692'	6,609'	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	848	A	15	Air	1 Centralizer every other jt
Production	3,088	A	14.5	Air / SOB	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc

*JL 1/10/18*

Pilot Hole PH TD @ 6,596' TVD  
 Landing Point @ 6,884' MD / 6,490' TVD  
 PH TD = 100' below Onondaga Top

Lateral TD @ 13,692' ft MD  
 6,609 ft TVD

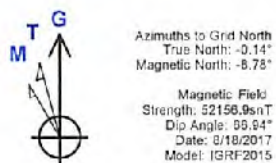
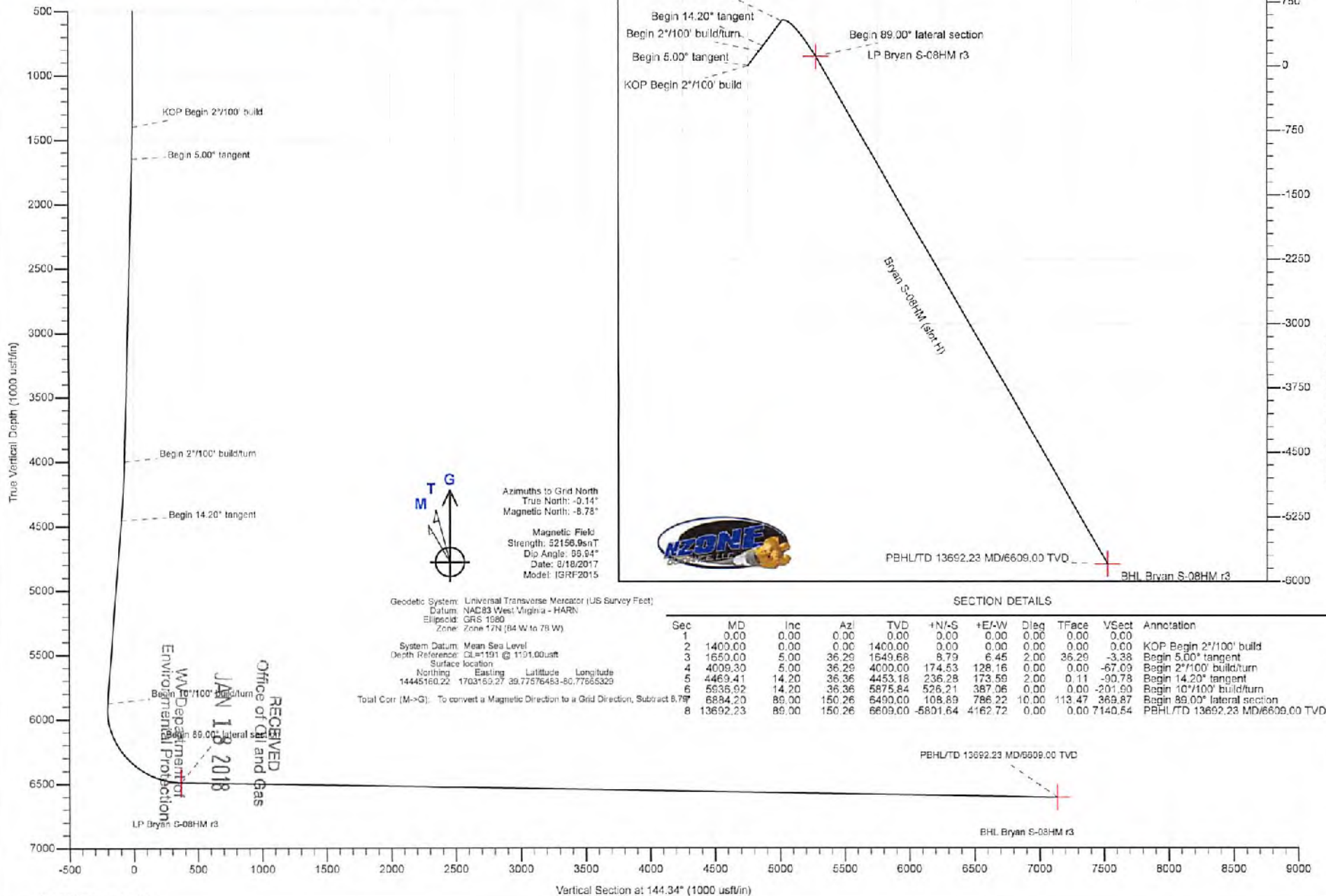
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4705101979



**TUG HILL**  
OPERATING

**Tug Hill Operating LLC**  
Well: **Bryan S-08HM (slot H)**  
Site: **Bryan Pad**  
Project: **Marshall County, WV**  
Design: **rev3**



Azimuths to Grid North  
True North: -0.14°  
Magnetic North: -8.78°  
  
Magnetic Field  
Strength: 52156.95nT  
Dip Angle: 69.84°  
Date: 8/18/2017  
Model: IGRF2015

Geodetic System: Universal Transverse Mercator (US Survey Feet)  
Datum: NAD83 West Virginia - HARN  
Ellipsoid: GRS 1980  
Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level  
Depth Reference: CAS1191 @ 1191.00usft  
Surface location  
Northing Easting Latitude Longitude  
14445160.22 1703159.27 39.77576453 -80.77565329

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.78°

**SECTION DETAILS**

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1400.00	0.00	0.00	1400.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1650.00	5.00	36.29	1649.68	8.79	6.45	2.00	36.29	-3.38	Begin 5.00° tangent
4	4009.30	5.00	36.29	4000.00	174.53	128.16	0.00	0.00	-67.09	Begin 2°/100' build/turn
5	4469.41	14.20	36.36	4453.18	236.28	173.59	2.00	0.11	-90.78	Begin 14.20° tangent
6	5535.92	14.20	36.36	5875.84	526.21	387.06	0.00	0.00	-201.90	Begin 10°/100' build/turn
7	6884.20	89.00	150.26	6490.00	108.89	788.22	10.00	113.47	369.87	Begin 89.00° lateral section
8	13692.23	89.00	150.26	6609.00	-5891.64	4162.72	0.00	0.00	7140.54	PBHL/TD 13692.23 MD/6609.00 TVD

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LP Bryan S-08HM r3



PBHL/TD 13692.23 MD/6609.00 TVD  
BHL Bryan S-08HM r3

Vertical Section at 144.34° (1000 usf/in)

4705101979





Planning Report - Geographic



<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan S-08HM (slot H)
<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-08HM (slot H)	<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-08HM (slot H)					
<b>Well Position</b>	+N/-S	0.00 usft	<b>Northing:</b>	14,445,160.23 usft	<b>Latitude:</b>	39.77576483
	+E/-W	0.00 usft	<b>Easting:</b>	1,703,169.27 usft	<b>Longitude:</b>	-80.77665329
<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	52,156.86760568

<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	144.34	

<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	13,692.23 rev3 (Original Hole)	MWD	MWD - Standard	

<b>Plan Sections</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	<b>TFO (°)</b>	
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	
1,650.00	5.00	36.29	1,649.88	8.79	6.45	2.00	2.00	0.00	36.29	
4,009.30	5.00	36.29	4,000.00	174.53	128.16	0.00	0.00	0.00	0.00	
4,489.41	14.20	36.36	4,453.18	236.28	173.59	2.00	2.00	0.02	0.11	
5,936.92	14.20	36.36	5,875.84	526.21	387.06	0.00	0.00	0.00	0.00	
6,884.20	89.00	150.26	6,490.00	103.89	786.22	10.00	7.90	12.02	113.47	LP Bryan S-08HM r3
13,692.23	89.00	150.26	6,609.00	-5,801.64	4,162.72	0.00	0.00	0.00	0.00	BHL Bryan S-08HM r3

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Planning Report - Geographic



Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Bryan Pad  
 Well: Bryan S-08HM (slot H)  
 Wellbore: Original Hole  
 Design: rev3

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

Well Bryan S-08HM (slot H)  
 GL=1191 @ 1191.00usft  
 GL=1191 @ 1191.00usft  
 Grid  
 Minimum Curvature

