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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 28, 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 N-2HM  
47-051-01999-00-00

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 N-2HM  
Farm Name: CNX LAND RESOURCES, INC.  
U.S. WELL NUMBER: 47-051-01999-00-00  
Horizontal 6A / New Drill  
Date Issued: 2/28/2018

Promoting a healthy environment.

03/02/2018

# PERMIT CONDITIONS

4705101999

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

## CONDITIONS

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

**PERMIT CONDITIONS** **4705101999**

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).

WW-6B  
(04/15)

API NO. 47-051 -  
OPERATOR WELL NO. Bryan N-2HM  
Well Pad Name: Bryan

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

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Franklin Powhatan Point  
Operator ID County District Quadrangle

2) Operator's Well Number: Bryan N-2HM 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 X Oil \_\_\_\_\_ Underground Storage \_\_\_\_\_

Other \_\_\_\_\_

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

Horizontal X \_\_\_\_\_

6) Existing Pad: Yes or No Yes

*JM*  
*12/13/17*

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 53' 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: 13,745'

11) Proposed Horizontal Leg Length: 6,495'

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 X

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

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WW-6B  
(04/15)

API NO. 47- 051  
OPERATOR WELL NO. Bryan N-2HM  
Well Pad Name: Bryan

18) CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	105'	100'	216FT^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	963'	953'	954ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	963'	953'	954ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,615'	2,605'	850ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	13,745'	13,735'	3435ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,073'	
Liners	N/A						

*Ju*  
12/13/17

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 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 - \_\_\_\_\_  
OPERATOR WELL NO. Bryan N-2HM  
Well Pad Name: Bryan

*John*  
*12/13/17*

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 16,237,500 lb proppant and 251,044 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

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## Tug Hill Operating, LLC Casing and Cement Program

### Bryan N-2HM

#### Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	100'	CTS
Surface	13 3/8"	H40	17 1/2"	953'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,805'	CTS
Production	5 1/2"	P110	8 7/8 x 8 3/4"	13,735'	CTS

#### Cement

Conductor: Premium NE-1 + 2% bwoc CaC12 + 48.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2

Surface: Premium NE-1 + 2% bwoc CaC12 + 48.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2

Intermediate: Premium NE-1 + 1% bwoc CaC12 + 48.5% 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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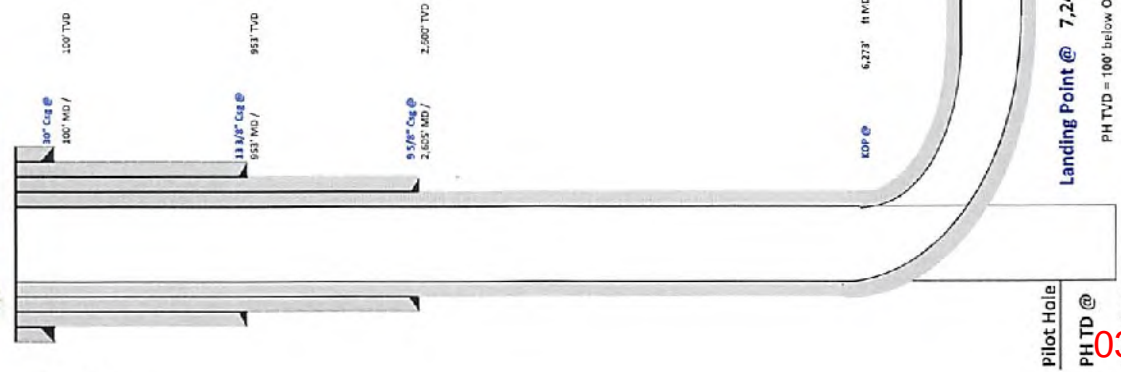
03/02/2018



4705101999



WELL NAME: Bryan N-2HM  
 STATE: West Virginia COUNTY: Marshall  
 DISTRICT: Meade GL Elev: 1,191'  
 OF Elev: 1,191'  
 TD: 13,735'  
 TM Latitude: 39.77560007  
 TM Longitude: -80.7755912  
 BH Latitude: 39.76924771  
 BH Longitude: -80.7802633



Formation	Depth TVD
Drepani Fresh Water	803
Sewardley Coal	701
Pittsburgh Coal	795
Big line	1970
Webb	2224
Berra	2559
Garden	2864
Rhinestreet	3817
Genesee/Junkett	6327
Tully	6362
Hamilton	6397
Marathon	6443
Landing Depth	6463
Onondaga	6456
Pilot Hole Depth	6566

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement Surface
Conductor	36	30	100'	100'	BW	BW	Surface
Surface	27.5	18 3/8	953'	953'	54.5	M-9	Surface
Intermediate 1	12.1/4	9 1/8	2,005'	2,000'	36	J55	Surface
Production	8 7/8 + 8 3/4	5 1/2	13,735'	6,350'	20	P-10	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Sacks	Class	Density	Fluid Type	Cementing Notes	
291	A	15.6	Job	None	
971	A	15.6	Job	3 Centralize at equal distance	
837	A	15	Air	1 Centralize every other ft;	
3,102	A	14.5	Air / SOBAM	1 every other joint in lateral; 1 per joint in curve; 1 every other ft to etc	

Lateral TD @ 13,745' ft MD  
 6,350' ft TVD

Pilot Hole  
 PH TD @ 6,566' TVD  
 Landing Point @ 7,241' MD / 6,463' TVD  
 PH TVD = 100' below Onondaga Top

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**TUG HILL OPERATING**

**Tug Hill Operating LLC**  
**Well: Bryan N-02HM (slot M)**  
**Site: Bryan Pad**  
**Project: Marshall County, WV**  
**Design: rev1**

**Geographic System: Universal Transverse Mercator (US Survey Feet)**  
**Datum: NAD83**  
**Ellipsoid: GRS 1980**  
**Prime Meridian: Greenwich**  
**Zone: Zone 17N (84 W to 78 W)**

**System Datum: Mean Sea Level**  
**Depth Reference Location: @ 118' (about)**  
**Nothing**  
**1444510.27 5703186.56 30.77560007 -80.7659120**  
**Northing Easting Latitude Longitude**

**Total Corr (M-S): To convert a Magnetic Direction to a Grid Direction, Subtract 8.76° 13735.37'**

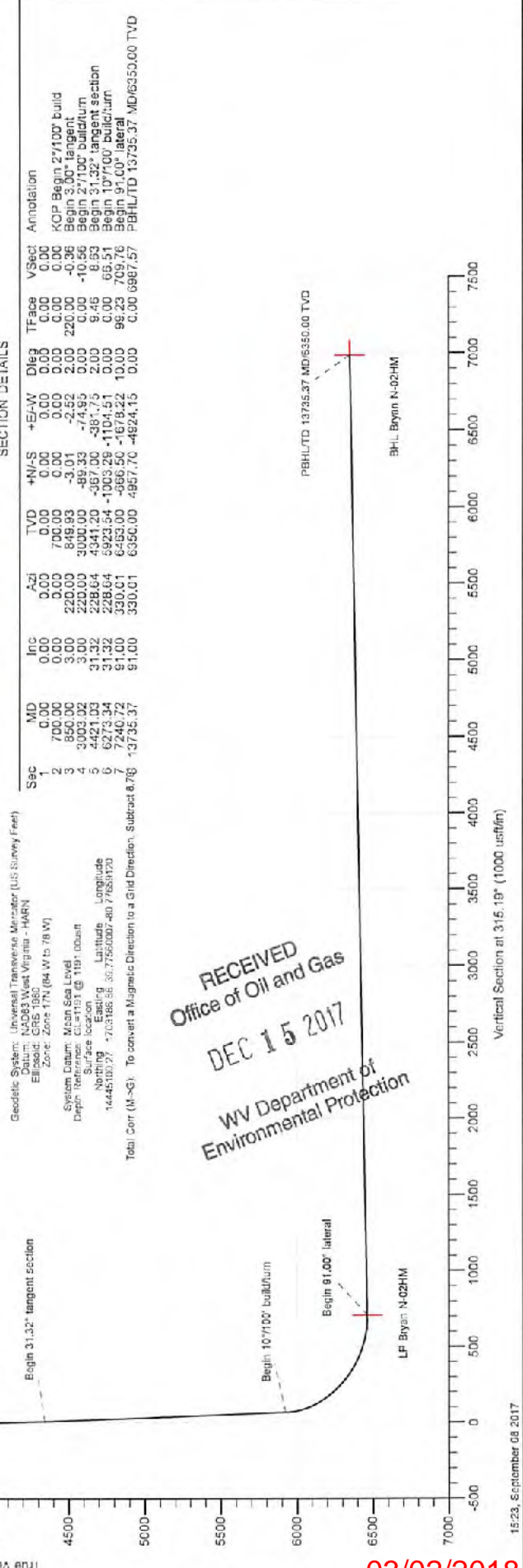
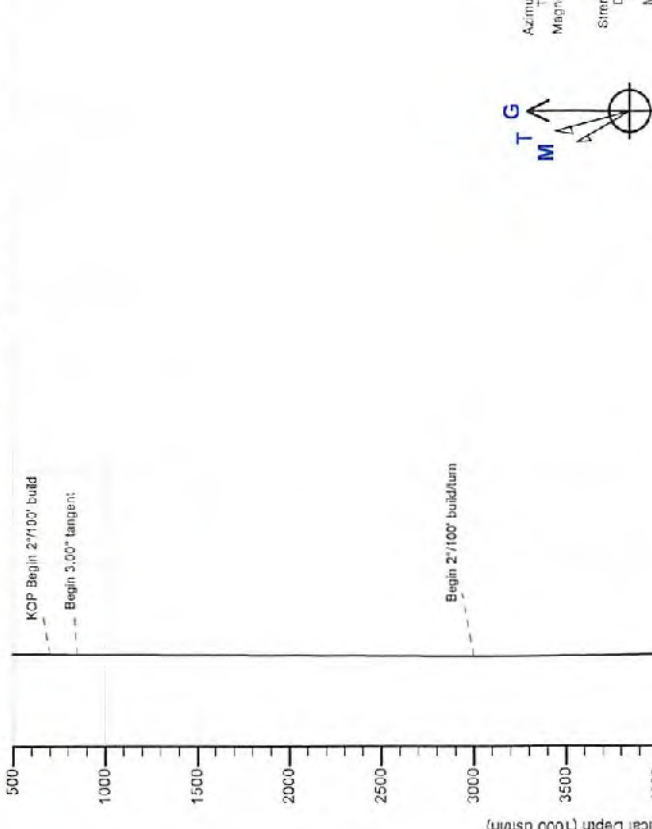
**Azimuths to Grid North**  
**True North: -0.14°**  
**Magnetic North: -8.76°**

**Magnetic Field**  
**Strength: 30.76e-05**  
**Direction: 11.18e-05**  
**Date: 01/18/2017**  
**Model: IGRF2015**



**SECTION DETAILS**

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2'100' build
3	850.00	3.00	220.00	848.93	-3.01	-2.52	2.00	220.00	-0.36	Begin 3.00' tangent
4	3003.02	3.00	220.00	3000.00	-89.33	-74.95	2.00	0.00	-10.56	Begin 2'100' build/lum
5	4421.03	3.132	228.64	4341.20	-381.75	-2.00	9.46	8.93	0.00	Begin 3.132' tangent section
6	6273.34	3.132	228.64	5923.34	-1003.28	-1104.51	2.00	0.00	05.51	Begin 10'7100' build/lum
7	7240.72	91.00	330.01	6453.00	-856.50	-1678.22	10.00	98.23	709.76	Begin 91.00' lateral
8	13735.37	91.00	330.01	6350.00	-497.70	-4924.13	0.00	0.00	0967.57	PBHLTD 13735.37 MD16350.00 TVD



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Planning Report - Geographic



<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan N-02HM (slot M)
<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 N-02HM (slot M)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev1		

<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 N-02HM (slot M)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,445,100.28 usft	<b>Latitude:</b>	39.77560007
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,703,186.88 usft	<b>Longitude:</b>	-80.77659120
<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	52,156.77728981

<b>Design</b>	rev1			
<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	315.19

<b>Plan Survey Tool Program</b>	<b>Date</b>	9/8/2017		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	13,735.37 rev1 (Original Hole)	MWD	MWD - Standard

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
850.00	3.00	220.00	849.93	-3.01	-2.52	2.00	2.00	0.00	220.00	
3,003.02	3.00	220.00	3,000.00	-89.33	-74.95	0.00	0.00	0.00	0.00	
4,421.03	31.32	228.64	4,341.20	-367.00	-381.75	2.00	2.00	0.61	9.46	
6,273.34	31.32	228.64	5,923.54	-1,003.29	-1,104.51	0.00	0.00	0.00	0.00	
7,240.72	91.00	330.01	6,463.00	-666.50	-1,678.22	10.00	6.17	10.48	99.23	LP Bryan N-02HM
13,735.37	91.00	330.01	6,350.00	4,857.70	-4,924.15	0.00	0.00	0.00	0.00	BHL Bryan N-02HM

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Planning Report - Geographic



Database: DB\_Jul2218dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Bryan Pad  
 Well: Bryan N-02HM (slot M)  
 Wellbore: Original Hole  
 Design: rev1

Local Co-ordinate Reference: Well Bryan N-02HM (slot M)  
 TVD Reference: GL=1191 @ 1191.00usft  
 MD Reference: GL=1191 @ 1191.00usft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

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Planned Survey

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	14,445,100.28	1,703,186.86	39.77580007	-80.77659120
100.00	0.00	0.00	100.00	0.00	0.00	14,445,100.28	1,703,186.86	39.77560007	-80.77659120
200.00	0.00	0.00	200.00	0.00	0.00	14,445,100.28	1,703,186.86	39.77560007	-80.77659120
300.00	0.00	0.00	300.00	0.00	0.00	14,445,100.28	1,703,186.86	39.77560007	-80.77659120
400.00	0.00	0.00	400.00	0.00	0.00	14,445,100.28	1,703,186.86	39.77560007	-80.77659120
500.00	0.00	0.00	500.00	0.00	0.00	14,445,100.28	1,703,186.86	39.77560007	-80.77659120
600.00	0.00	0.00	600.00	0.00	0.00	14,445,100.28	1,703,186.86	39.77560007	-80.77659120
700.00	0.00	0.00	700.00	0.00	0.00	14,445,100.28	1,703,186.86	39.77560007	-80.77659120
<b>KOP Begin 2°/100' build</b>									
800.00	2.00	220.00	799.98	-1.34	-1.12	14,445,098.94	1,703,185.74	39.77559841	-80.77659521
850.00	3.00	220.00	849.93	-3.01	-2.52	14,445,097.27	1,703,184.34	39.77559183	-80.77660021
<b>Begin 3.00° tangent</b>									
900.00	3.00	220.00	899.86	-5.01	-4.21	14,445,095.25	1,703,182.66	39.77558534	-80.77660621
1,000.00	3.00	220.00	999.72	-9.02	-7.57	14,445,091.28	1,703,179.29	39.77557535	-80.77661822
1,100.00	3.00	220.00	1,099.59	-13.03	-10.93	14,445,087.25	1,703,175.93	39.77556436	-80.77663023
1,200.00	3.00	220.00	1,199.45	-17.04	-14.30	14,445,083.24	1,703,172.56	39.77555337	-80.77664224
1,300.00	3.00	220.00	1,299.31	-21.05	-17.66	14,445,079.23	1,703,169.20	39.77554239	-80.77665425
1,400.00	3.00	220.00	1,399.17	-25.06	-21.03	14,445,075.22	1,703,165.83	39.77553140	-80.77666626
1,500.00	3.00	220.00	1,499.04	-29.07	-24.39	14,445,071.21	1,703,162.47	39.77552041	-80.77667827
1,600.00	3.00	220.00	1,598.90	-33.08	-27.75	14,445,067.20	1,703,159.11	39.77550943	-80.77669028
1,700.00	3.00	220.00	1,698.76	-37.09	-31.12	14,445,063.19	1,703,155.74	39.77549844	-80.77670228
1,800.00	3.00	220.00	1,798.63	-41.09	-34.48	14,445,059.18	1,703,152.38	39.77548745	-80.77671429
1,900.00	3.00	220.00	1,898.49	-45.10	-37.85	14,445,055.17	1,703,149.01	39.77547646	-80.77672630
2,000.00	3.00	220.00	1,998.35	-49.11	-41.21	14,445,051.16	1,703,145.65	39.77546548	-80.77673831
2,100.00	3.00	220.00	2,098.21	-53.12	-44.57	14,445,047.15	1,703,142.29	39.77545449	-80.77675032
2,200.00	3.00	220.00	2,198.08	-57.13	-47.94	14,445,043.15	1,703,138.92	39.77544350	-80.77676233
2,300.00	3.00	220.00	2,297.94	-61.14	-51.30	14,445,039.14	1,703,135.56	39.77543251	-80.77677434
2,400.00	3.00	220.00	2,397.80	-65.15	-54.67	14,445,035.13	1,703,132.19	39.77542153	-80.77678635
2,500.00	3.00	220.00	2,497.67	-69.16	-58.03	14,445,031.12	1,703,128.83	39.77541054	-80.77679835
2,599.99	3.00	220.00	2,597.53	-73.17	-61.40	14,445,027.11	1,703,125.47	39.77539955	-80.77681036
2,699.99	3.00	220.00	2,697.39	-77.18	-64.76	14,445,023.10	1,703,122.10	39.77538857	-80.77682237
2,799.99	3.00	220.00	2,797.25	-81.19	-68.12	14,445,019.09	1,703,118.74	39.77537758	-80.77683438
2,899.99	3.00	220.00	2,897.12	-85.20	-71.49	14,445,015.08	1,703,115.37	39.77536659	-80.77684639
2,999.99	3.00	220.00	2,996.98	-89.20	-74.85	14,445,011.07	1,703,112.01	39.77535560	-80.77685840
3,003.02	3.00	220.00	3,000.00	-89.33	-74.95	14,445,010.95	1,703,111.91	39.77535527	-80.77685876
<b>Begin 2°/100' build/turn</b>									
3,099.99	4.92	223.72	3,096.74	-94.28	-79.46	14,445,006.00	1,703,107.40	39.77534170	-80.77687485
3,199.99	6.92	225.38	3,196.20	-101.61	-86.71	14,444,998.67	1,703,100.15	39.77532162	-80.77690072
3,299.99	8.91	226.31	3,295.24	-111.19	-96.60	14,444,989.09	1,703,090.26	39.77529537	-80.77693800
3,399.99	10.91	226.89	3,393.74	-123.01	-109.11	14,444,977.27	1,703,077.75	39.77526300	-80.77698063
3,499.99	12.91	227.30	3,491.59	-137.05	-124.23	14,444,963.22	1,703,062.63	39.77522454	-80.77703456
3,599.99	14.91	227.60	3,588.65	-153.30	-141.94	14,444,946.97	1,703,044.92	39.77518003	-80.77709773
3,699.99	16.91	227.83	3,684.82	-171.74	-162.21	14,444,928.54	1,703,024.65	39.77512954	-80.77717006
3,799.99	18.90	228.01	3,779.97	-192.34	-185.03	14,444,907.94	1,703,001.83	39.77507312	-80.77725146
3,899.99	20.90	228.16	3,873.99	-215.08	-210.37	14,444,885.20	1,702,976.49	39.77501084	-80.77734183
3,999.99	22.90	228.28	3,966.77	-239.93	-236.19	14,444,860.34	1,702,948.67	39.77494278	-80.77744106
4,099.99	24.90	228.39	4,058.18	-268.87	-268.48	14,444,833.41	1,702,918.40	39.77486902	-80.77754903
4,199.99	26.90	228.48	4,148.13	-295.85	-301.14	14,444,804.43	1,702,885.72	39.77476965	-80.77766561
4,299.99	28.90	228.56	4,236.50	-326.84	-336.20	14,444,773.43	1,702,850.66	39.77470477	-80.77779066
4,399.99	30.90	228.63	4,323.19	-359.81	-373.59	14,444,740.46	1,702,813.27	39.77461448	-80.77792402
4,421.03	31.32	228.64	4,341.20	-367.00	-381.75	14,444,733.28	1,702,805.11	39.77459480	-80.77795312
<b>Begin 31.32° tangent section</b>									
4,499.99	31.32	228.64	4,408.65	-394.12	-412.56	14,444,706.16	1,702,774.30	39.77452052	-80.77806302
4,599.99	31.32	228.64	4,494.08	-428.47	-451.58	14,444,671.80	1,702,735.28	39.77442845	-80.77820219



