



west virginia department of environmental protection

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

Austin Caperton , Cabinet Secretary
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-3HM
47-051-02000-00-00

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-3HM
Farm Name: CNX LAND RESOURCES, INC.
U.S. WELL NUMBER: 47-051-02000-00-00
Horizontal 6A / New Drill
Date Issued: 2/28/2018

Promoting a healthy environment.

PERMIT CONDITIONS 4705102000

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

CONDITIONS

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

PERMIT CONDITIONS 4705102000

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.

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. Bryan N-3HM
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'	1070ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	963'	953'	1070ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,615'	2,605'	856ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	13, 440'	13,430'	3435ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,792'	
Liners	N/A						

Ju
12/14/17

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						

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PACKERS

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

WW-6B
(10/14)

API NO. 47-051 -

OPERATOR WELL NO. Bryan N-3HM

Well Pad Name: Bryan

JW
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

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25) Proposed borehole conditioning procedures:

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

*Note: Attach additional sheets as needed.

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 CaCl₂ + 46.5% Fresh Water

- Premium NE-1 – Class A Portland API spec
- CaCl₂ – 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
- CaCl₂ – 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-3HM

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"	2,605'	CTS
Production	5 1/2"	P110	8 7/8 x 8 3/4"	13,430'	CTS

Cement

Conductor: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2

Surface: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2

Intermediate: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.19

Kick Off Plug: Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug

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

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WELL NAME:	Bryan NSHM	COUNTY:	Marshall
STATE:	West Virginia		
DISTRICT:	Made	C.D.N.R.:	1,191
OP. DATE:	1,191		
TD:	13,430'		
TH Latitude:	39.27582713		
TH Longitude:	-80.27657829		
SH Latitude:	39.29272944		
SH Longitude:	-80.29176505		

FORMATION TOPS	Depth TVD
Formation	823
Deepest Fresh Water	823
Swallowy Coal	701
Fridborough Coal	798
Big Line	1970
Water	2234
Berea	2510
Gordon	2824
Rhodesport	3837
Conoco/Fordett	6327
Tully	6322
Hamilton	6397
Marcellus	6443
Landing Depth	6473
Onondaga	6496
Most Hole Depth	6596

CASING SUMMARY							
Type	Hole Size (in)	Csg. Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	100'	100'	8W	HW	Surface
Surface	17.5	13 3/8	553'	953'	54.5	H40	Surface
Intermediate 1	12 1/4	9 7/8	2,605'	2,600'	36	155	Surface
Production	8 7/8 x 8 3/4	5 1/2	13,430'	6,360'	20	P-130	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Slabs	Class	Density	MUD Type	Centrifuge Moins
Conductor	201	A	15.6	Air	None
Surface	971	A	15.6	Air	3 Centrifuges at equal distance
Intermediate 1	837	A	15	Air	1 Centrifuge every other ft
Production	3,080	A	14.5	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other ft to etc

12/13/17

PilotHole
PH TD @
6,596 TVD

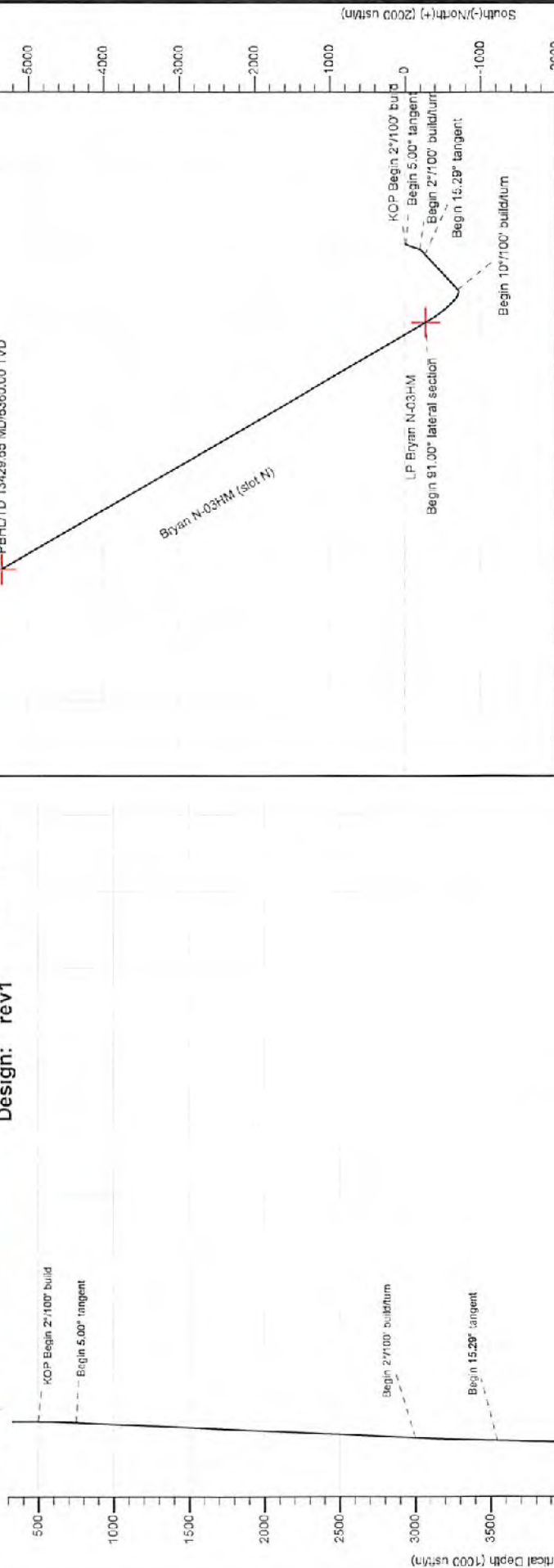
Landing Point @ 6,935' MD / 6,473' TVD

PH TVD = 100' Below Onondaga Top

Lateral TD @ 13,440' ft MD
6,360 ft TVD

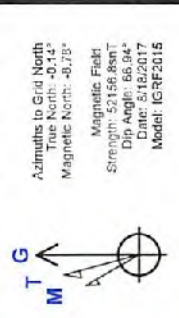


Tug Hill Operating LLC
Well: Bryan N-03HM (slot N)
Site: Bryan Pad
Project: Marshall County, WV
Design: rev 1



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2'7100' build
3	750.00	5.00	200.00	749.68	-10.24	-3.73	2.00	200.00	-5.67	Begin 5.00' tangent
4	3003.91	5.00	203.00	3000.00	-195.26	-71.06	0.00	0.00	-198.02	Begin 2'7100' build
5	3552.63	15.29	227.18	3544.56	-267.78	-133.06	2.00	0.00	-126.90	Begin 15.29' tangent
6	6991.62	91.00	330.00	6667.75	-703.21	-602.90	0.00	0.00	-172.24	Begin 10'7100' build
7	6936.02	91.00	330.00	6473.00	-573.97	-1031.28	10.00	102.13	-428.67	Begin 91.00' lateral section
8	13429.65	91.00	330.00	6360.00	5344.89	-4278.15	0.00	0.00	6360.00	PBHL/TD 13429.65 MD/6360.00 TVD



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Vertical Section at 321.32° (1000 usft/m)



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Bryan N-03HM (slot N)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1191 @ 1191.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1191 @ 1191.00usft
Site:	Bryan Pad	North Reference:	Grid
Well:	Bryan N-03HM (slot N)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Project	Marshall County, West Virginia		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD83 West Virginia - HARN		
Map Zone:	Zone 17N (84 W to 76 W)		

Site	Bryan Pad				
Site Position:		Northing:	14,445,110.80 usft	Latitude:	39.77562900
From:	Lat/Long	Easting:	1,703,181.57 usft	Longitude:	-80.77650992
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.14 °

Well	Bryan N-03HM (slot N)					
Well Position	+N/-S	0.00 usft	Northing:	14,445,088.28 usft	Latitude:	39.77556711
	+E/-W	0.00 usft	Easting:	1,703,190.38 usft	Longitude:	-80.77657879
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	1,191.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/18/2017	-8.64	66.94	52,156.75922341

Design	rev1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	321.32

Plan Survey Tool Program	Date	9/8/2017			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	13,429.65 rev1 (Original Hole)	MWD	MWD - Standard	

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Plan Sections											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
750.00	5.00	200.00	749.68	-10.24	-3.73	2.00	2.00	0.00	200.00	0.00	
3,008.91	5.00	200.00	3,000.00	-195.25	-71.06	0.00	0.00	0.00	0.00	0.00	
3,562.83	15.29	227.18	3,544.56	-267.78	-133.06	2.00	1.66	4.91	38.83	0.00	
5,991.82	15.29	227.18	5,887.78	-703.21	-602.90	0.00	0.00	0.00	0.00	0.00	
6,935.00	91.00	330.00	6,473.00	-278.97	-1,031.28	10.00	8.03	10.90	102.13	LP Bryan N-03HM	
13,429.65	91.00	330.00	6,360.00	5,344.69	-4,278.15	0.00	0.00	0.00	0.00	BHL Bryan N-03HM	