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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
0.00	0.00	0.00	0.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
100.00	0.00	0.00	100.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
200.00	0.00	0.00	200.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
300.00	0.00	0.00	300.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
400.00	0.00	0.00	400.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
500.00	0.00	0.00	500.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
600.00	0.00	0.00	600.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
700.00	0.00	0.00	700.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
800.00	0.00	0.00	800.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
900.00	0.00	0.00	900.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,445,160.23	1,703,169.27	39.77576483	-80.77665329
<b>KOP Begin 2°/100' build</b>									
1,500.00	2.00	36.29	1,499.98	1.41	1.03	14,445,161.63	1,703,170.30	39.77576869	-80.77664960
1,600.00	4.00	36.29	1,599.84	5.82	4.13	14,445,165.85	1,703,173.40	39.77578025	-80.77663854
1,650.00	5.00	36.29	1,649.68	8.79	6.45	14,445,169.01	1,703,175.72	39.77578892	-80.77663025
<b>Begin 5.00° tangent</b>									
1,700.00	5.00	36.29	1,699.49	12.30	9.03	14,445,172.53	1,703,178.30	39.77579855	-80.77662104
1,800.00	5.00	36.29	1,799.11	19.32	14.19	14,445,179.55	1,703,183.46	39.77581780	-80.77660262
1,900.00	5.00	36.29	1,898.73	26.35	19.35	14,445,186.58	1,703,188.61	39.77583706	-80.77658419
2,000.00	5.00	36.29	1,998.35	33.37	24.51	14,445,193.60	1,703,193.77	39.77585632	-80.77656577
2,100.00	5.00	36.29	2,097.97	40.40	29.67	14,445,200.63	1,703,198.93	39.77587558	-80.77654735
2,200.00	5.00	36.29	2,197.59	47.42	34.82	14,445,207.65	1,703,204.09	39.77589483	-80.77652893
2,300.00	5.00	36.29	2,297.21	54.45	39.98	14,445,214.68	1,703,209.25	39.77591409	-80.77651050
2,400.00	5.00	36.29	2,396.83	61.47	45.14	14,445,221.70	1,703,214.41	39.77593335	-80.77649208
2,500.00	5.00	36.29	2,496.45	68.50	50.30	14,445,228.73	1,703,219.57	39.77595261	-80.77647366
2,600.00	5.00	36.29	2,596.07	75.52	55.46	14,445,235.75	1,703,224.72	39.77597186	-80.77645524
2,700.00	5.00	36.29	2,695.69	82.55	60.62	14,445,242.78	1,703,229.88	39.77599112	-80.77643681
2,800.00	5.00	36.29	2,795.31	89.57	65.78	14,445,249.80	1,703,235.04	39.77601038	-80.77641839
2,900.00	5.00	36.29	2,894.93	96.60	70.93	14,445,256.83	1,703,240.20	39.77602964	-80.77639997
3,000.00	5.00	36.29	2,994.55	103.62	76.09	14,445,263.85	1,703,245.36	39.77604889	-80.77638155
3,100.00	5.00	36.29	3,094.17	110.65	81.25	14,445,270.88	1,703,250.52	39.77606815	-80.77636313
3,200.00	5.00	36.29	3,193.78	117.67	86.41	14,445,277.90	1,703,255.68	39.77608741	-80.77634470
3,300.00	5.00	36.29	3,293.40	124.70	91.57	14,445,284.93	1,703,260.83	39.77610666	-80.77632628
3,400.00	5.00	36.29	3,393.02	131.72	96.73	14,445,291.95	1,703,265.99	39.77612592	-80.77630786
3,500.00	5.00	36.29	3,492.64	138.75	101.88	14,445,298.98	1,703,271.15	39.77614518	-80.77628944
3,600.00	5.00	36.29	3,592.26	145.77	107.04	14,445,306.00	1,703,276.31	39.77616444	-80.77627101
3,700.00	5.00	36.29	3,691.88	152.80	112.20	14,445,313.03	1,703,281.47	39.77618369	-80.77625259
3,800.00	5.00	36.29	3,791.50	159.82	117.36	14,445,320.05	1,703,286.63	39.77620295	-80.77623417
3,900.00	5.00	36.29	3,891.12	166.85	122.52	14,445,327.08	1,703,291.78	39.77622221	-80.77621575
4,000.00	5.00	36.29	3,990.74	173.88	127.68	14,445,334.10	1,703,296.94	39.77624147	-80.77619732
4,009.30	5.00	36.29	4,000.00	174.53	128.16	14,445,334.75	1,703,297.42	39.77624326	-80.77619561
<b>Begin 2°/100' build/tum</b>									
4,100.00	6.81	36.32	4,090.22	182.05	133.68	14,445,342.28	1,703,302.95	39.77626388	-80.77617587
4,200.00	8.81	36.34	4,189.29	193.00	141.74	14,445,353.23	1,703,311.00	39.77629390	-80.77614711
4,300.00	10.81	36.35	4,287.82	208.73	151.84	14,445,366.96	1,703,321.11	39.77633153	-80.77611103
4,400.00	12.81	36.36	4,385.69	223.22	163.96	14,445,383.45	1,703,333.24	39.77637673	-80.77606769
4,469.41	14.20	36.38	4,453.18	236.28	173.59	14,445,396.50	1,703,342.85	39.77641252	-80.77603337
<b>Begin 14.20° tangent</b>									
4,500.00	14.20	36.36	4,482.84	242.32	178.04	14,445,402.55	1,703,347.30	39.77642909	-80.77601747
4,600.00	14.20	36.36	4,579.78	262.08	192.58	14,445,422.30	1,703,361.85	39.77648324	-80.77596552





4705101979



Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Bryan Pad  
 Well: Bryan S-08HM (slot H)  
 Wellbore: Original Hole  
 Design: rev3

Local Co-ordinate Reference: Well Bryan S-08HM (slot H)  
 TVD Reference: GL=1191 @ 1191.00usft  
 MD Reference: GL=1191 @ 1191.00usft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

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 Office of Oil and Gas  
 JAN 18 2018

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
4,700.00	14.20	36.36	4,676.72	281.83	207.13	14,445,442.06	1,703,376.40	39.77653740	-80.77591357
4,800.00	14.20	36.36	4,773.67	301.59	221.68	14,445,461.82	1,703,390.94	39.77659156	-80.77588162
4,900.00	14.20	36.36	4,870.61	321.35	236.22	14,445,481.57	1,703,405.49	39.77664572	-80.77580967
5,000.00	14.20	36.36	4,967.56	341.10	250.77	14,445,501.33	1,703,420.04	39.77669988	-80.77575772
5,100.00	14.20	36.36	5,064.50	360.86	265.32	14,445,521.09	1,703,434.58	39.77675404	-80.77570577
5,200.00	14.20	36.36	5,161.44	380.62	279.86	14,445,540.84	1,703,449.13	39.77680819	-80.77565382
5,300.00	14.20	36.36	5,258.39	400.38	294.41	14,445,560.60	1,703,463.68	39.77686235	-80.77560187
5,400.00	14.20	36.36	5,355.33	420.13	308.96	14,445,580.36	1,703,478.22	39.77691651	-80.77554992
5,500.00	14.20	36.36	5,452.27	439.89	323.50	14,445,600.12	1,703,492.77	39.77697067	-80.77549797
5,600.00	14.20	36.36	5,549.22	459.65	338.05	14,445,619.87	1,703,507.32	39.77702483	-80.77544602
5,700.00	14.20	36.36	5,646.16	479.40	352.60	14,445,639.63	1,703,521.86	39.77707899	-80.77539407
5,800.00	14.20	36.36	5,743.10	499.16	367.14	14,445,659.39	1,703,536.41	39.77713314	-80.77534212
5,900.00	14.20	36.36	5,840.05	518.92	381.69	14,445,679.14	1,703,550.96	39.77718730	-80.77529017
5,936.92	14.20	36.36	5,875.84	526.21	387.06	14,445,686.44	1,703,556.33	39.77720730	-80.77527099
<b>Begin 10°/100' build/turn</b>									
6,000.00	13.02	62.94	5,937.21	535.68	397.99	14,445,695.91	1,703,567.25	39.77723324	-80.77523201
6,100.00	16.69	100.11	6,034.06	538.29	422.22	14,445,698.52	1,703,591.48	39.77724023	-80.77514576
6,200.00	24.17	119.52	6,127.81	525.65	454.25	14,445,685.88	1,703,623.51	39.77720530	-80.77503186
6,300.00	32.96	129.62	6,215.60	496.15	493.11	14,445,659.36	1,703,662.38	39.77712950	-80.77489378
6,400.00	42.24	135.76	6,294.77	456.62	537.63	14,445,616.84	1,703,706.89	39.77701513	-80.774733571
6,500.00	51.75	140.00	6,362.92	402.32	586.44	14,445,562.55	1,703,755.71	39.77686568	-80.77456246
6,600.00	61.38	143.25	6,417.96	336.90	638.07	14,445,497.13	1,703,807.34	39.77668567	-80.77437929
6,700.00	71.07	145.95	6,458.24	262.36	690.94	14,445,422.59	1,703,860.21	39.77648058	-80.77419177
6,800.00	80.80	148.35	6,482.52	180.95	743.46	14,445,341.18	1,703,912.73	39.77625665	-80.77400559
6,884.20	89.00	150.26	6,490.00	106.89	786.22	14,445,269.12	1,703,955.49	39.77605847	-80.77385403
<b>Begin 89.00° lateral section</b>									
6,900.00	89.00	150.26	6,490.26	95.18	794.06	14,445,255.40	1,703,963.33	39.77602074	-80.77382627
7,000.00	89.00	150.26	6,492.02	8.36	843.86	14,445,168.59	1,704,012.92	39.77578197	-80.77365053
7,100.00	89.00	150.26	6,493.77	-78.46	893.25	14,445,081.77	1,704,062.52	39.77554320	-80.77347479
7,200.00	89.00	150.26	6,495.52	-165.27	942.85	14,444,994.95	1,704,112.11	39.77530444	-80.77329906
7,300.00	89.00	150.26	6,497.27	-252.09	992.44	14,444,908.14	1,704,161.71	39.77506567	-80.77312332
7,400.00	89.00	150.26	6,499.02	-338.91	1,042.04	14,444,821.32	1,704,211.30	39.77482690	-80.77294759
7,500.00	89.00	150.26	6,500.76	-425.73	1,091.63	14,444,734.50	1,704,260.90	39.77458813	-80.77277186
7,600.00	89.00	150.26	6,502.51	-512.54	1,141.23	14,444,647.68	1,704,310.50	39.77434936	-80.77259613
7,700.00	89.00	150.26	6,504.26	-599.36	1,190.83	14,444,560.87	1,704,360.09	39.77411059	-80.77242040
7,800.00	89.00	150.26	6,506.01	-686.18	1,240.42	14,444,474.05	1,704,409.69	39.77387182	-80.77224467
7,900.00	89.00	150.26	6,507.76	-772.99	1,290.02	14,444,387.23	1,704,459.28	39.77363305	-80.77206894
8,000.00	89.00	150.26	6,509.50	-859.81	1,339.61	14,444,300.42	1,704,508.88	39.77339428	-80.77189322
8,100.00	89.00	150.26	6,511.25	-946.63	1,389.21	14,444,213.60	1,704,558.48	39.77315551	-80.77171749
8,200.00	89.00	150.26	6,513.00	-1,033.44	1,438.81	14,444,126.78	1,704,608.07	39.77291674	-80.77154177
8,300.00	89.00	150.26	6,514.75	-1,120.26	1,488.40	14,444,039.96	1,704,657.67	39.77267797	-80.77136605
8,400.00	89.00	150.26	6,516.50	-1,207.08	1,538.00	14,443,953.15	1,704,707.26	39.77243919	-80.77119033
8,500.00	89.00	150.26	6,518.24	-1,293.90	1,587.59	14,443,866.33	1,704,756.86	39.77220042	-80.77101461
8,600.00	89.00	150.26	6,519.99	-1,380.71	1,637.19	14,443,779.51	1,704,806.45	39.77196185	-80.77083889
8,700.00	89.00	150.26	6,521.74	-1,467.53	1,686.78	14,443,692.70	1,704,856.05	39.77172288	-80.77066317
8,800.00	89.00	150.26	6,523.49	-1,554.35	1,736.38	14,443,605.88	1,704,905.65	39.77148410	-80.77048745
8,900.00	89.00	150.26	6,525.24	-1,641.16	1,785.98	14,443,519.06	1,704,955.24	39.77124533	-80.77031174
9,000.00	89.00	150.26	6,526.98	-1,727.98	1,835.57	14,443,432.25	1,705,004.84	39.77100656	-80.77013602
9,100.00	89.00	150.26	6,528.73	-1,814.80	1,885.17	14,443,345.43	1,705,054.43	39.77076778	-80.76995031
9,200.00	89.00	150.26	6,530.48	-1,901.62	1,934.76	14,443,258.61	1,705,104.03	39.77052901	-80.76978460
9,300.00	89.00	150.26	6,532.23	-1,988.43	1,984.36	14,443,171.79	1,705,153.63	39.77029024	-80.76960869
9,400.00	89.00	150.26	6,533.97	-2,075.25	2,033.96	14,443,084.98	1,705,203.22	39.77005146	-80.76943318
9,500.00	89.00	150.26	6,535.72	-2,162.07	2,083.55	14,442,998.16	1,705,252.82	39.76981269	-80.76925747
9,600.00	89.00	150.26	6,537.47	-2,248.88	2,133.15	14,442,911.34	1,705,302.41	39.76957391	-80.76908177