### Planning Report - Geographic



<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan N-02HM (slot M)
<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 N-02HM (slot M)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole	<b>RECEIVED</b>	
<b>Design:</b>	rev1	Office of Oil and Gas	
<b>DEC 15 2017</b>			

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#### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,699.99	31.32	228.64	4,579.50	-462.62	-490.60	14,444,637.45	1,702,696.27	39.77433238	-80.77834137
4,799.99	31.32	228.64	4,664.93	-497.18	-529.61	14,444,603.10	1,702,657.25	39.77423630	-80.77848055
4,899.99	31.32	228.64	4,750.35	-531.53	-568.63	14,444,568.75	1,702,618.23	39.77414423	-80.77861972
4,999.99	31.32	228.64	4,835.78	-565.68	-607.65	14,444,534.40	1,702,579.21	39.77405016	-80.77875890
5,099.99	31.32	228.64	4,921.20	-600.23	-646.67	14,444,500.05	1,702,540.19	39.77395608	-80.77889807
5,199.99	31.32	228.64	5,006.62	-634.58	-685.69	14,444,465.70	1,702,501.17	39.77386201	-80.77903724
5,299.99	31.32	228.64	5,092.05	-668.93	-724.71	14,444,431.34	1,702,462.15	39.77376793	-80.77917642
5,399.99	31.32	228.64	5,177.47	-703.28	-763.73	14,444,396.99	1,702,423.13	39.77367386	-80.77931559
5,499.99	31.32	228.64	5,262.90	-737.63	-802.75	14,444,362.64	1,702,384.11	39.77357978	-80.77945476
5,599.99	31.32	228.64	5,348.32	-771.99	-841.77	14,444,328.29	1,702,345.09	39.77348571	-80.77959394
5,699.99	31.32	228.64	5,433.75	-806.34	-880.79	14,444,293.94	1,702,306.07	39.77339164	-80.77973311
5,799.99	31.32	228.64	5,519.17	-840.69	-919.81	14,444,259.59	1,702,267.05	39.77329756	-80.77987228
5,899.99	31.32	228.64	5,604.60	-875.04	-958.83	14,444,225.24	1,702,228.03	39.77320349	-80.78001145
5,999.99	31.32	228.64	5,690.02	-909.39	-997.85	14,444,190.88	1,702,189.01	39.77310941	-80.78015062
6,099.99	31.32	228.64	5,775.45	-943.74	-1,036.87	14,444,156.53	1,702,149.99	39.77301533	-80.78028979
6,199.99	31.32	228.64	5,860.87	-978.09	-1,075.89	14,444,122.18	1,702,110.97	39.77292126	-80.78042896
6,273.34	31.32	228.64	5,923.54	-1,003.29	-1,104.51	14,444,086.96	1,702,082.35	39.77285225	-80.78056812
<b>Begin 10°/100' build/turn</b>									
6,299.99	31.00	233.75	5,946.34	-1,011.93	-1,115.24	14,444,069.35	1,702,071.62	39.77282651	-80.78056933
6,399.99	31.60	253.04	6,032.01	-1,034.85	-1,161.18	14,444,065.42	1,702,025.68	39.77276599	-80.78073302
6,499.99	34.87	270.34	6,115.63	-1,042.35	-1,214.97	14,444,057.93	1,701,971.90	39.77274573	-80.78092449
6,599.99	40.17	284.32	6,195.26	-1,034.18	-1,274.95	14,444,066.10	1,701,911.91	39.77276657	-80.78113792
6,699.99	46.79	295.25	6,267.89	-1,010.60	-1,339.33	14,444,089.67	1,701,847.53	39.77283375	-80.78136682
6,799.99	54.24	303.91	6,331.50	-972.33	-1,406.13	14,444,127.95	1,701,780.73	39.77293932	-80.78160424
6,899.99	62.20	311.04	6,384.17	-920.52	-1,473.33	14,444,179.76	1,701,713.53	39.77308205	-80.78184297
6,999.99	70.46	317.16	6,424.30	-856.75	-1,538.89	14,444,243.53	1,701,647.97	39.77325761	-80.78207574
7,099.99	78.94	322.70	6,450.67	-782.96	-1,600.82	14,444,317.32	1,701,586.04	39.77346057	-80.78229549
7,199.99	87.50	327.92	6,462.47	-701.39	-1,657.23	14,444,399.86	1,701,529.63	39.77365805	-80.78249555
7,240.72	91.00	330.01	6,463.00	-666.50	-1,678.22	14,444,433.78	1,701,508.64	39.77378102	-80.78266997
<b>Begin 91.00° lateral</b>									
7,299.99	91.00	330.01	6,461.97	-615.18	-1,707.84	14,444,485.10	1,701,479.02	39.77392216	-80.78267494
7,399.99	91.00	330.01	6,460.23	-528.58	-1,757.82	14,444,571.70	1,701,429.04	39.77416032	-80.78285207
7,499.99	91.00	330.01	6,458.49	-441.98	-1,807.80	14,444,659.29	1,701,379.06	39.77439847	-80.78302920
7,599.99	91.00	330.01	6,456.75	-355.39	-1,857.78	14,444,744.89	1,701,329.08	39.77463662	-80.78320633
7,699.99	91.00	330.01	6,455.01	-268.79	-1,907.76	14,444,831.49	1,701,279.10	39.77487477	-80.78338346
7,799.99	91.00	330.01	6,453.27	-182.19	-1,957.73	14,444,918.09	1,701,229.13	39.77511293	-80.78356050
7,899.99	91.00	330.01	6,451.53	-95.59	-2,007.71	14,445,004.68	1,701,179.15	39.77535108	-80.78373773
7,999.99	91.00	330.01	6,449.79	-9.00	-2,057.69	14,445,091.26	1,701,129.17	39.77558923	-80.78391487
8,099.99	91.00	330.01	6,448.05	77.60	-2,107.67	14,445,177.88	1,701,079.19	39.77582738	-80.78409200
8,199.99	91.00	330.01	6,446.31	164.20	-2,157.65	14,445,264.47	1,701,029.21	39.77606553	-80.78426914
8,299.99	91.00	330.01	6,444.57	250.80	-2,207.63	14,445,351.07	1,700,979.23	39.77630368	-80.78444628
8,399.99	91.00	330.01	6,442.83	337.39	-2,257.60	14,445,437.67	1,700,929.26	39.77654183	-80.78462342
8,499.99	91.00	330.01	6,441.09	423.99	-2,307.58	14,445,524.27	1,700,879.28	39.77677998	-80.78480056
8,599.99	91.00	330.01	6,439.35	510.59	-2,357.56	14,445,610.86	1,700,829.30	39.77701813	-80.78497771
8,699.99	91.00	330.01	6,437.61	597.18	-2,407.54	14,445,697.46	1,700,779.32	39.77725628	-80.78515485
8,799.99	91.00	330.01	6,435.87	683.78	-2,457.52	14,445,784.06	1,700,729.34	39.77749443	-80.78533200
8,899.99	91.00	330.01	6,434.13	770.38	-2,507.50	14,445,870.66	1,700,679.36	39.77773258	-80.78550914
8,999.99	91.00	330.01	6,432.39	856.98	-2,557.48	14,445,957.25	1,700,629.39	39.77797073	-80.78568629
9,099.99	91.00	330.01	6,430.65	943.57	-2,607.45	14,446,043.85	1,700,579.41	39.77820888	-80.78586344
9,199.99	91.00	330.01	6,428.91	1,030.17	-2,657.43	14,446,130.45	1,700,529.43	39.77844703	-80.78604059
9,299.99	91.00	330.01	6,427.17	1,116.77	-2,707.41	14,446,217.04	1,700,479.45	39.77868518	-80.78621774
9,399.99	91.00	330.01	6,425.43	1,203.37	-2,757.39	14,446,303.64	1,700,429.47	39.77892333	-80.78639489
9,499.99	91.00	330.01	6,423.69	1,289.96	-2,807.37	14,446,390.24	1,700,379.49	39.77916147	-80.78657205
9,599.99	91.00	330.01	6,421.95	1,376.56	-2,857.35	14,446,476.84	1,700,329.51	39.77939962	-80.78674920



Database: DB\_Jul2216dt\_V14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Bryan Pad  
 Well: Bryan N-02HM (slot M)  
 Wellbore: Original Hole  
 Design: rev1

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

Well Bryan N-02HM (slot M)  
 GL=1191 @ 1191.00usft  
 GL=1191 @ 1191.00usft  
 Grid  
 Minimum Curvature

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DEC 15 2017

Planned Survey

WV Department of  
 Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,699.98	91.00	330.01	6,420.21	1,463.16	-2,907.32	14,446,563.43	1,700,279.54	39.77963777	-80.78892836
9,799.98	91.00	330.01	6,418.47	1,549.75	-2,957.30	14,448,850.03	1,700,229.56	39.77987591	-80.78710352
9,899.98	91.00	330.01	6,416.73	1,636.35	-3,007.28	14,446,736.63	1,700,179.56	39.78011406	-80.78728067
9,999.98	91.00	330.01	6,414.99	1,722.95	-3,057.26	14,446,823.23	1,700,129.60	39.78035221	-80.78745783
10,099.98	91.00	330.01	6,413.25	1,809.55	-3,107.24	14,446,909.82	1,700,079.62	39.78059035	-80.78763499
10,199.98	91.00	330.01	6,411.51	1,896.14	-3,157.22	14,446,996.42	1,700,029.64	39.78082850	-80.78781216
10,299.98	91.00	330.01	6,409.77	1,982.74	-3,207.20	14,447,083.02	1,699,979.67	39.78106664	-80.78798932
10,399.98	91.00	330.01	6,408.03	2,069.34	-3,257.17	14,447,169.61	1,699,929.69	39.78130479	-80.78816649
10,499.98	91.00	330.01	6,406.29	2,155.94	-3,307.15	14,447,256.21	1,699,879.71	39.78154293	-80.78834365
10,599.98	91.00	330.01	6,404.55	2,242.53	-3,357.13	14,447,342.81	1,699,829.73	39.78178108	-80.78852082
10,699.98	91.00	330.01	6,402.81	2,329.13	-3,407.11	14,447,429.41	1,699,779.75	39.78201922	-80.78869799
10,799.98	91.00	330.01	6,401.07	2,415.73	-3,457.09	14,447,516.00	1,699,729.77	39.78225737	-80.78887516
10,899.98	91.00	330.01	6,399.33	2,502.32	-3,507.07	14,447,602.60	1,699,679.79	39.78249551	-80.78905233
10,999.98	91.00	330.01	6,397.59	2,588.92	-3,557.04	14,447,689.20	1,699,629.82	39.78273365	-80.78922950
11,099.98	91.00	330.01	6,395.85	2,675.52	-3,607.02	14,447,775.80	1,699,579.84	39.78297180	-80.78940667
11,199.98	91.00	330.01	6,394.11	2,762.12	-3,657.00	14,447,862.39	1,699,529.86	39.78320994	-80.78958385
11,299.98	91.00	330.01	6,392.37	2,848.71	-3,706.98	14,447,948.99	1,699,479.88	39.78344808	-80.78976102
11,399.98	91.00	330.01	6,390.63	2,935.31	-3,756.96	14,448,035.59	1,699,429.90	39.78368622	-80.78993820
11,499.98	91.00	330.01	6,388.89	3,021.91	-3,806.94	14,448,122.18	1,699,379.92	39.78392437	-80.79011538
11,599.98	91.00	330.01	6,387.15	3,108.51	-3,856.92	14,448,208.78	1,699,329.95	39.78416251	-80.79029256
11,699.98	91.00	330.01	6,385.41	3,195.10	-3,906.89	14,448,295.38	1,699,279.97	39.78440065	-80.79046974
11,799.98	91.00	330.01	6,383.67	3,281.70	-3,956.87	14,448,381.98	1,699,229.99	39.78463879	-80.79064692
11,899.98	91.00	330.01	6,381.93	3,368.30	-4,006.85	14,448,468.57	1,699,180.01	39.78487693	-80.79082410
11,999.98	91.00	330.01	6,380.19	3,454.89	-4,056.83	14,448,555.17	1,699,130.03	39.78511507	-80.79100129
12,099.98	91.00	330.01	6,378.45	3,541.49	-4,106.81	14,448,641.77	1,699,080.05	39.78535321	-80.79117847
12,199.98	91.00	330.01	6,376.71	3,628.09	-4,156.79	14,448,728.37	1,699,030.07	39.78559135	-80.79135566
12,299.98	91.00	330.01	6,374.97	3,714.69	-4,206.76	14,448,814.96	1,698,980.10	39.78582949	-80.79153285
12,399.98	91.00	330.01	6,373.23	3,801.28	-4,256.74	14,448,901.56	1,698,930.12	39.78606763	-80.79171004
12,499.98	91.00	330.01	6,371.49	3,887.88	-4,306.72	14,448,988.16	1,698,880.14	39.78630577	-80.79188723
12,599.98	91.00	330.01	6,369.75	3,974.48	-4,356.70	14,449,074.75	1,698,830.16	39.78654391	-80.79206442
12,699.97	91.00	330.01	6,368.01	4,061.08	-4,406.68	14,449,161.35	1,698,780.18	39.78678205	-80.79224161
12,799.97	91.00	330.01	6,366.28	4,147.67	-4,456.66	14,449,247.95	1,698,730.20	39.78702019	-80.79241881
12,899.97	91.00	330.01	6,364.54	4,234.27	-4,506.64	14,449,334.55	1,698,680.23	39.78725832	-80.79259600
12,999.97	91.00	330.01	6,362.80	4,320.87	-4,556.61	14,449,421.14	1,698,630.25	39.78749646	-80.79277320
13,099.97	91.00	330.01	6,361.06	4,407.46	-4,606.59	14,449,507.74	1,698,580.27	39.78773460	-80.79295039
13,199.97	91.00	330.01	6,359.32	4,494.06	-4,656.57	14,449,594.34	1,698,530.29	39.78797274	-80.79312759
13,299.97	91.00	330.01	6,357.58	4,580.66	-4,706.55	14,449,680.94	1,698,480.31	39.78821087	-80.79330479
13,399.97	91.00	330.01	6,355.84	4,667.26	-4,756.53	14,449,767.53	1,698,430.33	39.78844901	-80.79348200
13,499.97	91.00	330.01	6,354.10	4,753.85	-4,806.51	14,449,854.13	1,698,380.35	39.78868715	-80.79365920
13,599.97	91.00	330.01	6,352.36	4,840.45	-4,856.48	14,449,940.73	1,698,330.38	39.78892528	-80.79383640
13,699.97	91.00	330.01	6,350.62	4,927.05	-4,906.46	14,450,027.32	1,698,280.40	39.78916342	-80.79401361
13,735.37	91.00	330.01	6,350.00	4,957.70	-4,924.15	14,450,057.98	1,698,262.71	39.78924771	-80.79407633

PBHL/TD 13735.37 MD/6350.00 TVD



Planning Report - Geographic



<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan N-02HM (slot M)
<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 N-02HM (slot M)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev1		

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									
BHL Bryan N-02HM - plan hits target center - Point	0.00	0.00	6,350.00	4,957.70	-4,924.15	14,450,057.98	1,698,262.71	39.78924771	-80.79407633
LP Bryan N-02HM - plan hits target center - Point	0.00	0.00	6,463.00	-666.50	-1,678.22	14,444,433.78	1,701,508.64	39.77378102	-80.78256997

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
700.00	700.00	0.00	0.00	KOP Begin 2"/100' build
850.00	849.93	-3.01	-2.52	Begin 3.00° tangent
3,003.02	3,000.00	-89.33	-74.95	Begin 2"/100' build/turn
4,421.03	4,341.20	-367.00	-361.75	Begin 31.32° tangent section
6,273.34	5,923.54	-1,003.29	-1,104.51	Begin 10"/100' build/turn
7,240.72	6,463.00	-666.50	-1,678.22	Begin 91.00° lateral
13,735.37	6,350.00	4,957.70	-4,924.15	PBHL/TD 13735.37 MD/6350.00 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 N-2HM

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 in 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.



Select County: (051) Marshall  
 Enter Permit #: 01340  
 Get Data    Reset

Select categories:  Check All  
 Location     Production     Plugging  
 Demand/Completion     Stratigraphy     Sample  
 Pay/Spill/Water     Logs     Sit/Map/Log

Well: County = 51 Permit = 01340

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LONG_DD	UTM_E	UTM_N
4705101340	Marshall	1340	Franklin	18	18	710036	40727051	819030	4600276.6

Bottom Hole Location Information

API	EF	FLG	UTM_E	UTM_N	LONG_DD	LAT_DD
4705101340	1	A	819036	4600276.6	-83.782095	39.761791

Owner Information

API	CMP_ID	SUPPLY	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VO	PROP_TST_FM	FM_BEST_PR
4705101340	4705101340	4705101340	1340	Marshall	1340	51	51	51	51	Marshall & Wayne Bgn	AB Resources PA	6700	Marcellus Sh.

Completion Information

API	CMP_ID	SPUD_DT	ELEV DATUM	FIELD	DEPST_FM	DEPST_FWT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	END	NEW_FTO	G_BEF	G_AFT	O_BEF	O_AFT	NOL_BEF	NOL_AFT	P_BEF	P_AFT	
4705101340	4705101340	4/12/2010	327.25	1341	Kelly Bunting	Unnamed	Marcellus Sh.	Marcellus Sh.	Development/Prod	Development/Prod	Drill and Gas Rig	Rotational	6450	6009	10001	0	4277	0	216				

Comment: 4/12/2010 Kick off point at 5566

Pay/Show/Well Information

API	CMP_ID	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOT	FM_BOT	G_BEF	G_AFT	O_BEF	O_AFT	WATER_QNTY
4705101340	4705101340	Drill	Gas	Well	6450	Marcellus Sh.	10000	Marcellus Sh.					