Planning Report - Geographic



Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Bryan Pad
 Well: Bryan N-03HM (slot N)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Bryan N-03HM (slot N)
 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	14,445,088.28	1,703,190.38	39.77556711	-80.77657879
100.00	0.00	0.00	100.00	0.00	0.00	14,445,088.28	1,703,190.38	39.77556711	-80.77657879
200.00	0.00	0.00	200.00	0.00	0.00	14,445,088.28	1,703,190.38	39.77556711	-80.77657879
300.00	0.00	0.00	300.00	0.00	0.00	14,445,088.28	1,703,190.38	39.77556711	-80.77657879
400.00	0.00	0.00	400.00	0.00	0.00	14,445,088.28	1,703,190.38	39.77556711	-80.77657879
500.00	0.00	0.00	500.00	0.00	0.00	14,445,088.28	1,703,190.38	39.77556711	-80.77657879
KOP Begin 2°/100' build									
600.00	2.00	200.00	599.98	-1.64	-0.60	14,445,086.64	1,703,189.78	39.77556261	-80.77658093
700.00	4.00	200.00	699.84	-8.56	-2.39	14,445,081.73	1,703,187.99	39.77554912	-80.77658734
750.00	5.00	200.00	749.68	-10.24	-3.73	14,445,078.04	1,703,186.65	39.77553900	-80.77659215
Begin 5.00° tangent									
800.00	5.00	200.00	799.49	-14.34	-5.22	14,445,073.94	1,703,185.16	39.77552777	-80.77659749
900.00	5.00	200.00	899.11	-22.53	-8.20	14,445,065.75	1,703,182.18	39.77550530	-80.77660818
1,000.00	5.00	200.00	998.73	-30.72	-11.18	14,445,057.56	1,703,179.20	39.77548283	-80.77661886
1,100.00	5.00	200.00	1,098.35	-38.91	-14.16	14,445,049.37	1,703,176.22	39.77546035	-80.77662954
1,200.00	5.00	200.00	1,197.97	-47.10	-17.14	14,445,041.18	1,703,173.23	39.77543786	-80.77664022
1,300.00	5.00	200.00	1,297.59	-55.29	-20.12	14,445,032.99	1,703,170.25	39.77541541	-80.77665090
1,400.00	5.00	200.00	1,397.21	-63.48	-23.10	14,445,024.81	1,703,167.27	39.77539294	-80.77666159
1,500.00	5.00	200.00	1,496.83	-71.67	-26.09	14,445,016.62	1,703,164.29	39.77537047	-80.77667227
1,600.00	5.00	200.00	1,596.45	-79.86	-29.07	14,445,008.43	1,703,161.31	39.77534800	-80.77668295
1,700.00	5.00	200.00	1,696.06	-88.05	-32.05	14,445,000.24	1,703,158.33	39.77532553	-80.77669363
1,800.00	5.00	200.00	1,795.68	-96.24	-35.03	14,444,992.05	1,703,155.35	39.77530305	-80.77670431
1,900.00	5.00	200.00	1,895.30	-104.43	-38.01	14,444,983.86	1,703,152.37	39.77528058	-80.77671500
2,000.00	5.00	200.00	1,994.92	-112.62	-40.99	14,444,975.67	1,703,149.39	39.77525811	-80.77672568
2,100.00	5.00	200.00	2,094.54	-120.81	-43.97	14,444,967.48	1,703,146.41	39.77523564	-80.77673636
2,200.00	5.00	200.00	2,194.16	-129.00	-46.95	14,444,959.29	1,703,143.43	39.77521317	-80.77674704
2,300.00	5.00	200.00	2,293.78	-137.19	-49.93	14,444,951.10	1,703,140.45	39.77519070	-80.77675772
2,400.00	5.00	200.00	2,393.40	-145.38	-52.91	14,444,942.91	1,703,137.46	39.77516823	-80.77676841
2,500.00	5.00	200.00	2,493.02	-153.57	-55.89	14,444,934.72	1,703,134.48	39.77514575	-80.77677909
2,599.99	5.00	200.00	2,592.64	-161.76	-58.88	14,444,926.53	1,703,131.50	39.77512328	-80.77678977
2,699.99	5.00	200.00	2,692.26	-169.95	-61.86	14,444,918.34	1,703,128.52	39.77510081	-80.77680045
2,799.99	5.00	200.00	2,791.88	-178.14	-64.84	14,444,910.15	1,703,125.54	39.77507834	-80.77681113
2,899.99	5.00	200.00	2,891.50	-186.33	-67.82	14,444,901.96	1,703,122.56	39.77505587	-80.77682182
2,999.99	5.00	200.00	2,991.11	-194.52	-70.80	14,444,893.77	1,703,119.58	39.77503340	-80.77683250
3,008.91	5.00	200.00	3,000.00	-195.25	-71.06	14,444,893.04	1,703,119.31	39.77503139	-80.77683345
Begin 2°/100' build/turn									
3,099.99	6.52	210.11	3,090.82	-203.45	-75.02	14,444,884.83	1,703,115.36	39.77500889	-80.77684759
3,199.99	8.33	216.77	3,189.78	-214.17	-82.20	14,444,874.12	1,703,108.18	39.77497952	-80.77687325
3,299.99	10.21	221.03	3,288.47	-226.65	-92.35	14,444,861.63	1,703,098.02	39.77494529	-80.77690950
3,399.99	12.13	223.97	3,386.57	-240.90	-105.46	14,444,847.39	1,703,084.91	39.77490626	-80.77695629
3,499.99	14.07	226.11	3,483.97	-256.88	-121.52	14,444,831.40	1,703,068.86	39.77486247	-80.77701356
3,562.63	15.29	227.18	3,544.56	-267.78	-133.06	14,444,820.51	1,703,057.32	39.77483263	-80.77705474
Begin 15.29° tangent									
3,599.99	15.29	227.18	3,580.80	-274.47	-140.29	14,444,813.81	1,703,050.09	39.77481429	-80.77708052
3,699.99	15.29	227.18	3,677.06	-282.40	-159.63	14,444,795.89	1,703,030.75	39.77476520	-80.77714951
3,799.99	15.29	227.18	3,773.52	-310.32	-178.97	14,444,777.96	1,703,011.41	39.77471810	-80.77721851
3,899.99	15.29	227.18	3,869.98	-328.25	-198.31	14,444,760.03	1,702,992.07	39.77466701	-80.77728751
3,999.99	15.29	227.18	3,966.44	-346.17	-217.65	14,444,742.11	1,702,972.73	39.77461791	-80.77735650
4,099.99	15.29	227.18	4,062.90	-364.10	-236.99	14,444,724.18	1,702,953.39	39.77456882	-80.77742550
4,199.99	15.29	227.18	4,159.36	-382.02	-256.33	14,444,706.26	1,702,934.04	39.77451972	-80.77749449
4,299.99	15.29	227.18	4,255.82	-399.95	-275.68	14,444,688.33	1,702,914.70	39.77447062	-80.77756349
4,399.99	15.29	227.18	4,352.28	-417.87	-295.02	14,444,670.41	1,702,895.36	39.77442153	-80.77763248
4,499.99	15.29	227.18	4,448.74	-435.80	-314.36	14,444,652.48	1,702,876.02	39.77437243	-80.77770148
4,599.99	15.29	227.18	4,545.20	-453.72	-333.70	14,444,634.56	1,702,856.68	39.77432334	-80.77777048



Planning Report - Geographic



Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Bryan Pad
 Well: Bryan N-03HM (slot N)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Bryan N-03HM (slot N)
 TVD Reference: GL=1191 @ 1191.00usft
 MD Reference: GL=1191 @ 1191.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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DEC 15 2017

WV Department of
 Environmental Protection

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	15.29	227.18	4,641.66	-471.65	-353.04	14,444,616.63	1,702,837.34	39.774272424	-80.77783947
4,799.99	15.29	227.18	4,738.12	-489.57	-372.38	14,444,598.71	1,702,818.00	39.77422515	-80.77790847
4,899.99	15.29	227.18	4,834.58	-507.50	-391.72	14,444,580.78	1,702,798.65	39.77417605	-80.77797746
4,999.99	15.29	227.18	4,931.04	-525.42	-411.06	14,444,562.88	1,702,779.31	39.77412696	-80.77804646
5,099.99	15.29	227.18	5,027.50	-543.35	-430.41	14,444,544.93	1,702,759.97	39.77407786	-80.77811545
5,199.99	15.29	227.18	5,123.96	-561.27	-449.75	14,444,527.01	1,702,740.63	39.77402877	-80.77818445
5,299.99	15.29	227.18	5,220.42	-579.20	-469.09	14,444,509.08	1,702,721.29	39.77397967	-80.77825344
5,399.99	15.29	227.18	5,316.88	-597.12	-488.43	14,444,491.16	1,702,701.95	39.77393057	-80.77832244
5,499.99	15.29	227.18	5,413.34	-615.05	-507.77	14,444,473.23	1,702,682.61	39.77388148	-80.77839143
5,599.99	15.29	227.18	5,509.80	-632.97	-527.11	14,444,455.31	1,702,663.26	39.77383238	-80.77846042
5,699.99	15.29	227.18	5,606.26	-650.90	-546.45	14,444,437.38	1,702,643.92	39.77378329	-80.77852942
5,799.99	15.29	227.18	5,702.72	-668.83	-565.80	14,444,419.46	1,702,624.58	39.77373419	-80.77859841
5,899.99	15.29	227.18	5,799.18	-686.75	-585.14	14,444,401.53	1,702,605.24	39.77368509	-80.77866741
5,991.82	15.29	227.18	5,887.77	-703.21	-602.90	14,444,383.07	1,702,587.48	39.77364001	-80.77873077
Begin 10°/100' build/turn									
5,999.99	15.14	230.24	5,895.65	-704.63	-604.51	14,444,383.68	1,702,585.87	39.77363613	-80.77873651
6,099.99	16.69	286.88	5,992.05	-713.78	-628.95	14,444,374.50	1,702,561.43	39.77361115	-80.77882357
6,199.99	22.88	290.51	6,088.25	-707.74	-661.58	14,444,380.55	1,702,528.80	39.77362798	-80.77893965
6,299.99	31.04	303.42	6,175.38	-686.67	-701.41	14,444,401.61	1,702,488.97	39.77368809	-80.77908122
6,399.99	39.88	311.18	6,256.74	-651.23	-747.23	14,444,437.05	1,702,443.15	39.77376374	-80.77924398
6,499.99	49.28	316.45	6,327.85	-602.48	-797.64	14,444,485.80	1,702,392.73	39.77391795	-80.77942299
6,599.99	58.75	320.42	6,388.55	-541.92	-851.13	14,444,546.37	1,702,339.25	39.77408465	-80.77961280
6,699.99	68.33	323.65	6,431.06	-471.37	-906.05	14,444,616.91	1,702,284.33	39.77427876	-80.77980765
6,799.99	77.96	326.47	6,460.03	-392.99	-960.74	14,444,695.30	1,702,229.64	39.77449440	-80.78000162
6,899.99	87.61	329.10	6,472.58	-309.15	-1,013.54	14,444,779.14	1,702,176.84	39.77472500	-80.78018882
6,935.00	91.00	330.00	6,473.00	-278.97	-1,031.28	14,444,809.31	1,702,159.09	39.77480799	-80.78025170
Begin 91.00° lateral section									
6,999.99	91.00	330.00	6,471.87	-222.70	-1,083.77	14,444,865.59	1,702,126.61	39.77496275	-80.78036683
7,099.99	91.00	330.00	6,470.13	-136.11	-1,113.76	14,444,952.17	1,702,076.61	39.77520088	-80.78054401
7,199.99	91.00	330.00	6,468.39	-49.52	-1,163.76	14,445,038.78	1,702,026.62	39.77543902	-80.78072118
7,299.99	91.00	330.00	6,466.65	37.07	-1,213.75	14,445,125.35	1,701,976.63	39.77567715	-80.78089836
7,399.99	91.00	330.00	6,464.91	123.66	-1,263.74	14,445,211.94	1,701,926.63	39.77591528	-80.78107554
7,499.99	91.00	330.00	6,463.17	210.25	-1,313.74	14,445,298.53	1,701,876.64	39.77615342	-80.78125272
7,599.98	91.00	330.00	6,461.43	296.84	-1,363.73	14,445,385.12	1,701,826.65	39.77639155	-80.78142990
7,699.98	91.00	330.00	6,459.69	383.42	-1,413.72	14,445,471.71	1,701,776.66	39.77662968	-80.78160708
7,799.98	91.00	330.00	6,457.95	470.01	-1,463.71	14,445,558.30	1,701,726.66	39.77686781	-80.78178426
7,899.98	91.00	330.00	6,456.21	558.80	-1,513.71	14,445,644.89	1,701,676.67	39.77710594	-80.78196145
7,999.98	91.00	330.00	6,454.47	643.19	-1,563.70	14,445,731.48	1,701,626.68	39.77734408	-80.78213883
8,099.98	91.00	330.00	6,452.73	729.78	-1,613.69	14,445,818.08	1,701,576.68	39.77758221	-80.78231582
8,199.98	91.00	330.00	6,450.99	816.37	-1,663.69	14,445,904.65	1,701,526.69	39.77782034	-80.78249300
8,299.98	91.00	330.00	6,449.25	902.96	-1,713.68	14,445,991.24	1,701,476.70	39.77805847	-80.78267019
8,399.98	91.00	330.00	6,447.51	989.55	-1,763.67	14,446,077.83	1,701,426.71	39.77829660	-80.78284738
8,499.98	91.00	330.00	6,445.77	1,076.14	-1,813.66	14,446,164.42	1,701,376.71	39.77853473	-80.78302457
8,599.98	91.00	330.00	6,444.03	1,162.73	-1,863.66	14,446,251.01	1,701,326.72	39.77877286	-80.78320177
8,699.98	91.00	330.00	6,442.29	1,249.31	-1,913.65	14,446,337.60	1,701,276.73	39.77901099	-80.78337896
8,799.98	91.00	330.00	6,440.55	1,335.90	-1,963.64	14,446,424.19	1,701,226.73	39.77924912	-80.78355616
8,899.98	91.00	330.00	6,438.81	1,422.49	-2,013.64	14,446,510.78	1,701,176.74	39.77948725	-80.78373335
8,999.98	91.00	330.00	6,437.07	1,509.08	-2,063.63	14,446,597.36	1,701,126.75	39.77972538	-80.78391055
9,099.98	91.00	330.00	6,435.33	1,595.67	-2,113.62	14,446,683.95	1,701,076.76	39.77996351	-80.78408775
9,199.98	91.00	330.00	6,433.59	1,682.26	-2,163.61	14,446,770.54	1,701,026.76	39.78020163	-80.78426495
9,299.98	91.00	330.00	6,431.85	1,768.85	-2,213.61	14,446,857.13	1,700,976.77	39.78043976	-80.78444215
9,399.98	91.00	330.00	6,430.11	1,855.44	-2,263.60	14,446,943.72	1,700,926.78	39.78067789	-80.78461935
9,499.98	91.00	330.00	6,428.37	1,942.03	-2,313.59	14,447,030.31	1,700,876.78	39.78091602	-80.78479656
9,599.98	91.00	330.00	6,426.63	2,028.61	-2,363.59	14,447,116.90	1,700,826.79	39.78115414	-80.78497376



Planning Report - Geographic



Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Bryan Pad
 Well: Bryan N-03HM (slot N)
 Wellbore: Original Hole
 Design: rev1

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

Well Bryan N-03HM (slot N)
 GL=1191 @ 1191.00usft
 GL=1191 @ 1191.00usft
 Grid
 Minimum Curvature

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 Office of Oil and Gas
 DEC 15 2017

WV Department of Environmental Protection

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,699.98	91.00	330.00	6,424.89	2,115.20	-2,413.58	14,447,203.49	1,700,776.80	39.78139227	-80.78515097
9,799.98	91.00	330.00	6,423.15	2,201.79	-2,463.57	14,447,290.08	1,700,726.81	39.78163040	-80.78532817
9,899.98	91.00	330.00	6,421.41	2,288.38	-2,513.58	14,447,376.67	1,700,676.81	39.78186852	-80.78550536
9,999.98	91.00	330.00	6,419.67	2,374.97	-2,563.56	14,447,463.25	1,700,626.82	39.78210565	-80.78568259
10,099.98	91.00	330.00	6,417.93	2,461.56	-2,613.55	14,447,549.84	1,700,576.83	39.78234478	-80.78585980
10,199.98	91.00	330.00	6,416.19	2,548.15	-2,663.54	14,447,636.43	1,700,526.83	39.78258290	-80.78603701
10,299.98	91.00	330.00	6,414.45	2,634.74	-2,713.54	14,447,723.02	1,700,476.84	39.78282103	-80.78621423
10,399.98	91.00	330.00	6,412.71	2,721.33	-2,763.53	14,447,809.61	1,700,426.85	39.78305915	-80.78639144
10,499.98	91.00	330.00	6,410.97	2,807.92	-2,813.52	14,447,896.20	1,700,376.86	39.78329728	-80.78656866
10,599.98	91.00	330.00	6,409.23	2,894.50	-2,863.51	14,447,982.79	1,700,326.86	39.78353540	-80.78674587
10,699.98	91.00	330.00	6,407.49	2,981.09	-2,913.51	14,448,069.38	1,700,276.87	39.78377352	-80.78692309
10,799.98	91.00	330.00	6,405.75	3,067.68	-2,963.50	14,448,155.97	1,700,226.88	39.78401165	-80.78710031
10,899.98	91.00	330.00	6,404.01	3,154.27	-3,013.49	14,448,242.55	1,700,176.88	39.78424977	-80.78727753
10,999.98	91.00	330.00	6,402.27	3,240.86	-3,063.48	14,448,329.14	1,700,126.89	39.78448789	-80.78745475
11,099.98	91.00	330.00	6,400.53	3,327.45	-3,113.48	14,448,415.73	1,700,076.90	39.78472602	-80.78763198
11,199.98	91.00	330.00	6,398.79	3,414.04	-3,163.47	14,448,502.32	1,700,026.91	39.78496414	-80.78780920
11,299.98	91.00	330.00	6,397.05	3,500.63	-3,213.46	14,448,588.91	1,699,976.91	39.78520226	-80.78798643
11,399.98	91.00	330.00	6,395.31	3,587.22	-3,263.46	14,448,675.50	1,699,926.92	39.78544039	-80.78816365
11,499.98	91.00	330.00	6,393.57	3,673.80	-3,313.45	14,448,762.09	1,699,876.93	39.78567851	-80.78834088
11,599.98	91.00	330.00	6,391.83	3,760.39	-3,363.44	14,448,848.68	1,699,826.93	39.78591663	-80.78851811
11,699.98	91.00	330.00	6,390.09	3,846.98	-3,413.44	14,448,935.27	1,699,776.94	39.78615475	-80.78869534
11,799.98	91.00	330.00	6,388.35	3,933.57	-3,463.43	14,449,021.86	1,699,726.95	39.78639287	-80.78887257
11,899.98	91.00	330.00	6,386.61	4,020.16	-3,513.42	14,449,108.44	1,699,676.96	39.78663099	-80.78904981
11,999.98	91.00	330.00	6,384.87	4,106.75	-3,563.41	14,449,195.03	1,699,626.96	39.78686911	-80.78922704
12,099.98	91.00	330.00	6,383.14	4,193.34	-3,613.41	14,449,281.62	1,699,576.97	39.78710723	-80.78940427
12,199.98	91.00	330.00	6,381.40	4,279.93	-3,663.40	14,449,368.21	1,699,526.98	39.78734535	-80.78958151
12,299.98	91.00	330.00	6,379.66	4,366.52	-3,713.39	14,449,454.80	1,699,476.98	39.78758347	-80.78975875
12,399.98	91.00	330.00	6,377.92	4,453.11	-3,763.39	14,449,541.39	1,699,426.99	39.78782159	-80.78993599
12,499.98	91.00	330.00	6,376.18	4,539.69	-3,813.38	14,449,627.98	1,699,377.00	39.78805971	-80.79011323
12,599.98	91.00	330.00	6,374.44	4,626.28	-3,863.37	14,449,714.57	1,699,327.01	39.78829783	-80.79029047
12,699.97	91.00	330.00	6,372.70	4,712.87	-3,913.37	14,449,801.16	1,699,277.01	39.78853595	-80.79046771
12,799.97	91.00	330.00	6,370.96	4,799.46	-3,963.36	14,449,887.74	1,699,227.02	39.78877407	-80.79064496
12,899.97	91.00	330.00	6,369.22	4,886.05	-4,013.35	14,449,974.33	1,699,177.03	39.78901218	-80.79082220
12,999.97	91.00	330.00	6,367.48	4,972.64	-4,063.34	14,450,060.92	1,699,127.03	39.78925030	-80.79099945
13,099.97	91.00	330.00	6,365.74	5,059.23	-4,113.34	14,450,147.51	1,699,077.04	39.78948842	-80.79117669
13,199.97	91.00	330.00	6,364.00	5,145.82	-4,163.33	14,450,234.10	1,699,027.05	39.78972654	-80.79135394
13,299.97	91.00	330.00	6,362.26	5,232.41	-4,213.32	14,450,320.69	1,698,977.06	39.78996465	-80.79153119
13,399.97	91.00	330.00	6,360.52	5,318.99	-4,263.32	14,450,407.28	1,698,927.06	39.79020277	-80.79170844
13,429.85	91.00	330.00	6,360.00	5,344.69	-4,278.15	14,450,432.98	1,698,912.22	39.79027344	-80.79176105

PBHL/TD 13429.65 MD/6360.00 TVD

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N-S (usft)	+E-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL Bryan N-03HM - plan hits target center - Point	0.00	0.00	6,360.00	5,344.69	-4,278.15	14,450,432.98	1,698,912.22	39.79027344	-80.79176105
LP Bryan N-03HM - plan hits target center - Point	0.00	0.00	6,473.00	-278.97	-1,031.28	14,444,809.32	1,702,159.09	39.77480800	-80.76025170



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Bryan N-03HM (slot N)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1191 @ 1191.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1191 @ 1191.00usft
Site:	Bryan Pad	North Reference:	Grid
Well:	Bryan N-03HM (slot N)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.00	500.00	0.00	0.00	KOP Begin 2°/100' build
750.00	749.68	-10.24	-3.73	Begin 5.00° tangent
3,008.91	3,000.00	-195.25	-71.06	Begin 2°/100' build/turn
3,582.63	3,544.56	-287.78	-133.06	Begin 15.29° tangent
5,991.82	5,887.77	-703.21	-602.90	Begin 10°/100' build/turn
6,935.00	6,473.00	-278.97	-1,031.28	Begin 91.00° lateral section
13,429.65	6,360.00	5,344.68	-4,278.15	PBHL/TD 13429.65 MD/6360.00 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 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

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470510200

Permit well - Bryan N-3HM

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.