4705101979



Planning Report - Geographic



<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan S-08HM (slot H)
<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-08HM (slot H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,700.00	89.00	150.26	6,539.22	-2,335.70	2,182.74	14,442,824.53	1,705,352.01	39.76933514	-80.76890606	
9,800.00	89.00	150.26	6,540.97	-2,422.52	2,232.34	14,442,737.71	1,705,401.80	39.76909636	-80.76873036	
9,900.00	89.00	150.26	6,542.71	-2,509.33	2,281.93	14,442,650.89	1,705,451.20	39.76885759	-80.76855466	
10,000.00	89.00	150.26	6,544.46	-2,596.15	2,331.53	14,442,564.07	1,705,500.80	39.76861881	-80.76837695	
10,100.00	89.00	150.26	6,546.21	-2,682.97	2,381.13	14,442,477.26	1,705,550.39	39.76838003	-80.76820325	
10,200.00	89.00	150.26	6,547.96	-2,769.79	2,430.72	14,442,390.44	1,705,599.99	39.76814126	-80.76802755	
10,300.00	89.00	150.26	6,549.71	-2,856.60	2,480.32	14,442,303.62	1,705,649.58	39.76790248	-80.76785186	
10,400.00	89.00	150.26	6,551.45	-2,943.42	2,529.91	14,442,216.81	1,705,699.18	39.76766370	-80.76767616	
10,500.00	89.00	150.26	6,553.20	-3,030.24	2,579.51	14,442,129.99	1,705,748.78	39.76742492	-80.76750046	
10,600.00	89.00	150.26	6,554.95	-3,117.05	2,629.11	14,442,043.17	1,705,798.37	39.76718615	-80.76732477	
10,700.00	89.00	150.26	6,556.70	-3,203.87	2,678.70	14,441,956.36	1,705,847.97	39.76694737	-80.76714908	
10,800.00	89.00	150.26	6,558.45	-3,290.69	2,728.30	14,441,869.54	1,705,897.56	39.76670859	-80.76697339	
10,900.00	89.00	150.26	6,560.19	-3,377.50	2,777.89	14,441,782.72	1,705,947.16	39.76646981	-80.76679769	
11,000.00	89.00	150.26	6,561.94	-3,464.32	2,827.49	14,441,695.90	1,705,996.75	39.76623103	-80.76662200	
11,100.00	89.00	150.26	6,563.69	-3,551.14	2,877.08	14,441,609.09	1,706,046.35	39.76599225	-80.76644632	
11,200.00	89.00	150.26	6,565.44	-3,637.96	2,926.68	14,441,522.27	1,706,095.95	39.76575348	-80.76627063	
11,300.00	89.00	150.26	6,567.19	-3,724.77	2,976.28	14,441,435.45	1,706,145.54	39.76551470	-80.76609494	
11,400.00	89.00	150.26	6,568.93	-3,811.59	3,025.87	14,441,348.64	1,706,195.14	39.76527592	-80.76591926	
11,500.00	89.00	150.26	6,570.68	-3,898.41	3,075.47	14,441,261.82	1,706,244.73	39.76503714	-80.76574358	
11,600.00	89.00	150.26	6,572.43	-3,985.22	3,125.06	14,441,175.00	1,706,294.33	39.76479836	-80.76556789	
11,700.00	89.00	150.26	6,574.18	-4,072.04	3,174.66	14,441,088.19	1,706,343.93	39.76455957	-80.76539221	
11,800.00	89.00	150.26	6,575.93	-4,158.86	3,224.26	14,441,001.37	1,706,393.52	39.76432079	-80.76521653	
11,900.00	89.00	150.26	6,577.67	-4,245.68	3,273.85	14,440,914.55	1,706,443.12	39.76408201	-80.76504085	
12,000.00	89.00	150.26	6,579.42	-4,332.49	3,323.45	14,440,827.73	1,706,492.71	39.76384323	-80.76486518	
12,100.00	89.00	150.26	6,581.17	-4,419.31	3,373.04	14,440,740.92	1,706,542.31	39.76360445	-80.76468950	
12,200.00	89.00	150.26	6,582.92	-4,506.13	3,422.64	14,440,654.10	1,706,591.90	39.76336567	-80.76451383	
12,300.00	89.00	150.26	6,584.66	-4,592.94	3,472.23	14,440,567.28	1,706,641.50	39.76312688	-80.76433815	
12,400.00	89.00	150.26	6,586.41	-4,679.76	3,521.83	14,440,480.47	1,706,691.10	39.76288810	-80.76416248	
12,500.00	89.00	150.26	6,588.16	-4,766.58	3,571.43	14,440,393.65	1,706,740.69	39.76264932	-80.76398681	
12,600.00	89.00	150.26	6,589.91	-4,853.39	3,621.02	14,440,306.83	1,706,790.29	39.76241054	-80.76381114	
12,700.00	89.00	150.26	6,591.66	-4,940.21	3,670.62	14,440,220.01	1,706,839.88	39.76217175	-80.76363547	
12,800.00	89.00	150.26	6,593.40	-5,027.03	3,720.21	14,440,133.20	1,706,889.48	39.76193297	-80.76345980	
12,900.00	89.00	150.26	6,595.15	-5,113.85	3,769.81	14,440,046.38	1,706,939.08	39.76169418	-80.76328413	
13,000.00	89.00	150.26	6,596.90	-5,200.66	3,819.41	14,439,959.56	1,706,988.67	39.76145540	-80.76310847	
13,100.00	89.00	150.26	6,598.65	-5,287.48	3,869.00	14,439,872.75	1,707,038.27	39.76121662	-80.76293281	
13,200.00	89.00	150.26	6,600.40	-5,374.30	3,918.60	14,439,785.93	1,707,087.86	39.76097783	-80.76275714	
13,300.00	89.00	150.26	6,602.14	-5,461.11	3,968.19	14,439,699.11	1,707,137.46	39.76073905	-80.76258148	
13,400.00	89.00	150.26	6,603.89	-5,547.93	4,017.79	14,439,612.30	1,707,187.05	39.76050026	-80.76240582	
13,500.00	89.00	150.26	6,605.64	-5,634.75	4,067.38	14,439,525.48	1,707,236.65	39.76026148	-80.76223016	
13,600.00	89.00	150.26	6,607.39	-5,721.57	4,116.98	14,439,438.66	1,707,286.25	39.76002269	-80.76205450	
13,692.23	89.00	150.26	6,609.00	-5,801.64	4,162.72	14,439,358.59	1,707,331.99	39.75980246	-80.76189249	

PBHL/TD 13692.23 MD/6609.00 TVD

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<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan S-08HM (slot H)
<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-08HM (slot H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
LP Bryan S-08HM r3 - plan hits target center - Point	0.00	0.00	6,490.00	108.89	786.22	14,445,269.12	1,703,955.49	39.77605846	-80.77385403
BHL Bryan S-08HM r3 - plan hits target center - Point	0.00	0.01	6,609.00	-5,801.64	4,162.72	14,439,358.59	1,707,331.99	39.75980245	-80.76189249

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)		
1,400.00	1,400.00	0.00	0.00		KOP Begin 2°/100' build
1,650.00	1,649.68	8.79	6.45		Begin 5.00° tangent
4,009.30	4,000.00	174.53	128.18		Begin 2°/100' build/turn
4,469.41	4,453.18	236.28	173.59		Begin 14.20° tangent
5,936.92	5,875.84	526.21	387.08		Begin 10°/100' build/turn
6,884.20	6,490.00	108.89	786.22		Begin 89.00° lateral section
13,692.23	6,609.00	-5,801.64	4,162.72		PBHL/TD 13692.23 MD/8609.00 TVD

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## Area of Review

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

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

#### Data Sources Reviewed:

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

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

#### Request maps for:

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

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

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



Permit well - Bryan S-8HM

Wells within 500' Buffer

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

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Comments
4705101340	Tug Hill Operating (formerly operated by Chevron and AB Resources)	6450' TVD 10601' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore  Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.