Production Gas Information (Volumes in Mcf)

API	PRODUCING_OPERATOR	PROD_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	205	490	0	0	0	0	0	24	687	81	580	82	318	80	80	0	0
4705101340	Chevron Appalachia, LLC	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2013	265	870	18,241	0	0	0	0	1,837	40	601	55,063	18,100	49,673	41,660	50,027		
4705101340	Chevron Appalachia, LLC	2014	57,748	42,815	43,328	30	0	0	1,358	220	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2015	444	217	0	0	8,223	22,420	10,587	55,700	55,804	57,555	57,640	58,304	56,441	55,170			
4705101340	Chevron Appalachia, LLC	2016	41,074	42,815	41,084	48,629	48,000	49,758	42,151	41,486	41,002	41,110	43,414	49,800	36,333				

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

API	PRODUCING_OPERATOR	PROD_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	23,974	0	0	0	0	0	4,103	8,160	3,106	5,433	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	16,840	192	0	0	0	0	662	3,528	3,320	1,153	2,740	2,268	2,022
4705101340	Chevron Appalachia, LLC	2014	8,328	2,201	1,290	1,170	0	0	181	40	0	0	112	0	0
4705101340	Chevron Appalachia, LLC	2015	17,719	0	0	240	2,242	1,658	3,278	2,889	2,105	1,328	1,868	1,193	961
4705101340	Chevron Appalachia, LLC	2016	6,118	1,002	760	331	643	608	812	670	530	335	342	440	343

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

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

Stratigraphy Information

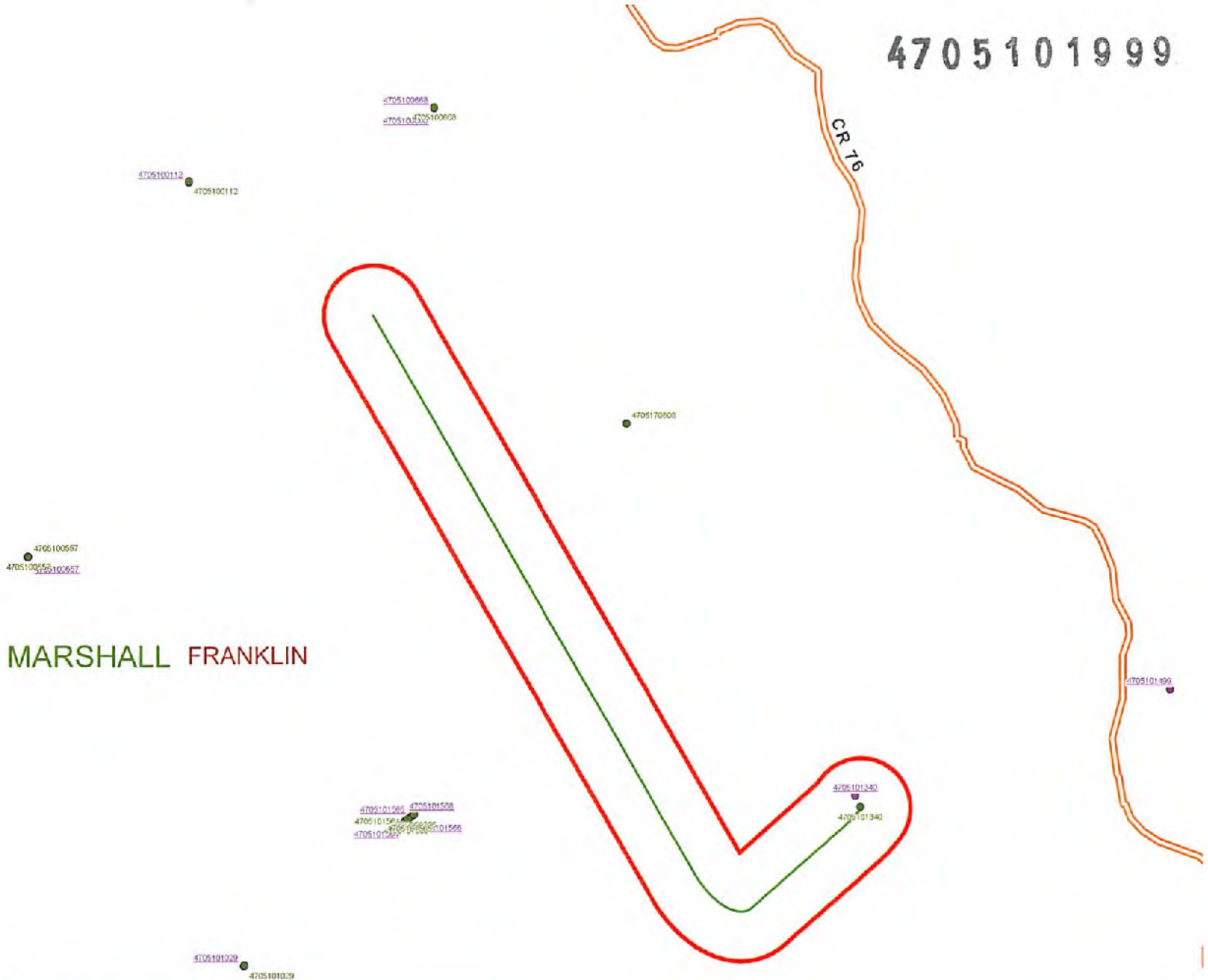
API	SUFFID	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705101340	Drill Dept Log	Bumper	Well Record	7336	Reasonable	46	Reasonable	1217 Kelly Bunting
4705101340	Drill Dept Log	Tuff Lt	Well Record	6376	Reasonable	28	Reasonable	1217 Kelly Bunting
4705101340	Drill Dept Log	Marathon	Well Record	6414	Reasonable	46	Reasonable	1217 Kelly Bunting
4705101340	Drill Dept Log	Marcellus Sh	Well Record	5282	Reasonable	41	Reasonable	1217 Kelly Bunting
4705101340	Drill Dept Log	Chickasaw Sh	Well Record	6144	Reasonable	21	Reasonable	1217 Kelly Bunting

Wellbore (E-Log) Information

API	LOG_TOP	LOG_BOT	DEPST_FWL	LOG_AVAIL	SCAN	DIGITIZED	GR_TOP	GR_BOT	D_TOP	D_BOT	N_TOP	N_BOT	I_TOP	I_BOT	T_TOP	T_BOT	S_TOP	S_BOT	O_TOP	O_BOT	INCHS	INCHS	REDUCED	LOGMD	ELEV_N
4705101340	60	6006	0	0	0	0	60	6006	2640	6006	2640	6006	2640	6006	2640	6006	2640	6006	2640	6006	2640	6006	2640	6006	2640

Comment: \*logs, caliper, tension, PE, LWDL, G with measured and vertical depth included

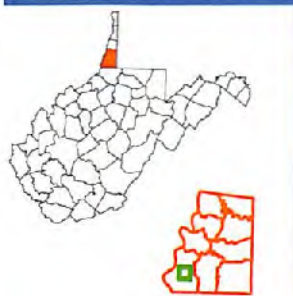
4705101999



MARSHALL FRANKLIN

**Legend**

- Well Locations ([ims.wvgs.wvnet.edu](http://ims.wvgs.wvnet.edu))
- WVDEP O & G Permits ([tagis.dep.wv.gov](http://tagis.dep.wv.gov))
- Major Highways
- Major Roads
- Bryan N-2HM
- 500 Ft Buffer
- Counties
- Districts



Bryan N-2HM  
Franklin District  
Marshall County, WV



Map Prepared by:  
**DPS**  
03/02/2018  
LAND SERVICES

WW-9  
(4/16)

API Number 47 - 051 - \_\_\_\_\_  
Operator's Well No. Bryan N-2HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

Watershed (HUC 10) Fish Creek - Ohio River (Undefined) Quadrangle Powhatan Point 7.5'

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

Will a pit be used? Yes  No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

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

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

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

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

Company Official Signature \_\_\_\_\_  
Company Official (Typed Name) David Patterson  
Company Official Title Senior Vice President, Operations

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WV Department of  
Environmental Protection

Subscribed and sworn before me this 12th day of December, 20 17

Sarah Mchugh

Notary Public

My commission expires 08-31-2021



03/02/2018

Form WW-9

Operator's Well No. Bryan N-2HM

**Tug Hill Operating, LLC**

Proposed Revegetation Treatment: Acres Disturbed 17.78 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Rye Grain	140	Tall Fescue	40
		Ladino Clover	5

**Attach:**

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *Jim Nicholas*

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

Title: Oil & Gas Inspector

Date: 12/13/17

Field Reviewed?  Yes  No

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WW-9

# PROPOSED BRYAN N-2HM

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 50% FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

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

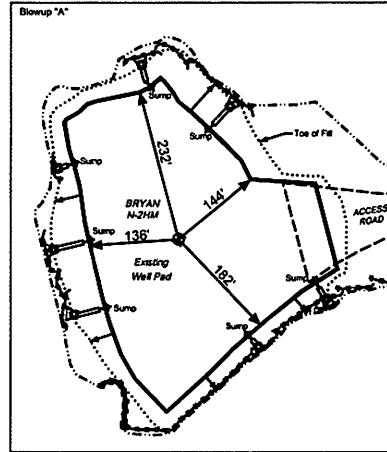
ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED. TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

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

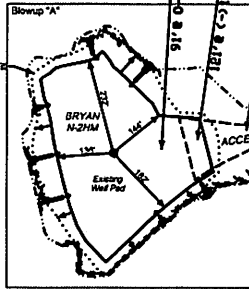
ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.

TERRY ROSE et al.  
T.M. 15/7  
4.5 ACRES

TERRY D. ROSE ET UX  
T.M. 15/08  
77.11 Acres



DRAWING NOT TO SCALE



CNX Land Resources Inc.  
Tax Map: 18  
Parcel: 23

RAY MINOR et al.  
T.M. 1923.1  
2 ACRES

MICHAEL and BRENDA BRYAN  
T.M. 1923.4  
3 ACRES

GREG and CHRISTINA RIDDLE  
T.M. 1923.3  
1 ACRE

CNX LAND RESOURCES INC.  
T.M. 15/9  
81.98 ACRES

CNX LAND RESOURCES INC.  
T.M. 1923  
60.139 ACRES

BORROW & STOCKPILE AREA

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Environmental Protection

MARK STANLEY RUCKMAN  
T.M. 15/10  
153.75 Acres

**LEGEND**

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

DATE: 12/12/17

PROJECT NO: 494510851

DRAWN BY: J.A.H.

4705101999



RECEIVED  
Office of Oil and Gas

DEC 15 2017

WV Department of  
Environmental Protection

# Well Site Safety Plan

## Tug Hill Operating, LLC

*Ju*  
12/13/17

Well Name: Bryan N-2HM

Pad Location: Bryan Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,402,875.37

Easting: 519,132.39

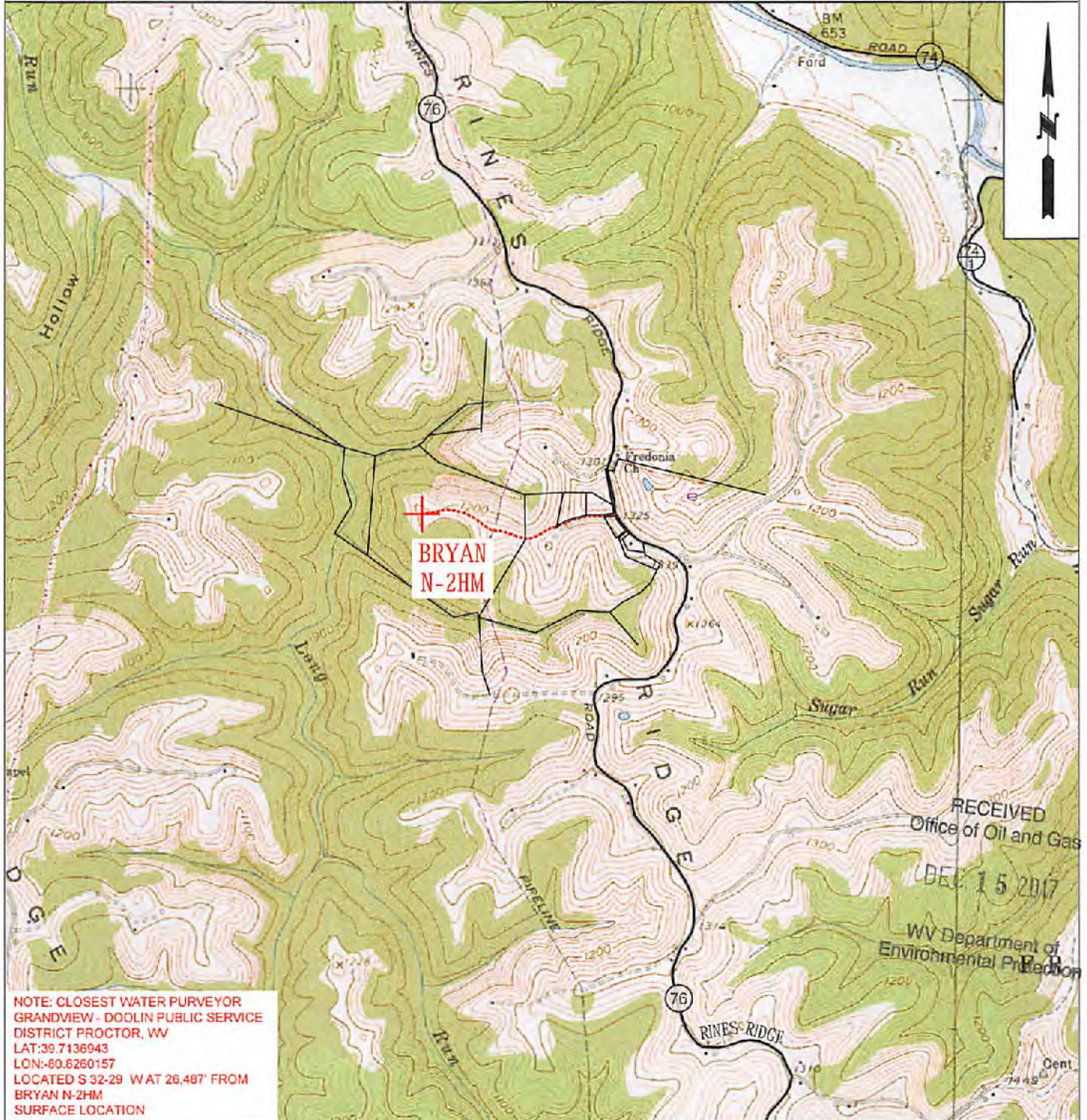
December 2017

03/02/2018


WW-9

# PROPOSED BRYAN N-2HM

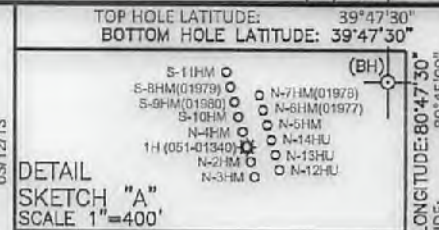
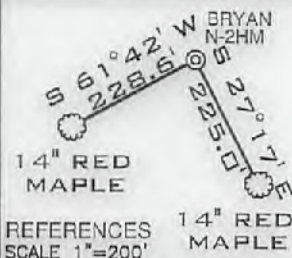
SUPPLEMENT PG 2



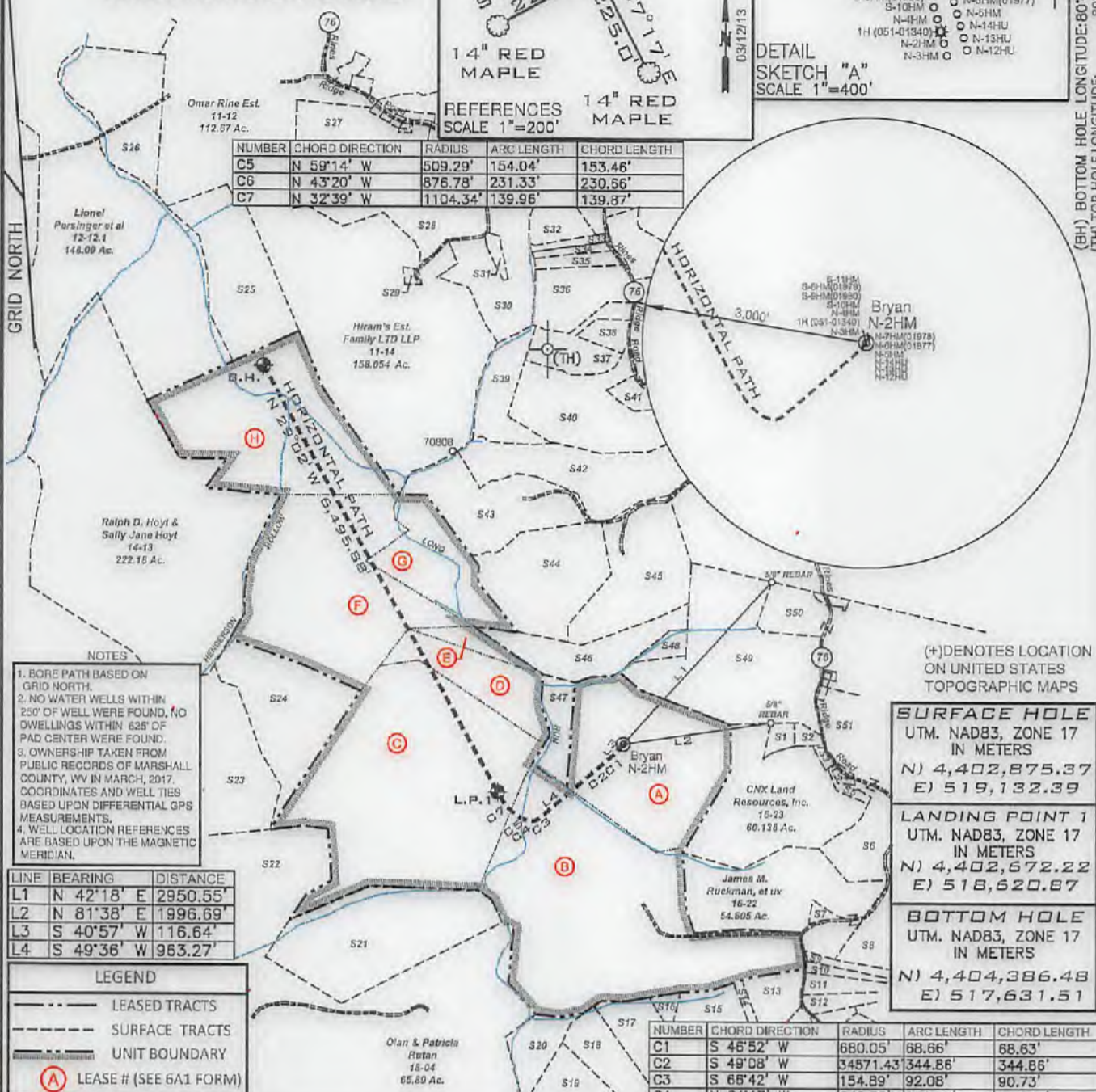
NOTE: CLOSEST WATER PURVEYOR  
GRANDVIEW - DOOLIN PUBLIC SERVICE  
DISTRICT PROCTOR, WV  
LAT:39.7136943  
LON:-80.6260157  
LOCATED S 32-29 W AT 26.487' FROM  
BRYAN N-2HM  
SURFACE LOCATION