WV Geological & Economic Survey

Well: County = 51 Permit = 01340

Location Information: View Map

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LONG_DD	STRE	UTM
4705101340	Marshall	1340	1340			775926	-80.776811	419230.7	4402076.8

Bottom Hole Location Information:

API	EF	FLWD	STRE	UTM	LOW_ZOO	LAT_DD
4705101340	1	As Reported	818425.4	4404202.8	02	782028.28

Owner Information:

API	COMP	DT	SUPPLR	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR	AT_COMPLETION	PROP_VD	PROP_TST	FM	TRM_EST	PR
4705101340	412010	010	Compas	CL	Land Resources Inc	14		Byan	1400	Marshall & Brandy Bryan	AB Resources PA	5100	Marshall Co				

Completion Information:

API	COMP	DT	SPND	DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FHT	INITIAL_CLASS	FINAL_CLASS	TYPE	R/O	CMP	FRIND	TVD	END	NEW	FTD	O_BEF	G_AFT	O_BEF	G_AFT	INCL	DEF	HQ_L	AT	P_BEF	P_AFT	
4705101340	412010	010	010	010	1217	Kick	Byan	Marshall Sh	Marshall Sh	Development Well	Development Well	Oil and Gas	Relay	Produced	6450	6450	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comment: 4702010 Kick off point at 6065

Play/Show Water Information:

API	COMP	DT	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOTTOM	FM_BOTTOM	O_BEFF	G_AFT	O_BEFF	G_AFT	WATER	GNTY
4705101340	412010	010	Water	Gas	Water	1400	Marshall Sh	1712	Marshall Sh	1712	Marshall Sh	1712	Marshall Sh	1712	Marshall Sh

Production Gas Information: (Volumes in MCF)

API	PRODUCING_OPERATOR	FID	YEAR	ANK	Q1	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	AB Resources PA	2050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

API	PRODUCING_OPERATOR	FID	YEAR	ANK	Q1	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	AB Resources PA	2050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

API	PRODUCING_OPERATOR	FID	YEAR	ANK	Q1	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	Chevron Appalachia, LLC	2051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Water Information: (Volumes in Gallons)

API	PRODUCING_OPERATOR	FID	YEAR	ANK	Q1	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	Chevron Appalachia, LLC	2051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Stratigraphy Information:

API	SUFFL	FM	FM_QUALITY	DEPTH_TOP	DEPTH_BOTTOM	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705101340	Dyni Drgn Les	Burnet	Well Record	5334	Reasonable	40	Reasonable	1217

Wellbore (E-Log) Information:

API	LOG_TOP	LOG_BOTTOM	DEEPT_FT	FML	LOG_AVAILABLE	SCAN	DIGITIZED	GRL_TOP	GRL_BOTTOM	D_TOP	D_BOTTOM	N_BOTTOM	N_BOSE	L_DP	L_BOT	T_TOP	T_DOT	S_TOP	S_BOT	O_BOT	INCH	REDUCED	KOP	LOGMD	ELEV	HW
4705101340	85	2064	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comment: logs: caliper, lorenson, PE, LWD, G with measured and vertical depth included.

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4705102000

4705100658
4705100659
4705100660

4705100112
4705100112

CR 16

4705173908

FRANKLIN
MARSHALL

4705104400

4705101569
4705101569
4705101569
4705101569
4705101569
4705101569
4705101569

4705101240
4705101340

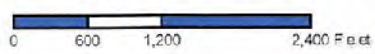
4705101029

Legend

- Well Locations (ims.wvgs.wvnet.edu)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Bryan N-3HM
- 500 Ft Buffer
- Counties
- Districts



Bryan N-3HM
Franklin District
Marshall County, WV



Map Created: December 7, 2017
Map Current As Of: December 7, 2017

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

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WV Department of Environmental Protection Prepared by:



WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Bryan N-3HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

WV Department of
Environmental Protection

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
- Undergound 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.

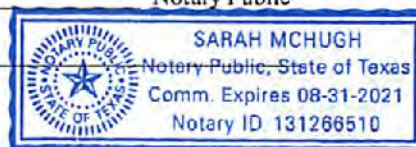
Company Official Signature _____
Company Official (Typed Name) David Patterson
Company Official Title Senior Vice President, Operations

Subscribed and sworn before me this 12th day of December, 2017

Sarah Mchugh

Notary Public

My commission expires 08-31-2021



Form WW-9

Operator's Well No. Bryan N-3HM

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

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Seed Mixtures

Temporary

Permanent

Seed Type	lbs/acre
Rye Grain	140

Seed Type	lbs/acre
Tall Fescue	40
Ladino Clover	5

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *Jim Usher*

Comments: _____

Title: *Oil & Gas Inspector* Date: *12/13/17*

Field Reviewed? Yes No

4705102000



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WV Department of
Environmental Protection

Well Site Safety Plan

Tug Hill Operating, LLC

ju
12/13/17

Well Name: Bryan N-3HM

Pad Location: Bryan Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,404,500.78

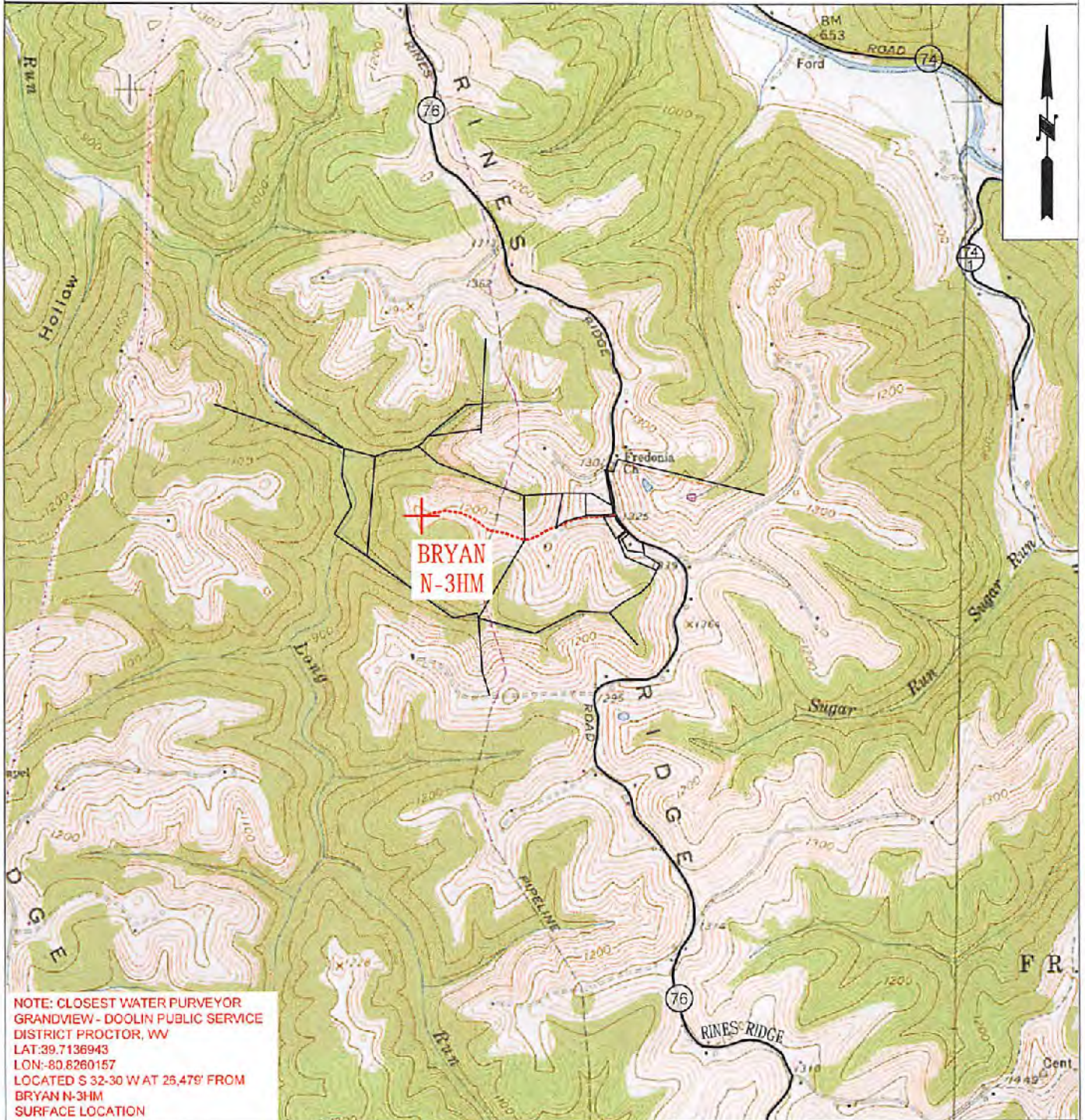
Easting: 517,829.48

December 2017


WW-9

SUPPLEMENT PG 2

PROPOSED BRYAN N-3HM

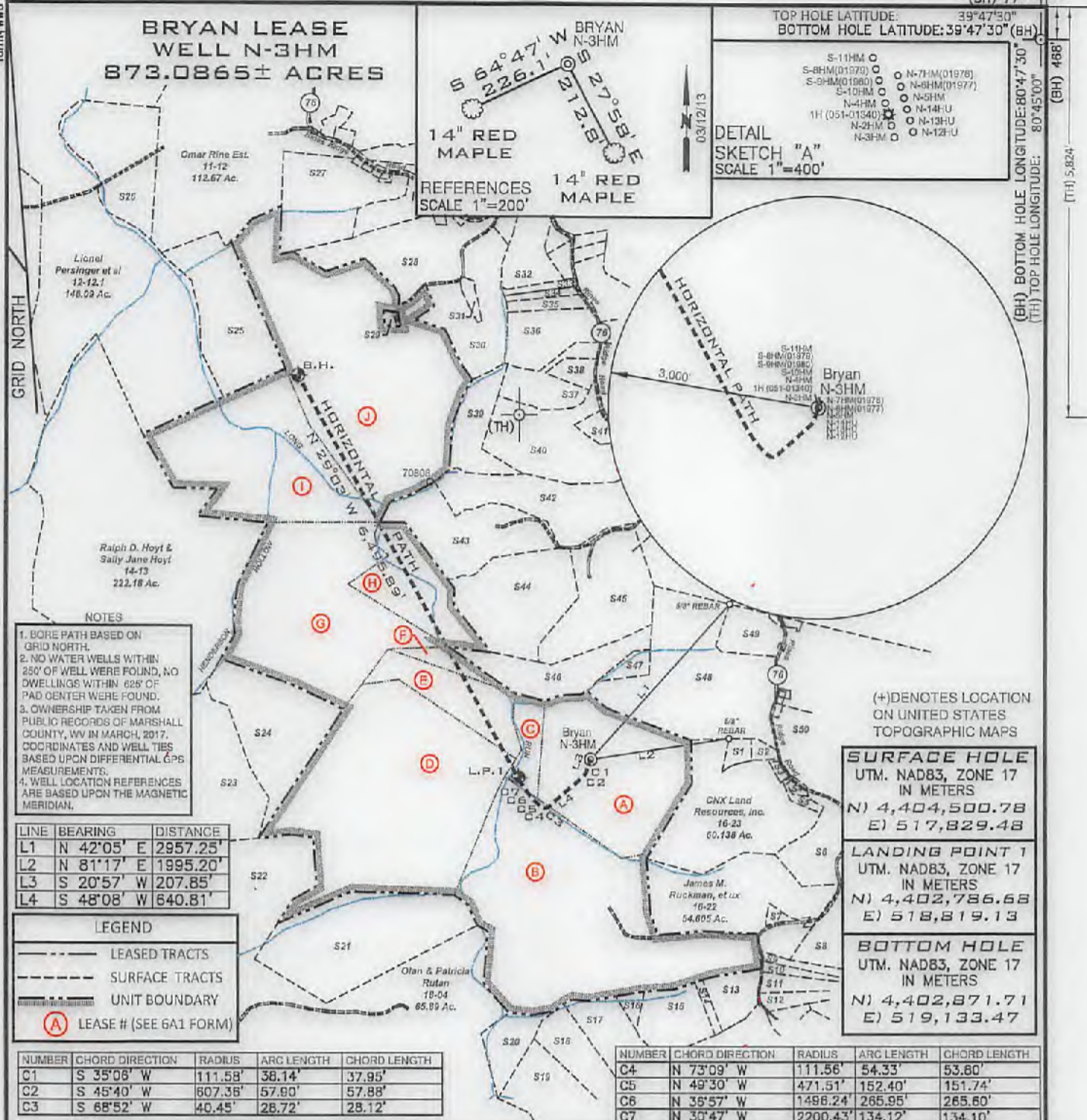
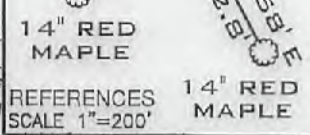
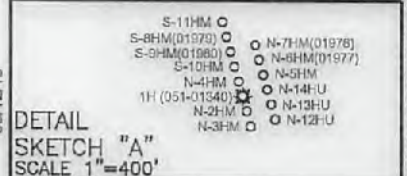


NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN PUBLIC SERVICE
DISTRICT PROCTOR, WV
LAT: 39.7136943
LON: -80.8260157
LOCATED S 32-30 W AT 25.479' FROM
BRYAN N-3HM
SURFACE LOCATION

 TUG HILL OPERATING	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-3HM
873.0865± ACRES**

TOP HOLE LATITUDE: 39°47'30"
BOTTOM HOLE LATITUDE: 39°47'30" (BH)



- 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°05' E	2957.25'
L2	N 81°17' E	1995.20'
L3	S 20°57' W	207.85'
L4	S 48°08' W	640.81'

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

NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH
C1	S 35°08' W	111.58'	38.14'	37.95'
C2	S 45°40' W	607.36'	57.90'	57.88'
C3	S 68°52' W	40.45'	28.72'	28.12'

NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH
C4	N 73°09' W	111.56'	54.33'	53.60'
C5	N 49°30' W	471.51'	152.40'	151.74'
C6	N 35°57' W	1496.24'	265.95'	265.60'
C7	N 30°47' W	2200.43'	134.12'	134.10'

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,404,500.78
E) 517,829.48

LANDING POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,402,786.68
E) 518,819.13

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,402,871.71
E) 519,133.47

FILE NUMBER _____

DRAWING NUMBER **BRYAN_WP_N-3HM**

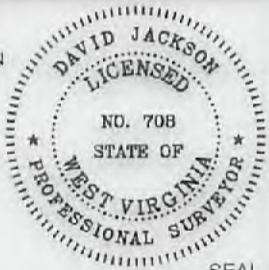
SCALE **1" = 2000'**

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. 70B *David L Jackson*



JACKSON SURVEYING INC.
P.O. Box 1490
Clarksburg, WV 26302
304-623-6651

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

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

DATE: DECEMBER 12, 2017
OPERATORS WELL NO. BRYAN N-3HM
API WELL NO. 47-051-02000
STATE COUNTY PERMIT

LOCATION ELEVATION 1191.0' WATERSHED (HUC 10) Fish Creek
DISTRICT Franklin COUNTY Marshall
QUADRANGLE Powhatan Point 7.5' LEASE NUMBER SEE WW-6A1 Form

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

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD: 6,596' TMD: 13,440'

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

COUNTY NAME
PERMIT

**BRYAN LEASE
WELL N-3HM
873.0865± ACRES**

GRID NORTH

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	15-7	Terry D. Rose Et Ux	4.5
S48	15-8	Terry D. Rose Et Ux	77.11
S49	16-3	Donna Vivian Yoho	71.205
S50	16-25	John Swierkos	74.09



P.S. 708

David L Jackson



TUG HILL
OPERATING

OPERATOR'S
WELL #: Bryan N-3HM
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV

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

4705102000

WW-6A1 Supplement

Operator's Well No. Bryan N - 3HM

Lessee No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19294	A	5-15-9	BRENDA K BRYAN	TRIENERGY INC	1/8+		741	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	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19294	A	5-15-9	MICHAEL R BRYAN	TRIENERGY INC	1/8+		741	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	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19294	A	5-15-9	WESLEY RUSSELL BRYAN II	TRIENERGY INC	1/8+		741	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	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19294	A	5-15-9	APPALACHIAN ENERGY HOLDINGS I LP	TRIENERGY INC	1/8+		741	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	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19339	B	5-15-10	MARK STANLEY RUCKMAN	TRIENERGY INC	1/8+		75	20/252 TriEnergy Inc to AB Resources LLC	N/A	N/A	N/A	N/A	N/A	N/A
10*21175	C	5-15-13	KEITH A RYAN	TH EXPLORATION, LLC	1/8+		952	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21177	C	5-15-13	RHONDA R AND DAVID R TOPPER	TH EXPLORATION, LLC	1/8+		181	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21176	C	5-15-13	FLORENCE K AND DAVID B FOSTER	TH EXPLORATION, LLC	1/8+		952	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19294	C	5-15-13	MICHAEL R. BRYAN BRENDA K. BRYAN	TRIENERGY, INC.	1/8+		666	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	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19337	D	5-15-12	JACK PETROCK HATTIE PETROCK	TRIENERGY, INC.	1/8+		663	20/252 TriEnergy Inc to AB Resources LLC	Chief Exploration & Development LLC	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19299	F	5-15-2	KAREN DENNY	CHEVRON USA INC	1/8+		798	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19310	F	5-15-2	ELEN DINGER	CHEVRON USA INC	1/8+		101	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19311	F	5-15-2	FLORENCE KATHERINE FOSTER	CHEVRON USA INC	1/8+		395	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19312	F	5-15-2	MARK A GALLAGHER	CHEVRON USA INC	1/8+		92	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19313	F	5-15-2	NANCY KAY GALLAGHER	CHEVRON USA INC	1/8+		579	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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10*19314	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19315	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19316	F	5-15-2	CAROLA KURTZ	CHEVRON USA INC	1/8+	798	361	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19317	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19318	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19319	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19320	F	5-15-2	ALBERTA RYAN	CHEVRON USA INC	1/8+	799	46	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19321	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19322	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19323	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19324	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19325	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19326	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19327	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19328	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19329	F	5-15-2	GEORGE SETTLES	CHEVRON USA INC	1/8+	799	28	N/A	N/A	N/A	N/A	N/A	N/A	40/57 Chevron USA Inc to TH Exploration LLC
10*19330	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19331	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19332	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19333	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19334	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19335	F	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	40/57 Chevron USA Inc to TH Exploration LLC
10*19337	F	5-15-2	JACK PETROCK HATTIE PETROCK	TRIENERGY, INC.	1/8+	663	498	N/A	20/252 TriEnergy Inc to AB Resources LLC	21/520 Chief Exploration & Development, LLC and Radler 2000 Limited Partnership to Enerplus Resources USA Corporation	21/520 Chief Exploration & Development, LLC and Radler 2000 Limited Partnership to Enerplus Resources USA Corporation	21/520 Chief Exploration & Development, LLC and Radler 2000 Limited Partnership to Enerplus Resources USA Corporation	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*14053	G	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	36/9 Gstar Exploration Inc to TH Exploration II, LLC
10*14054	G	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	36/9 Gstar Exploration Inc to TH Exploration II, LLC
10*14055	G	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	36/9 Gstar Exploration Inc to TH Exploration II, LLC
10*14056	G	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	36/9 Gstar Exploration Inc to TH Exploration II, LLC

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10*14057	G	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	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14058	G	5-15-1	NANCY HOFSTATTER	GASTAR EXPLORATION USA, INC.	1/8*	732	628	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14059	G	5-15-1	LAURA BERRY MCGLYNN	GASTAR EXPLORATION USA, INC.	1/8*	732	622	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14060	G	5-15-1	SUSAN E GORE	GASTAR EXPLORATION USA INC	1/8*	768	488	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14061	G	5-15-1	LINDA TAYLOR	GASTAR EXPLORATION USA, INC	1/8*	770	476	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14062	G	5-15-1	REBECCA MCMILLAN	GASTAR EXPLORATION USA INC	1/8*	803	482	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14063	G	5-15-1	DAVID BURKETT	GASTAR EXPLORATION USA INC	1/8*	803	480	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14043	G	5-15-1	PATRICK R. WALSH	GASTAR EXPLORATION USA, INC.	1/8*	725	566	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14044	G	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	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14045	G	5-15-1	LAMOYNE BAKER	GASTAR EXPLORATION USA, INC.	1/8*	724	236	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14046	G	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	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14047	G	5-15-1	LESLIE ANN BLYTHE	GASTAR EXPLORATION USA, INC.	1/8*	726	645	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14048	G	5-15-1	BRYANNA FLYNN RANKIN	GASTAR EXPLORATION USA, INC.	1/8*	727	3	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14049	G	5-15-1	WILDA WINTERS	GASTAR EXPLORATION USA, INC.	1/8*	726	643	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14050	G	5-15-1	JUDITH L CHAMBERS	GASTAR EXPLORATION USA, INC.	1/8*	726	647	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14051	G	5-15-1	AMANDA L. SMITH	GASTAR EXPLORATION USA, INC.	1/8*	727	572	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14052	G	5-15-1	MAY ELIZABETH GALLAHER BROWNING	GASTAR EXPLORATION USA, INC.	1/8*	727	568	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*47051.331.1	G	5-15-1	LEEANN M LEMONOVICH	TH EXPLORATION LLC	1/8*	910	136	N/A	N/A	N/A	N/A	N/A	N/A
10*14042	G	5-15-1	RALPH B TAYLOR	GASTAR EXPLORATION USA, INC.	1/8*	665	487	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*14064	G	5-15-1	CIRRUS MINERALS LLC BY CHRISTO	GASTAR EXPLORATION INC	1/8*	843	452	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger, Gastar Exploration USA, Inc to Gastar Exploration II, LLC
10*19038	H	5-15-3	PHYLLIS L PARSONS	CHEVRON USA INC	1/8*	814	379	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19254	H	5-15-3	JOANNE LABRY	CHEVRON USA, INC	1/8*	820	320	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC

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10*19046	H	5-15-3	CAROL J WEINSTEIN	CHEVRON USA INC	1/8*	813	33	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19047	H	5-15-3	DEBORAH CROSTEN-PURCELL	CHEVRON USA INC	1/8*	813	28	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19048	H	5-15-3	JANET FRANKHAUSER WILSON	CHEVRON USA INC	1/8*	817	627	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19055	H	5-15-3	DONNA LGORDYAN	CHEVRON USA INC	1/8*	814	468	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19056	H	5-15-3	LEKLE R KEYS	CHEVRON USA INC	1/8*	814	463	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19061	H	5-15-3	ANN WOLLSCHLEGER	CHEVRON USA INC	1/8*	817	615	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19066	H	5-15-3	MICHAEL L FRANKHAUSER	CHEVRON USA INC	1/8*	818	29	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19068	H	5-15-3	LINDA L RUPERT	CHEVRON USA INC	1/8*	820	229	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19069	H	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	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19071	H	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	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19074	H	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	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19076	H	5-15-3	FRANKHAUSER LIVING TRUST SUSAN LIVINGSTON, TRUSTEE	CHEVRON USA INC	1/8*	826	485	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19030	H	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	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19080	H	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	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19081	H	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	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19128	H	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	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19293	H	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	20/252 TriEnergy Inc to AB Resources LLC	666/40 AB Resources LLC to Chief Exploration & Development LLC	20/252 TriEnergy Inc to AB Resources LLC	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc
10*19374	I	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
10*19953	I	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
10*19950	I	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
10*18174	I	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
10*18045	I	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
10*17329	I	5-11-15	JOHN P ICARD AND REVA J ICARD LJONEL L AND MARY LEE	TH EXPLORATION LLC	1/8*	943	524	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16913	I	5-11-15	PERSINGER	TH EXPLORATION LLC	1/8*	910	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*14911	I	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	36/9 Gastar Exploration Inc to TH Exploration II, LLC
10*19642	I	5-11-15	NOELA PARKS	TH EXPLORATION LLC	1/8*	944	92	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19139	J	5-11-14	HIRAM V MOORE	GASTAR EXPLORATION USA INC	1/8*	699	53	N/A	N/A	23/353 Gastar Exploration USA Inc to Althum Marcellus LLC	23/353 Gastar Exploration USA Inc to Althum Marcellus LLC	23/353 Gastar Exploration USA Inc to Althum Marcellus LLC	23/353 Gastar Exploration USA Inc to Althum Marcellus LLC	40/127 Chevron USA Inc. to TH Exploration, LLC

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WW-6A1
(5/13)

Operator's Well No. Bryan N-3HM

**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

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Environmental Protection

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

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

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

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

Well Operator: Tug Hill Operating, LLC
 By: Ben Irwin 
 Its: Land Team Lead

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 / 2nd 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, its 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 13th DAY OF MARCH 2008.

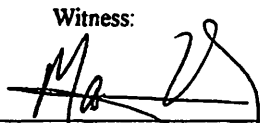
Witness:

TRIENERGY, INC.




Print Name: Matthew Riva

By: Joseph E. Bojalad
Its: President

Witness:


Mark H. Van Tyne

AB RESOURCES LLC


By: Gordon O. Yonel
Its: Chief Executive Officer

Chief Expl & Dev LLC
6051 Shallow Rd East, Suite 210
Aberfeld, Pa 15890

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.

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;

ASSIGNMENT AND BILL OF SALE

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

JTH LAND SERVICE, INC.
11106 STATE HIGHWAY 18
CONNEAUT LAKE, PA 16516-3620

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 7th Street, 4th 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

Prepared by:

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

JIM BOURBEAU LAND SERVICE INC
11106 ST HWY 18
CONNEAUT LAKE, PA 16316-3620

BOOK 0756 PAGE 0397

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

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, 2nd 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").

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

ASSIGNMENT AND BILL OF SALE

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

RECTALS

- 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.

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 / 2nd 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, its 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.

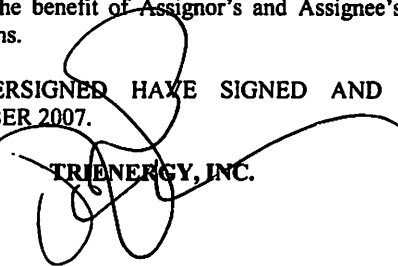
IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND SEALED THIS INSTRUMENT THIS 19th DAY OF DECEMBER 2007.

Witness:

TRIENERGY, INC.



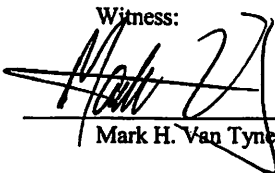
Print Name: Deb Reid



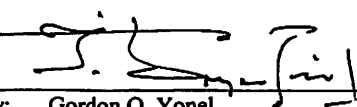
By: Joseph E. Bojalad
Its: President

Witness:

AB RESOURCES LLC



Mark H. Van Tyne



By: Gordon O. Yonel
Its: Chief Executive Officer

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

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 & DEVELOPMENT LLC

By: 

Glynne Mildren
Senior Vice President - Land

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

BOOK0021 PAGE0041

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.

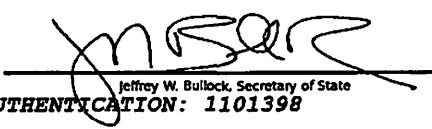
Jan Pest
 MARSHALL County 02:00:18 PM
 Instrument No 1357802
 Date Recorded 03/20/2014
 Document Type HIS
 Pages Recorded 3
 Book-Page 21-41
 Recording Fee \$5.00
 Additional \$6.00



4987302 8100M

140115998

You may verify this certificate online
 at corp.delaware.gov/authver.shtml


 Jeffrey W. Bullock, Secretary of State
 AUTHENTICATION: 1101398

DATE: 01-31-14

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

4705 102000
BOOK:040 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:

I. 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

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.

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 Post
MARSHALL County 02:28:35 PM
Instrument No: 1367204
Date Recorded: 10/02/2014
Document Type: SM
Pages Recorded: 8
Book-Page: 32-362
Recording Fee: \$2.00
Additional: \$6.00

THIS ASSIGNMENT made this 25 day of September, 2014, from Gstar 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, and 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, forever, all of Assignor's right, title and interest in, to and under the Leases, and subleases thereof and 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



December 14, 2017

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

RE: Bryan N-3HM

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.

Sincerely,

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

Amy L. Miller
Permitting Specialist – Appalachia Region

RECEIVED
Office of Oil and Gas
DEC 15 2017
WV Department of
Environmental Protection

DEC 15 2017

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

WV Department of
Environmental Protection

Date of Notice Certification: 12/14/2017

API No. 47- 051 -

Operator's Well No. Bryan N-3HM

Well Pad Name: Bryan

Notice has been given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>517,829.489</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,500.78</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>CNX Land Resources, Inc.</u>	
Watershed:	<u>Fish Creek (HUC-10)</u>			

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

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

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.

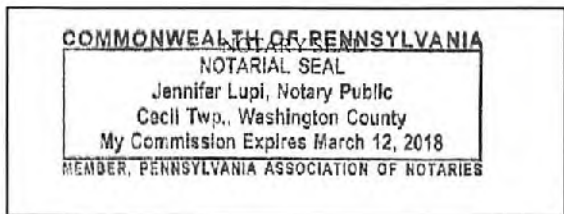
4705 102000

Certification of Notice is hereby given:

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

Well Operator: Tug Hill Operating, LLC
By: Amy L. Miller
Its: 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 14th 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.

RECEIVED
Office of Oil and Gas
DEC 15 2017
WV Department of
Environmental Protection

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

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

Date of Notice: 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

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

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

SURFACE OWNER(s)
 Name: CNX Land Resources, Inc. (Pad)
 Address: 1000 Consol Energy Drive
Canonsburg, PA 15317
 Name: Greg and Christina Riddle (Road)
 Address: 4205 Rines Ridge Road
Proctor, WV 26055

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

SURFACE OWNER(s) (Impoundments or Pits)
 Name: _____
 Address: _____

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

COAL OPERATOR
 Name: _____
 Address: _____

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

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
 Name: _____
 Address: _____

*Please attach additional forms if necessary

RECEIVED
 Office of Oil and Gas
 DEC 15 2017

WV Department of Environmental Protection

DEC 15 2017

API NO. 47- 4705102000
OPERATOR WELL NO. Bryan N-3HM
Well Pad Name: BryanWV Department of
Environmental Protection**Notice is hereby given:**

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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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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WW-6A
(8-13)

API NO. 47- **47-05102000**
OPERATOR WELL NO. Bryan N-3HM
Well Pad Name: Bryan

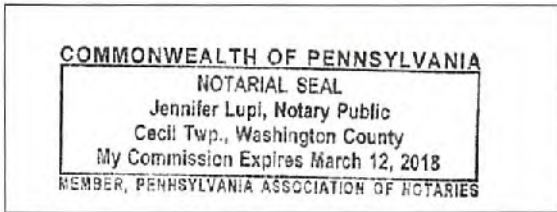
Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-6368
Email: amiller@tug-hill-op.com *Amiller*

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.



Subscribed and sworn before me this 14th day of Dec, 2017.
Jennifer Lupi Notary Public
My Commission Expires March 12, 2018

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WW-6A

Supplement Pg. 1A

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

WATER WELL REPORT

Well: BRYAN No. N-3HM
 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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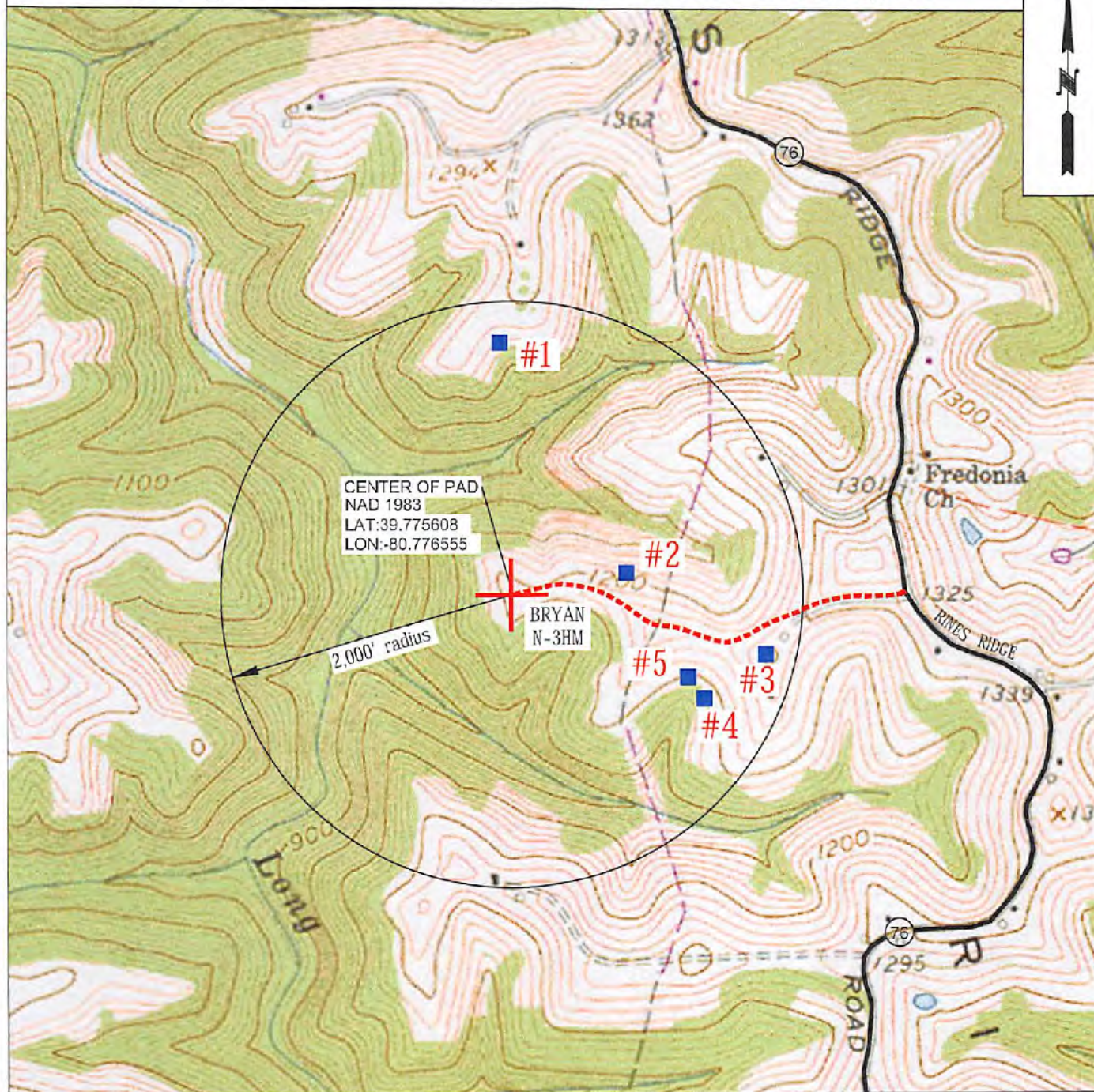
**WV Department of
Environmental Protection**

WW-6A

PROPOSED BRYAN N-3HM

SUPPLEMENT PG 1

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



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

BRYAN
N-3HM

2,000' radius

#1

#2

#5

#3

#4

Fredonia
Ch

RIVER RIDGE

76

1295

1200

1325

1300

76

1367

1294 X

Long



TUG HILL
OPERATING

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	

10/10/10

10/10/10

10/10/10

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10/10/10

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

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

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

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

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

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

Notice is hereby provided to:

SURFACE OWNER(s)

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

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

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

COAL OWNER OR LESSEE

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

MINERAL OWNER(s)

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

*please attach additional forms if necessary

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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	Approx. Latitude & Longitude:	39.7756312; -80.7756011
County:	Marshall	Public Road Access:	Rines Ridge Road (County Route 76)
District:	Franklin	Watershed:	(HUC-10) Fish Creek
Quadrangle:	Powhatan Point	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 57th 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.

Notice is hereby given by:

Well Operator:	Tug Hill Operating, LLC	Address:	380 Southpointe Boulevard, Plaza II, Suite 200
Telephone:	724-749-8388		Canonsburg, PA 15317
Email:	amiller@tug-hill-op.com	Facsimile:	724-338-2030

Oil and Gas Privacy Notice:

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

Operator Well No. Bryan N-3HM**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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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: 4193 Rines Ridge Road
Proctor, WV 26055 *See attached sheet

Notice is hereby given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>519,133.47</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,871.71</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 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Operator: Tug Hill Operating, LLC

Telephone: 724-749-8388

Email: amiller@tug-hill-op.com

Address: 380 Southpointe Boulevard, Plaza II, Suite 200

Canonsburg, PA 15317

Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

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

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4705 102000

Operator Well No. Bryan N-3HM

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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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways

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

Jim Justice
 Governor

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

September 7, 2017

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

Subject: DOH Permit for the Bryan Pad, Marshall County
 Bryan N-3HM 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,

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

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

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PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Bryan N-3HM

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

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Well Pad Site

Construction Plan, &
 Erosion Control Plans
 for Well Operating
 in Franklin 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

Property Owner Information - Bryan Well Pad Site

Franklin District - Marshall County							
Owner	TM Parcel	Well Pad	Staging	Access Road	Topsoil Excav	Add. Clearing	Total Disturbed
Ray Minor et ux	16-21-1	0.00	0.00	1.00	0.00	0.01	0.01
Loree & Christina Jodala	16-23-2	0.00	0.00	1.00	0.00	0.04	0.04
Michael & Brenda Urban	16-23-4	0.00	0.00	1.00	0.00	0.26	0.26
CNS Land Resources Inc	16-23	0.00	0.00	1.58	0.00	0.69	1.27
CNS Land Resources Inc	15-9	1.91	1.00	1.07	0.82	7.29	14.35
Site Totals (Ac)							
	3.91	1.00	2.07	0.82	8.28	15.14	

Design: Issue for Permitting



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

Access Road

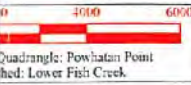
Surface Owner	TM Parcel	Road Length	Type
Michael & Brenda Urban	16-23-4	46.55'	Existing Access Road
CNS Land Resources Inc	15-9	1,296.74'	Existing Access Road
CNS Land Resources Inc	15-9	1,424.34'	Existing Access Road

Disturbed Area

Well Pad Construction	3.91 Ac
Access Road Construction	2.07 Ac
Access Road Staging Area Crest	1.05 Ac
Topsoil Excav Material	0.82 Ac
Additional Clearing	8.28 Ac
Total Disturbed Area	16.14 Ac
Additional Information	
Total Wooded Acres Disturbed	0.16 Ac
Total Linear Feet of Access Road	2,747.51'

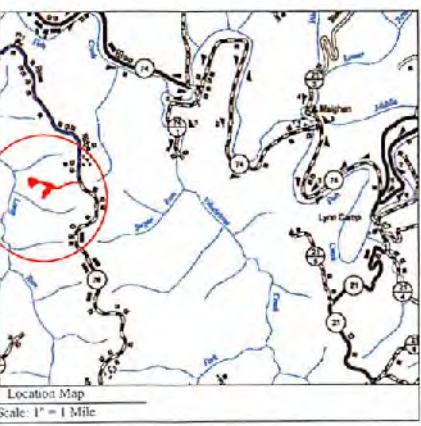
Bryan Well Pad Site Quantities

Description	Cut (CY)	Fill (CY)	Spill (CY)	Removal (CY)	Max. Slope	Length of Slope
Well Pad Modification	2,420.95	11.24	2,810.20		N/A	N/A
Well Pad Berm	0.00	777.64		777.64	N/A	N/A
Access Road Staging Area	3,945.88	5,916.05		2,000.22	N/A	N/A
Well Pad Access Road Mod #1	8.10	39.14		31.04	16.34%	36.71'
Well Pad Access Road Mod #2	14.02	200.93		366.91	16.34%	36.71'
Well Pad Access Road Mod #3	336.61	404.88		143.73	16.34%	36.71'
Formed Slope Removal	3,651.65	0.00	3,651.65		N/A	N/A
Topsoil Excav Material Stockpile	0.00	3,802.21		3,802.21	N/A	N/A
Totals	10,918.64	11,629.64	6,607.08	7,248.88		
Total Spill (CY) =		-691.00	(Excess Spill Capacity)			



Site Locations (NAD 83)

Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.7751752	-80.76697314
Center of Well Pad	39.77560812	-80.77655533



The drawings, construction notes and reference diagrams attached hereto have been prepared in accordance with the West Virginia Code of State Rules, Division of Professional Professions, Office of Professional Regulation.

All Plans, Sheets, and/or Reference Diagrams included in this design constitute a complete set of plans. A complete set of plans is necessary to construct the site shown on these plans with the design.

Zachary C. Sumner, P.E.
 REG. 22214
 R&B - Engineering PLLC
 608A-62424-00

Date: 08-29-2017

Sheet	Description
1	Cover Sheet
V1	Schedule of Quantities
N1-N3	Site Notes
2	Pre-Construction Site Conditions
3	Site Soil Map
4	Clearing 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



THIS DOCUMENT
 PREPARED FOR
 TUG HILL
 OPERATING



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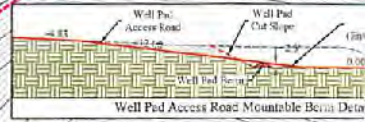
Cover Sheet
 Bryan Well Pad Site
 Franklin District
 Marshall County, WV

Date: 08/29/2017
 Scale: As Shown
 Designed By: ZS
 File No.
 Sheet 1 of 17

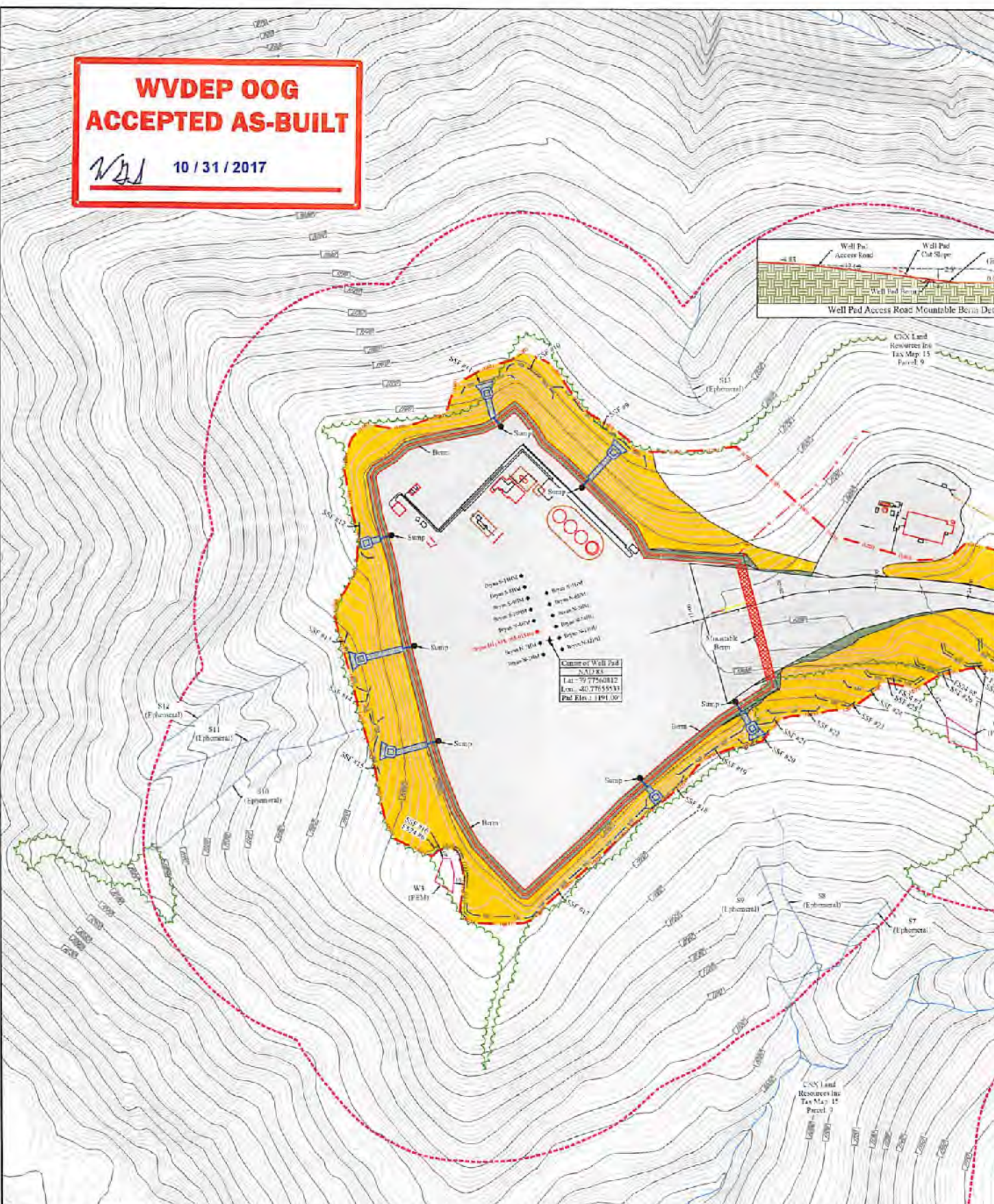
WVDEP OOG ACCEPTED AS-BUILT

WJ

10 / 31 / 2017



CNS Land Resources Inc
Tax Map 15
Parcel 9



Corner of Well Pad
NAD 83
Lat: 39.77560812
Long: -82.77659333
Pol. Elev.: 1191.00'

Access Road			
Surface Owner	TM - parcel	Block	Lot(s)
Michael R. Veranda Evans	10-20-14	40-33	Existing Access Road
CNS Land Resources Inc	16-23	1-276-45	Existing Access Road
CNS Land Resources Inc	15-9	1-232-24	Existing Access Road

Legend

	Original Ground 2' Contour		12" Wall		PEM Wetland
	Original Ground 10' Contour		24" Corrugated Filter Sock		POW Wetland
	Center of Structure		Super Silt Fence		Potential Stream
			Line of Disturbance		Information Stream
			Area of Interest		Ephemeral Stream
			Existing Gas Line		Seed and Muck Area
			Existing Utility Public Line		Erosion Control Filtered Slope Area
					Steep Chalk Out

Disturbed Area	
Well Pad Construction	3.91 Ac
Access Road Construction	2.07 Ac
Access Road Staging Area Cont'd	1.09 Ac
Type of Filled Material	0.92 Ac
Additional Clearing	8.24 Ac
Total Disturbed Area	16.14 Ac
Additional Information	
Total Wooded Area Disturbed	0.16 Ac
Total Linear Feet of Access Road	2,767.31'

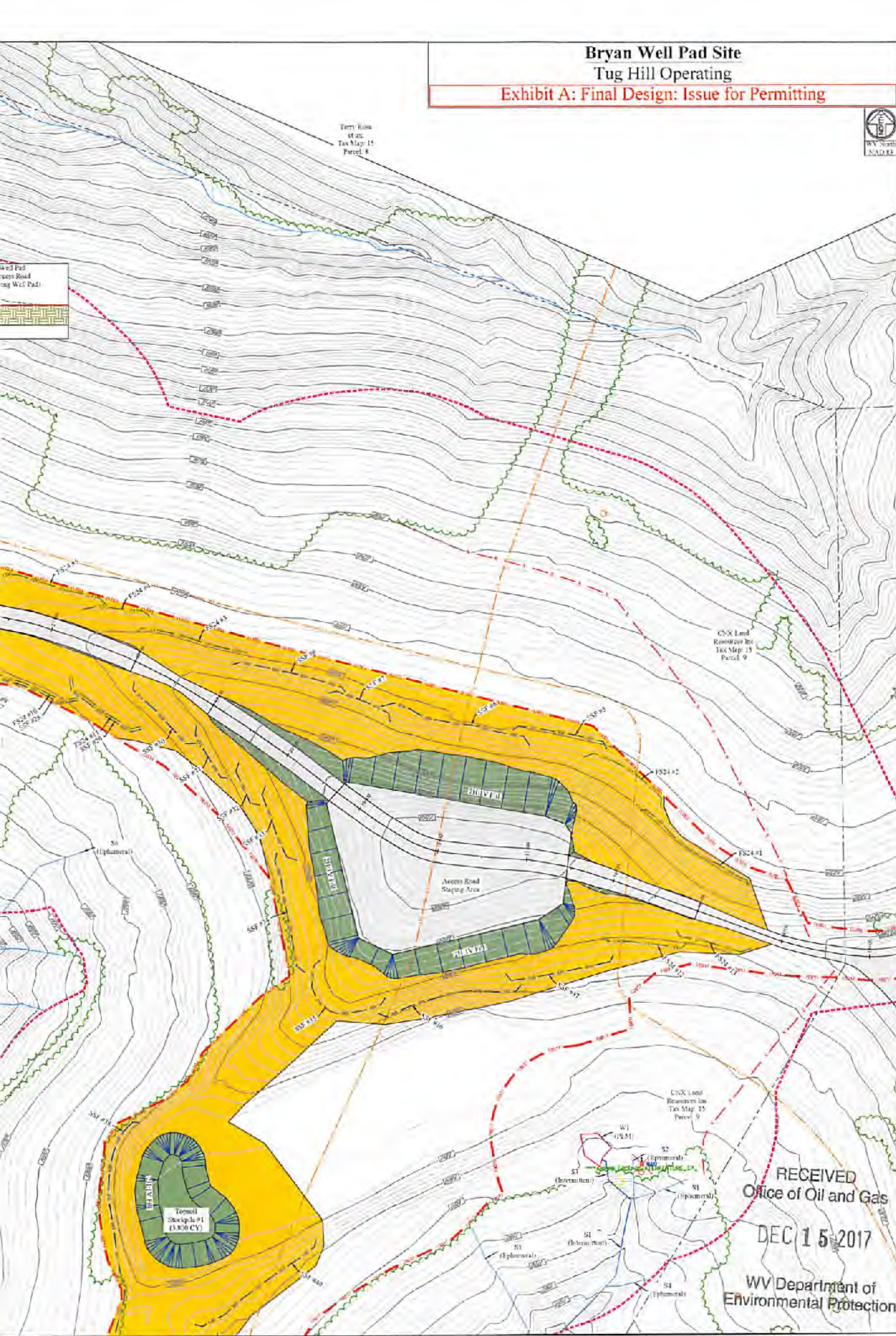
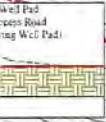
NOTE:
All surface boundary lines shown herein are based on boundary evidence collected with mapping grade GPS receivers.

0 50 100 150

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



Terrain
 et al.
 Tax Map 15
 Parcel 8



Revision	Date
Design	08-29-2017
Design: WDDLP Comments	10-20-2017

TUG HILL
OPERATING

THIS DOCUMENT
 PREPARED FOR
 TUG HILL
 OPERATING

Kelly Surveying
 P.O. Box 206
 Charleston, WV 25301
 304.763.1111

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

RECEIVED
 Office of Oil and Gas
 DEC 15 2017
 WV Department of
 Environmental Protection

Date: 08/29/2017
Scale: As Shown
Designed By: ZS
File No.
Sheet 9 of 17