**Well: County = 51 Permit = 01340**

**Location Information:**

API: COUNTY PERMIT TAX\_DISTRICT QUAD\_16 QUAD\_16 LAT\_DD LON\_DD UTMN UTMN  
 4705101340 51 01340 1217 Any Building Unimproved Marcellus Sh Marcellus Sh Development Well Development Well Oil and Gas Policy Practices 8455 10524 10501 0 4277 0 205

**Bottom Hole Location Information:**

API: EP FLGID DTME UTMN LON\_DD LAT\_DD  
 4705101340 1 JA Proposed 01401 4 4040022.9 4075008.39 758711

**Owner Information:**

API	COMP_ID	SURFID	STATUS	SURFACE_OWNER	WELL_NUM	CD_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_V6	PROP_TYD	FM	UTM_N	UTM_E
4705101340	4112010	Dist Crpt Lnd	Completed	Chk Land Resources Inc	56		Shaw		Honest & Bracco Swan +S Resources PA		6100	Marcellus Sh			

**Completion Information:**

API	COMP_ID	SPD	DT	ELEV DATUM	FIELD	DEEPEST FM	DEEPEST FMT	INITIAL CLASS	FINAL CLASS	TYPE	RIG	CMP_MIND	TVD	THD	NEP_FIG	Q_BSC	Q_APT	Q_BFP	Q_AFT	NGL_BSP	NGL_AFT	P_BSP
4705101340	4112010	Water	4112010	Water	Dist Crpt Lnd	1420	1420	Marcellus System	1718	Marcellus												

**Pay/Show/Water Information:**

API	COMP_ID	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOT	FM_BOT	Q_BSP	Q_APT	Q_BFP	Q_AFT	WATER_QNTY
4705101340	4112010	Water	Dist Crpt Lnd	Water	1420	1420	1420	1420					
4705101340	4112010	Pay	Oil & Gas	Develd	5520	Marcellus Sh	10555	Marcellus Sh					

**Production Gas Information: (Volumes in Mcf)**

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	AB Resources PA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2011	228,458	0	0	0	0	0	24,697	87,850	73,182	62,332	61,100	0	0
4705101340	Chevron Appalachia, LLC	2012	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2013	260,872	81,211	0	0	0	0	7,937	49,832	66,262	18,180	47,823	41,082	52,327
4705101340	Chevron Appalachia, LLC	2014	27,748	42,815	42,324	20	0	1,768	224	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2015	444,817	0	0	2,822	22,428	13,887	88,768	59,884	87,818	67,840	65,214	64,444	63,170
4705101340	Chevron Appalachia, LLC	2016	481,014	43,818	41,874	45,426	43,000	43,782	42,102	43,485	41,602	11,182	41,412	42,850	34,371

**Production Oil Information: (Volumes in Bbl) \*\* some operators may have reported NGL under Oil**

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_OIL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	AB Resources PA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2011	33,974	0	0	0	0	0	4,103	8,189	8,130	6,153	5,433	0	0
4705101340	Chevron Appalachia, LLC	2012	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2013	18,900	797	0	0	0	0	592	3,829	3,322	1,183	2,749	2,093	2,622
4705101340	Chevron Appalachia, LLC	2014	6,325	2,391	1,962	1,176	0	0	184	40	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2015	17,718	0	0	240	2,042	1,938	3,276	2,267	2,102	1,729	1,490	1,182	954
4705101340	Chevron Appalachia, LLC	2016	6,119	1,027	780	321	642	609	319	450	600	188	342	450	347

**Production NGL Information: (Volumes in Bbl) \*\* some operators may have reported NGL under Oil**

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_NGL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	Chevron Appalachia, LLC	2010	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2011	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2012	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2013	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2015	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2016	0	0	0	0	0	0	0	0	0	0	0	0	0

**Production Water Information: (Volumes in Gallons)**

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_WTR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	Chevron Appalachia, LLC	2016	0												

**Stratigraphy Information:**

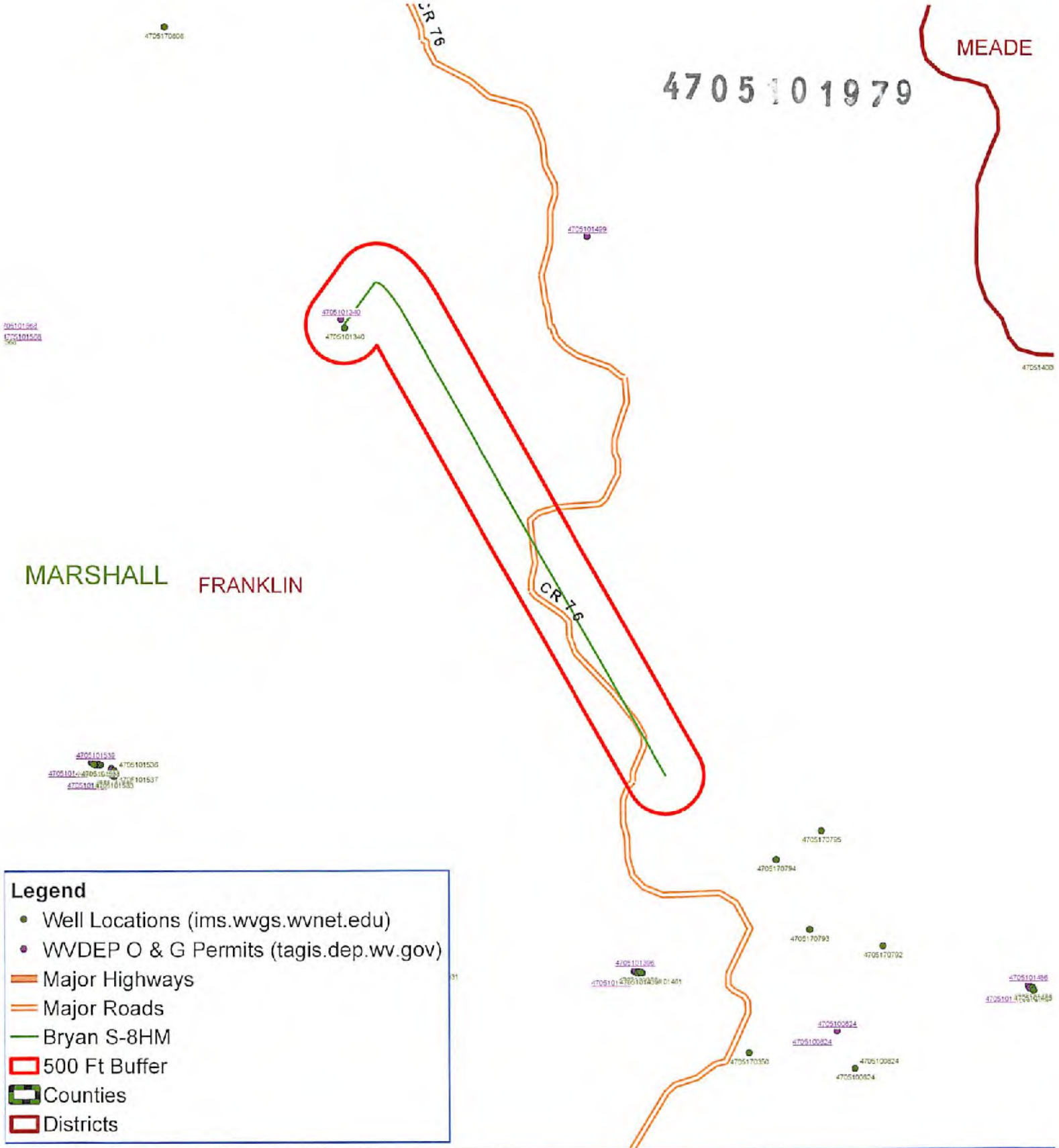
API	SURFID	FM	FM_QUALITY	DEPTH_TOP	DEPTH_BOT	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705101340	Dist Crpt Lnd	Burrell	Well Record	5138	Reservoir	65	Reservoir	1217
4705101340	Dist Crpt Lnd	Tully Ls	Well Record	5378	Reservoir	37	Reservoir	1217
4705101340	Dist Crpt Lnd	Harrison	Well Record	5434	Reservoir	46	Reservoir	1217
4705101340	Dist Crpt Lnd	Marcellus Sh	Well Record	6480	Reservoir	47	Reservoir	1217
4705101340	Dist Crpt Lnd	Cherryvale Sh	Well Record	6514	Reservoir	31	Reservoir	1217

**Wirelogs (E-Log) Information:**

API	LOG_TOP	LOG_BOT	DEEPEST FNL	LOGS_AVAIL	SCAN	DC72ED	DR_TOP	GR_BOT	E_BOT	N_TOP	R_BOT	L_TOP	L_BOT	T_TOP	T_BOT	D_SCP	D_BOT	INCH	INCH	REDUCED	KOP	LOGGED	ELEV_M
4705101340	60	6004	6004	Y	N		85	5555	2545	5022	2450	6092				2642	8994	N	Y	N		1081	

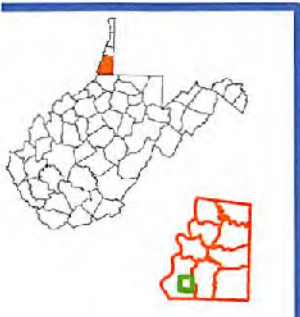
Comment: logs: caliper, tension, PE, LWL, G with measured and vertical depth included

Page 2 of 3

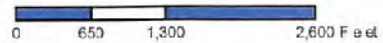


**Legend**

- Well Locations (ims.wvgs.wvnet.edu)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Bryan S-8HM
- 500 Ft Buffer
- Counties
- Districts



# Bryan S-8HM Franklin District Marshall County, WV





WW-9  
(4/16)

4705 01979

API Number 47 - 051 - \_\_\_\_\_  
Operator's Well No. Bryan S-BHM

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 slaging fresh water for frac and flow back water

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC# 1385426)

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 \_\_\_\_\_

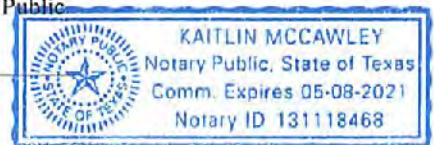
Company Official (Typed Name) Sean Gasser

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



4705101979

Form WW-9

Operator's Well No. Bryan S-8HM

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 Trish*

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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