 <b>TUG HILL OPERATING</b>	OPERATOR	494510851	TOPO SECTION	LEASE NAME
	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	BRYAN
			SCALE: 1" = 2000'	DATE: DATE: 12/12/17

**BRYAN LEASE  
WELL N-2HM  
690.7979± ACRES**



NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH
C5	N 59°14' W	509.29'	154.04'	153.46'
C6	N 43°20' W	876.78'	231.33'	230.56'
C7	N 32°39' W	1104.34'	139.96'	139.87'



- NOTES**
1. BORE PATH BASED ON GRID NORTH.
  2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
  3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN 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 42°18' E	2950.55'
L2	N 81°38' E	1996.69'
L3	S 40°57' W	116.64'
L4	S 49°36' W	963.27'

**LEGEND**

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

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

SURFACE HOLE	
UTM. NAD83, ZONE 17	IN METERS
N) 4,402,875.37	E) 519,132.39

LANDING POINT 1	
UTM. NAD83, ZONE 17	IN METERS
N) 4,402,672.22	E) 518,620.87

BOTTOM HOLE	
UTM. NAD83, ZONE 17	IN METERS
N) 4,404,386.48	E) 517,631.51

NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH
C1	S 48°52' W	680.05'	68.86'	68.63'
C2	S 49°08' W	34571.43'	344.86'	344.86'
C3	S 68°42' W	154.89'	92.08'	90.73'
C4	N 81°17' W	249.82'	121.87'	120.67'

FILE NUMBER \_\_\_\_\_

DRAWING NUMBER BRYAN\_WP\_N-2HM

SCALE 1" = 2000'

MINIMUM DEGREE OF ACCURACY 1/200

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING  
GRADE GPS

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

P.S. 708 *David L Jackson*



JACKSON SURVEYING INC.  
P.O. Box 1460  
Clarksburg, WV 26302  
304-823-6861



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

DATE: DECEMBER 12, 2017

OPERATORS WELL NO. BRYAN N-2HM

API WELL NO. 47-051-01999

STATE WV COUNTY MARSHALL PERMIT 01999

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

LOCATION ELEVATION 1191.0' WATERSHED (HUC 10) Fish Creek

DISTRICT Franklin COUNTY Marshall

QUADRANGLE Powhatan Point 7.5' LEASE NUMBER SEE WW-6A1 Form

SURFACE OWNER CNX LAND RESOURCES, INC. ACREAGE 81.98

OIL & GAS ROYALTY OWNER MICHAEL R. BRYAN - SEE WW 6A1 LEASE ACREAGE 81.98

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

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD: 6,596' TMD: 13,745'

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

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

03/02/2018

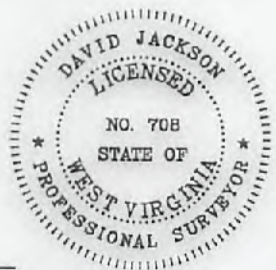
COUNTY NAME PERMIT



FORM 8865  
GRID NORTH

PG 2 OF 2  
**BRYAN LEASE  
WELL N-2HM  
690.7979± ACRES**

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S1	16-23.4	Michael R. & Brenda K. Bryan	3.0
S2	16-23.1	Ray E. Minor Et Ux	2.0
S3	16-23.3	Greg & Christina Riddle	1.0
S4	16-24	Alan M. Beyser Et Ux	1.083
S5	16-23.2	Alan M. Beyser Et Ux	1.726
S6	16-25	John Swierkos	74.09
S7	16-22.1	Heather A. Burgy	1.465
S8	16-21	James M. Ruckman Et Ux	60.75
S9	18-56	William O'Hara	3.965
S10	18-55	William O'Hara	3.202
S11	18-28	Dotson Harrison	6.36
S12	18-28.1	Carol Helmick	5.696
S13	18-11	Benjamin Robinson	12.883
S14	18-11.2	Edward Lee Burge Jr.	2.0
S15	18-11.1	Edward Lee Burge Jr.	18.0
S16	18-15	Edward Lee Burge Jr.	2.495
S17	18-15.4	Edward Lee Burge Jr.	22.34
S18	18-15.3	Charles Yeater	26.44
S19	18-6	Charles Yeater	26.0
S20	18-5	Terry Melott	8.14
S21	15-11	Diana Henry Haynes & Carol Henry	65.59
S22	19-13	Rona Lee Rice & Charles Franklin McCardle	94.93
S23	14-15	Robert L. Shields Et Al	53.0
S24	15-15	Robert L. Shields Et Al	49.0
S25	12-11	Wesley R. & Wesley R. Bryan II	52.478
S26	12-12	Lionel L. Persinger Et Ux	45.0
S27	11-17	Kevin R. Corley Et Ux	36.13
S28	11-17.2	Brenda & Michael Bryan	11.504
S29	11-14.1	Dennis F. Moore Et Ux	1.056
S30	11-16	Keith E. Haught Et Al	83.674
S31	11-16.2	Joseph Haught	2.181
S32	11-9.3	Joseph M. & Steven Haught	16.3
S33	11-9.5	Southern Country Farms Inc.	2.559
S34	11-9.6	Southern Country Farms Inc.	2.488
S35	11-9.9	Leonard L. Parsons Et Ux	5.89
S36	11-9	Edwin C. & Kimberly A. Miller	41.773
S37	11-11.4	Brad M. & Amanda J. Blake	15.193
S38	11-11	Brad M. & Amanda J. Blake	5.0
S39	11-13	Joy D. Gartman & Arlin Gatts	12.29
S40	11-11.3	Herman D. & Herman J. Lantz	43.96
S41	11-11.1	Nellie Marie & Robert W. Spencer	5.813
S42	11-12	Joseph J. Kramer Et Ux	43.2188
S43	15-4	Joseph J. Kramer Et Ux	41.106
S44	15-5	Joseph J. Kramer Et Ux	35.0
S45	15-6	Joseph J. Kramer Et Ux	42.5
S46	15-6.1	Joseph J. Kramer Et Ux	39.4
S47	15-13	CNX Land Resources Inc.	11.0
S48	15-7	Terry D. Rose Et Ux	4.5
S49	15-8	Terry D. Rose Et Ux	77.11
S50	16-3	Donna Vivian Yoho	71.205
S51	16-25	John Swierkos	74.09



P.S. 708 *David L Jackson*

03/02/2018



**TUG HILL**  
OPERATING

OPERATOR'S  
WELL #: Bryan N-2HM  
DISTRICT: Franklin  
COUNTY: Marshall  
STATE: WV

WELL PLAT  
PAGE 2 OF 2  
DATE: 12/12/2017

WW-6A1  
(5/13)

Operator's Well No. Bryan N-2HM

**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

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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: Ben Irwin   
 Its: Land Team Lead

Lessee No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19294	A	5-15-9	BRENDA K BRYAN	TRIENERGY INC	1/8+	741	78	20/348 TriEnergy Inc to AB Resources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	685/643 Chief Exploration & Development LLC and Radler 2000 Limited Partnership to Enerplus Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/997 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	A	5-15-9	MICHAEL R 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.	756/997 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	A	5-15-9	WESLEY RUSSELL BRYAN II	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.	756/997 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	A	5-15-9	APPALACHIAN ENERGY HOLDINGS I LP	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.	756/997 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	B	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.	756/997 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*19337	C	5-15-12	JACK PETROCK HATTIE PETROCK	TRIENERGY, INC.	1/8+	663	498	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.	756/997 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*19337	D	5-15-14	JACK PETROCK HATTIE PETROCK	TRIENERGY, INC.	1/8+	663	498	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.	756/997 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*19309	E	5-15-2	KAREN I DENNY	CHEVRON USA INC	1/8+	798	551	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC	
10*19310	E	5-15-2	ELLEN DINGER	CHEVRON USA INC	1/8+	799	101	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC	
10*19311	E	5-15-2	FLORENCE KATHERINE FOSTER	CHEVRON USA INC	1/8+	798	395	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC	
10*19312	E	5-15-2	MARK A GALLAGHER	CHEVRON USA INC	1/8+	799	92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC	
10*19313	E	5-15-2	NANCY KAY GALLAGHER	CHEVRON USA INC	1/8+	798	579	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC	
10*19314	E	5-15-2	THE JOSEPHINE A. RYAN REVOCABLE LIVING TRUST	CHEVRON USA INC	1/8+	798	495	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC	
10*19315	E	5-15-2	REBECCA J KOVALCHIK	CHEVRON USA INC	1/8+	798	597	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC	

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Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19316	E	5-15-2	CAROLA KURTZ	CHEVRON USA INC	1/8+	798	361	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19317	E	5-15-2	SHIRLEY J POGORZELSKI	CHEVRON USA INC	1/8+	798	588	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19318	E	5-15-2	PATRICIA M PORTWOOD	CHEVRON USA INC	1/8+	798	561	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19319	E	5-15-2	JUDY L RIDGWAY	CHEVRON USA INC	1/8+	798	110	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19320	E	5-15-2	ALBERTA RYAN	CHEVRON USA INC	1/8+	799	46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19321	E	5-15-2	FINLEY L RYAN JR	CHEVRON USA INC	1/8+	798	624	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19322	E	5-15-2	JAMES D RYAN	CHEVRON USA INC	1/8+	798	504	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19323	E	5-15-2	JAMES R RYAN JR	CHEVRON USA INC	1/8+	798	370	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19324	E	5-15-2	KEVIN MICHAEL RYAN	CHEVRON USA INC	1/8+	799	166	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19325	E	5-15-2	RUTH E RYAN	CHEVRON USA INC	1/8+	798	570	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19326	E	5-15-2	VINCENT JASON RYAN III	CHEVRON USA INC	1/8+	799	137	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19327	E	5-15-2	WILBERT W RYAN JR	CHEVRON USA INC	1/8+	798	615	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19328	E	5-15-2	WILLIAM HERVEY MILLER RYAN	CHEVRON USA INC	1/8+	799	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19329	E	5-15-2	GEORGE SETTLES	CHEVRON USA INC	1/8+	799	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19330	E	5-15-2	ELSIE M SHORTLAND	CHEVRON USA INC	1/8+	799	119	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19331	E	5-15-2	RHONDA R TOPPER	CHEVRON USA INC	1/8+	799	19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19332	E	5-15-2	MARY F WASZKIEWICZ	CHEVRON USA INC	1/8+	798	606	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19333	E	5-15-2	AUDREY E WELLS	CHEVRON USA INC	1/8+	798	386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC

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WV Department of  
Environmental Protection

03/02/2018

Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19334	E	5-15-2	KATHRYN G WOOD	CHEVRON USA INC	1/8+	800	162	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19335	E	5-15-2	WOODROW A. RYAN REV TRST JACK W. RYAN, TRUSTEE	CHEVRON USA INC	1/8+	799	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19337	E	5-15-2	JACK PETROCK HATTIE PETROCK	TRIENERGY, INC.	1/8+	663	498	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*14053	F	5-15-1	LARRY D. MCWHORTER	GASTAR EXPLORATION USA, INC.	1/8+	727	570	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14054	F	5-15-1	RUDOLPH RAUKAR, JR.	GASTAR EXPLORATION USA, INC.	1/8+	730	189	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14055	F	5-15-1	VICTOR PEDDICORD	GASTAR EXPLORATION USA, INC.	1/8+	730	193	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14056	F	5-15-1	WALLACE T. BERRY	GASTAR EXPLORATION USA, INC.	1/8+	731	156	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14057	F	5-15-1	THE SAMUEL MILTON SHEETS TRUST	GASTAR EXPLORATION USA, INC.	1/8+	732	624	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14058	F	5-15-1	NANCY HOFSTATTER	GASTAR EXPLORATION USA, INC.	1/8+	732	628	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14059	F	5-15-1	LAURA BERRY MCGLYNN	GASTAR EXPLORATION USA, INC.	1/8+	732	622	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14060	F	5-15-1	SUSAN E GORE	GASTAR EXPLORATION USA INC	1/8+	768	488	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14061	F	5-15-1	LINDA TAYLOR	GASTAR EXPLORATION USA, INC	1/8+	770	476	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14062	F	5-15-1	REBECCA MCMILLAN	GASTAR EXPLORATION USA INC	1/8+	803	482	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14063	F	5-15-1	DAVID BURNETT	GASTAR EXPLORATION USA INC	1/8+	803	480	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14043	F	5-15-1	PATRICK R. WALSH	GASTAR EXPLORATION USA, INC.	1/8+	725	566	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14044	F	5-15-1	JOSEPH WESLEY GALLAHER, II	GASTAR EXPLORATION USA, INC.	1/8+	724	232	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14045	F	5-15-1	LAMOYNE BAKER	GASTAR EXPLORATION USA, INC.	1/8+	724	236	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC
10*14046	F	5-15-1	CHARLES THOMPSON GALLAHER, II	GASTAR EXPLORATION USA, INC.	1/8+	724	234	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gaster Exploration II, Inc to TH Exploration II, LLC

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Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*14047	F	5-15-1	LESLIE ANN BLYTHE	GASTAR EXPLORATION USA, INC.	1/8+		645	N/A	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gstar Exploration USA, Inc to Gstar Exploration Inc	36/9 Gstar Exploration Inc to TH Exploration II, LLC
10*14048	F	5-15-1	BRYANNA FLYNN RANKIN	GASTAR EXPLORATION USA, INC.	1/8+		727	N/A	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gstar Exploration USA, Inc to Gstar Exploration Inc	36/9 Gstar Exploration Inc to TH Exploration II, LLC
10*14049	F	5-15-1	WILDA WINTERS	GASTAR EXPLORATION USA, INC.	1/8+		726	N/A	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gstar Exploration USA, Inc to Gstar Exploration Inc	36/9 Gstar Exploration Inc to TH Exploration II, LLC
10*14050	F	5-15-1	JUDITH L. CHAMBERS	GASTAR EXPLORATION USA, INC.	1/8+		726	N/A	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gstar Exploration USA, Inc to Gstar Exploration Inc	36/9 Gstar Exploration Inc to TH Exploration II, LLC
10*14051	F	5-15-1	AMANDA L. SMITH	GASTAR EXPLORATION USA, INC.	1/8+		727	N/A	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gstar Exploration USA, Inc to Gstar Exploration Inc	36/9 Gstar Exploration Inc to TH Exploration II, LLC
10*14052	F	5-15-1	MAY ELIZABETH GALLAHER BROWNING	GASTAR EXPLORATION USA, INC.	1/8+		727	N/A	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gstar Exploration USA, Inc to Gstar Exploration Inc	36/9 Gstar Exploration Inc to TH Exploration II, LLC
10*47051.331.1	F	5-15-1	LEANN M LEMONOVICH	TH EXPLORATION LLC	1/8+		910	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*14042	F	5-15-1	RALPH B TAYLOR	GASTAR EXPLORATION USA, INC.	1/8+		665	N/A	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gstar Exploration USA, Inc to Gstar Exploration Inc	36/9 Gstar Exploration Inc to TH Exploration II, LLC
10*14064	F	5-15-1	CIRRUS MINERALS LLC BY CHRISTO	GASTAR EXPLORATION INC	1/8+		843	N/A	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gstar Exploration USA, Inc to Gstar Exploration Inc	40/127 Chevron USA
10*19038	G	5-15-3	PHYLLIS L PARSONS	CHEVRON USA INC	1/8+		814	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA	Inc. to TH Exploration, LLC
10*19254	G	5-15-3	JOANNE LABRY	CHEVRON USA INC	1/8+		820	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA	Inc. to TH Exploration, LLC
10*19046	G	5-15-3	CAROL J WEINSTEIN	CHEVRON USA INC	1/8+		813	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA	Inc. to TH Exploration, LLC
10*19047	G	5-15-3	DEBORAH CROSTEN-PURCELL	CHEVRON USA INC	1/8+		813	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA	Inc. to TH Exploration, LLC
10*19048	G	5-15-3	JANET FRANKHAUSER WILSON	CHEVRON USA INC	1/8+		817	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA	Inc. to TH Exploration, LLC
10*19055	G	5-15-3	DONNA J GORDYAN	CHEVRON USA INC	1/8+		814	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA	Inc. to TH Exploration, LLC
10*19056	G	5-15-3	LESLIE R KEYS	CHEVRON USA INC	1/8+		814	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA	Inc. to TH Exploration, LLC
10*19061	G	5-15-3	ANN WOLLSCHLEGER	CHEVRON USA INC	1/8+		817	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA	Inc. to TH Exploration, LLC
10*19066	G	5-15-3	MICHAEL L FRANKHAUSER	CHEVRON USA INC	1/8+		818	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA	Inc. to TH Exploration, LLC
10*19068	G	5-15-3	LINDA L RUPERT	CHEVRON USA INC	1/8+		820	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA	Inc. to TH Exploration, LLC

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10*19069	G	5-15-3	SCOTT D FRANKHAUSER	CHEVRON USA INC	1/8+	822	446	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19071	G	5-15-3	DONNA L CLAPPER	CHEVRON USA INC	1/8+	820	191	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19074	G	5-15-3	PHILIP G FRANKHAUSER	CHEVRON USA INC	1/8+	822	441	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19076	G	5-15-3	FRANKHAUSER LIVING TRUST SUSAN LIVINGSTON, TRUSTEE	CHEVRON USA INC	1/8+	826	495	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19080	G	5-15-3	KATHLEEN R CUSTEAD	CHEVRON USA INC	1/8+	806	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19081	G	5-15-3	REVOCABLE TRUST AGREEMENT CHARLES S HAMEL	CHEVRON USA INC	1/8+	835	266	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19081	G	5-15-3	RUDINA A FRANKHAUSER	CHEVRON USA INC	1/8+	831	457	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19128	G	5-15-3	RUDOLPH G FRANKHAUSER	CHEVRON USA INC	1/8+	860	258	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19293	G	5-15-3	JOSEPH I. KRAMAR, SR. JO ANN KRAMAR	TRIENERGY, INC.	1/8+	655	566	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*19374	H	5-11-15	BARBARA ANN ADKINS JOHNSON	TH EXPLORATION LLC	1/8+	938	387	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19353	H	5-11-15	KATHLEEN TOLER CLEMENTS AND DAN CLEMENTS	TH EXPLORATION LLC	1/8+	939	322	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19350	H	5-11-15	JANE A TOLER FOREMAN	TH EXPLORATION LLC	1/8+	939	329	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18174	H	5-11-15	THE ESTATE OF ROY JOSEPH LEACH	TH EXPLORATION LLC	1/8+	927	647	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18045	H	5-11-15	KLOVA ANN MORRIS	TH EXPLORATION LLC	1/8+	927	114	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17329	H	5-11-15	JOHN P ICARD AND REVA J ICARD	TH EXPLORATION LLC	1/8+	943	524	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16913	H	5-11-15	LIONEL L AND MARY LEE PERSINGER	TH EXPLORATION LLC	1/8+	910	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*14911	H	5-11-15	FORREST MILLER	GASTAR EXPLORATION USA INC	1/8+	819	316	N/A	N/A	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gaster Exploration USA, Inc to TH Exploration II, Gaster Exploration Inc
10*19642	H	5-11-15	NOEL A PARKS	TH EXPLORATION LLC	1/8+	944	92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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TRIENERGY INC  
P O BOX 89  
SEWICKLEY, PA 15143-0089

STATE OF WEST VIRGINIA :  
:  
COUNTY OF MARSHALL :

ASSIGNMENT OF  
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS:

THAT, the undersigned:

TRIENERGY, INC.  
412 Beaver Street / 2<sup>nd</sup> floor  
P.O. Box 89  
Sewickley, PA 15143  
("Assignor")

For and in consideration of Ten Dollars (\$10.00) and other valuable consideration, the receipt of which is hereby acknowledged, does hereby sell, assign, convey, transfer and set over unto:

AB RESOURCES LLC  
7000 South Edgerton Road  
Suite 102  
Brecksville, OH 44141  
("Assignee")

A 100% WORKING INTEREST IN AND TO THE OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA AS SET FORTH IN EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF; AND RESERVING UNTO ASSIGNOR CERTAIN OVERRIDING ROYALTIES, DRILL SITE FEES AND ADDITIONAL TERMS AND CONDITIONS AS SET FORTH IN THAT CERTAIN "AGREEMENT TO ACQUIRE LEASEHOLD ACREAGE" DATED SEPTEMBER 2, 2006, BY AND BETWEEN ASSIGNOR AND ASSIGNEE.