Field Reviewed?  Yes  No

WW-9

**PROPOSED BRYAN  
S-8HM**

SUPPLEMENT PG 1

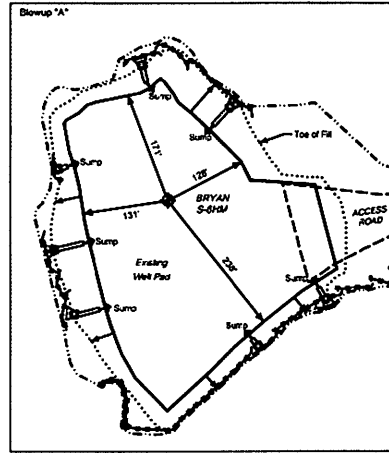
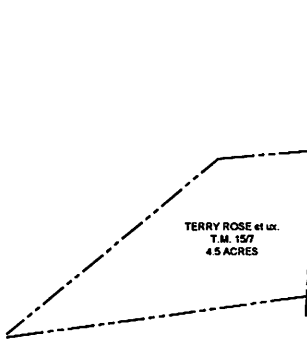
REFERENCE IS HEREBY MADE TO THE  
WV D.E.P. OFFICE OF OIL & GAS,  
"EROSION AND SEDIMENT CONTROL  
FIELD MANUAL" FOR REQUIREMENTS  
AND BMPs FOR AVERAGE FIELD  
CONDITIONS CONCERNING THE  
MAINTENANCE OF EXISTING ROADS  
AND THE CONSTRUCTION OF  
PROPOSED ROADS. FIELD CONDITIONS  
MAY REQUIRE VARIANCE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

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

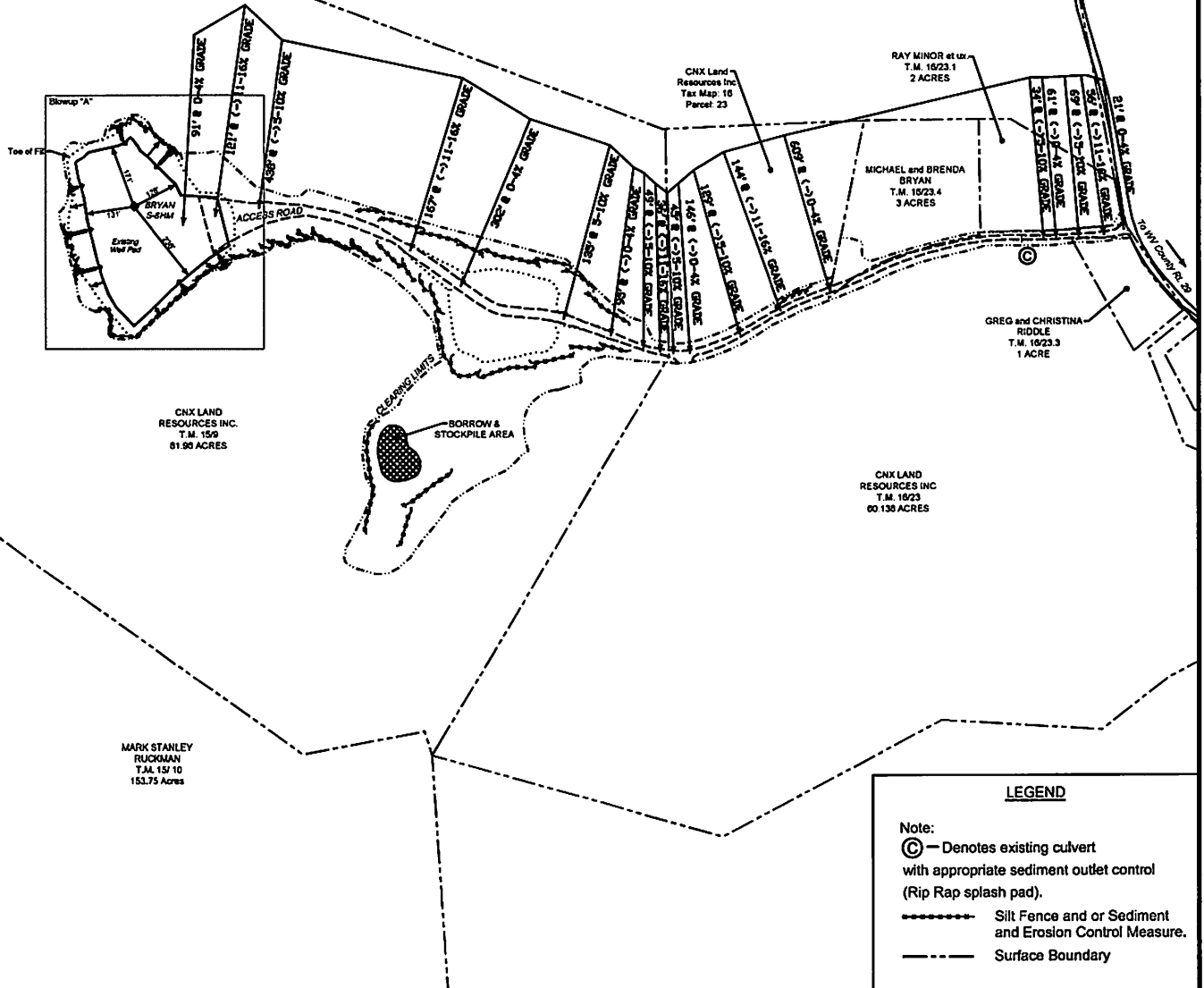
ENTRANCES ONTO PUBLIC ROADS  
SHALL BE CONSTRUCTED OR  
MAINTAINED IN ACCORDANCE WITH WV  
D.O.T. REGULATIONS. ADDITIONAL  
PERMITS MAY BE REQUIRED.  
TEMPORARILY SEED AND MULCH  
ALL SLOPES UPON  
CONSTRUCTION OF LOCATION.

ALL CUT AND FILL SLOPES ARE  
3:1 - 4:1 SLOPE

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



DRAWING NOT  
TO SCALE





4705101979



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

*Ju*  
*1/18/18*

Well Name: Bryan S-8HM

Pad Location: Bryan Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,402,893.64

Easting: 519,127.03

January 2018  
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JAN 18 2018

WV Department of  
Environmental Protection



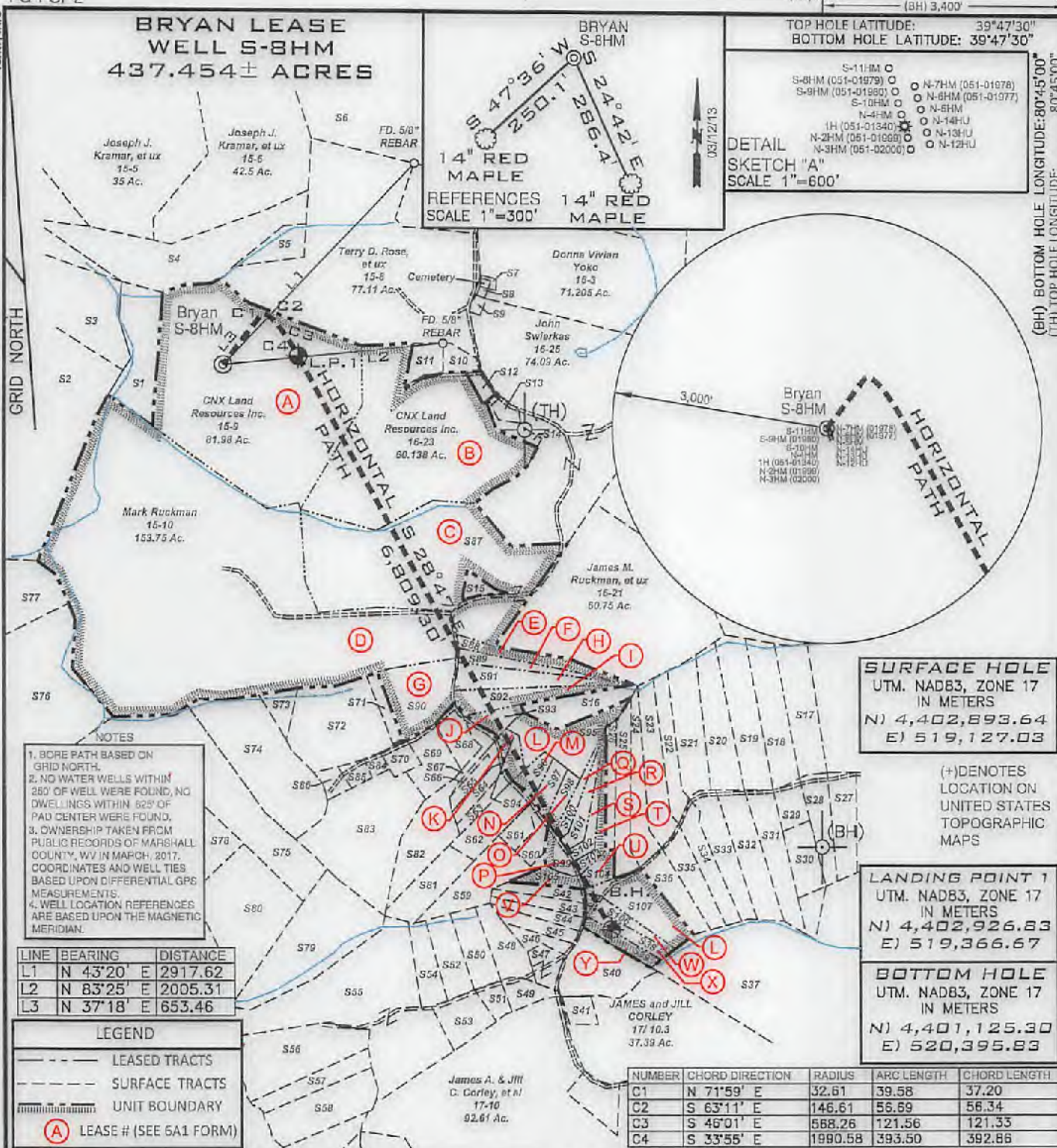
**BRYAN LEASE  
WELL S-8HM  
437.454 ± ACRES**

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

S-11-HM ○  
S-8HM (051-01979) ○  
S-9HM (051-01980) ○  
S-10HM ○  
N-4HM ○  
1H (051-01840) ○  
N-2HM (051-01868) ○  
N-3HM (051-02000) ○  
N-7HM (051-01978) ○  
N-6HM (051-01977) ○  
N-8HM ○  
N-14HJ ○  
N-13HJ ○  
N-12HJ ○

DETAIL SKETCH "A"  
SCALE 1"=600'

14" RED MAPLE  
REFERENCES 14" RED MAPLE  
SCALE 1"=300'



**NOTES**  
1. BORE PATH BASED ON GRID NORTH.  
2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 500' OF PAD CENTER WERE FOUND.  
3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2017. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.  
4. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

LINE	BEARING	DISTANCE
L1	N 43°20' E	2917.62
L2	N 83°25' E	2005.31
L3	N 37°18' E	653.46

**LEGEND**

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

**SURFACE HOLE**  
UTM. NAD83, ZONE 17  
IN METERS  
N) 4,402,893.64  
E) 519,127.03

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

**LANDING POINT 1**  
UTM. NAD83, ZONE 17  
IN METERS  
N) 4,402,926.83  
E) 519,366.67

**BOTTOM HOLE**  
UTM. NAD83, ZONE 17  
IN METERS  
N) 4,401,125.30  
E) 520,395.83

NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH
C1	N 71°59' E	32.61	39.58	37.20
C2	S 63°11' E	146.61	55.89	56.34
C3	S 46°01' E	588.26	121.56	121.33
C4	S 33°55' E	1990.58	393.50	392.86

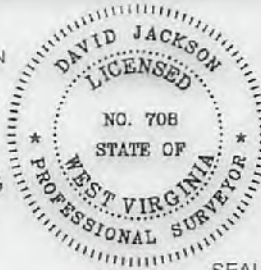
FILE NUMBER \_\_\_\_\_  
DRAWING NUMBER BRYAN\_WP\_S-8HM  
SCALE 1" = 1500'  
MINIMUM DEGREE OF ACCURACY 1/200  
PROVEN SOURCE OF ELEVATION SUBMETER MAPPING GRADE GPS

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

*David L Jackson*



JACKSON SURVEYING INC.  
P.O. Box 1460  
Clarksburg, WV 26302  
304-623-5851



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

DATE: DECEMBER 27, 2017  
REVISED: JANUARY 09, 2018  
OPERATORS WELL NO. BRYAN S-8HM  
API WELL NO. 47-051-01979  
STATE COUNTY PERMIT

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: 13,692'  
PLUG & ABANDON \_\_\_ CLEAN OUT & REPLUG \_\_\_

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

COUNTY NAME  
PERMIT



form wv6  
GRID NORTH

**BRYAN LEASE  
WELL S-8HM  
437.454± ACRES**

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES	Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S1	15-13	CNX Land Resources Inc.	11.0	S55	18-13	Southern Country Farms Inc.	24.724
S2	15-12	John David Petrock Et Ux	150.23	S56	18-59	Southern Country Farms Inc.	15.79
S3	15-14	John David Petrock Et Ux	25.0	S57	18-30	Jon Schmidt Et Al	5.46
S4	15-6.1	Josaph J. Kramer Et Ux	39.40	S58	18-13.10	Carl Berg	10.88
S5	15-7	Terry D. Rose Et Ux	4.5	S59	18-13.1	Betty Tagg Est.	9.248
S6	10-15	Paul Andrew & Debra A. Rine	120.805	S60	18-41	Cory A. Holt	2.308
S7	16-3.1	Dennis Jackson Et Ux	0.27	S61	18-40	Cory A. Holt	2.237
S8	16-2	Fredonia Christian Church	0.19	S62	18-14	Michael S. Fincham & Kezia M. Winters	6.386
S9	16-1	Fredonia Christian Church	0.50	S63	18-45	Michael S. Fincham & Kezia M. Winters	2.07
S10	16-23.1	Ray E. Minor Et Ux	2.0	S64	18-46	Dale W. & Patricia Gardner	2.030
S11	16-23.4	Michael R. & Brenda K. Bryan	3.0	S65	18-47	Robert Pelley II & Susan Briggs	2.010
S12	16-23.3	Greg & Christina Riddle	1.0	S66	18-13.5	Wesley Bryan	1.023
S13	16-24	Alan M. Beyser Et Ux	1.083	S67	18-36	Ruth Mulligan Est.	2.030
S14	16-23.2	Alan M. Beyser Et Ux	1.726	S68	18-15.2	Edward Burge	4.171
S15	16-22.1	Heather A. Burgy	1.465	S69	18-15.1	Jason Blair	5.948
S16	18-13.2	Steven Berisford	6.023	S70	18-12	William Wayne Et Ux	2.27
S17	16-15.1	Glen A. Gunto	10.17	S71	18-11.2	Edward Lee Burge Jr.	2.0
S18	17-15	Glen A. Gunto	10.22	S72	18-11.1	Edward Lee Burge Jr.	18.0
S19	18-13	Southern Country Farms Inc.	11.415	S73	18-15	Edward Lee Burge Jr.	2.495
S20	18-13.9	Roy & Renee Butler	9.603	S74	18-15.4	Edward Lee Burge Jr.	22.34
S21	18-13.4	Renee D. Streight	9.938	S75	18-15.3	Charles Yeater	26.44
S22	18-13.12	Charles A. & Mary Nice	5.969	S76	18-4	Olan & Patricia Rutan	65.89
S23	18-13	Southern Country Farms Inc.	8.037	S77	15-11	Diana Henry Hayes & Carol Henry	65.59
S24	18-60	Christopher M. Pravitara	6.297	S78	18-6	Charles Yeater	26.0
S25	18-53.1	Christopher M. Pravitara	6.283	S79	18-16	Charles Yeater	17.768
S26	18-13.11	Linda L. Moore	3.156	S80	18-7	Charles Yeater	24.22
S27	17-1.6	Lola M. Slaughter	6.347	S81	18-17	Michael S. Fincham & Kezia M. Winters	6.555
S28	17-1.5	Donnie R. & Lola M. Slaughter	5.607	S82	18-13.3	Robert Closterman	9.813
S29	17-1.2	Donnie R. & Lola M. Slaughter	5.073	S83	18-15.5	Darrell & Teresa Boley	23.547
S30	17-1.3	Jody & Michelle Anderson	5.0	S84	18-10	David & Nancy Anderson	0.907
S31	17-1.1	Donnie R. & Lola M. Slaughter	8.078	S85	18-10.2	David Anderson Et Ux	1.377
S32	17-1.4	Donnie R. & Lola M. Slaughter	8.844	S86	18-10.1	David Anderson Et Ux	1.65
S33	17-14	Southern Country Farms Inc.	7.314	S87	18-22	James M. Ruckmen et ux	54.605
S34	17-13	Roy E. & Renee Butler	5.433	S88	18-56	William O' Hara	3.965
S35	17-1.7	Roy E. & Renee Butler	5.22	S89	18-55	William O' Hara	3.202
S36	17-1	Southern Country Farms Inc.	5.030	S90	18-11	Benjamin Robinson	12.883
S37	17-2	Phyllis Flouhouse Trust & Belle Yoho	104.08	S91	18-28	Dotson Harrison	6.36
S38	18-35	Mary Anderson	2.635	S92	18-28.1	Carol Helmick	5.686
S39	18-42	Roger Howard Hall Jr.	2.383	S93	18-50	Steven Berisford	2.170
S40	18-19	Roger White Jr.	10.0	S94	18-49	Tanner Butler	2.023
S41	17-10.4	Ron Murrin Et Al	2.01	S95	18-13	Southern Country Farms, Inc.	11.054
S42	18-43	Roy Butler	2.532	S96	18-37	John W. Watzel	2.064
S43	18-51	Roger Hall	2.505	S97	18-38	Marlon R. Conner	2.231
S44	18-52	Roger Hall	2.536	S98	18-39	Marlon R. Conner	2.001
S45	18-61	Roger White Jr.	2.984	S99	18-25	Charles & Marla Rayl	2.133
S46	18-57	Marvin D. Roberts	2.228	S100	18-27.1	Marlon R. Conner	2.003
S47	18-18	Linda Coon	3.0	S101	18-27.2	Linda L. Moore	3.009
S48	18-13.7	Victor W. Woods Jr. & Jessica L. Woods	5.255	S102	18-27	Linda L. Moore	2.447
S49	18-48	Marvin Dean Roberts Et Al	2.920	S103	18-26	Linda L. Moore	2.624
S50	18-13.6	Glenn Eugene Whisler Et Ux	5.384	S104	18-53	Christopher M. Pravitara	2.00
S51	18-13.14	Glenn & Sandra Whisler	2.116	S105	18-44	Renee Streight	2.532
S52	18-13.13	Glenn E. & Sandra K. Whisler	5.59	S106	18-58	Kevin W. Roberts	2.435
S53	18-33	Glenn & Sandra Whisler	5.343	S107	18-13	Southern Country Farms, Inc.	8.743
S54	18-34	Jodi A. & Cary A. Hall	5.002				



P.S. 708 *David L Jackson*



**TUG HILL  
OPERATING**

OPERATOR'S  
WELL #: Bryan S-8HM  
DISTRICT: Franklin  
COUNTY: Marshall  
STATE: WV

WELL PLAT  
PAGE 2 OF 2  
DATE: 10/03/2017  
REVISED: 01/09/2018



**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
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\*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: Permitting Specialist

4705101979

RECEIVED  
 Chief of Oil and Gas  
 JAN 18 2018  
 WY Dept of Environmental Protection

Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19295	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*19294	B	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	C	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*19339	D	5-15-10	MARK STANLEY RUCKMAN	TRIENERGY INC	1/8+	741	75	N/A	20/252 TriEnergy Inc to AB Resources LLC	666/40 AB Resources LLC to Chief Exploration & Development LLC	21/520 Chief Exploration & Development, LLC and Radler 2000 Limited Partnership to Enerplus Resources USA Corporation	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	E	5-18-56	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14099	F	5-18-55	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*19218	G	5-18-11	ROBINSON BENJAMIN	TRIENERGY HOLDINGS, LLC	1/8+	727	211	N/A	N/A	N/A	N/A	N/A	25/463 Tri Energy Holdings, LLC to NPAR, LLC	26/269 NPAR, LLC to Chevron USA, Inc.	40/127 Chevron U.S.A. Inc. to TH Exploration, LLC
10*47051.10	H	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	I	5-18-28.1	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14099	J	5-18-50	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14099	K	5-18-49	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar 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	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14099	M	5-18-37	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14099	N	5-18-38	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14099	O	5-18-39	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC

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

Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment		
10*17618	P	5-18-25	CHARLES H RAYL AND MARIA A RAYL	TH EXPLORATION LLC	1/8+	942	329	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
10*17643	Q	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		
10*17639	R	5-18-27.2	LINDA L MOORE	TH EXPLORATION LLC	1/8+	940	443	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
10*17639	S	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		
10*17639	T	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		
10*14099	U	5-18-53	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC	
10*14099	V	5-18-44	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC	
10*14099	W	5-18-58	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC	
10*14099	X	5-18-35	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA, INC.	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC	
10*17826	X	5-18-35	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	X	5-18-35	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	X	5-18-35	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	X	5-18-35	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	X	5-18-35	CHESTNUT HOLDINGS, INC.	GASTAR EXPLORATION INC	1/8+	827	552	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC
10*17826	Y	5-18-42	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	N/A
10*17812	Y	5-18-42	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	N/A
10*21465	Y	5-18-42	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	N/A
10*21462	Y	5-18-42	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	N/A
10*14915	Y	5-18-42	CHESTNUT HOLDINGS, INC.	GASTAR EXPLORATION INC	1/8+	827	552	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC

AFFIDAVIT

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STATE OF TEXAS §  
§ SS  
COUNTY OF TARRANT §

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

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

FURTHER, AFFIANT SAITH NOT.