Assignor's overriding royalty interest reserved hereunder shall be calculated and paid in the same manner as the Lessor's royalty as provided for in the subject leases. In the event any of the leases cover less than a full mineral interest in the lands described therein or Assignor owns less than a full interest in the leases, Assignor's overriding royalty interest shall be proportionately reduced.


Assignor covenants with and warrants to Assignee, its successors and assigns, that Assignor is the lawful owner of the interests in said leases, that Assignor has good and right authority to sell and convey the same, and that said leases are free and clear of all encumbrances, by, through or under Assignor.

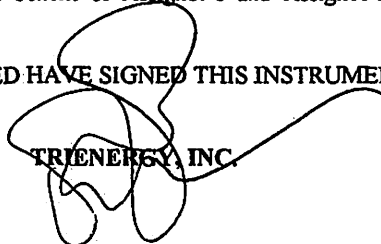
Assignee, by the acceptance of this Assignment, hereby agrees to be bound by and fulfill all of the terms, conditions, limitations and covenants of the leases herein assigned, and assumes and agrees to pay, perform or carry, as the case may be, its proportionate part of any royalties, overriding royalties, rentals, payments out of or with respect to production, and all other lease burdens and encumbrances to the extent of Assignee's interest. All interests and rights of Assignor in and to the assigned leasehold premises and the production therefrom provided for in this Assignment shall extend not only to the lease(s) assigned hereby, but also to any and all extensions or renewals thereof which maybe acquired by Assignee, it successors and assigns of any of the leases herein assigned.

This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED THIS INSTRUMENT THIS 13<sup>th</sup> DAY OF MARCH 2008.

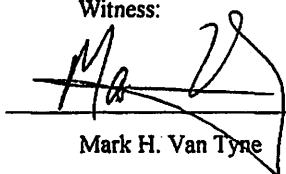
Witness:

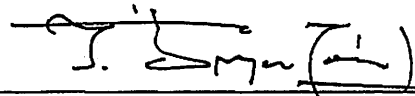
  
Print Name: Matthew Riva

  
TRIENERGY, INC.

By: Joseph E. Bojalad  
Its: President

Witness:

  
Mark H. Van Tyne

AB RESOURCES LLC  


By: Gordon O. Yonel  
Its: Chief Executive Officer

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*Chief Expl. & Dev. LLC  
6051 Shallice Rd. Ext. Suite 210  
Sheffield, Pa 15090*

BOOK 0021 PAGE 0491

## ASSIGNMENT OF OIL AND GAS LEASES

This Assignment of Oil and Gas Leases (the "Assignment") is from AB RESOURCES LLC, a Delaware limited liability company, whose address is 6802 W. Snowville Road, Suite E, Brecksville, Ohio 44141 (referred to as "Assignor") to CHIEF EXPLORATION & DEVELOPMENT LLC, a Texas limited liability company, whose address is 5956 Sherry Lane, Suite 1500, Dallas, Texas, and RADLER 2000 LIMITED PARTNERSHIP, a Texas limited partnership, whose address is 777 Taylor Street, Suite PII-C, Fort Worth, Texas 76102 (referred to jointly as "Assignee").

For adequate consideration the receipt of which is acknowledged, Assignor, subject to the terms and provisions herein contained as well as the reservations herein after set forth, does hereby grant, sell, assign and convey, effective as of March 26, 2008 (the "Effective Date"), unto Assignee, its successors and assigns, an undivided fifty percent (50%) working interest in, to and under the Oil and Gas Leases identified on Exhibit "A" attached to and made a part hereof covering the lands described on Exhibit "A".

For purposes of this Assignment (a) the Oil and Gas Leases described on Exhibit "A" are referred to as the "Leases", (b) the lands covered by the Leases are referred to as the "Lands", and (c) the undivided working interest in, to and under the Leases and the Lands assigned and conveyed by Assignor to Assignee pursuant to this Assignment hereinafter collectively are referred to as the "Assigned Interests".

This Assignment is made expressly subject to the following:

1. The Assigned Interests will be subject to (i) the royalty interest as provided in the Leases and any recorded assignment of the Leases to Assignee, and (ii) all of the terms, conditions and provisions set forth in the Leases and/or such assignment of the Leases to Assignee.
2. The Assigned Interests will be subject to that certain Participation Agreement dated November 29, 2007 (the "Agreement"), between AB Resources LLC and Chief Exploration & Development LLC, as well as the Operating Agreement that is part of and associated with the Agreement, and any reference hereunder to the "Agreement" shall include its associated Operating Agreement. All the terms and provisions of the Agreement are fully incorporated herein by reference.
3. Assignor warrants the title to the Assigned Interests unto Assignee, its successors and assigns, against all adverse claims arising by, through and under Assignor, but not otherwise. EXCEPT AS PROVIDED IN THE PRECEDING SENTENCE AND EXCEPT AS PROVIDED IN THE UNRECORDED AGREEMENT, THIS ASSIGNMENT IS WITHOUT WARRANTY, EXPRESS, IMPLIED, OR STATUTORY, WHATSOEVER.

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CONVEYANCE

THE STATE OF WEST VIRGINIA §

COUNTY OF MARSHALL §

Chief Exploration & Development LLC and Radler 2000 Limited Partnership (herein each individually called "Any Grantor" and collectively called "Grantor"), for Ten Dollars and other good and valuable consideration (the receipt and sufficiency of which are hereby acknowledged), do hereby GRANT, BARGAIN, SELL, CONVEY, ASSIGN, TRANSFER, SET OVER, and DELIVER unto Enerplus Resources (USA) Corporation (herein called "Grantee"), whose address is Wells Fargo Center, 1700 Lincoln Street, Suite 1300, Denver, CO 80203, effective as of May 1, 2009 (the "Effective Date") an undivided thirty percent (30%) interest in and of:

(a) all of Grantor's rights, titles, interests and obligations in and to the oil, gas or mineral lease(s) described on **Exhibit A** hereto and made a part hereof for all purposes; and

(b) all rights, titles, interests and obligations of Grantor in and to (i) the oil, gas or mineral lease(s) described on **Exhibit B** hereto and (ii) the wells described on **Exhibit C** hereto.

The properties, rights and interests specified in the foregoing subparagraphs (a) and (b), except for the Excluded Properties excepted and reserved below, are herein sometimes collectively called the "**Subject Properties**". The Subject Properties do not include, and there is hereby expressly excepted and excluded therefrom and reserved to Grantor:

- i. all rights and choses in action, arising, occurring or existing in favor of Grantor prior to the Effective Date or arising out of the operation of or production from the Subject Properties prior to the Effective Date (including any and all contract rights, claims, receivables, revenues, recoupment rights, recovery rights, accounting adjustments, mispayments, erroneous payments or other claims of any nature in favor of Grantor and relating and accruing to any time period prior to the Effective Date); provided, however, notwithstanding anything herein to the contrary, "Excluded Properties" shall not include any rights and choses in action arising or attributable to any Minimum Royalty Litigation with respect to the Subject Properties, regardless of whether such rights or choses in action are attributable to periods prior to, on or after the Effective Date;
- ii. any accounts payable accruing before the Effective Date;
- iii. all corporate, financial, tax and legal (other than title) records of Any Grantor;
- iv. all contracts of insurance or indemnity subject to Section 15.1 of the Purchase and Sale Agreement (as defined below);
- v. all hydrocarbon production from or attributable to production from the Subject Properties with respect to all periods prior to the Effective Date as described in Section 13.1 of the Purchase and Sale Agreement and all proceeds attributable thereto;
- vi. any refund of costs, taxes or expenses borne by Grantor attributable to the period prior to the Effective Date;
- vii. all deposits, cash, checks, funds and accounts receivable attributable to the Subject Properties with respect to any period of time prior to the Effective Date;
- viii. all computer or communications software or intellectual property (including tapes, data and program documentation and all tangible manifestations and technical information relating thereto) owned, licensed or used by Any Grantor;

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ASSIGNMENT AND BILL OF SALE

STATE OF WEST VIRGINIA

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§

COUNTY OF MARSHALL

JIM LAND SERVICE INC.  
11106 STATE HIGHWAY 18  
CONNEAUT LAKE, PA 16316-3620

THIS ASSIGNMENT AND BILL OF SALE (this "Assignment") is made by and among Chief Exploration & Development LLC, a Texas limited liability company, having an office at 5956 Sherry Lane, Suite 1500, Dallas, TX 75225, Chief Oil & Gas LLC, a Texas limited liability company, having an office at 5956 Sherry Lane, Suite 1500, Dallas, TX 75225, (jointly "Chief"), Radler 2000 Limited Partnership, a Texas limited partnership, having an office at 3131 West 7<sup>th</sup> Street, 4<sup>th</sup> Floor, Fort Worth, TX 76107 ("Radler" and together with Chief "Chief/Radler"), and Enerplus Resources (USA) Corporation, a Delaware corporation, having an office at US Bank Tower, 950 17th Street, Denver, Colorado 80202-2805 ("Enerplus" and together with Chief/Radler, "Assignors"), and Chevron U.S.A. Inc., a Pennsylvania corporation, having an office at Westpointe Corporate Center One, 1550 Coraopolis Heights Road, Moon Township, PA 15108 ("Assignee"). Hereinafter, each of Assignors and Assignee are referred to as a "Party" and collectively as the "Parties".

ARTICLE I  
ASSIGNMENT OF INTEREST

1.1 **Assignment.** For and in consideration of Ten Dollars (\$10.00) and other good and valuable consideration, including (a) as to Chief/Radler and Assignee, the mutual covenants and agreements described in that certain unrecorded Purchase and Sale Agreement dated May 3, 2011, by and among Chief/Radler, as sellers, and Assignee, as buyer (the "Chief/Radler Purchase Agreement") and (b) as to Enerplus and Assignee, the mutual covenants and agreements described in that certain unrecorded Purchase and Sale Agreement dated June 14, 2011, by and between Enerplus, as seller, and Assignee, as buyer (the "Enerplus Purchase Agreement" and together with the Chief/Radler Purchase Agreement, the "Purchase Agreements"), the receipt and sufficiency of which is hereby acknowledged by Assignors, Assignors do hereby GRANT, BARGAIN, SELL, CONVEY, ASSIGN, TRANSFER, and SET OVER unto Assignee, effective as of the Effective Date (as defined below), subject to the exceptions, reservations, terms and conditions herein contained, all of Assignors' rights, title and interest in and to the following assets (collectively, the "Subject Properties"):

(a) All of the oil, gas or mineral leases described on Exhibit A attached hereto, and any ratifications and amendments thereof, whether or not same are described thereon (the "Leases");

(b) All of the wells described on Exhibit B attached hereto (the "Wells") together with all oil, gas, other liquid or gaseous hydrocarbons, or any of them or any combination thereof, and all products extracted, separated, processed and produced therefrom ("Hydrocarbon");

(c) All presently existing and valid, oil, gas or mineral unitization, pooling, and/or communitization agreements, declarations and/or orders, and Assignor's interests in and to the properties covered or the units created thereby to the extent attributable to the Leases (collectively the "Units");

(d) All presently existing and valid operating agreements, production sales contracts, and other agreements and contracts, including, but not limited to those listed on Exhibit C attached hereto to the extent that they relate to any of the Leases, Wells, or Units (the "Contracts");

(e) All materials, supplies, machinery, equipment, improvements and other personal property and fixtures, including, but not limited to, all wellhead equipment, pumping units, wellsite flowlines, tanks, buildings, injection facilities, saltwater disposal

Prepared by:

Chief Oil & Gas LLC  
5956 Sherry Lane, Suite 1500  
Dallas, Texas 75225

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ASSIGNMENT AND BILL OF SALE

STATE OF WEST VIRGINIA  
  
COUNTY OF MARSHALL

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JTA LAND SERVICE, INC.  
11106 STATE HIGHWAY 18  
CUMMERT LAKE, PA 16316-3620

THIS ASSIGNMENT AND BILL OF SALE (this "Assignment") is made by and among Chief Exploration & Development LLC, a Texas limited liability company, having an office at 5956 Sherry Lane, Suite 1500, Dallas, TX 75225, Chief Oil & Gas LLC, a Texas limited liability company, having an office at 5956 Sherry Lane, Suite 1500, Dallas, TX 75225, (jointly "Chief"), Radler 2000 Limited Partnership, a Texas limited partnership, having an office at 3131 West 7<sup>th</sup> Street, 4<sup>th</sup> Floor, Fort Worth, TX 76107 ("Radler" and together with Chief "Chief/Radler"), and Enerplus Resources (USA) Corporation, a Delaware corporation, having an office at US Bank Tower, 950 17th Street, Denver, Colorado 80202-2805 ("Enerplus" and together with Chief/Radler, "Assignors"), and Chevron U.S.A. Inc., a Pennsylvania corporation, having an office at Westpointe Corporate Center One, 1550 Coraopolis Heights Road, Moon Township, PA 15108 ("Assignee"). Hereinafter, each of Assignors and Assignee are referred to as a "Party" and collectively as the "Parties".

ARTICLE I  
ASSIGNMENT OF INTEREST

1.1 **Assignment.** For and in consideration of Ten Dollars (\$10.00) and other good and valuable consideration, including (a) as to Chief/Radler and Assignee, the mutual covenants and agreements described in that certain unrecorded Purchase and Sale Agreement dated May 3, 2011, by and among Chief/Radler, as sellers, and Assignee, as buyer (the "Chief/Radler Purchase Agreement") and (b) as to Enerplus and Assignee, the mutual covenants and agreements described in that certain unrecorded Purchase and Sale Agreement dated June 14, 2011, by and between Enerplus, as seller, and Assignee, as buyer (the "Enerplus Purchase Agreement" and together with the Chief/Radler Purchase Agreement, the "Purchase Agreements"), the receipt and sufficiency of which is hereby acknowledged by Assignors, Assignors do hereby GRANT, BARGAIN, SELL, CONVEY, ASSIGN, TRANSFER, and SET OVER unto Assignee, effective as of the Effective Date (as defined below), subject to the exceptions, reservations, terms and conditions herein contained, all of Assignors' rights, title and interest in and to the following assets (collectively, the "Subject Properties"):

(a) All of the oil, gas or mineral leases described on Exhibit A attached hereto, and any ratifications and amendments thereof, whether or not same are described thereon (the "Leases");

(b) All of the wells described on Exhibit B attached hereto (the "Wells") together with all oil, gas, other liquid or gaseous hydrocarbons, or any of them or any combination thereof, and all products extracted, separated, processed and produced therefrom ("Hydrocarbons");

(c) All presently existing and valid, oil, gas or mineral unitization, pooling, and/or communitization agreements, declarations and/or orders, and Assignor's interests in and to the properties covered or the units created thereby to the extent attributable to the Leases (collectively the "Units");

(d) All presently existing and valid operating agreements, production sales contracts, and other agreements and contracts, including, but not limited to those listed on Exhibit C attached hereto, to the extent that they relate to any of the Leases, Wells, or Units (the "Contracts");

(e) All materials, supplies, machinery, equipment, improvements and other personal property and fixtures, including, but not limited to, all wellhead equipment, pumping units, wellsite flowlines, tanks, buildings, injection facilities, saltwater disposal facilities, compression facilities, and other equipment) to the extent that they relate to any of the Leases, Wells, or Units and are used in connection with the exploration, development, operation or maintenance thereof;

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Jan Pest  
MARSHALL County 10:58:04 AM  
Instrument No 1317418  
Date Recorded 01/26/2012  
Document Type O&G  
Pages Recorded 31  
Book-Page 756-397  
Recording Fee \$31.00  
Additional \$9.00

MARSHALL COUNTY, WEST VIRGINIA

CONVEYANCE

This Conveyance (this "Conveyance") is dated as of August 5, 2011 (the "Execution Date"), by and between AB Resources LLC, a Delaware limited liability company ("Grantor"), on the one part, and Chevron U.S.A. Inc., a Pennsylvania corporation ("Grantee"), on the other part. Each of Grantor and Grantee are sometimes referred to herein individually as a "Party" and collectively as the "Parties."

Capitalized terms used but not defined herein shall have the respective meanings set forth in that certain Purchase and Sale Agreement (the "PSA"), dated as of July 6, 2011, by and between Grantor and Grantee.