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

David D. Kalish  
Affiant: David D. Kalish

JURAT

Carol S Haight  
WETZEL County 10:29:27 AM  
Instrument No 212095  
Date Recorded 10/20/2016  
Document Type AF07  
Pages Recorded 1  
Book-Page 119-291  
Recording Fee \$5.00  
Additional \$6.00

STATE OF TEXAS §  
§ SS  
COUNTY OF TARRANT §

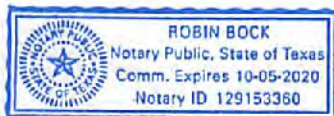
Sworn and subscribed to (or affirmed) before me on this, the 18<sup>th</sup> day of October, 2016, by David D. Kalish.

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

My Commission Expires: 10-05-2020

Signature/Notary Public: Robin Bock

Name/Notary Public (Print): Robin Bock





**COPY**

4705101979

Marshall County  
Jan Pest, Clerk  
Instrument 1427814  
08/03/2017 @ 03:36:24 PM  
ASSIGNMENTS  
Book 40 @ Page 57  
Pages Recorded 38  
Recording Cost \$ 47.01

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 IH 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.

STATE OF WEST VIRGINIA §  
  §  
COUNTY OF MARSHALL §

Marshall County  
Jan Pest, Clerk  
Instrument 1428356  
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 1 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

**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 LEHON  
6000 TOWN CENTER BOUL SITE 145  
CANDLERBURG PA 15317-5870





TUG HILL

4705101979

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-8HM

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-8HM well plat.

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

Sincerely,

Amy L. Miller  
Permitting Specialist – Appalachia Region



4705101979

**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-8HM

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>519,127.03</u>
County: <u>Marshall</u>		Northing: <u>4,402,893.64</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.

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p><b>OOG OFFICE USE ONLY</b></p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p>
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**Required Attachments:**

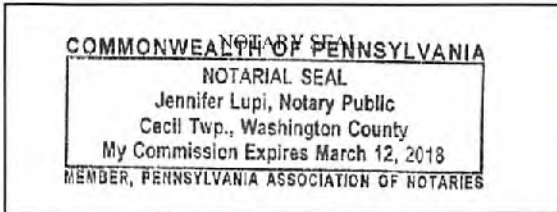
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

**Certification of Notice is hereby given:**

THEREFORE, I 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:** 10/5/2017    **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. (Pad)  
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

WW-6A  
(8-13)

4705101979  
API NO. 47- -  
OPERATOR WELL NO. Bryan S-9HM  
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.**



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

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

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

**Comment Requirements**

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

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

**Permit Denial or Condition**

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

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

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

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

WW-6A  
(8-13)

API NO. 4705101979  
OPERATOR WELL NO. Bryan S-9HM  
Well Pad Name: Bryan

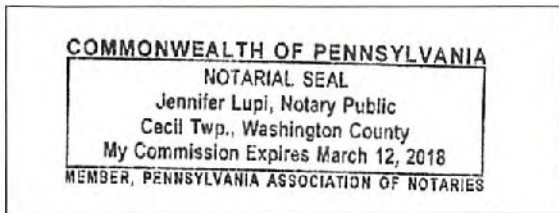
**Notice is hereby given by:**

Well Operator: Tug Hill Operating, LLC  
Telephone: 724-749-8388  
Email: amiller@tug-hilltop.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 14th day of Oct, 2017.  
Jennifer Lupi Notary Public  
My Commission Expires March 12, 2018

WW-6A

Supplement Pg. 1A

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

**WATER WELL REPORT**

Well: BRYAN No. S-8HM  
 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	

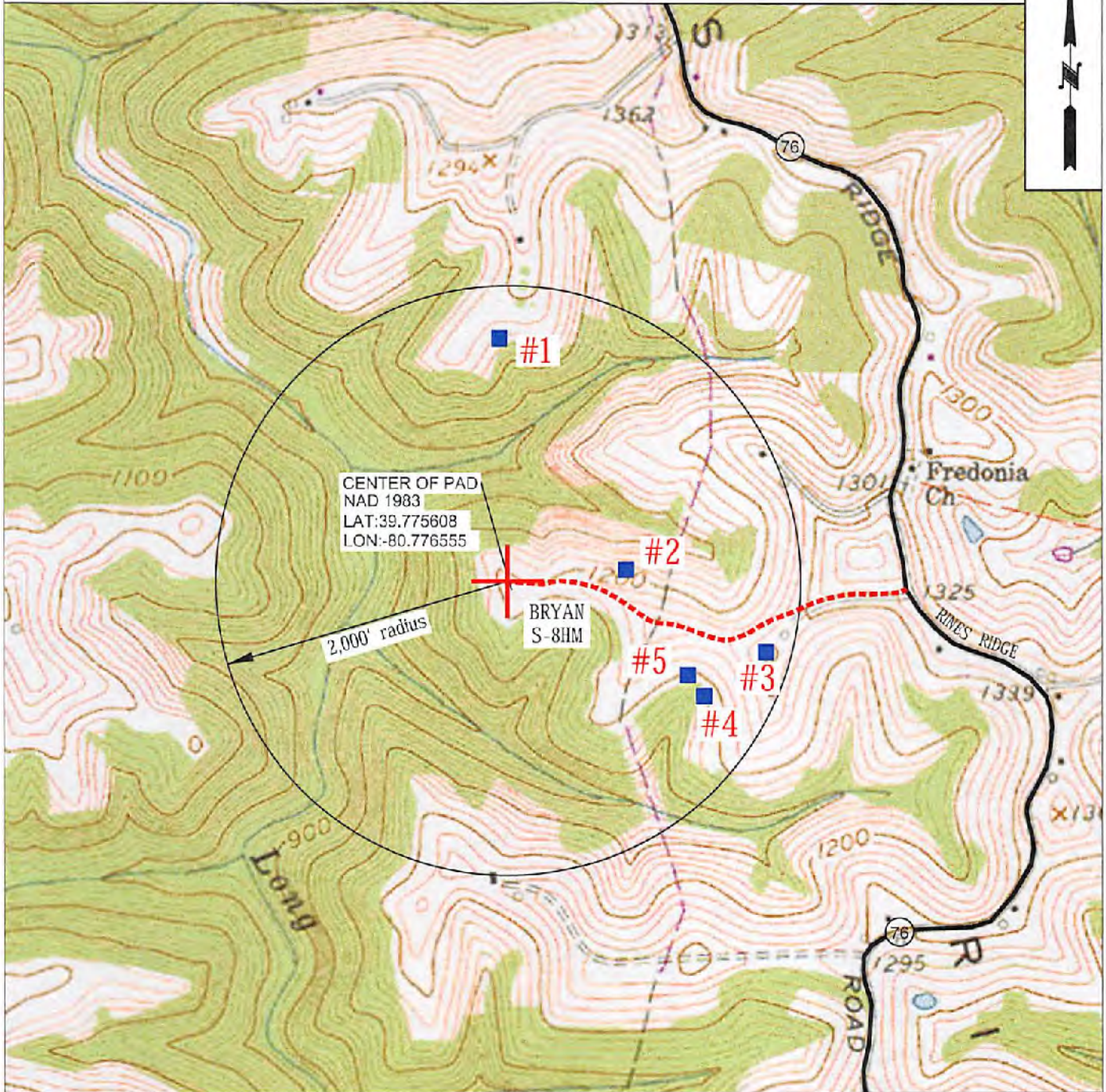


WW-6A

# PROPOSED BRYAN S-8HM

SUPPLEMENT PG 1

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



CENTER OF PAD  
NAD 1983  
LAT:39.775608  
LON:-80.776555

#1

#2

#5

#3

#4

2,000' radius

BRYAN  
S-8HM



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

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

**LEASE NAME**  
BRYAN  
**DATE:**  
DATE: 10/03/17



WW-6A3  
(1/12)

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

Approx. Latitude & Longitude: 39.7756312; -80.7768011  
Public Road Access: Rines Ridge Road (County Route 76)  
Watershed: (HUC-10) Fish Creek  
Generally used farm name: Michael and Brenda Bryan

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: Tug Hill Operating, LLC  
Telephone: 724-749-8388  
Email: amiller@tug-hill-op.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).

4705101979

Operator Well No. Bryan S-8HM

**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



**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:

<b>State:</b>	West Virginia	<b>UTM NAD 83</b>	<b>Easting:</b>	519,127.03
<b>County:</b>	Marshall		<b>Northing:</b>	4,402,893.64
<b>District:</b>	Franklin	<b>Public Road Access:</b>	Rines Ridge Road	
<b>Quadrangle:</b>	Powhatan Point 7.5'	<b>Generally used farm name:</b>	CNX Land Resources, Inc.	
<b>Watershed:</b>	Fish Creek (HUC-10)			

**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:** 724-749-8386

**Email:** amiller@tug-hill-op.com

**Address:** 330 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).



4705101979

Operator Well No. Bryan N-8HM

**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

Handwritten blue checkmark and scribble.