ARTICLE I  
CONVEYANCE

Section 1.1 Conveyance. Subject to the terms and conditions hereof, with effect as of 7:00 a.m., Eastern Time, on April 1, 2011 (the "Effective Date"), Grantor, for and in consideration of the sum of Ten Dollars (\$10.00) cash and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, hereby sells, transfers and conveys unto Grantee, and Grantee hereby accepts from Grantor, all of Grantor's right, title and interest in and to the following (collectively the "Assets"; but excepting and excluding, in all such instances, the Excluded Assets):

(a) All oil and gas leases, oil, gas and mineral leases, subleases and other leaseholds, royalties, overriding royalties, net profits interests, mineral fee interests, carried interests and other rights to Hydrocarbons in place owned by Grantor in the Asset Areas, including those that are identified on Exhibit A-1 (collectively, the "Leases"), subject to the depth limitations and other restrictions that may be set forth in the Leases;

(b) All pooled, communitized or unitized acreage which includes all or a part of any Lease (the "Units"), and all tenements, hereditaments and appurtenances belonging to the Leases and Units;

(c) All oil, gas, water, carbon dioxide or injection wells located on the Leases or Units, whether producing, shut-in or temporarily abandoned, including the interests in the wells shown on Exhibit A-2, but excluding, however, the Devonian Wells (subject to such exclusion, the "Wells");

(d) All flowlines, pipelines, gathering systems and appurtenances thereto located on the Leases or Units or used, or held for use, in connection with the operation of the

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Attached to the Asset Sale and Purchase Agreement dated December 31, 2012, between TriEnergy Holdings, LLC and TriEnergy, Inc. as Seller, and Chevron U.S.A. Inc., as Buyer.

**CONVEYANCE, ASSIGNMENT AND BILL OF SALE**

THIS CONVEYANCE, ASSIGNMENT AND BILL OF SALE (this "Assignment") dated effective from and after 11:59 p.m., December 31, 2012 Eastern Standard Time Zone (said date and time hereinafter referred to as the "Effective Date"), is by and between TriEnergy Holdings, LLC, a Pennsylvania limited liability company, and TriEnergy, Inc., a Pennsylvania corporation, both with an address at 412 Beaver Street, 2<sup>nd</sup> Floor, Sewickley, Pennsylvania 15143 (collectively "Assignor") and Chevron U.S.A. Inc., a Pennsylvania corporation, having an office at 1550 Coraopolis Heights Road, P.O. Box 611, Moon Township, Pennsylvania 15108 ("Assignee").

WITNESSETH:

1. Conveyance. For and in consideration of the sum of Ten and No/100 Dollars (\$10.00), cash in hand paid, and other valuable consideration, including the assumption by Assignee of certain obligations and liabilities described in that certain Asset Sale and Purchase Agreement dated effective December 31, 2012, by and between Assignor, as Seller, and Assignee, as Buyer, (the "Purchase and Sale Agreement"), the receipt and sufficiency of which are hereby acknowledged, Assignor, subject to said Purchase and Sale Agreement (which Purchase and Sale Agreement is incorporated herein by reference for all purposes), does hereby sell, transfer, assign, convey, set over and deliver unto Assignee good and marketable title to the Assets (as defined below), but in "AS IS WHERE IS" condition as to quality, with the express conditions and limitations contained in the Purchase and Sale Agreement, and in particular to the working interests and participatory rights shown on Exhibit A attached hereto and made a part hereof for all purposes, with and under warranty of its title against encumbrances, mortgages and liabilities, limited to claims or omissions by, through or under Assignor, Assignor's affiliates, and the directors, officers, employees, contractors and representatives of each of them, together with full rights of subrogation in and to all prior warranties, subject to the terms hereof, all of Assignor's rights, title and interests in and to the following (collectively, the "Assets"):
  - 1.1 All working interests and participatory interests in rights to explore and produce from or operating rights in oil and gas leases and associated properties (the "Leases") in Marshall County, West Virginia that AB Resources LLC and NPAR, Inc. previously assigned to Assignee, which Leases are listed on Exhibit A, attached to this Assignment (including any renewals, extensions, ratifications and amendments to such interests whether or not such renewals, extensions, ratifications or amendments are described on Exhibit A) (including any option to participate in future development), together with all oil and gas unitization and communitization agreements, declarations and/or orders relating to the Leases (collectively, the "Units").
  - 1.2 All oil and gas wells and other wells located on the Leases, within the Units or as listed on Exhibit B (collectively, the "Wells").

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STATE OF WEST VIRGINIA

§

COUNTY OF MARSHALL

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**ASSIGNMENT AND BILL OF SALE**

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

**RECITALS**

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

**1. DEFINITIONS**

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

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

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

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

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

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

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

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TRIENERGY, INC  
PO BOX 89  
SEWICKLEY, PA 15143-0089

BOOK 20 PAGE 252

STATE OF WEST VIRGINIA :  
:  
COUNTY OF MARSHALL :

ASSIGNMENT OF  
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS:

THAT, the undersigned:

TRIENERGY, INC.  
412 Beaver Street / 2<sup>nd</sup> floor  
P.O. Box 89  
Sewickley, PA 15143  
("Assignor")

JAN PEST  
MARSHALL County 12:12:26 PM  
Instrument No 1248387  
Date Recorded 01/22/2008  
Document Type ASN  
Book-Page 20-252  
Rec/Preserve \$5.00 \$1.00

For and in consideration of Ten Dollars (\$10.00) and other valuable consideration, the receipt of which is hereby acknowledged, does hereby sell, assign, convey, transfer and set over unto:

AB RESOURCES LLC  
7000 South Edgerton Road  
Suite 102  
Brecksville, OH 44141  
("Assignee")

A 100% WORKING INTEREST IN AND TO THE OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA AS SET FORTH IN EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF; AND RESERVING UNTO ASSIGNOR CERTAIN OVERRIDING ROYALTIES, DRILL SITE FEES AND ADDITIONAL TERMS AND CONDITIONS AS SET FORTH IN THAT CERTAIN "AGREEMENT TO ACQUIRE LEASEHOLD ACREAGE" DATED SEPTEMBER 2, 2006, BY AND BETWEEN ASSIGNOR AND ASSIGNEE.

Assignor's overriding royalty interest reserved hereunder shall be calculated and paid in the same manner as the Lessor's royalty as provided for in the subject leases. In the event any of the leases cover less than a full mineral interest in the lands described therein or Assignor owns less than a full interest in the leases, Assignor's overriding royalty interest shall be proportionately reduced.

Assignor covenants with and warrants to Assignee, its successors and assigns, that Assignor is the lawful owner of the interests in said leases, that Assignor has good and right authority to sell and convey the same, and that said leases are free and clear of all encumbrances, by, through or under Assignor.

Assignee, by the acceptance of this Assignment, hereby agrees to be bound by and fulfill all of the terms, conditions, limitations and covenants of the leases herein assigned, and assumes and agrees to pay, perform or carry, as the case may be, its proportionate part of any royalties, overriding royalties, rentals, payments out of or with respect to production, and all other lease burdens and encumbrances to the extent of Assignee's interest. All interests and rights of Assignor in and to the assigned leasehold premises and the production therefrom provided for in this Assignment shall extend not only to the lease(s) assigned hereby, but also to any and all extensions or renewals thereof which maybe acquired by Assignee, it successors and assigns of any of the leases herein assigned.

This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND SEALED THIS INSTRUMENT THIS 19<sup>th</sup> DAY OF DECEMBER 2007.

Witness:

*Deb Reid*

Print Name: Deb Reid

TRIENERGY, INC.

By: Joseph E. Bojalad  
Its: President

Witness:

*Mark H. Van Tyne*  
Mark H. Van Tyne

AB RESOURCES LLC

By: Gordon O. Yonel  
Its: Chief Executive Officer

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WV Dept. of Environmental Protection



## MEMORANDUM OF PARTICIPATION AGREEMENT

This Memorandum of Participation Agreement is entered into this 29th day of November, 2007, between AB RESOURCES LLC, whose address is 7000 S. Edgerton Road, Suite 102, Brecksville, Ohio 44141 (referred to hereinafter as "AB") and CHIEF EXPLORATION & DEVELOPMENT LLC, whose address is 5956 Sherry Lane, Suite 1500, Dallas, Texas 75225 (referred to hereinafter as "Chief").

AB owns oil and gas leases covering approximately 41,084 net mineral acres of land situated in Marshall County, West Virginia, Somerset and Fayette Counties, Pennsylvania, and Garrett County, Maryland. Such oil and gas leases collectively are referred to hereinafter as the "Leases." The Leases and the lands covered by the Leases are described on Exhibit "A" attached hereto.

AB and Chief have entered into a Participation Agreement of even date herewith (the "Agreement") pursuant to which by causing wells in search of oil and/or gas to be drilled upon or involving the Leases, subject to the terms and conditions expressed in the Agreement, Chief owns an exclusive option to earn and be entitled to receive a record assignment of up to an undivided fifty percent (50%) working interest in and to the Leases, limited to all depths/formations below the top of the Huron Shale formation.

The duration of the Agreement is from the date hereof until such time as Chief has failed to drill and complete as producers of oil or gas or plug and abandon as dry holes the minimum number of wells annually as prescribed in the Agreement.

Among the provisions of the Agreement are the following:

"For the duration of this Agreement and until such time as the leasehold assignments contemplated in Section 4.3 [of the Agreement] are delivered by AB to Chief and recorded in the applicable public records, AB will be prohibited from doing or undertaking any of the following actions relative to or affecting the undivided working interests in any and all of the Leases to which Chief has become entitled to an assignment or as to which Chief yet may earn the right to an assignment, in accordance with the terms and provisions of this Agreement (collectively, the "Chief Interests"):

- (a) Assigning any interest out of or burdening the Chief Interests;
- (b) Creating or allowing to be created any lien, encumbrance or contract right affecting the Chief Interests;
- (c) Entering into any mortgage, pledge or security agreement as to which the Chief Interests serve as collateral, in whole or in part;
- (d) Dedicating or otherwise committing the Chief Interests to any oil or gas sales contract; and
- (e) Entering into any transaction, executing any documentation or otherwise taking any action which would have the effect of causing title to the Chief Interests not to be free and clear of any and all claims arising by, through and under AB."

The Agreement, with all of its terms, covenants and other provisions, is referred to and incorporated into this Memorandum for all purposes. This Memorandum is placed of record for the purpose of giving notice of the Agreement. Nothing contained in this Memorandum will alter or amend any of the terms and provisions of the Agreement. Complete copies of the Agreement are maintained at the offices of AB and Chief at the addresses set forth above.

This Memorandum may be executed in counterparts each of which will be deemed to be an original. Counterparts of this Memorandum will be filed for recording

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BOOK 0021 PAGE 0520

## MEMORANDUM OF PARTIAL ASSIGNMENT OF CONTRACT RIGHTS

This Memorandum of Partial Assignment of Contract Rights (the "Memorandum") is executed this 1st day of September, 2009, by Chief Exploration and Development LLC (herein individually called "Chief"), whose address is 5956 Sherry Lane, Suite 1500, Dallas, Texas 75225 and Radler 2000 Limited Partnership, whose address is 777 Taylor Street, Suite PII-C, Fort Worth, Texas 76102 (herein jointly called "Grantor").

Previously Chief entered into a certain Participation Agreement dated November 29, 2007 (the "Participation Agreement"), with AB Resources LLC, whose address is 7000 S. Edgerton Road, Suite 102, Brecksville, Ohio 44141 applicable to oil and gas leases covering approximately 41,084 net mineral acres of land situated in Marshall County, West Virginia, Somerset and Fayette Counties, Pennsylvania, and Garrett County, Maryland.

Memoranda of the Participation Agreement, including descriptions of the oil and gas leases and lands covered by the Participation Agreement (the "Subject Properties"), are recorded in the public records of the herein after named counties, as follows (the "Prior Memoranda"):

- (a) Instrument Number 200800001360, Book 3052, Page 952 of the Official Records in the Recorder's Office of Fayette County, Pennsylvania;
- (b) Book 2018, Page 145 in the Recorder of Deeds Office of Somerset County, Pennsylvania;
- (c) Liber 1353, Page 450 in the Land Records of Garrett County, Maryland; and
- (d) Book 666, Page 40 in the records maintained in the Office of the Clerk of the County Commission of Marshall County, West Virginia.

Effective as of 7:00 a.m. Local Time of the location of the applicable Subject Properties on May 1, 2009, Grantor executed and delivered to Enerplus Resources (USA) Corporation, whose address is Suite 1300, Wells Fargo Center, 1700 Lincoln Street, Denver, Colorado 80203 (herein called "Grantee") a Partial Assignment of Contract Rights (the "Assignment") therein SELLING, TRANSFERRING AND ASSIGNING unto Grantee, subject to the terms and conditions set forth in the Assignment, an undivided thirty percent (30%) interest in and of all of Grantor's rights, titles, interests and obligations in, to and under the Participation Agreement.

The Assignment, the Participation Agreement and the Prior Memoranda, with all of their respective terms, covenants and other provisions, collectively are referred to and incorporated into this Memorandum for all purposes. This Memorandum is placed of record for purpose of giving notice of the Assignment. Nothing contained in this Memorandum will alter or amend any of the terms and provisions of the Assignment, the Participation Agreement or the Prior Memoranda. Complete copies of the Assignment are maintained at the offices of Grantor and Grantee at the addresses set forth above.

This Memorandum may be executed in counterparts each of which will be deemed to be an original, except that each counterpart will contain the form of acknowledgment applicable to the particular county and state or commonwealth in which such counterpart is to be recorded.

CHIEF EXPLORATION &amp; DEVELOPMENT LLC

By: Glynne Mildren  
Senior Vice President - Land

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Environmental Protection

03/02/2018

CAPITOL SERVICES INC  
 PO BOX 1831  
 AUSTIN, TX 78767-1831

BOOK 0021 PAGE 0041

# Delaware

PAGE 1

*The First State*

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF MERGER, WHICH MERGES:

"GASTAR EXPLORATION, INC.", A DELAWARE CORPORATION, WITH AND INTO "GASTAR EXPLORATION USA, INC." UNDER THE NAME OF "GASTAR EXPLORATION INC.", A CORPORATION ORGANIZED AND EXISTING UNDER THE LAWS OF THE STATE OF DELAWARE, AS RECEIVED AND FILED IN THIS OFFICE THE THIRTY-FIRST DAY OF JANUARY, A.D. 2014, AT 10:13 O'CLOCK A.M.

A FILED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS.

Jan Pest  
 MARSHALL County 02:00:18 PM  
 Instrument No 1357802  
 Date Recorded 03/20/2014  
 Document Type MIS  
 Pages Recorded 3  
 Book-Page 21-41  
 Recording Fee \$5.00  
 Additional \$6.00

4987302 8100M

140115998

You may verify this certificate online  
 at [corp.delaware.gov/authver.shtml](http://corp.delaware.gov/authver.shtml)



  
 Jeffrey W. Bullock, Secretary of State  
 AUTHENTICATION: 1101398

DATE: 01-31-14

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 WV Department of  
 Environmental Protection

03/02/2018

WHEN RECORDED RETURN TO:  
TH Exploration II, LLC  
1320 South University Drive, Suite 500  
Fort Worth, Texas 76107  
Attn: David Kalish

*Execution Version*

**ASSIGNMENT AND BILL OF SALE**

STATE OF WV §  
COUNTY OF MARSHALL §      **KNOW ALL MEN BY THESE PRESENTS:**

THIS ASSIGNMENT AND BILL OF SALE (this "*Assignment*"), dated April 7, 2016, but effective as of 7:00 A.M. Houston time on January 1, 2016 (the "*Effective Time*"), is between Gstar Exploration Inc., a Delaware corporation, whose address is 1331 Lamar Street, Suite 650 Houston, Texas 77010 ("*Assignor*"), and TH Exploration II, LLC, a Texas limited liability company, whose address is 1320 South University Drive, Suite 500, Fort Worth, Texas 76107 ("*Assignee*"). Assignor and Assignee are each, individually, referred to herein as a "*Party*" and, collectively, as the "*Parties*".

Capitalized terms used but not defined herein shall have the respective meanings set forth in that certain Purchase and Sale Agreement (the "*Purchase Agreement*"), dated as of February 19, 2016, by and between Assignor and Assignee (as successor-in-interest).

**Section 1. Assignment.** The conveyance and assignment herein shall be deemed effective as of the Effective Time.

For Ten Dollars (\$10.00) and other good and valuable consideration (the receipt and sufficiency of which are hereby acknowledged), Assignor does hereby forever GRANT, BARGAIN, SELL, CONVEY, ASSIGN, TRANSFER, SET OVER AND DELIVER unto Assignee, all of Assignor's right, title and interest in and to the following interests and properties (such right, title and interest described in *subsections (a) through (l)* of this Section 1, less and except the Excluded Assets, collectively, the "*Conveyed Interests*");

(a) all oil, gas and/or mineral leases of Assignor, together with any and all other right, title and interest of Assignor in and to the leasehold estates created thereby, including subleases, royalties, overriding royalties, net profits interest, carried interests or similar rights or interests in such leases, and together with all rights, privileges, benefits and powers conferred upon Assignor with respect to the use and occupation of the lands covered thereby that may be necessary, convenient or incidental to the possession and enjoyment of such leases, located in Marshall, Wetzell, Doddridge, Harrison, Lewis, Marion, and Monongalia Counties, West Virginia and Greene, Butler, Fayette, Somerset, and Clearfield Counties, Pennsylvania, including those described on Exhibit A—Part 1 attached hereto (subject to any reservations, limitations or depth restrictions described on Exhibit A—Part 1), (Assignor's interest in such leases and other right, title and interest as so limited, the "*Leases*");

(b) all rights and interests in, under or derived from all unitization agreements in effect with respect to any of the Leases and the units created thereby, including those described

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

BOOK 0040 PAGE 0127

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

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Environmental Protection

SKADDEN ARPS SLATE MEAGHER & FLOM LLP ATT: DAVID PASSARELLI  
1000 LOUISIANA SUITE 6800  
HOUSTON, TX 77002-5026

BOOK 0023 PAGE 0353

When Recorded Please Return To:  
Skadden, Arps, Slate, Meagher & Flom LLP  
1000 Louisiana, Suite 6800  
Houston, TX 77002  
Attn: David Passarelli

**ASSIGNMENT, BILL OF SALE AND CONVEYANCE**

This Assignment, Bill of Sale and Conveyance (this "Assignment") is from Gstar Exploration USA, Inc., a Michigan Corporation ("Assignor"), whose address is 1331 Lamar, Suite 1080, Houston, Texas 77010, to Atinum Marcellus I LLC, a Delaware limited liability company ("Assignee"), whose address is 333 Clay, Suite 700, Houston, Texas 77002, and effective as of 12:01 a.m. (Eastern Time) on September 1, 2010 (the "Effective Time").

**RECITALS**

WHEREAS, Assignor and Assignee desire that Assignor sell, assign, transfer and convey to Assignee, and that Assignee purchase and receive from Assignor, an undivided 3/14ths, increasing automatically to 50% as provided in Section 2.3 below, of all right, title and interest held by Assignor in the assets and properties described below in accordance with this Assignment and the Purchase Agreement (defined below).

WHEREAS, the parties acknowledge and agree that the transactions contemplated by this Assignment are integral to the transactions contemplated by the Purchase Agreement and the Participation Agreement (defined below) and that the execution of this Assignment on the terms and conditions set forth herein is a condition to the parties' obligations to effect the closing under the Purchase Agreement.

NOW, THEREFORE, for and in consideration of the mutual promises contained herein and in the Purchase Agreement, the benefits to be derived by each party hereunder and under the Purchase Agreement, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

**ARTICLE I  
DEFINED TERMS**

**1.1 Definitions.**

(a) In addition to the terms defined in the preamble of this Assignment, for the purposes hereof, the following expressions and terms shall have the meanings set forth in this Section 1.1(a), unless the context otherwise requires:

(i) "Participation Agreement" shall mean the Participation Agreement, dated as of November 1, 2010, by and among Assignor and Assignee.

(ii) "Purchase Agreement" shall mean the Purchase and Sale Agreement, dated as of September 21, 2010, by and between Assignor and Assignee.

(b) Other capitalized terms used in this Assignment and not otherwise defined herein and defined in the Purchase Agreement shall have the meanings given to such terms in the Purchase Agreement.

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BOOK 0032 PAGE 0362

CHEVRON  
PO BOX 611  
MOON TOWNSHIP, PA 15108-0611

**ASSIGNMENT OF OIL AND GAS LEASES**

STATE OF WEST VIRGINIA  
COUNTY OF MARSHALL

KNOW ALL MEN BY THESE PRESENTS:

Jan Pest  
MARSHALL County 02:28:35 PM  
Instrument #: 1567204  
Date Recorded: 10/02/2014  
Document Type: SM  
Pages Recorded: 8  
Book-Page: 32-362  
Recording Fee: \$8.00  
Additional: \$6.00

THIS ASSIGNMENT made this 25 day of September, 2014, from Gastar Exploration Inc, a Delaware Corporation, with its principal offices at 1331 Lamar Street, Suite 650, Houston, Texas 77010 and Atinum Marcellus I LLC, a Delaware limited liability company, with an address at 333 Clay, Suite 700, Houston, TX 77002 ("Assignor") to Chevron U.S.A. Inc., a Pennsylvania corporation, with an address at 1550 Coraopolis Heights Road, P.O. Box 611, Moon Township, PA 15108 ("Assignee").

Any capitalized terms used but not defined in this Assignment shall have the meaning ascribed to such terms in that certain Acreage Trade Agreement dated August 1, 2014 by and among Assignor, Assignee (the "Trade Agreement").

WITNESSETH THAT:

WHEREAS, Assignor is the owner of an undivided interest in those certain Oil and Gas Leases in Marshall County, West Virginia, which are described in Schedule A attached hereto (the "Leases"); and

WHEREAS, Assignor desires to grant, bargain, sell, convey, transfer and assign to Assignee all of Assignor's right, title and interest in the oil and gas leasehold estates covered by the Leases.

NOW, THEREFORE, in consideration of One Dollar (\$1.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, subject to the limited warranties and conditions hereinafter mentioned, Assignor does hereby grant, bargain, sell, convey, transfer and assign to Assignee, its successors and assigns, all of Assignor's right, title and interest in, to and under the Leases, and subleases thereon, easements to the extent appurtenant thereto, operating rights, Working Interests, permits, authorizations, Net Revenue Interests, and other rights to Petroleum Substances described in Schedule A, subject to the terms and conditions of the Leases and this Assignment.

Assignee does hereby assume and agree to pay, satisfy and/or perform all of the obligations, covenants and liabilities of Assignor under said Leases with respect to the interests in the oil and gas leasehold estates covered by this Assignment, and Assignor does hereby covenant and agree to pay, satisfy and/or perform all of its obligations, covenants and liabilities under said Leases, in each case, pursuant to the Trade Agreement.

Assignor hereby agrees to warrant and defend the title to the Leases hereby assigned unto Assignee, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignor, but not otherwise.

This Assignment may be executed in any number of counterparts, each of which will be deemed an original of this Assignment, and which together will constitute one and the same instrument; provided that no party is bound to this Assignment unless and until all parties have executed a counterpart.

Signature Page Follows-

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03/02/2018



December 14, 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 N-2HM

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 N-2HM 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-hillop.com](mailto:amiller@tug-hillop.com).

Sincerely,

A handwritten signature in blue ink that reads "Amy L. Miller".

Amy L. Miller  
Permitting Specialist – Appalachia Region

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

Date of Notice Certification: 12/14/2017

API No. 47- 051 -  
Operator's Well No. Bryan N-2HM  
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: West Virginia  
County: Marshall  
District: Franklin  
Quadrangle: Powhatan Point 7.5'  
Watershed: Fish Creek (HUC-10)

UTM NAD 83 Easting: 519,132.39  
Northing: 4,402,875.37  
Public Road Access: Rines Ridge Road  
Generally used farm name: CNX Land Resources, Inc.

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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 align="center"><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:**

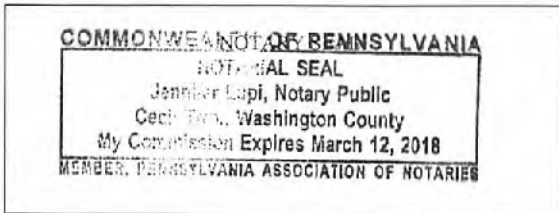
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication 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-hilop.com



Subscribed and sworn before me this 14<sup>th</sup> day of Dec. 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).

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**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:** 12/14/2017 **Date Permit Application Filed:** 12/15/2017

**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

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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 Christine Riddle (Road)  
Address: 4205 Rines Ridge Road  
Proctor, WV 26055

SURFACE OWNER(s) (Road and/or Other Disturbance)  
Name: Ray E. and Katherine L. Minor  
Address: 4193 Rines Ridge Road  
Proctor, WV 26055

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

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

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

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

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

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

\*Please attach additional forms if necessary

**Notice is hereby given:**

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

**This Notice Shall Include:**

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

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

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

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

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

**Well Location Restrictions**

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

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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

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

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

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

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

**Comment Requirements**

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

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

**Permit Denial or Condition**

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

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

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

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

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API NO. 47- \_\_\_\_\_  
OPERATOR WELL NO. Bryan N-2HM  
Well Pad Name: Bryan

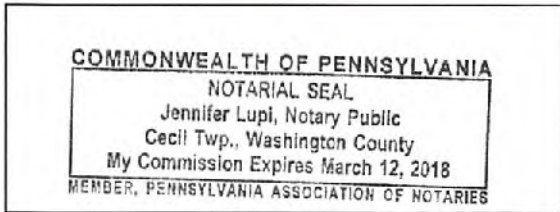
**Notice is hereby given by:**

Well Operator: Tug Hill Operating, LLC  
Telephone: 724-749-8388  
Email: amiller@tug-hillcp.com *[Signature]*

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 14<sup>th</sup> day of Dec, 2017.

Jennifer Lupi Notary Public

My Commission Expires March 12, 2018

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03/02/2018

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

### WATER WELL REPORT

Well: BRYAN No. N-2HM  
 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	

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 Environmental Protection

03/02/2018

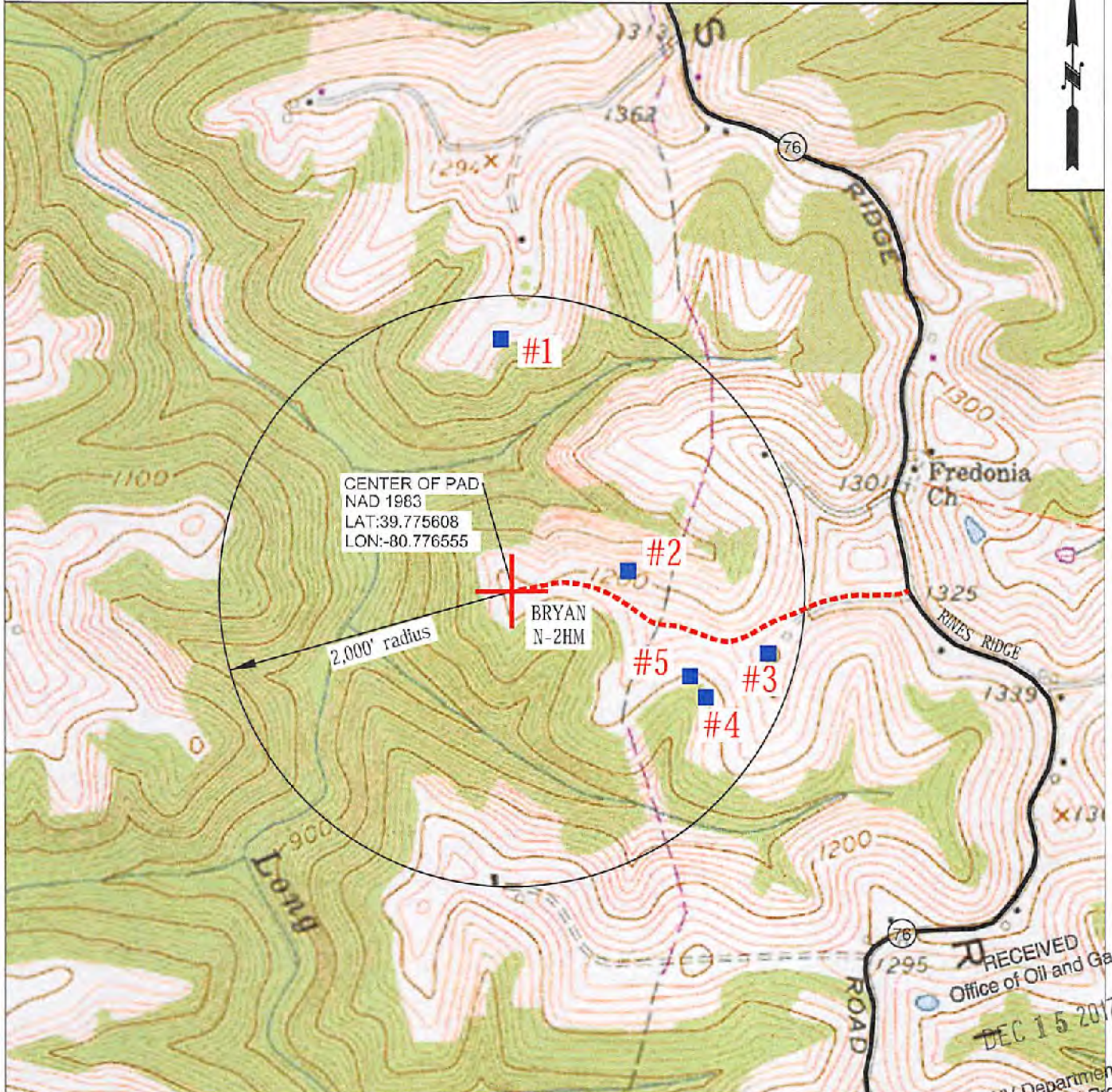


WW-6A

# PROPOSED BRYAN N-2HM

SUPPLEMENT PG 1

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



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WV Department of Environmental Protection



OPERATOR	494510851	TOPO SECTION	LEASE NAME
TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	BRYAN
		SCALE:	DATE:
		1" = 1000'	DATE: 12/12/17

0001015058

SECRET

CONFIDENTIAL

SECRET

CONFIDENTIAL

CONFIDENTIAL

CONFIDENTIAL

CONFIDENTIAL

CONFIDENTIAL

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 15317-8506

MINERAL OWNER(s)

Name: Greg and Christina Riddle

Address: 4205 Rines Ridge Road  
Proctor, WV 26055

\*please attach additional forms if necessary

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WV Department of  
Environmental Protection

**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: 39.7755312; -80.7766011  
 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.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).

03/02/2018

Operator Well No. Bryan N-2HM**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:** Michael R. Bryan  
**Address:** 195 Isaiah Drive  
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

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Environmental Protection

03/02/2018

WW-6A5  
(1/12)

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

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

**Date of Notice:** 12/12/2017      **Date Permit Application Filed:** 12/15/2017

**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: 4198 Rines Ridge Road  
Proctor, WV 26055 \*See attached sheet

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>519.132.39</u>
County:	<u>Marshall</u>		Northing:	<u>4402875.37</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>CNX Land Resources, Inc.</u>	
Watershed:	<u>Fish Creek (HUC-10)</u>			

**This Notice Shall Include:**

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

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

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

**Oil and Gas Privacy Notice:**

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

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03/02/2018

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Operator Well No. Bryan N-2HM

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

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Office of Oil and Gas

DEC 13 2017

WV Department of  
Environmental Protection

03/02/2018



## WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

**Division of Highways**1900 Kanawha Boulevard East • Building Five • Room 110  
Charleston, West Virginia 25305-0430 • (304) 558-3505Jim Justice  
GovernorThomas 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 25304Subject: DOH Permit for the Bryan Pad, Marshall County  
Bryan N-2HM Well site

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,

A handwritten signature in blue ink that reads "Gary K. Clayton".

Gary K. Clayton, P.E.  
Regional Maintenance Engineer  
Central Office O&G CoordinatorCc: Jonathan White  
Tug Hill Operating, LLC  
CH, OM, D-6  
File



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Bryan N-2HM

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



**WEST VIRGINIA  
 COUNTY MAP**

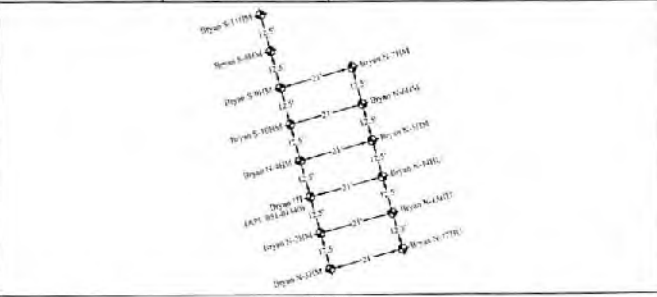


**WVDEP OOG  
 ACCEPTED AS-BUILT**

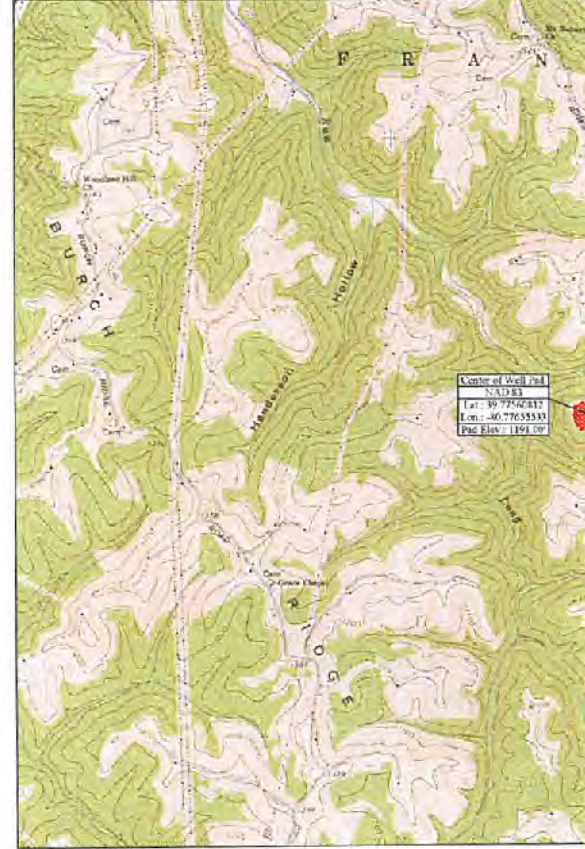
*WJD* 10/31/2017

**Exhibit A: Final De**

Site Entrance	Center of Well Pad
WV-NAD 83 N: 407166.78 WV-NAD 83 E: 161214.01 WV-NAD 27 N: 407166.78 WV-NAD 27 E: 161214.01 Lat. NAD 83: 39.7757152 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 N: 4402890.50 UTM 17 NAD 83 E: 519135.02	WV-NAD 83 N: 407166.06 WV-NAD 83 E: 160920.52 WV-NAD 27 N: 407166.06 WV-NAD 27 E: 161113.51 Lat. NAD 83: 39.7756912 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 N: 4402876.27 UTM 17 NAD 83 E: 519135.49 Pad Elev.: 1191.00'



Well Table	
<b>Bryan S-111M</b> WV-NAD 83 N: 407234.58 WV-NAD 83 E: 160920.58 WV-NAD 27 N: 407234.58 WV-NAD 27 E: 161113.07 Lat. NAD 83: 39.7757178 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 (m) N: 4402897.30 UTM 17 NAD 83 (m) E: 519125.96	<b>Bryan S-112M</b> WV-NAD 83 N: 407222.53 WV-NAD 83 E: 160993.99 WV-NAD 27 N: 407186.12 WV-NAD 27 E: 161113.39 Lat. NAD 83: 39.7756833 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 (m) N: 4402883.64 UTM 17 NAD 83 (m) E: 519127.03
<b>Bryan S-113M</b> WV-NAD 83 N: 407166.78 WV-NAD 83 E: 161214.01 WV-NAD 27 N: 407166.78 WV-NAD 27 E: 161113.07 Lat. NAD 83: 39.7757178 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 (m) N: 4402897.30 UTM 17 NAD 83 (m) E: 519135.02	<b>Bryan S-114M</b> WV-NAD 83 N: 407166.06 WV-NAD 83 E: 160920.52 WV-NAD 27 N: 407166.06 WV-NAD 27 E: 161113.51 Lat. NAD 83: 39.7756912 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 (m) N: 4402876.27 UTM 17 NAD 83 (m) E: 519135.49



<b>Bryan S-115M</b> WV-NAD 83 N: 407166.78 WV-NAD 83 E: 161214.01 WV-NAD 27 N: 407166.78 WV-NAD 27 E: 161113.07 Lat. NAD 83: 39.7757178 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 (m) N: 4402897.30 UTM 17 NAD 83 (m) E: 519135.02	<b>Bryan S-116M</b> WV-NAD 83 N: 407222.53 WV-NAD 83 E: 160993.99 WV-NAD 27 N: 407186.12 WV-NAD 27 E: 161113.39 Lat. NAD 83: 39.7756833 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 (m) N: 4402883.64 UTM 17 NAD 83 (m) E: 519127.03	<b>Bryan S-117M</b> WV-NAD 83 N: 407166.78 WV-NAD 83 E: 161214.01 WV-NAD 27 N: 407166.78 WV-NAD 27 E: 161113.07 Lat. NAD 83: 39.7757178 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 (m) N: 4402897.30 UTM 17 NAD 83 (m) E: 519135.02	<b>Bryan S-118M</b> WV-NAD 83 N: 407166.06 WV-NAD 83 E: 160920.52 WV-NAD 27 N: 407166.06 WV-NAD 27 E: 161113.51 Lat. NAD 83: 39.7756912 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 (m) N: 4402876.27 UTM 17 NAD 83 (m) E: 519135.49	<b>Bryan S-119M</b> WV-NAD 83 N: 407166.78 WV-NAD 83 E: 161214.01 WV-NAD 27 N: 407166.78 WV-NAD 27 E: 161113.07 Lat. NAD 83: 39.7757178 Lon. NAD 83: -80.7765533 UTM 17 NAD 83 (m) N: 4402897.30 UTM 17 NAD 83 (m) E: 519135.02
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**Project Contacts**

**Tug Hill Operating**  
 Amanda White - Regulatory Analyst  
 724-485-2020 ext. 304-569-7676 Cell

**Geoff Raffler - V.P. Production**  
 814-342-5209 Off

**Tug Hill Operating, LLC**  
 330 Southview Blvd  
 Southview Plaza II, Suite 200  
 Conowingo, PA 15117

**Survey and Engineer**  
 Kenneth Kelly  
 304-328-6985 Off

**John P. Seo**  
 304-442-220 Off

**Zachary Sonnenfeldt**  
 304-436-0987 Off

**Geotechnical Engineer**  
 American Geotech, Inc  
 Keith Patel  
 304-340-4271 Off

**Environmental:**  
 Wetland Delineations as provided by Alluvia Ecology dated August 5, 2017

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

**MISS UTILITY OF WEST VIRGINIA**  
 1-800-245-4848  
 West Virginia State Law Section 21-2-1, Chapter 24-C requires that you call two business days before you dig in the state of West Virginia. IT'S THE LAW. **811** Know what's below. Call before you dig.

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

The WV Mines Website was consulted. Previous (Current) mining activities are not within the AOI

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

**Well Location Restrictions:**  
 All Well construction complies with the following restrictions:  
 \*250' from any existing well or developed spring used for human or domestic animals.  
 \*25' from an existing well or bore greater than 2,500 SF used for poultry or dairy measured from the center of the pad.  
 \*100' from the edge of disturbance to perennial stream, natural or artificial lake, pond or reservoir.  
 \*500' from the edge of disturbance to a naturally replenishing stream stream.  
 \*1,000' of a surface or ground water intake to a public water supply.  
 (Well Location Restrictions of WV Code 22-6-12)

**USGS 7.5 Minute Topographic Map**

Site Locations (NAD 27)		
Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.7756438	-80.7761717
Center of Well Pad	39.7755122	-80.7761763

**Approach Routes:**  
 From the intersection of WV Rt 2 and OH Rt 7 near New Martinsville, WV, follow WV Rt 2 North for 1.5 mi. Turn Right onto Co Rt 27 (Woodland and Graysville Rd). Follow Co Rt 27 for 1.0 mi. Turn Right onto Co Rt 76 (Rines Ridge Rd) Follow Co Rt 76 for 4.2 mi. The site entrance (Bryan Lane) will be on the Right (West) side of the road.



**Floodplain Conditions**

Do site construction activities take place in a floodplain?	NO
Permit needed from county floodplain coordinator?	NO
Flood Hazard Zone	X
HEC-RAS Study completed?	N/A
Floodplain shown on drawings?	N/A
FORM Map Number(s) for site:	54251K-0145E
Acres of construction in floodplain:	N/A

03/02/2018

# Well Pad Site

Construction Plan, &  
Sediment Control Plans  
Well Operating  
Marshall County  
Franklin District  
39.77560812°  
-80.77655533°  
Lower Fish Creek Watershed

**Pertinent Site Information**  
 Bryan Well Pad Site  
 Emergency Number: 304-845-1920  
 Franklin District, Marshall County, WV  
 Watershed: Lower Fish Creek Watershed  
 Tug Hill Contact Number: 1-817-632-3400

Sign: Issue for Permitting

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

Franklin District - Marshall County							
Owner	TM - Parcel	Well Pad	Staging	Access Road	Topsoil/Assets	Add. Clearing	Total Disturbed
Rav Miron et al.	16623.1	0.00	0.00	0.00	0.00	0.00	0.00
Long & Christian Ridge	16623.3	0.00	0.00	0.00	0.00	0.00	0.00
Michael & Brenda Bryan	16623.4	0.00	0.00	0.02	0.00	0.26	0.28
CNSV Land Resources Inc	16623	0.00	0.00	0.58	0.00	0.09	1.27
CNSV Land Resources Inc	15-9	3.91	1.36	1.47	0.82	7.79	14.55
Site (Acres)		4.91	1.36	2.01	0.82	8.28	16.14



WV State Plane Coordinate System  
 North Zone, NAD 83  
 Elevations Based on NAVD83  
 Established By Survey Grade GPS  
 and GPS Post-Processing

**Access Road**

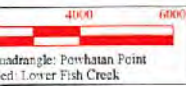
Surface Owner	TM - Parcel	Road Length	Type
Michael & Brenda Bryan	16623.4	46.55'	Existing Access Road
CNSV Land Resources Inc	16623	1,121.53'	Existing Access Road
CNSV Land Resources Inc	15-9	1,121.53'	Existing Access Road

**Disturbed Area**

Well Pad Construction	3.91 Ac
Access Road Construction	2.07 Ac
Access Road Staging Area Cont.	1.06 Ac
Topsoil / Access Material	0.82 Ac
Additional Clearing	8.28 Ac
<b>Total Disturbed Area</b>	<b>15.14 Ac</b>
<b>Additional Information</b>	
Total Wooded Acres Disturbed	0.16 Ac
Total Linear Feet of Access Road	2,717.51'

**Bryan Well Pad Site Quantities**

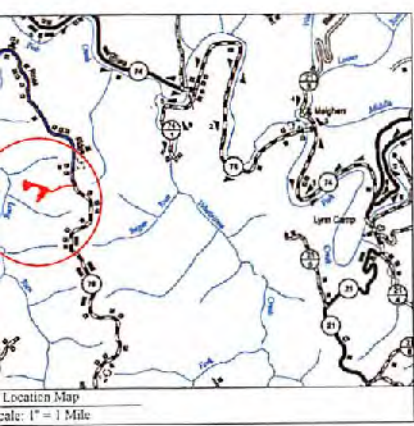
Description	Cut (CY)	Fill (CY)	Spec. (CY)	Borrow (CY)	Max. Slope	Length of Slope
Well Pad Modification	2,820.24	19.23	2,810.29	N/A	N/A	N/A
Well Pad Berms	0.00	777.64	777.64	N/A	N/A	N/A
Access Road Staging Area	3,915.83	5,916.05	2,000.22	N/A	N/A	N/A
Well Pad Access Road Mod #1	8.10	59.14	51.04	16.14%	36.71'	
Well Pad Access Road Mod #2	74.92	700.93	666.91	16.14%	36.71'	
Well Pad Access Road Mod #3	306.61	803.38	143.23	16.14%	36.71'	
Topsoil Stockpile Removal	3,633.65	0.00	3,633.65	N/A	N/A	N/A
Topsoil Exports Material Stockpile	0.00	3,802.27	3,802.27	N/A	N/A	N/A
<b>Totals</b>	<b>11,518.34</b>	<b>11,629.64</b>	<b>6,607.08</b>	<b>2,298.78</b>		
<b>Total Spoil (CY)</b>			<b>467.00</b>	<b>(Access Spoil Capacity)</b>		



Triangle: Powhatan Point  
 Red: Lower Fish Creek

**Site Locations (NAD 83)**

Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.77571752°	-80.76697134°
Center of Well Pad	39.77560812°	-80.77655533°



**Design Certificate**

The above engineering calculations and reference diagrams attached hereto have been prepared in accordance with the West Virginia Code of State Rules, Department of Environmental Protection, Office of Oil and Gas, 58-2-20.

All Plans, Sheets, and/or Reference Diagrams included in this design constitutes a complete set of plans. A complete set of plans is necessary to construct the well as shown on the drawings.

Zachary C. Sumner  
 8102 777-14  
 Kelly Surveying PLLC  
 COA 02425209

*Zachary C. Sumner* Date: 08/22/2017

Sheet	Description
1	Cover Sheet
V1	Schedule of Quantities
N1-N7	Site Notes
2	Pre-Construction Site Conditions
3	Site Soil Map
4	Cleaning Exhibit
5	Overall Plan View
6-9	E&S Plan View
10	Toe Key Exhibit
11-14	Plan View
15	Cross Sections - Well Pad
16	Cross Sections - Tank Pad
17	Cross Sections - Access Road
G1-G2	Geotechnical Exhibit
L1	Landowner Disturbed Area Exhibit
S1	Site Reclamation
M1-M2	Production Exhibit
D1-D2	Erosion and Sediment Control Details
R1	Access Road Details
P1	Pad Details

Revision  
 Design  
 Date: 08-29-2017

**TUG HILL OPERATING**



THIS DOCUMENT  
 PREPARED FOR  
 TUG HILL  
 OPERATING



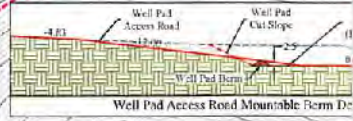
Cover Sheet  
 Bryan Well Pad Site  
 Franklin District  
 Marshall County, WV

Date: 08/22/2017  
 Scale: As Shown  
 Designed By: ZS  
 File No:

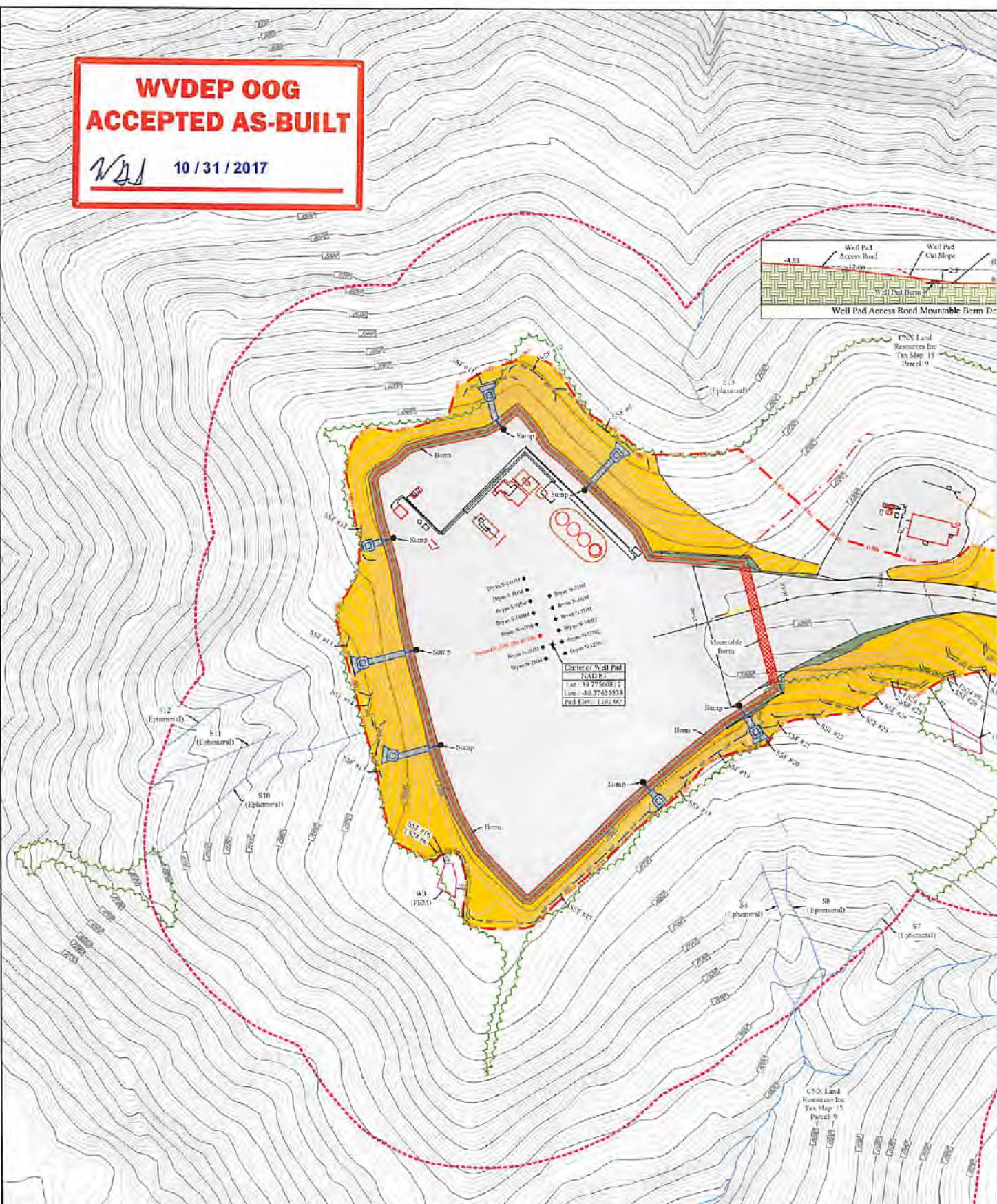
03/02/2018

# WVDEP OOG ACCEPTED AS-BUILT

WJ 10/31/2017



CNN Land Resources Inc Tax Map 15 Parcel 9



- Pipe to 1000'
- Pipe to 1500'
- Pipe to 2000'
- Pipe to 2500'
- Pipe to 3000'
- Pipe to 3500'
- Pipe to 4000'
- Pipe to 4500'
- Pipe to 5000'
- Pipe to 5500'
- Pipe to 6000'
- Pipe to 6500'
- Pipe to 7000'
- Pipe to 7500'
- Pipe to 8000'
- Pipe to 8500'
- Pipe to 9000'
- Pipe to 9500'
- Pipe to 10000'

Center of Well Pad	
NADEP:	
Lat: N 77.56681 2	
Long: -80.7553933	
Pad Elev: 1151.00'	

Access Road			
Surface Owner	Est. Acres	Road Length	Type
Michael & Patricia Iyer	10.23	49.33	EXISTING ACCESS ROAD
CNN Land Resources Inc	16.23	1,276.42	EXISTING ACCESS ROAD
CNN Land Resources Inc	1.50	1,474.50'	EXISTING ACCESS ROAD

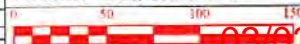
**Legend**

- Original Ground 2 Contour
- Original Ground 10 Contour
- Center of Structure
- 12" Wall
- 24" Composite Filter Sock
- Super Silt Fence
- 100 lbs F/D fabric
- Area of Interest
- Existing Gas Line
- Existing Utility Pad Line
- FEM Wetland
- POW Wetland
- PSS Wetland
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- Seep or Muck Area
- Erosion Control Blanket Slope Area
- Stone Check Dam

Disturbed Area	
Well Pad Construction	3.01 AC
Access Road Construction	2.07 AC
Access Road Striping Area	1.06 AC
Impervious Access Material	1.88 AC
Additional Clearing	8.28 AC
Total Disturbed Area	16.41 AC

NOTE: all surface boundary lines shown hereon are based on boundary evidence collected with mapping grade GPS receivers

Additional Information	
Total Wooded Area Disturbed	0.16 AC
Total Linear Feet of Access Road	2,747.51'

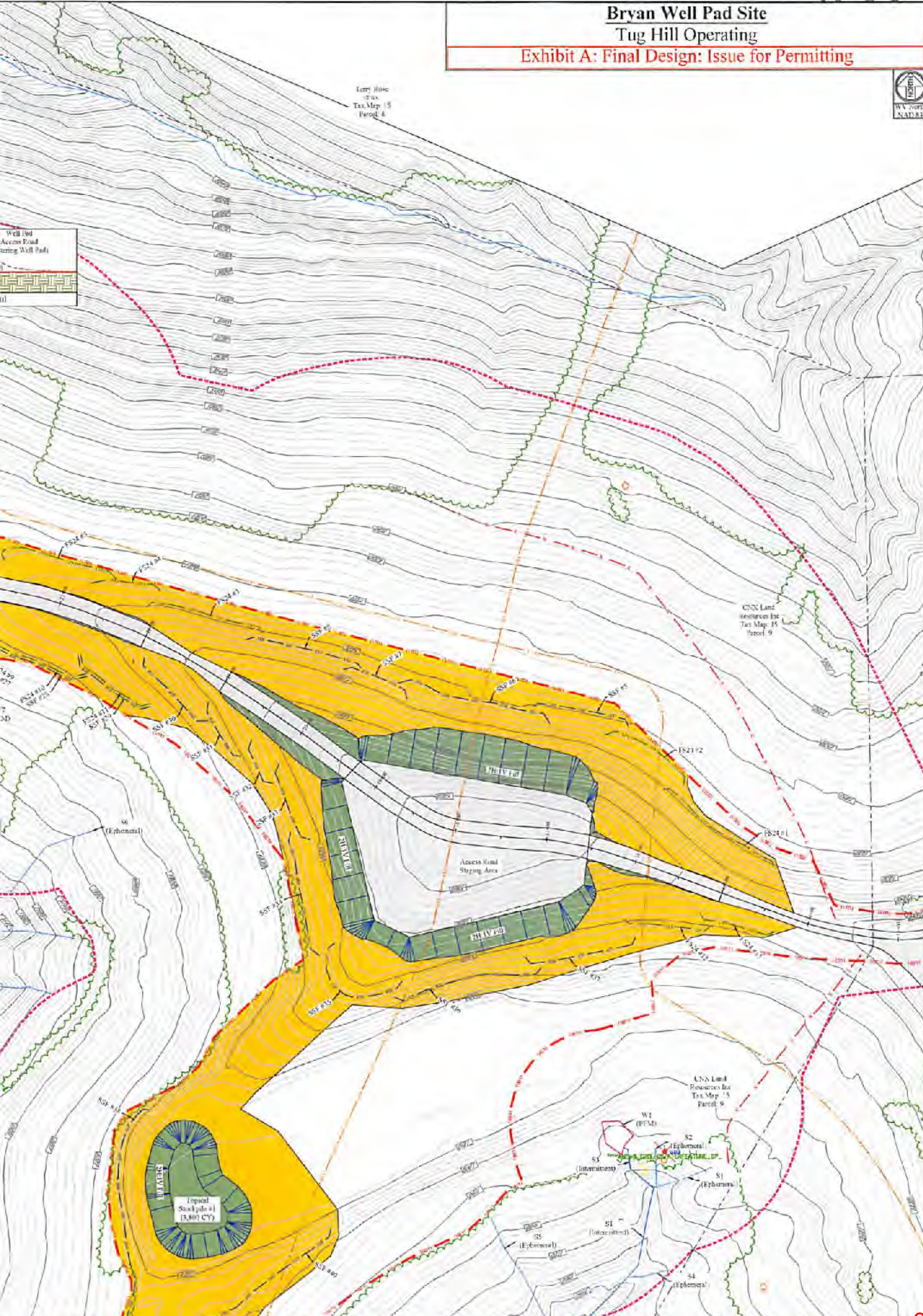


09/02/2018

Bryan Well Pad Site

Tug Hill Operating

Exhibit A: Final Design: Issue for Permitting



Revision  
Design  
Design: WVDPE Comments

Date:  
08-29-2017  
10-30-2017

TUG HILL  
OPERATING



THIS DOCUMENT  
PREPARED FOR  
TUG HILL  
OPERATING

Kelly S. Surveying  
P.O. Box 288  
Elkins, WV 26039  
304-835-2222

Erosion and Sediment Control Plan  
Bryan Well Pad Site  
Franklin District  
Marshall County, WV

Date: 08/29/2017  
Scale: As Shown  
Designed By: ZS  
File No:

08/02/2018