4705101979

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-8HM Well site

47-051-01979

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



**PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION**

**Well No. Bryan S-8HM**

<b>PRODUCT NAME:</b>	<b>CHEMICAL DESCRIPTION:</b>	<b>PRODUCT USE:</b>	<b>HAZARDOUS COMPONENT:</b>
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

# 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: 304-843-1920  
Franklin District, Marshall County, WV  
Watershed: Lower Fish Creek Watershed  
Tug Hill Contact Number: 1-817-637-3400

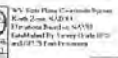


**WVDEP OOG  
ACCEPTED AS-BUILT**  
WVA 10/31/2017

Property Owner Information - Bryan Well Pad Site

Item	Value	Unit	Item	Value	Unit
Acres	101.211	Sq Ft	101.211	43,613,311	Sq Ft
Top Matter Area	14,211	Sq Ft	14,211	636,893	Sq Ft
Top Matter Area (Acres)	0.324	Acres	0.324	0.324	Acres
Wooded Area	7,824	Sq Ft	7,824	340,980	Sq Ft
Wooded Area (Acres)	0.179	Acres	0.179	0.179	Acres
Open Field Area	6,387	Sq Ft	6,387	279,218	Sq Ft
Open Field Area (Acres)	0.146	Acres	0.146	0.146	Acres

## Exhibit A: Final Design: Issue for Permitting



Access Road

Location	Length	Width	Surface	Notes
Access Road	100.00	12.00	Gravel	
Access Road	100.00	12.00	Gravel	
Access Road	100.00	12.00	Gravel	
Access Road	100.00	12.00	Gravel	
Access Road	100.00	12.00	Gravel	

Distributed Area

Item	Value	Unit
Gravel	10,000	Sq Yd
Gravel	10,000	Sq Yd
Gravel	10,000	Sq Yd
Gravel	10,000	Sq Yd

Additional Information

Item	Value	Unit
Gravel	10,000	Sq Yd
Gravel	10,000	Sq Yd

Property Line

Point	Easting	Northing	Point	Easting	Northing
1	1000000.00	1000000.00	2	1000000.00	1000000.00
2	1000000.00	1000000.00	3	1000000.00	1000000.00
3	1000000.00	1000000.00	4	1000000.00	1000000.00
4	1000000.00	1000000.00	5	1000000.00	1000000.00
5	1000000.00	1000000.00	6	1000000.00	1000000.00
6	1000000.00	1000000.00	7	1000000.00	1000000.00
7	1000000.00	1000000.00	8	1000000.00	1000000.00
8	1000000.00	1000000.00	9	1000000.00	1000000.00
9	1000000.00	1000000.00	10	1000000.00	1000000.00

Bryan Well Pad Site Quantities

Item	Quantity	Unit	Notes
Gravel	10,000	Sq Yd	
Gravel	10,000	Sq Yd	
Gravel	10,000	Sq Yd	
Gravel	10,000	Sq Yd	
Gravel	10,000	Sq Yd	
Gravel	10,000	Sq Yd	
Gravel	10,000	Sq Yd	
Gravel	10,000	Sq Yd	

**Project Contacts**

**Design Engineer**  
Name: [Redacted]  
Title: [Redacted]  
Phone: [Redacted]

**Client Representative**  
Name: [Redacted]  
Title: [Redacted]  
Phone: [Redacted]

**Regulatory Agency**  
Name: WVDEP  
Title: [Redacted]  
Phone: [Redacted]

**Site Erosion Control**

From the construction of the well pad, erosion control measures shall be installed to prevent sediment from the site from entering the stream. Erosion control measures shall be installed on all areas of exposed soil. Erosion control measures shall be installed on all areas of exposed soil. Erosion control measures shall be installed on all areas of exposed soil.

**Site Erosion Control Plan**

Scale: 1" = 100'

**Professional Engineer Seal**

Seal of the State of West Virginia, Professional Engineer, No. 22217, State of WV, Exp. 12/31/2018.

Sheet Description

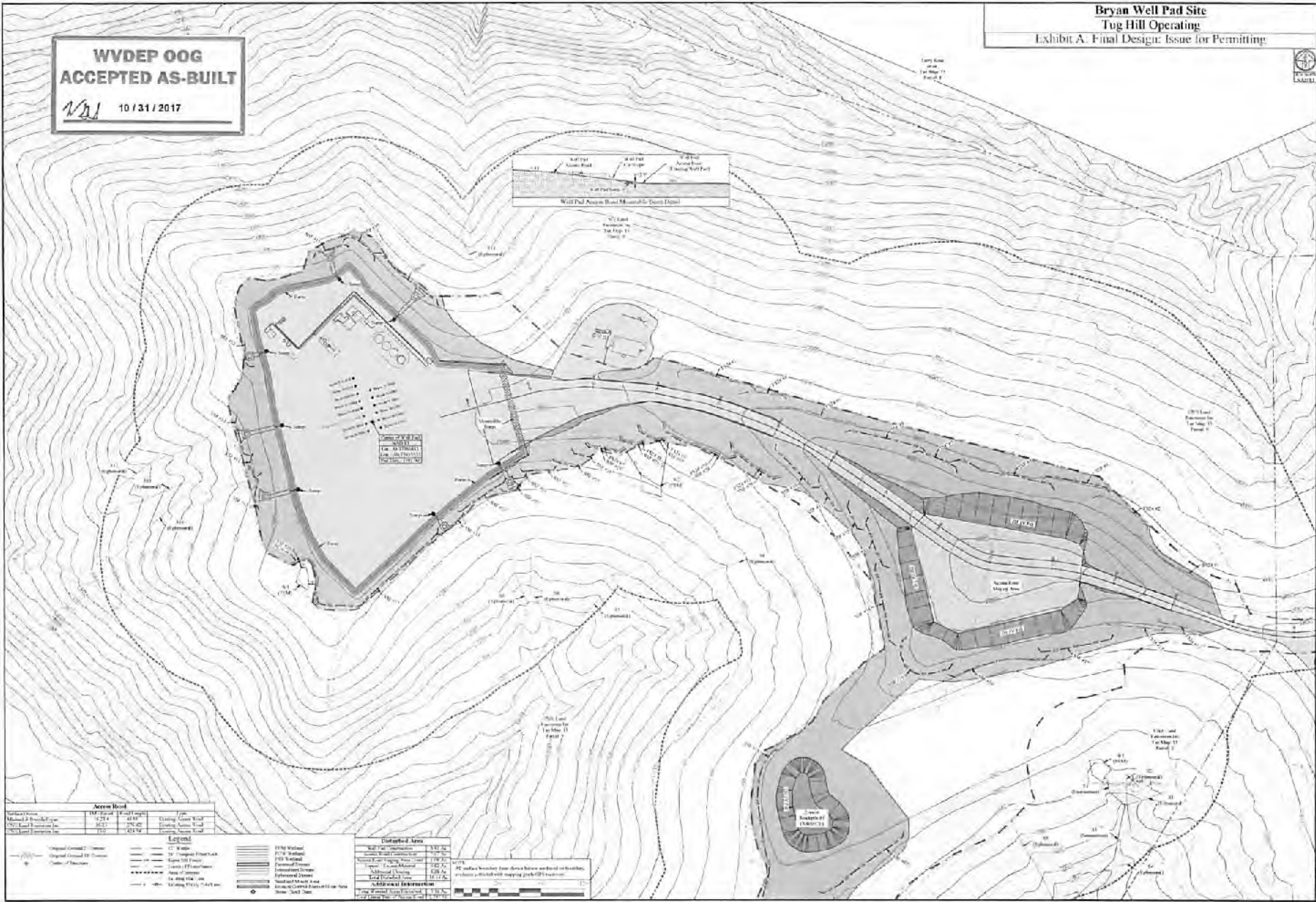
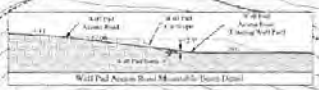
Sheet	Description
VI	Site Plan
VI-A	Site Plan - Detail
VI-B	Site Plan - Detail
VI-C	Site Plan - Detail
VI-D	Site Plan - Detail
VI-E	Site Plan - Detail
VI-F	Site Plan - Detail
VI-G	Site Plan - Detail
VI-H	Site Plan - Detail
VI-I	Site Plan - Detail
VI-J	Site Plan - Detail
VI-K	Site Plan - Detail
VI-L	Site Plan - Detail
VI-M	Site Plan - Detail
VI-N	Site Plan - Detail

**TUG HILL OPERATING**  
 4705101979  
 Bryan Well Pad Site  
 Franklin District  
 Marshall County, WV



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

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



**Access Road**

Material	Thickness (ft)	Notes
Subgrade	12" to 18"	As per design
Base Course	6" to 8"	As per design
Surface Course	4" to 6"	As per design

**Legend**

---	Proposed	---	2" Well
---	Original Ground	---	4" Well
---	Proposed Footprint	---	6" Well
---	Proposed Driveway	---	8" Well
---	Proposed Driveway	---	10" Well
---	Proposed Driveway	---	12" Well
---	Proposed Driveway	---	14" Well
---	Proposed Driveway	---	16" Well
---	Proposed Driveway	---	18" Well
---	Proposed Driveway	---	20" Well
---	Proposed Driveway	---	22" Well
---	Proposed Driveway	---	24" Well
---	Proposed Driveway	---	26" Well
---	Proposed Driveway	---	28" Well
---	Proposed Driveway	---	30" Well

**Disturbed Area**

Area	Area (sq ft)
Well Pad	1,200
Access Road	1,500
Driveway	1,000
Other	500
<b>Total</b>	<b>4,200</b>

**Additional Information**

1. All areas shown on this plan are to be disturbed.

2. All areas shown on this plan are to be restored to original condition or better.

3. All areas shown on this plan are to be revegetated with native species.

4. All areas shown on this plan are to be stabilized with appropriate erosion control measures.

**TUG HILL**  
 OPERATING



THIS DOCUMENT  
 PREPARED FOR  
 TUG HILL  
 OPERATING

**Kelly Surveys**  
 INCORPORATED

Lawson and Seimann Ground Plan  
**Bryan Well Pad Site**  
 Franklin District  
 Mineral County, WV

Date: 10/31/2017  
 Scale: As Shown  
 Designer: J. ZA  
 Plot No.:  
 Sheet No. of: