



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

Thursday, May 9, 2019
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit Modification Approval for TEN HIGH 1S-17HU
47-051-02033-00-00

Lateral Extension TMD 20,138'

TUG HILL OPERATING, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926-0450.

A handwritten signature in blue ink, appearing to read "James A. Martin", is written over a circular blue ink stamp.

James A. Martin
Chief

Operator's Well Number: TEN HIGH 1S-17HU
Farm Name: LAWRENCE & SHIRLEY CONKLE ESTS
U.S. WELL NUMBER: 47-051-02033-00-00
Horizontal 6A New Drill
Date Modification Issued:

Promoting a healthy environment.

05/10/2019



west virginia department of environmental protection

Oil and Gas Conservation Commission
601 57th Street SE, Charleston, WV 25304
304-926-0499 Ext 1274

Barry K. Lay, Chairman
dep.wv.gov

April 2, 2019

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

RE: Application for Deep Well Permit – API #47-051-02033

COMPANY: Tug Hill Operating, LLC

FARM: Lawrence & Shirley Conkle Ests Ten High 1S-17HU

COUNTY: Marshall DISTRICT: Meade QUAD: Glen Easton

The deep well review of the application for the above company is **Approved to drill to Trenton for Point Pleasant completion.**

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

1. Comments to Notice of Deviation filed? No
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners? Yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells: Heaven Hill 3-8HU 47-051-01967; Ten High 1N-11HU 47-051-01960; Ten High 1N-12HU 47-051-01961; Ten High 1N-13HU 47-051-01965; Ten High 1N-20HU 47-051-02021; Ten High 1S-16HU 47-051-02028; Ten High 1S-15HU 47-051-02027; Ten High 1S-14HU 47-051-01966
4. Provided a plat showing that the proposed location is a distance of 400+ feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

A handwritten signature in blue ink that reads "Susan Rose".

Susan Rose
Administrator

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

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Meade Glen Easton 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Ten High 1S-17HU Well Pad Name: Ten High

3) Farm Name/Surface Owner: Lawrence & Shirley Conkle, ests Public Road Access: Shepherd Ridge Lane CR 21/9

4) Elevation, current ground: 1310' Elevation, proposed post-construction: 1310'

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Point Pleasant is the target formation at a depth of 11,589' - 11,728' thickness of 139' and anticipated pressure of approx. 9500 psi

8) Proposed Total Vertical Depth: 11,878' ✓

9) Formation at Total Vertical Depth: Trenton

10) Proposed Total Measured Depth: 20,138' ✓

11) Proposed Horizontal Leg Length: 7,689.84'

12) Approximate Fresh Water Strata Depths: 70', 1026'

13) Method to Determine Fresh Water Depths: Offset well reports or noticeable flow at the flowline or when need to start soaping

14) Approximate Saltwater Depths: 2,167'

15) Approximate Coal Seam Depths: Sewickly Coal - 935' and Pittsburgh Coal - 1020'

16) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

(a) If Yes, provide Mine Info: Name: Marshall County Coal Co. / Marshall County Mine

Depth: 1020' TVD and 290' subsea level

Seam: Pittsburgh #8

Owner: Murray Energy / Consolidated Coal Co.

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	125'	125'	270FT^3(CTS)
Fresh Water	20"	NEW	J55	106.5#	1,125'	1,125'	1,860ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2,801'	2,801'	1,976ft^3(CTS)
Intermediate	9 5/8"	NEW	HPP110	47#	10,839'	10,839'	3,534ft^3(CTS)
Production	5 1/2"	NEW	P110	23#	20,138'	20,138'	4797ft^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		12,304'	
Liners							

ju
11/7/13

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	20"	26"	.5	2,410	1,928	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.38	2,740	2,192	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.472	10,730	6,968	SEE#24	1.99
Production	5 1/2"	8 1/2"	.415	16,510	10,864	SEE#24	1.18
Tubing	2 7/8"			11,385	11,624		
Liners							

PACKERS

Kind:	N/A			RECEIVED Office of Oil and Gas
Sizes:	N/A			NOV 14 2018
Depths Set:	N/A			WV Department of Environmental Protection

John
11/7/18

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

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

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

Well to be completed with approximately 19,220,000 lb proppant and 297,155 bbl of water. Max rate = 80 bpm; max psi = 12,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.2

22) Area to be disturbed for well pad only, less access road (acres): 5.92

23) Describe centralizer placement for each casing string:

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

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

*See Attachment

25) Proposed borehole conditioning procedures:

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

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*Note: Attach additional sheets as needed.

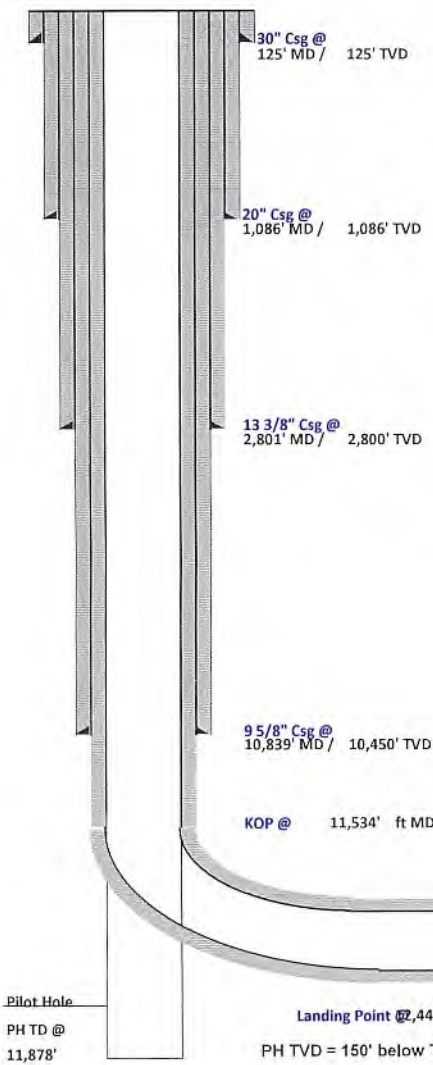


WELL NAME: Ten High 15-17HU
STATE: West Virginia **COUNTY:** Marshall
DISTRICT: Meade
DF Elev: 1,310' **GL Elev:** 1,310'
TD: 20,138'
TH Latitude: 39.80677792
TH Longitude: -80.68083671
BH Latitude: 39.79160000
BH Longitude: -80.65860700

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	1,026'
Sewickley Coal	935'
Pittsburgh Coal	1,020'
Big Lime	2,049'
Berea	2,673'
Tully	6,606'
Marcellus	6,713'
Onondaga	6,765'
Salina	7,497'
Lockport	8,562'
Utica	11,413'
Point Pleasant	11,589'
Landing Depth	11,653'
Trenton	11,728'
Pilot Hole TD	11,878'

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	125'	125'	BW	BW	Surface
Surface	26	20	1,086'	1,086'	106.5	J55	Surface
Intermediate 1	17 1/2	13 3/8	2,801'	2,800'	54.5	J55	Surface
Intermediate 2	12 1/4	9 5/8	10,839'	10,450'	47	HPP110	Surface
Production	8 1/2	5 1/2	20,138'	11,787'	23	HCP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	350	A	15.6	Air	None
Surface	1,882	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	2,140	A	15	Air	1 Centralizer every other jt
Intermediate 2	2,861	A	14.5	Air	1 Centralizer every other jt
Production	4,125	A	15	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



Handwritten signature and date: 11/2/15

Pilot Hole
 PH TD @ 11,878'
 Landing Point @ 2,449' MD / 11,653' TVD
 PH TVD = 150' below Trenton Top

Lateral TD @ 20,138' ft MD
 11,787' ft TVD

51-02033 MDW



Tug Hill Operating, LLC Casing and Cement Program
Ten High 1S-17HU

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	125'	CTS
Surface	20"	J55	26"	1,088' 1125'	CTS
Intermediate 1	13 3/8"	J55	17 1/2"	2,801'	CTS
Intermediate 2	9 5/8"	HPP110	12 1/4"	10,839'	CTS
Production	5 1/2"	HCP110	8 1/2"	20,138'	CTS

Cement

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

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

Intermediate 2: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.99

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 = 1.18

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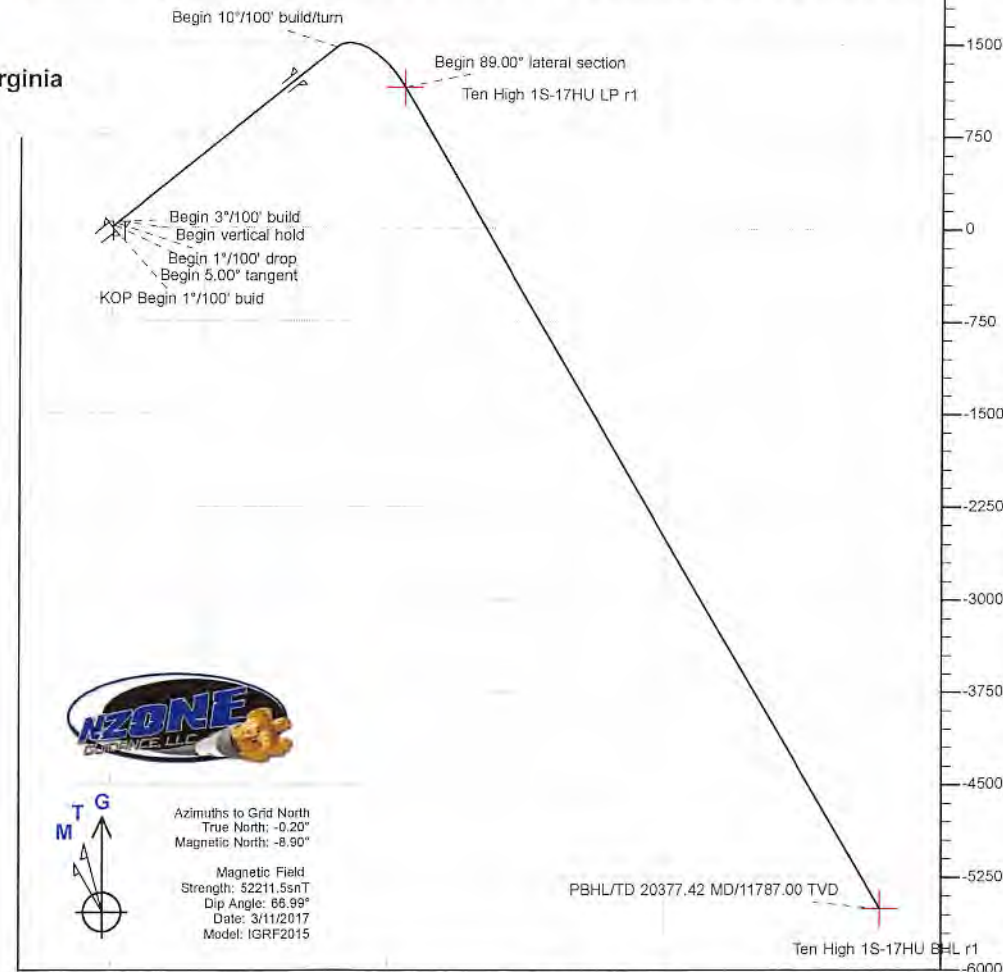
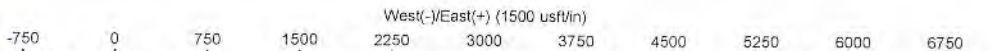
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TUG HILL
OPERATING

Well: Ten High 1S-17HU (F)
Site: Ten High
Project: Marshall County, West Virginia
Design: rev1



Azimuths to Grid North
True North: -0.20°
Magnetic North: -8.90°

Magnetic Field
Strength: 52211.5snT
Dip Angle: 66.99°
Date: 3/11/2017
Model: IGRF2015

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	1600.00	0.00	0.00	1600.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 1°/100' build
3	2100.00	5.00	51.28	2099.37	13.64	17.01	1.00	51.28	3.76	Begin 5.00° tangent
4	2400.00	5.00	51.28	2398.22	29.99	37.41	0.00	0.00	8.27	Begin 1°/100' drop
5	2900.00	0.00	51.28	2887.59	43.63	54.42	1.00	180.00	12.04	Begin vertical hold section
6	7002.41	0.00	51.28	7000.00	43.63	54.42	0.00	51.28	12.04	Begin 3°/100' build
7	8078.58	32.29	51.14	8020.12	228.89	284.33	3.00	51.14	62.26	Begin 32.29° tangent
8	11751.80	32.29	51.14	11125.45	1459.93	1812.06	0.00	0.00	396.02	Begin 10°/100' build/turn
9	12688.99	89.00	149.71	11653.00	1136.57	2374.68	10.00	97.79	1031.76	Begin 89.00° lateral section
10	20377.42	89.00	149.71	11787.00	-5500.91	6251.88	0.00	0.00	8327.42	PBHLTD 20377.42 MD/11787.00 TVD

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

System Datum: Mean Sea Level
Depth Reference: GL=1310 @ 1310.00usft

Northing: 14456531.74 Easting: 1730062.34 Latitude: 39.80677019 Longitude: -80.68079336

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.90°

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PBHLTD 20377.42 MD/11787.00 TVD

Ten High 1S-17HU BHL r1

True Vertical Depth (1500 usft/in)

South(-)/North(+) (1500 usft/in)



Planning Report



Database: DB_Jul2216dt_v14
Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia
Site: Ten High
Well: Ten High 1S-17HU (F)
Wellbore: Original Hole
Design: rev1

Local Co-ordinate Reference: Well Ten High 1S-17HU (F)
TVD Reference: GL=1310 @ 1310.00usft
MD Reference: GL=1310 @ 1310.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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Planned Survey

WV Department of
Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,900.00	32.29	51.14	9,559.95	839.32	1,041.88	227.76	0.00	0.00	0.00
10,000.00	32.29	51.14	9,644.49	872.83	1,083.47	236.85	0.00	0.00	0.00
10,100.00	32.29	51.14	9,729.03	906.35	1,125.06	245.93	0.00	0.00	0.00
10,200.00	32.29	51.14	9,813.57	939.86	1,166.65	255.02	0.00	0.00	0.00
10,300.00	32.29	51.14	9,898.11	973.37	1,208.24	264.11	0.00	0.00	0.00
10,400.00	32.29	51.14	9,982.65	1,006.89	1,249.83	273.19	0.00	0.00	0.00
10,500.00	32.29	51.14	10,067.19	1,040.40	1,291.42	282.28	0.00	0.00	0.00
10,600.00	32.29	51.14	10,151.73	1,073.92	1,333.01	291.37	0.00	0.00	0.00
10,700.00	32.29	51.14	10,236.27	1,107.43	1,374.61	300.45	0.00	0.00	0.00
10,800.00	32.29	51.14	10,320.81	1,140.94	1,416.20	309.54	0.00	0.00	0.00
10,900.00	32.29	51.14	10,405.35	1,174.46	1,457.79	318.63	0.00	0.00	0.00
11,000.00	32.29	51.14	10,489.89	1,207.97	1,499.38	327.71	0.00	0.00	0.00
11,100.00	32.29	51.14	10,574.43	1,241.49	1,540.97	336.80	0.00	0.00	0.00
11,200.00	32.29	51.14	10,658.97	1,275.00	1,582.56	345.88	0.00	0.00	0.00
11,300.00	32.29	51.14	10,743.51	1,308.51	1,624.15	354.97	0.00	0.00	0.00
11,400.00	32.29	51.14	10,828.05	1,342.03	1,665.74	364.06	0.00	0.00	0.00
11,500.00	32.29	51.14	10,912.59	1,375.54	1,707.33	373.14	0.00	0.00	0.00
11,600.00	32.29	51.14	10,997.13	1,409.05	1,748.92	382.23	0.00	0.00	0.00
11,700.00	32.29	51.14	11,081.67	1,442.57	1,790.52	391.32	0.00	0.00	0.00
11,751.80	32.29	51.14	11,125.46	1,459.93	1,812.06	396.02	0.00	0.00	0.00
Begin 10°/100° build/turn									
11,800.00	31.95	60.19	11,166.31	1,474.35	1,833.16	402.34	10.00	-0.69	18.78
11,900.00	33.30	78.63	11,250.73	1,492.97	1,883.16	427.58	10.00	1.35	18.44
12,000.00	37.09	94.74	11,332.62	1,495.89	1,940.27	468.52	10.00	3.79	16.11
12,100.00	42.66	107.74	11,409.47	1,483.05	2,002.75	523.91	10.00	5.57	13.00
12,200.00	49.40	118.03	11,478.95	1,454.81	2,068.70	592.08	10.00	6.74	10.29
12,300.00	56.89	126.33	11,538.95	1,412.05	2,136.12	670.94	10.00	7.48	8.31
12,400.00	64.84	133.29	11,587.65	1,356.06	2,202.97	758.11	10.00	7.95	6.96
12,500.00	73.07	139.39	11,623.56	1,288.55	2,267.21	850.94	10.00	8.23	6.09
12,600.00	81.46	144.96	11,645.60	1,211.56	2,326.88	946.60	10.00	8.40	5.57
12,688.99	89.00	149.71	11,653.00	1,136.96	2,374.68	1,031.76	10.00	8.47	5.34
Begin 89.00° lateral section									
12,700.00	89.00	149.71	11,653.19	1,127.46	2,380.23	1,042.20	0.00	0.00	0.00
12,800.00	89.00	149.71	11,654.94	1,041.12	2,430.66	1,137.10	0.00	0.00	0.00
12,900.00	89.00	149.71	11,656.68	954.79	2,481.09	1,231.99	0.00	0.00	0.00
13,000.00	89.00	149.71	11,658.42	868.45	2,531.52	1,326.88	0.00	0.00	0.00
13,100.00	89.00	149.71	11,660.16	782.12	2,581.95	1,421.77	0.00	0.00	0.00
13,200.00	89.00	149.71	11,661.91	695.78	2,632.38	1,516.66	0.00	0.00	0.00
13,300.00	89.00	149.71	11,663.65	609.44	2,682.81	1,611.55	0.00	0.00	0.00
13,400.00	89.00	149.71	11,665.39	523.11	2,733.24	1,706.44	0.00	0.00	0.00
13,500.00	89.00	149.71	11,667.14	436.77	2,783.66	1,801.34	0.00	0.00	0.00
13,600.00	89.00	149.71	11,668.88	350.44	2,834.09	1,896.23	0.00	0.00	0.00
13,700.00	89.00	149.71	11,670.62	264.10	2,884.52	1,991.12	0.00	0.00	0.00
13,800.00	89.00	149.71	11,672.36	177.76	2,934.95	2,086.01	0.00	0.00	0.00
13,900.00	89.00	149.71	11,674.11	91.43	2,985.38	2,180.90	0.00	0.00	0.00
14,000.00	89.00	149.71	11,675.85	5.09	3,035.81	2,275.79	0.00	0.00	0.00
14,100.00	89.00	149.71	11,677.59	-81.24	3,086.24	2,370.68	0.00	0.00	0.00
14,200.00	89.00	149.71	11,679.34	-167.58	3,136.67	2,465.58	0.00	0.00	0.00
14,300.00	89.00	149.71	11,681.08	-253.91	3,187.10	2,560.47	0.00	0.00	0.00
14,400.00	89.00	149.71	11,682.82	-340.25	3,237.53	2,655.36	0.00	0.00	0.00
14,500.00	89.00	149.71	11,684.56	-426.59	3,287.95	2,750.25	0.00	0.00	0.00
14,600.00	89.00	149.71	11,686.31	-512.92	3,338.38	2,845.14	0.00	0.00	0.00
14,700.00	89.00	149.71	11,688.05	-599.26	3,388.81	2,940.03	0.00	0.00	0.00
14,800.00	89.00	149.71	11,689.79	-685.59	3,439.24	3,034.92	0.00	0.00	0.00



Planning Report



Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Ten High
 Well: Ten High 1S-17HU (F)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Ten High 1S-17HU (F)
 TVD Reference: GL=1310 @ 1310.00usft
 MD Reference: GL=1310 @ 1310.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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WV Department of
 Environmental Protection

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,900.00	89.00	149.71	11,691.54	-771.93	3,489.67	3,129.82	0.00	0.00	0.00
15,000.00	89.00	149.71	11,693.28	-858.27	3,540.10	3,224.71	0.00	0.00	0.00
15,100.00	89.00	149.71	11,695.02	-944.60	3,590.53	3,319.60	0.00	0.00	0.00
15,200.00	89.00	149.71	11,696.76	-1,030.94	3,640.96	3,414.49	0.00	0.00	0.00
15,300.00	89.00	149.71	11,698.51	-1,117.27	3,691.39	3,509.38	0.00	0.00	0.00
15,400.00	89.00	149.71	11,700.25	-1,203.61	3,741.81	3,604.27	0.00	0.00	0.00
15,500.00	89.00	149.71	11,701.99	-1,289.95	3,792.24	3,699.17	0.00	0.00	0.00
15,600.00	89.00	149.71	11,703.74	-1,376.28	3,842.67	3,794.06	0.00	0.00	0.00
15,700.00	89.00	149.71	11,705.48	-1,462.62	3,893.10	3,888.95	0.00	0.00	0.00
15,800.00	89.00	149.71	11,707.22	-1,548.95	3,943.53	3,983.84	0.00	0.00	0.00
15,900.00	89.00	149.71	11,708.96	-1,635.29	3,993.96	4,078.73	0.00	0.00	0.00
16,000.00	89.00	149.71	11,710.71	-1,721.62	4,044.39	4,173.62	0.00	0.00	0.00
16,100.00	89.00	149.71	11,712.45	-1,807.96	4,094.82	4,268.51	0.00	0.00	0.00
16,200.00	89.00	149.71	11,714.19	-1,894.30	4,145.25	4,363.41	0.00	0.00	0.00
16,300.00	89.00	149.71	11,715.94	-1,980.63	4,195.68	4,458.30	0.00	0.00	0.00
16,400.00	89.00	149.71	11,717.68	-2,066.97	4,246.10	4,553.19	0.00	0.00	0.00
16,500.00	89.00	149.71	11,719.42	-2,153.30	4,296.53	4,648.08	0.00	0.00	0.00
16,600.00	89.00	149.71	11,721.16	-2,239.64	4,346.96	4,742.97	0.00	0.00	0.00
16,700.00	89.00	149.71	11,722.91	-2,325.98	4,397.39	4,837.86	0.00	0.00	0.00
16,800.00	89.00	149.71	11,724.65	-2,412.31	4,447.82	4,932.75	0.00	0.00	0.00
16,900.00	89.00	149.71	11,726.39	-2,498.65	4,498.25	5,027.65	0.00	0.00	0.00
17,000.00	89.00	149.71	11,728.14	-2,584.98	4,548.68	5,122.54	0.00	0.00	0.00
17,100.00	89.00	149.71	11,729.88	-2,671.32	4,599.11	5,217.43	0.00	0.00	0.00
17,200.00	89.00	149.71	11,731.62	-2,757.66	4,649.54	5,312.32	0.00	0.00	0.00
17,300.00	89.00	149.71	11,733.36	-2,843.99	4,699.97	5,407.21	0.00	0.00	0.00
17,400.00	89.00	149.71	11,735.11	-2,930.33	4,750.39	5,502.10	0.00	0.00	0.00
17,500.00	89.00	149.71	11,736.85	-3,016.66	4,800.82	5,596.99	0.00	0.00	0.00
17,600.00	89.00	149.71	11,738.59	-3,103.00	4,851.25	5,691.89	0.00	0.00	0.00
17,700.00	89.00	149.71	11,740.34	-3,189.33	4,901.68	5,786.78	0.00	0.00	0.00
17,800.00	89.00	149.71	11,742.08	-3,275.67	4,952.11	5,881.67	0.00	0.00	0.00
17,900.00	89.00	149.71	11,743.82	-3,362.01	5,002.54	5,976.56	0.00	0.00	0.00
18,000.00	89.00	149.71	11,745.56	-3,448.34	5,052.97	6,071.45	0.00	0.00	0.00
18,100.00	89.00	149.71	11,747.31	-3,534.68	5,103.40	6,166.34	0.00	0.00	0.00
18,200.00	89.00	149.71	11,749.05	-3,621.01	5,153.83	6,261.24	0.00	0.00	0.00
18,300.00	89.00	149.71	11,750.79	-3,707.35	5,204.25	6,356.13	0.00	0.00	0.00
18,400.00	89.00	149.71	11,752.54	-3,793.69	5,254.68	6,451.02	0.00	0.00	0.00
18,500.00	89.00	149.71	11,754.28	-3,880.02	5,305.11	6,545.91	0.00	0.00	0.00
18,600.00	89.00	149.71	11,756.02	-3,966.36	5,355.54	6,640.80	0.00	0.00	0.00
18,700.00	89.00	149.71	11,757.76	-4,052.69	5,405.97	6,735.69	0.00	0.00	0.00
18,800.00	89.00	149.71	11,759.51	-4,139.03	5,456.40	6,830.58	0.00	0.00	0.00
18,900.00	89.00	149.71	11,761.25	-4,225.36	5,506.83	6,925.48	0.00	0.00	0.00
19,000.00	89.00	149.71	11,762.99	-4,311.70	5,557.26	7,020.37	0.00	0.00	0.00
19,100.00	89.00	149.71	11,764.74	-4,398.04	5,607.69	7,115.26	0.00	0.00	0.00
19,200.00	89.00	149.71	11,766.48	-4,484.37	5,658.12	7,210.15	0.00	0.00	0.00
19,300.00	89.00	149.71	11,768.22	-4,570.71	5,708.54	7,305.04	0.00	0.00	0.00
19,400.00	89.00	149.71	11,769.96	-4,657.04	5,758.97	7,399.93	0.00	0.00	0.00
19,500.00	89.00	149.71	11,771.71	-4,743.38	5,809.40	7,494.82	0.00	0.00	0.00
19,600.00	89.00	149.71	11,773.45	-4,829.72	5,859.83	7,589.72	0.00	0.00	0.00
19,700.00	89.00	149.71	11,775.19	-4,916.05	5,910.26	7,684.61	0.00	0.00	0.00
19,800.00	89.00	149.71	11,776.94	-5,002.39	5,960.69	7,779.50	0.00	0.00	0.00
19,900.00	89.00	149.71	11,778.68	-5,088.72	6,011.12	7,874.39	0.00	0.00	0.00
20,000.00	89.00	149.71	11,780.42	-5,175.06	6,061.55	7,969.28	0.00	0.00	0.00
20,100.00	89.00	149.71	11,782.17	-5,261.40	6,111.98	8,064.17	0.00	0.00	0.00
20,200.00	89.00	149.71	11,783.91	-5,347.73	6,162.40	8,159.06	0.00	0.00	0.00



Planning Report



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-17HU (F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1310 @ 1310.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1310 @ 1310.00usft
Site:	Ten High	North Reference:	Grid
Well:	Ten High 1S-17HU (F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
20,300.00	89.00	149.71	11,785.65	-5,434.07	6,212.83	8,253.96	0.00	0.00	0.00	
20,377.42	89.00	149.71	11,787.00	-5,500.91	6,251.88	8,327.42	0.00	0.00	0.00	
PBHL/TD 20377.42 MD/11787.00 TVD										

WV Department of Environmental Protection

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Ten High 1S-17HU LP r1 - hit/miss target - Shape - Point	0.00	0.00	11,653.00	1,136.97	2,374.68	14,457,668.71	1,732,437.02	39.80986900	-80.67232300
Ten High 1S-17HU BHL - plan hits target center - Point	0.00	0.00	11,787.00	-5,500.91	6,251.88	14,451,030.83	1,736,314.21	39.79160000	-80.65860700

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,175.00	1,175.00	20" Casing @ 1175 TVD	20	24
2,982.41	2,980.00	13 3/8" Casing @ 2980 TVD	13-3/8	17-1/2
11,041.53	10,525.00	9 5/8" Casing @ 10525 TVD	9-5/8	12-1/4

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,600.00	1,600.00	0.00	0.00	KOP Begin 1°/100' build
2,100.00	2,099.37	13.64	17.01	Begin 5.00° tangent
2,400.00	2,398.22	29.99	37.41	Begin 1°/100' drop
2,900.00	2,897.59	43.63	54.42	Begin vertical hold section
7,002.41	7,000.00	43.63	54.42	Begin 3°/100' build
8,078.58	8,020.12	228.89	284.33	Begin 32.29° tangent
11,751.80	11,125.46	1,459.93	1,812.06	Begin 10°/100' build/turn
12,688.99	11,653.00	1,136.96	2,374.68	Begin 89.00° lateral section
20,377.42	11,787.00	-5,500.91	6,251.88	PBHL/TD 20377.42 MD/11787.00 TVD



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-17HU (F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1310 @ 1310.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1310 @ 1310.00usft
Site:	Ten High	North Reference:	Grid
Well:	Ten High 1S-17HU (F)	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 78 W)		

Site	Ten High				
Site Position:		Northing:	14,456,545.60 usft	Latitude:	39.80680885
From:	Lat/Long	Easting:	1,730,001.41 usft	Longitude:	-80.68101011
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.20 °

Well	Ten High 1S-17HU (F)					
Well Position	+N/-S	0.00 usft	Northing:	14,456,531.74 usft	Latitude:	39.80677019
	+E/-W	0.00 usft	Easting:	1,730,062.34 usft	Longitude:	-80.68079336
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,310.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/11/2017	-8.70	66.99	52,211.49090564

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	131.34

Plan Survey Tool Program	Date	8/6/2017		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	20,377.42 rev1 (Original Hole)	MWD	
			MWD - Standard	



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-17HU (F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1310 @ 1310.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1310 @ 1310.00usft
Site:	Ten High	North Reference:	Grid
Well:	Ten High 1S-17HU (F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Plan Sections											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00		
2,100.00	5.00	51.28	2,099.37	13.64	17.01	1.00	1.00	0.00	51.28		
2,400.00	5.00	51.28	2,398.22	29.99	37.41	0.00	0.00	0.00	0.00		
2,900.00	0.00	51.28	2,897.59	43.63	54.42	1.00	-1.00	0.00	180.00		
7,002.41	0.00	51.28	7,000.00	43.63	54.42	0.00	0.00	0.00	51.28		
8,078.58	32.29	51.14	8,020.12	228.89	284.33	3.00	3.00	0.00	51.14		
11,751.80	32.29	51.14	11,125.45	1,459.93	1,812.06	0.00	0.00	0.00	0.00		
12,688.99	89.00	149.71	11,653.00	1,136.97	2,374.68	10.00	6.05	10.52	97.79	Ten High 1S-17HU LF	
20,377.42	89.00	149.71	11,787.00	-5,500.91	6,251.88	0.00	0.00	0.00	0.00	Ten High 1S-17HU BF	

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Planning Report - Geographic



Database: DB_Jul2216dt_V14
Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia
Site: Ten High
Well: Ten High 1S-17HU (F)
Wellbore: Original Hole
Design: rev1

Local Co-ordinate Reference: Well Ten High 1S-17HU (F)
TVD Reference: GL=1310 @ 1310.00usft
MD Reference: GL=1310 @ 1310.00usft
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	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
100.00	0.00	0.00	100.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
200.00	0.00	0.00	200.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
300.00	0.00	0.00	300.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
400.00	0.00	0.00	400.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
500.00	0.00	0.00	500.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
600.00	0.00	0.00	600.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
700.00	0.00	0.00	700.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
800.00	0.00	0.00	800.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
900.00	0.00	0.00	900.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,456,531.74	1,730,062.34	39.80677019	-80.68079336	
KOP Begin 1°/100' buid										
1,700.00	1.00	51.28	1,699.99	0.55	0.68	14,456,532.29	1,730,063.02	39.80677168	-80.68079093	
1,800.00	2.00	51.28	1,799.96	2.18	2.72	14,456,533.93	1,730,065.06	39.80677616	-80.68078364	
1,900.00	3.00	51.28	1,899.86	4.91	6.13	14,456,536.65	1,730,068.46	39.80678362	-80.68077148	
2,000.00	4.00	51.28	1,999.68	8.73	10.89	14,456,540.47	1,730,073.23	39.80679406	-80.68075448	
2,100.00	5.00	51.28	2,099.37	13.64	17.01	14,456,545.38	1,730,079.35	39.80680748	-80.68073262	
Begin 5.00° tangent										
2,200.00	5.00	51.28	2,198.99	19.09	23.81	14,456,550.83	1,730,086.15	39.80682238	-80.68070833	
2,300.00	5.00	51.28	2,298.60	24.54	30.61	14,456,556.28	1,730,092.95	39.80683729	-80.68068405	
2,400.00	5.00	51.28	2,398.22	29.99	37.41	14,456,561.74	1,730,099.75	39.80685219	-80.68065977	
Begin 1°/100' drop										
2,500.00	4.00	51.28	2,497.91	34.90	43.53	14,456,566.64	1,730,105.87	39.80686561	-80.68063791	
2,600.00	3.00	51.28	2,597.73	38.72	48.30	14,456,570.46	1,730,110.63	39.80687605	-80.68062090	
2,700.00	2.00	51.28	2,697.63	41.45	51.70	14,456,573.19	1,730,114.04	39.80688351	-80.68060875	
2,800.00	1.00	51.28	2,797.59	43.09	53.74	14,456,574.83	1,730,116.08	39.80688799	-80.68060146	
2,900.00	0.00	51.28	2,897.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
Begin vertical hold section										
3,000.00	0.00	0.00	2,997.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
3,100.00	0.00	0.00	3,097.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
3,200.00	0.00	0.00	3,197.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
3,300.00	0.00	0.00	3,297.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
3,400.00	0.00	0.00	3,397.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
3,500.00	0.00	0.00	3,497.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
3,600.00	0.00	0.00	3,597.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
3,700.00	0.00	0.00	3,697.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
3,800.00	0.00	0.00	3,797.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
3,900.00	0.00	0.00	3,897.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
4,000.00	0.00	0.00	3,997.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
4,100.00	0.00	0.00	4,097.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
4,200.00	0.00	0.00	4,197.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
4,300.00	0.00	0.00	4,297.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
4,400.00	0.00	0.00	4,397.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
4,500.00	0.00	0.00	4,497.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
4,600.00	0.00	0.00	4,597.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
4,700.00	0.00	0.00	4,697.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
4,800.00	0.00	0.00	4,797.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	
4,900.00	0.00	0.00	4,897.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903	

51-02033
05/10/2019
MOD



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-17HU (F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1310 @ 1310.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1310 @ 1310.00usft
Site:	Ten High	North Reference:	Grid
Well:	Ten High 1S-17HU (F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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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
5,000.00	0.00	0.00	4,997.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
5,100.00	0.00	0.00	5,097.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
5,200.00	0.00	0.00	5,197.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
5,300.00	0.00	0.00	5,297.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
5,400.00	0.00	0.00	5,397.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
5,500.00	0.00	0.00	5,497.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
5,600.00	0.00	0.00	5,597.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
5,700.00	0.00	0.00	5,697.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
5,800.00	0.00	0.00	5,797.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
5,900.00	0.00	0.00	5,897.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
6,000.00	0.00	0.00	5,997.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
6,100.00	0.00	0.00	6,097.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
6,200.00	0.00	0.00	6,197.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
6,300.00	0.00	0.00	6,297.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
6,400.00	0.00	0.00	6,397.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
6,500.00	0.00	0.00	6,497.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
6,600.00	0.00	0.00	6,597.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
6,700.00	0.00	0.00	6,697.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
6,800.00	0.00	0.00	6,797.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
6,900.00	0.00	0.00	6,897.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
7,000.00	0.00	0.00	6,997.59	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
7,002.41	0.00	0.00	7,000.00	43.63	54.42	14,456,575.37	1,730,116.76	39.80688948	-80.68059903
Begin 3°/100' build									
7,100.00	2.93	51.14	7,097.55	45.20	56.36	14,456,576.94	1,730,118.70	39.80689376	-80.68059210
7,200.00	5.93	51.14	7,197.24	50.04	62.37	14,456,581.78	1,730,124.71	39.80690700	-80.68057063
7,300.00	8.93	51.14	7,296.39	58.15	72.44	14,456,589.89	1,730,134.78	39.80692917	-80.68053469
7,400.00	11.93	51.14	7,394.72	69.50	86.53	14,456,601.25	1,730,148.87	39.80696022	-80.68048437
7,500.00	14.93	51.14	7,491.98	84.07	104.61	14,456,615.81	1,730,166.95	39.80700005	-80.68041981
7,600.00	17.93	51.14	7,587.89	101.81	126.63	14,456,633.56	1,730,188.97	39.80704856	-80.68034118
7,700.00	20.93	51.14	7,682.18	122.68	152.53	14,456,654.42	1,730,214.86	39.80710561	-80.68024870
7,800.00	23.93	51.14	7,774.61	146.62	182.23	14,456,678.36	1,730,244.57	39.80717105	-80.68014263
7,900.00	26.93	51.14	7,864.91	173.56	215.66	14,456,705.30	1,730,278.00	39.80724470	-80.68002325
8,000.00	29.93	51.14	7,952.84	203.42	252.72	14,456,735.16	1,730,315.06	39.80732636	-80.67989090
8,078.58	32.29	51.14	8,020.12	228.89	284.33	14,456,760.63	1,730,346.67	39.80739599	-80.67977802
Begin 32.29° tangent									
8,100.00	32.29	51.14	8,038.23	236.07	293.24	14,456,767.81	1,730,355.58	39.80741562	-80.67974621
8,200.00	32.29	51.14	8,122.77	269.58	334.83	14,456,801.33	1,730,397.17	39.80750725	-80.67959769
8,300.00	32.29	51.14	8,207.31	303.10	376.42	14,456,834.84	1,730,438.76	39.80759888	-80.67944917
8,400.00	32.29	51.14	8,291.85	336.61	418.01	14,456,868.35	1,730,480.35	39.80769050	-80.67930064
8,500.00	32.29	51.14	8,376.39	370.13	459.60	14,456,901.87	1,730,521.94	39.80778213	-80.67915212
8,600.00	32.29	51.14	8,460.93	403.64	501.20	14,456,935.38	1,730,563.53	39.80787376	-80.67900360
8,700.00	32.29	51.14	8,545.47	437.15	542.79	14,456,968.90	1,730,605.12	39.80796539	-80.67885507
8,800.00	32.29	51.14	8,630.01	470.67	584.38	14,457,002.41	1,730,646.71	39.80805701	-80.67870655
8,900.00	32.29	51.14	8,714.55	504.18	625.97	14,457,035.92	1,730,688.31	39.80814864	-80.67855802
9,000.00	32.29	51.14	8,799.09	537.69	667.56	14,457,069.44	1,730,729.90	39.80824027	-80.67840950
9,100.00	32.29	51.14	8,883.63	571.21	709.15	14,457,102.95	1,730,771.49	39.80833189	-80.67826097
9,200.00	32.29	51.14	8,968.17	604.72	750.74	14,457,136.46	1,730,813.08	39.80842352	-80.67811245
9,300.00	32.29	51.14	9,052.71	638.24	792.33	14,457,169.98	1,730,854.67	39.80851515	-80.67796392
9,400.00	32.29	51.14	9,137.25	671.75	833.92	14,457,203.49	1,730,896.26	39.80860677	-80.67781539
9,500.00	32.29	51.14	9,221.79	705.26	875.51	14,457,237.01	1,730,937.85	39.80869840	-80.67766687
9,600.00	32.29	51.14	9,306.33	738.78	917.11	14,457,270.52	1,730,979.44	39.80879002	-80.67751834
9,700.00	32.29	51.14	9,390.87	772.29	958.70	14,457,304.03	1,731,021.03	39.80888165	-80.67736981
9,800.00	32.29	51.14	9,475.41	805.81	1,000.29	14,457,337.55	1,731,062.62	39.80897327	-80.67722128
9,900.00	32.29	51.14	9,559.95	839.32	1,041.88	14,457,371.06	1,731,104.22	39.80906490	-80.67707276



Planning Report - Geographic



Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Ten High
 Well: Ten High 1S-17HU (F)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Ten High 1S-17HU (F)
 TVD Reference: GL=1310 @ 1310.00usft
 MD Reference: GL=1310 @ 1310.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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 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
15,000.00	89.00	149.71	11,693.28	-858.27	3,540.10	14,455,673.48	1,733,602.44	39.80437783	-80.66819945
15,100.00	89.00	149.71	11,695.02	-944.60	3,590.53	14,455,587.14	1,733,652.87	39.80414022	-80.66802103
15,200.00	89.00	149.71	11,696.76	-1,030.94	3,640.96	14,455,500.80	1,733,703.29	39.80390260	-80.66784262
15,300.00	89.00	149.71	11,698.51	-1,117.27	3,691.39	14,455,414.47	1,733,753.72	39.80366499	-80.66766420
15,400.00	89.00	149.71	11,700.25	-1,203.61	3,741.81	14,455,328.13	1,733,804.15	39.80342738	-80.66748579
15,500.00	89.00	149.71	11,701.99	-1,289.95	3,792.24	14,455,241.80	1,733,854.58	39.80318976	-80.66730738
15,600.00	89.00	149.71	11,703.74	-1,376.28	3,842.67	14,455,155.46	1,733,905.01	39.80295215	-80.66712897
15,700.00	89.00	149.71	11,705.48	-1,462.62	3,893.10	14,455,069.13	1,733,955.44	39.80271453	-80.66695056
15,800.00	89.00	149.71	11,707.22	-1,548.95	3,943.53	14,454,982.79	1,734,005.87	39.80247692	-80.66677215
15,900.00	89.00	149.71	11,708.96	-1,635.29	3,993.96	14,454,896.45	1,734,056.30	39.80223930	-80.66659375
16,000.00	89.00	149.71	11,710.71	-1,721.62	4,044.39	14,454,810.12	1,734,106.73	39.80200169	-80.66641534
16,100.00	89.00	149.71	11,712.45	-1,807.96	4,094.82	14,454,723.78	1,734,157.15	39.80176407	-80.66623694
16,200.00	89.00	149.71	11,714.19	-1,894.30	4,145.25	14,454,637.45	1,734,207.58	39.80152646	-80.66605853
16,300.00	89.00	149.71	11,715.94	-1,980.63	4,195.68	14,454,551.11	1,734,258.01	39.80128884	-80.66588013
16,400.00	89.00	149.71	11,717.68	-2,066.97	4,246.10	14,454,464.77	1,734,308.44	39.80105123	-80.66570173
16,500.00	89.00	149.71	11,719.42	-2,153.30	4,296.53	14,454,378.44	1,734,358.87	39.80081361	-80.66552333
16,600.00	89.00	149.71	11,721.16	-2,239.64	4,346.96	14,454,292.10	1,734,409.30	39.80057599	-80.66534494
16,700.00	89.00	149.71	11,722.91	-2,325.98	4,397.39	14,454,205.77	1,734,459.73	39.80033838	-80.66516654
16,800.00	89.00	149.71	11,724.65	-2,412.31	4,447.82	14,454,119.43	1,734,510.16	39.80010076	-80.66498814
16,900.00	89.00	149.71	11,726.39	-2,498.65	4,498.25	14,454,033.09	1,734,560.59	39.79986314	-80.66480975
17,000.00	89.00	149.71	11,728.14	-2,584.98	4,548.68	14,453,946.76	1,734,611.02	39.79962552	-80.66463136
17,100.00	89.00	149.71	11,729.88	-2,671.32	4,599.11	14,453,860.42	1,734,661.44	39.79938790	-80.66445297
17,200.00	89.00	149.71	11,731.62	-2,757.66	4,649.54	14,453,774.09	1,734,711.87	39.79915029	-80.66427458
17,300.00	89.00	149.71	11,733.36	-2,843.99	4,699.97	14,453,687.75	1,734,762.30	39.79891267	-80.66409619
17,400.00	89.00	149.71	11,735.11	-2,930.33	4,750.39	14,453,601.42	1,734,812.73	39.79867505	-80.66391780
17,500.00	89.00	149.71	11,736.85	-3,016.66	4,800.82	14,453,515.08	1,734,863.16	39.79843743	-80.66373941
17,600.00	89.00	149.71	11,738.59	-3,103.00	4,851.25	14,453,428.74	1,734,913.59	39.79819981	-80.66356103
17,700.00	89.00	149.71	11,740.34	-3,189.33	4,901.68	14,453,342.41	1,734,964.02	39.79796219	-80.66338264
17,800.00	89.00	149.71	11,742.08	-3,275.67	4,952.11	14,453,256.07	1,735,014.45	39.79772457	-80.66320426
17,900.00	89.00	149.71	11,743.82	-3,362.01	5,002.54	14,453,169.74	1,735,064.88	39.79748695	-80.66302588
18,000.00	89.00	149.71	11,745.56	-3,448.34	5,052.97	14,453,083.40	1,735,115.30	39.79724933	-80.66284750
18,100.00	89.00	149.71	11,747.31	-3,534.68	5,103.40	14,452,997.06	1,735,165.73	39.79701171	-80.66266912
18,200.00	89.00	149.71	11,749.05	-3,621.01	5,153.83	14,452,910.73	1,735,216.16	39.79677409	-80.66249074
18,300.00	89.00	149.71	11,750.79	-3,707.35	5,204.25	14,452,824.39	1,735,266.59	39.79653647	-80.66231236
18,400.00	89.00	149.71	11,752.54	-3,793.69	5,254.68	14,452,738.06	1,735,317.02	39.79629884	-80.66213399
18,500.00	89.00	149.71	11,754.28	-3,880.02	5,305.11	14,452,651.72	1,735,367.45	39.79606122	-80.66195561
18,600.00	89.00	149.71	11,756.02	-3,966.36	5,355.54	14,452,565.38	1,735,417.88	39.79582360	-80.66177724
18,700.00	89.00	149.71	11,757.76	-4,052.69	5,405.97	14,452,479.05	1,735,468.31	39.79558598	-80.66159887
18,800.00	89.00	149.71	11,759.51	-4,139.03	5,456.40	14,452,392.71	1,735,518.74	39.79534835	-80.66142050
18,900.00	89.00	149.71	11,761.25	-4,225.36	5,506.83	14,452,306.38	1,735,569.17	39.79511073	-80.66124213
19,000.00	89.00	149.71	11,762.99	-4,311.70	5,557.26	14,452,220.04	1,735,619.59	39.79487311	-80.66106376
19,100.00	89.00	149.71	11,764.74	-4,398.04	5,607.69	14,452,133.71	1,735,670.02	39.79463548	-80.66088539
19,200.00	89.00	149.71	11,766.48	-4,484.37	5,658.12	14,452,047.37	1,735,720.45	39.79439786	-80.66070703
19,300.00	89.00	149.71	11,768.22	-4,570.71	5,708.54	14,451,961.03	1,735,770.88	39.79416023	-80.66052866
19,400.00	89.00	149.71	11,769.96	-4,657.04	5,758.97	14,451,874.70	1,735,821.31	39.79392261	-80.66035030
19,500.00	89.00	149.71	11,771.71	-4,743.38	5,809.40	14,451,788.36	1,735,871.74	39.79368499	-80.66017194
19,600.00	89.00	149.71	11,773.45	-4,829.72	5,859.83	14,451,702.03	1,735,922.17	39.79344737	-80.65999357
19,700.00	89.00	149.71	11,775.19	-4,916.05	5,910.26	14,451,615.69	1,735,972.60	39.79320973	-80.65981521
19,800.00	89.00	149.71	11,776.94	-5,002.39	5,960.69	14,451,529.35	1,736,023.03	39.79297211	-80.65963686
19,900.00	89.00	149.71	11,778.68	-5,088.72	6,011.12	14,451,443.02	1,736,073.46	39.79273448	-80.65945850
20,000.00	89.00	149.71	11,780.42	-5,175.06	6,061.55	14,451,356.68	1,736,123.88	39.79249686	-80.65928014
20,100.00	89.00	149.71	11,782.17	-5,261.40	6,111.98	14,451,270.35	1,736,174.31	39.79225923	-80.65910179
20,200.00	89.00	149.71	11,783.91	-5,347.73	6,162.40	14,451,184.01	1,736,224.74	39.79202160	-80.65892343
20,300.00	89.00	149.71	11,785.65	-5,434.07	6,212.83	14,451,097.67	1,736,275.17	39.79178398	-80.65874508

51-02033
05/10/2019
MOD



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-17HU (F)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1310 @ 1310.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1310 @ 1310.00usft
Site:	Ten High	North Reference:	Grid
Well:	Ten High 1S-17HU (F)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
20,377.42	89.00	149.71	11,787.00	-5,500.91	6,251.88	14,451,030.83	1,736,314.21	39.79160000	-80.65860700
PBHL/TD 20377.42 MD/11787.00 TVD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Ten High 1S-17HU LP r1 - hit/miss target - Shape - Point	0.00	0.00	11,653.00	1,136.97	2,374.68	14,457,668.71	1,732,437.02	39.80986900	-80.67232300
Ten High 1S-17HU BHL - plan hits target center - Point	0.00	0.00	11,787.00	-5,500.91	6,251.88	14,451,030.83	1,736,314.21	39.79160000	-80.65860700

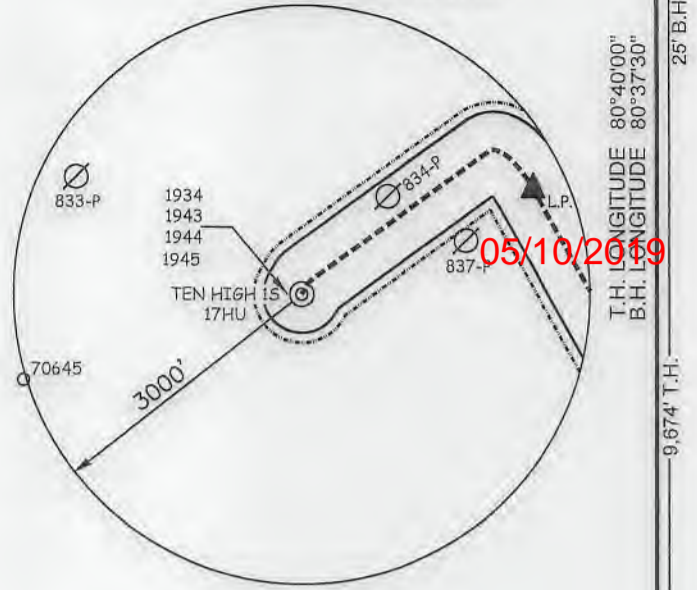
Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,175.00	1,175.00	20" Casing @ 1175 TVD	20	24	
2,982.41	2,980.00	13 3/8" Casing @ 2980 TVD	13-3/8	17-1/2	
11,041.53	10,525.00	9 5/8" Casing @ 10525 TVD	9-5/8	12-1/4	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,600.00	1,600.00	0.00	0.00	KOP Begin 1°/100' build
2,100.00	2,099.37	13.64	17.01	Begin 5.00° tangent
2,400.00	2,398.22	29.99	37.41	Begin 1°/100' drop
2,900.00	2,897.59	43.63	54.42	Begin vertical hold section
7,002.41	7,000.00	43.63	54.42	Begin 3°/100' build
8,078.58	8,020.12	228.89	284.33	Begin 32.29° tangent
11,751.80	11,125.46	1,459.93	1,812.06	Begin 10°/100' build/turn
12,688.99	11,653.00	1,136.96	2,374.68	Begin 89.00° lateral section
20,377.42	11,787.00	-5,500.91	6,251.88	PBHL/TD 20377.42 MD/11787.00 TVD

**TEN HIGH 1S LEASE
UTICA UNIT - 295.39 AC±
WELL 17HU
TUG HILL OPERATING**

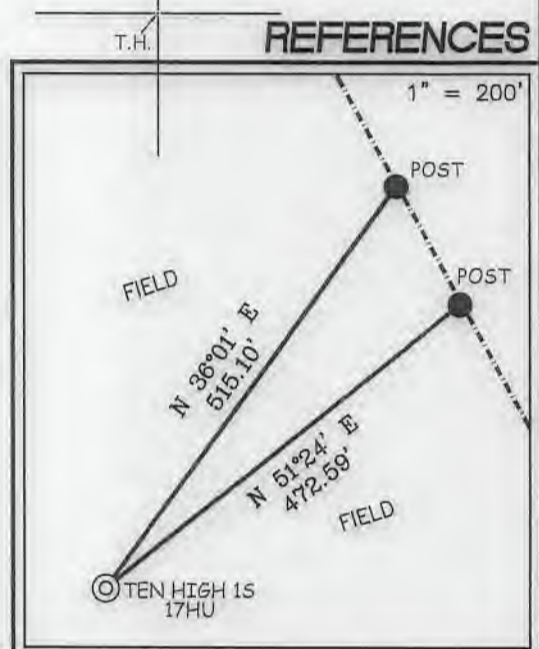
9,443' B.H. 3,981' T.H.

T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°47'30"



(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'83 S.P.C.(FT)	N. 478,149.83	E. 1,636,770.22
NAD'83 GEO.	LAT-(N) 39.806778	LONG-(W) 80.680837
NAD'83 UTM (M)	N. 4,406,360.53	E. 527,320.34
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 479,244.3	E. 1,639,176.5
NAD'83 GEO.	LAT-(N) 39.809869	LONG-(W) 80.672323
NAD'83 UTM (M)	N. 4,406,706.2	E. 528,047.9
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 472,540.4	E. 1,642,943.5
NAD'83 GEO.	LAT-(N) 39.791600	LONG-(W) 80.658607
NAD'83 UTM (M)	N. 4,404,683.0	E. 529,229.6



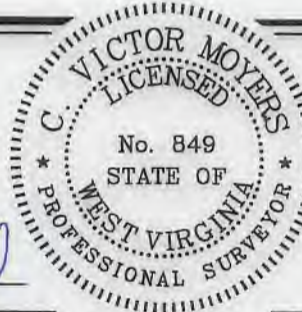
NOTES ON SURVEY

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'



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 REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 849 *C. Victor Moyers*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE AUGUST 29, 20 17
REVISED 01-15-2018, 02-15-2019
OPERATORS WELL NO. TEN HIGH 1S-17HU
API WELL NO. 47-051-02033 MOD
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8655P17HUR3.dwg
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

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

LOCATION: GROUND = 1,322.30' ELEVATION PROPOSED = 1,310.06' WATERSHED MIDDLE BOWMAN RUN OF FISH CREEK (HUC 10)
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER LAWRENCE & SHIRLEY CONKLE ESTS ACREAGE 139.79±
ROYALTY OWNER ANDY PAUL & JACKIE KUHN, ET AL - SEE ADDITIONAL SHEETS ACREAGE 139.79±

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION POINT PLEASANT
ESTIMATED DEPTH TVD: 11,878' / TMD: 20,138'

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

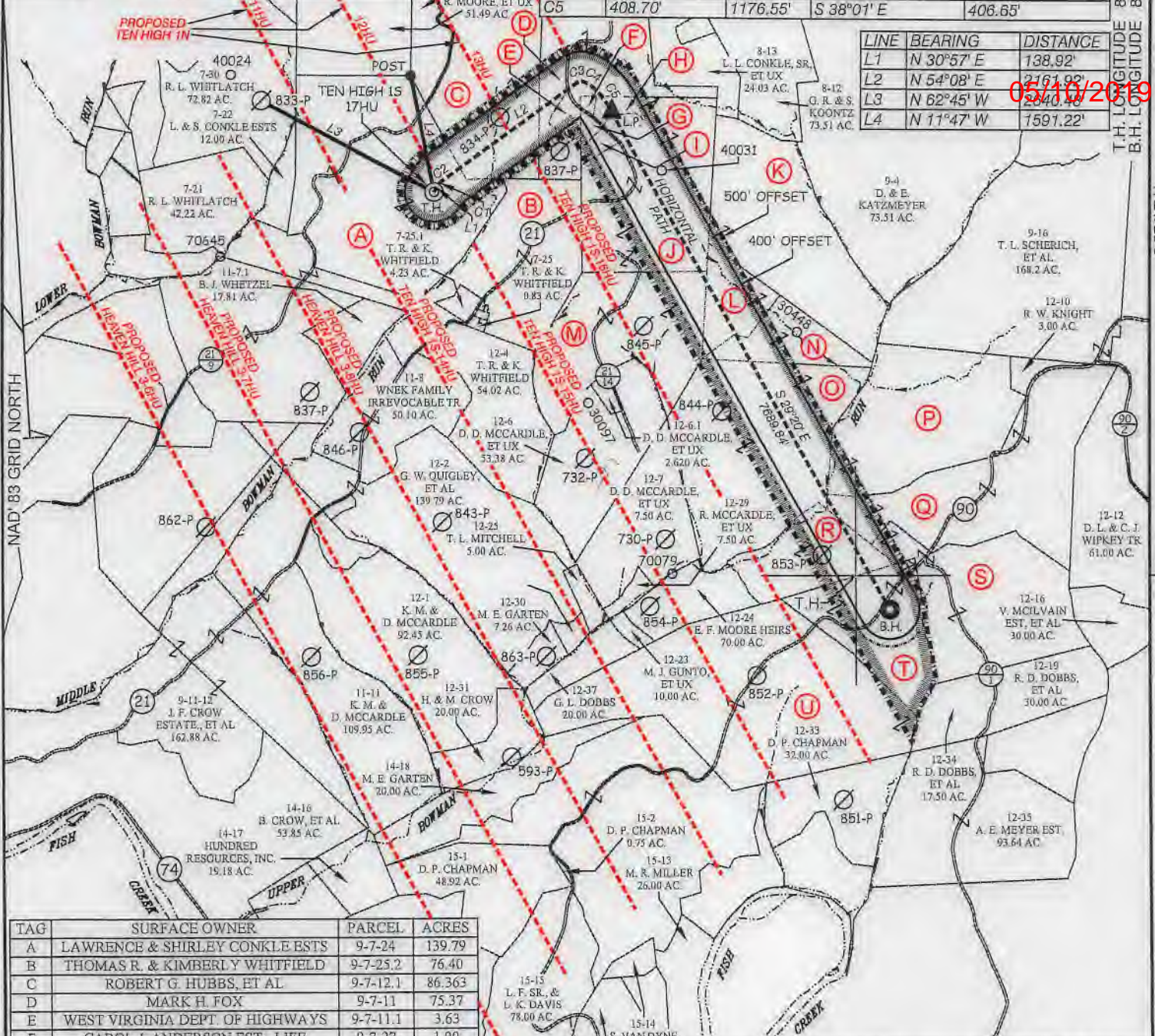
COUNTY NAME
PERMIT

**TEN HIGH 1S LEASE
UTICA UNIT - 295.39 AC ±
WELL 17HU
TUG HILL OPERATING**

T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°47'30"

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	19.84'	105.32'	N 44°08' E	19.81'
C2	137.59'	1848.13'	N 52°50' E	137.56'
C3	80.93'	96.99'	N 84°24' E	78.61'
C4	152.21'	367.23'	S 59°52' E	151.12'
C5	408.70'	1176.55'	S 38°01' E	406.65'

LINE	BEARING	DISTANCE
L1	N 30°57' E	138.92'
L2	N 54°08' E	2161.92'
L3	N 62°45' W	2040.48'
L4	N 11°47' W	1591.22'



TAG	SURFACE OWNER	PARCEL	ACRES
A	LAWRENCE & SHIRLEY CONKLE ESTS	9-7-24	139.79
B	THOMAS R. & KIMBERLY WHITFIELD	9-7-25,2	76.40
C	ROBERT G. HUBBS, ET AL	9-7-12,1	86.363
D	MARK H. FOX	9-7-11	75.37
E	WEST VIRGINIA DEPT. OF HIGHWAYS	9-7-11,1	3.63
F	CAROL J. ANDERSON EST - LIFE	9-7-27	1.00
G	VICTOR & CLAIRE CAMERON	9-7-28	1.983
H	CAROL J. ANDERSON EST - LIFE	9-7-29,1	5.004
I	NATHAN WILLIAMS	9-7-28,1	2.768
J	CAROL J. ANDERSON EST - LIFE	9-7-29	85.540
K	CONSOLIDATION COAL COMPANY	9-9-3	84.50
L	DONALD DALE MCCARDLE, ET UX	9-9-2	21.11

TAG	SURFACE OWNER	PARCEL	ACRES
M	DONALD DALE MCCARDLE, ET UX	9-12-5	75.28
N	DONALD DALE MCCARDLE, ET UX	9-9-1	20.89
O	DONALD DALE MCCARDLE, ET UX	9-12-8	117.85
P	CHARLES WILLIAM DOBBS, ET AL	9-12-9	82.26
Q	WARREN B. CHAMBERS, ET UX	9-12-11	91.00
R	OLIVER CROW	9-12-22	38.58
S	RONALD EUGENE DOBBS, ET UX	9-12-20	91.00
T	DAVID P. CHAPMAN	9-12-21	50.00
U	DAVID P. CHAPMAN	9-12-32	150.00

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenview, WV 26035 • (204) 862-5634
www.slsurveyors.com

47-051-02033 H6A

P.S. 849 *C. Victor Moyers*

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 478,149.83 E. 1,636,770.22
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 NAD'83 GEO. LAT.(N) 39.791600 LONG.(W) 80.658607
 NAD'83 UTM (M) N. 4,404,683.0 E. 529,229.6

VICTOR MOYERS
LICENSED
No. 849
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

LEGEND

- UNIT BOUNDARY
- LEASED TRACTS INSIDE UNIT BOUNDARY
- SURFACE LINE
- DEED WELL LATERAL WITHIN 3000'
- WELL LATERAL
- 400' OFFSET LINE
- 500' OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- SURFACE OWNER (SEE TABLE-SHEET 1)
- LEASE # (SEE ADDITIONAL SHEETS)

SCALE 1" = 2000' FILE NO. 8655P17HUR3.dwg
 DATE AUGUST 29, 20 17
 REVISED 01-15-2018, 02-15-2019
 OPERATORS WELL NO. TEN HIGH 1S-17HU
 API WELL NO. 47-051-02033 H6A
 NO. STATE COUNTY PERMIT

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

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

TEN HIGH 1S LEASE
 UTICA UNIT - 295.39 AC ±
 WELL 17HU
 TUG HILL OPERATING



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 P.O. Box 150 ♦ 12 Vanhorn Drive ♦ Glenville, WV 26031 ♦ (304) 482-5834
 www.slsurveys.com

05/10/2019

No.	Lease Name or No.	Tag	Parcel	Oil & Gas Royalty Owners	Deed Book/Page
1	10*15662	A	9-7-24	LARRY LEE CONKLE	863 354
2	10*15663	A	9-7-24	ROY A CONKLE SR	863 311
3	10*15664	A	9-7-24	THERESA ANNE HUGHES	863 343
4	10*15666	A	9-7-24	BRENDA I WHETZEL	863 635
5	10*16049	A	9-7-24	DANNY SHAWN KERNS AND AMY LYNN KERNS	905 518
6	10*16138	A	9-7-24	LARRY W KUHN AND VICKIE B KUHN, HUSBAND AND WIFE	905 522
7	10*16139	A	9-7-24	HUBERT DEAN KUHN AND ANDREA KUHN	905 524
8	10*16140	A	9-7-24	ANDY PAUL & JACKIE KUHN	905 525
9	10*16141	A	9-7-24	HOWARD L KUHN AND MARY L KUHN	905 528
10	10*16820	A	9-7-24	ROBERTA ANN AND DAVID S GIBB	919 237
11	10*17365	A	9-7-24	MYSTI JOANNE GOODMAN	927 268
12	10*17370	A	9-7-24	KELLY JUNE GOODMAN	927 470
13	10*18256	A	9-7-24	JEFFREY STEPHEN GOODMAN	929 1
14	10*47051,295.10	A	9-7-24	DEENA J PALOMO	905 470
15	10*47051,295.11	A	9-7-24	REGINA D FIGUEROA AND DAVID FIGUEROA	905 435
16	10*47051,295.12	A	9-7-24	EARL D WELLMAN	905 432
17	10*47051,295.13	A	9-7-24	THE DOLLY F WOOD REVOCABLE TRUST BY NICHOLAS CHARLES WOOD AS TRUSTEE	904 641
18	10*47051,295.3	A	9-7-24	HAZEL ARIZONA MOORE REYNOLDS	904 632
19	10*47051,295.4	A	9-7-24	LLOYD D MOORE	904 459
20	10*47051,295.5	A	9-7-24	DALE R MOORE	904 635
21	10*47051,295.6	A	9-7-24	MARY I BURKHART	904 638
22	10*47051,295.7	A	9-7-24	JEANNEV MELCHIORI	904 462
23	10*47051,295.9	A	9-7-24	JAMES E HIMELRICK JR AND KAREN HIMELRICK	904 465
24	10*15481	B	9-7-25.2	DEAN P RIGBY AND SUSAN RIGBY	908 197
25	10*15482	B	9-7-25.2	SUSAN NELSON	908 203
26	10*15686	B	9-7-25.2	JOHN OMER BOLTZ	908 160
27	10*15750	B	9-7-25.2	SANDRA K TRULL	908 229
28	10*16058	B	9-7-25.2	MATTIE RUTH JACKSON PRESCOTT	908 231
29	10*16118	B	9-7-25.2	RUBY RIDDLE JACKSON	908 233
30	10*16297	B	9-7-25.2	ROBERT A LEADBETTER AND M REBECCA LEADBETTER	908 235
31	10*16298	B	9-7-25.2	GEOFFREY A SHIEFER AND STEPHANIE L SCHIEFER	908 238
32	10*16883	B	9-7-25.2	ROBERT STEPHEN DRIGGERS	908 224
33	10*16414	B	9-7-25.2	MARY ELIZABETH DRIGGERS	908 208
34	10*16415	B	9-7-25.2	TERENCE J ANDERSON AND NANCY J ANDERSON	908 213
35	10*16416	B	9-7-25.2	CYNTHIA HUDSON	908 219
36	10*16424	B	9-7-25.2	ROBERT J RIGBY	908 241
37	10*16448	B	9-7-25.2	RALPH L AND JUANITA L CRIM	908 584
38	10*16478	B	9-7-25.2	MARION LAND EMILY CAMPBELL	908 245
39	10*16514	B	9-7-25.2	ALEX RUSSELL AND JOYCE A CAMPBELL	908 248
40	10*16515	B	9-7-25.2	ANNA MARIE JACKSON	908 251
41	10*16516	B	9-7-25.2	WILSON ANDREW JACKSON	908 253
42	10*16545	B	9-7-25.2	ROBERT G & ELLEN FOUNDS	908 260
43	10*16662	B	9-7-25.2	RICHARD THOMAS AND VICKI J MIMS	908 863
44	10*16666	B	9-7-25.2	MICHAEL P PYLE	908 255
45	10*16667	B	9-7-25.2	CHARLES F AND GAIL ANN PYLE	908 266
46	10*16668	B	9-7-25.2	JACK I AND MERRILEE PYLE	908 257
47	10*16669	B	9-7-25.2	JOHN S AND PATRICIA S DADO	908 269
48	10*16686	B	9-7-25.2	CHERYLE M TRACEY	927 475
49	10*16688	B	9-7-25.2	SHERRY L PYLE BAIR	927 481
50	10*16689	B	9-7-25.2	JOHN C FOUNDS	927 478
51	10*16690	B	9-7-25.2	RICARDO ORTIZ	921 352
52	10*16720	B	9-7-25.2	DONNA ELAINE BRASKETT	921 152
53	10*16738	B	9-7-25.2	CHARLES A RINE AND RUTH K RINE	908 274
54	10*16742	B	9-7-25.2	PAUL C WILSON	927 490
55	10*16747	B	9-7-25.2	WILLIAM DALE BRASKETT	921 96
56	10*16798	B	9-7-25.2	PATRICK A RANKIN AND ROBIN A RANKIN	921 364
57	10*16800	B	9-7-25.2	JAMES KENNETH JACKSON AND JULIE JACKSON	921 83
58	10*16802	B	9-7-25.2	CHRISTOPHER AND TAMMY RICHARDSON	921 495
59	10*16804	B	9-7-25.2	WILLIAM N AND SHERRY D TAYLOR	921 510
60	10*16806	B	9-7-25.2	VIRGINIA WHITMAN TRUST DTD 7-25-1984 JON WHITMAN TRUSTEE	921 528
61	10*16807	B	9-7-25.2	DAVID TULLER AND SUSAN STORTS TULLER	921 513
62	10*16808	B	9-7-25.2	MICHAEL L ORTIZ	921 349
63	10*16815	B	9-7-25.2	HAROLD W PYLE	921 357
64	10*16819	B	9-7-25.2	TERESA ORTIZ BIGGS	921 147
65	10*16821	B	9-7-25.2	SHEILA BRASKETT WEICHEY	921 516
66	10*16836	B	9-7-25.2	RIK A AND LENORE A STORTS	921 507
67	10*16837	B	9-7-25.2	TERRY L AND THELMA A POFF	927 472
68	10*16838	B	9-7-25.2	ROBERT G FUJARI	921 82
69	10*16839	B	9-7-25.2	JAMES B FOUNDS AND LYNN M MOWERY	921 73
70	10*16863	B	9-7-25.2	TINA MOORE	921 334
71	10*16868	B	9-7-25.2	MICHAEL W STORTS AND JESSICA M STORTS	921 504
72	10*16879	B	9-7-25.2	MARK E AND LESLEY A STORTS	921 501
73	10*16880	B	9-7-25.2	BEVERLY ANN STORTS	921 498
74	10*16902	B	9-7-25.2	MARY BARCAW DUKE	921 105
75	10*16962	B	9-7-25.2	DENNIS P AND BARBARA EZELL FLORY	921 70
76	10*16976	B	9-7-25.2	LESTER G AND CONSTANCE B NICKOLSON	921 343
77	10*16977	B	9-7-25.2	JEREMY COCHENOUR	921 102
78	10*16987	B	9-7-25.2	LAURIE EZELL PERRY	921 355
79	10*16989	B	9-7-25.2	BRITTANY RICHARDSON	921 376
80	10*16991	B	9-7-25.2	MARYELLEN FOUNDS AND LAUREN FOUNDS	921 79
81	10*16996	B	9-7-25.2	THOMAS RANKIN	917 75
82	10*17130	B	9-7-25.2	CINDY L BARGER	921 137
83	10*17155	B	9-7-25.2	JESSE LEON JR AND TERESA GAIL EZELLE	921 118
84	10*17156	B	9-7-25.2	HENRI NELL JACKSON KENT BARNES	921 139
85	10*17157	B	9-7-25.2	JAMES N REEVES JR AND RITA M REEVES	921 367
86	10*17198	B	9-7-25.2	THOMAS G AND DIANE W BAYLESS	921 141
87	10*17205	B	9-7-25.2	SANDRA JEAN WILSON	921 524
88	10*17208	B	9-7-25.2	PATRICK S GALLAGHER AND JOYCE ANN FOUNDS	921 86
89	10*17274	B	9-7-25.2	DAVID H WILSON	921 474
90	10*17275	B	9-7-25.2	JOHN R REEVES AND MONA G REEVES	921 373
91	10*17276	B	9-7-25.2	BERTHA EZELL WYATT	921 526
92	10*17278	B	9-7-25.2	MICHAEL L EZELLE	921 121
93	10*17339	B	9-7-25.2	JOSEPH W FOUNDS	921 76
94	10*17377	B	9-7-25.2	MILTON HOWARD EZELLE JR AND ELIZABETH A EZELLE	921 123
95	10*17416	B	9-7-25.2	ANDREW M ORTIZ	921 346
96	10*17438	B	9-7-25.2	DENNIS M WILSON	921 476
97	10*17440	B	9-7-25.2	KENDRA WALISA	927 484
98	10*17441	B	9-7-25.2	RALPH J WILSON	921 522
99	10*17442	B	9-7-25.2	SHANE ALLEN AND MENDY JEAN ALLEN	921 134
100	10*17443	B	9-7-25.2	MICHELLE MORROW-BACK	921 337

FILE NO. 8655P17HUR3.dwg

DATE AUGUST 29, 20 17

REVISED 01-15-2018, 02-15-2019

OPERATORS WELL NO. _____

API WELL NO. 47 — OSI — D203346A
 NO. STATE COUNTY PERMIT



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



P.S. 849 C. Victor Moyers

COUNTY NAME

PERMIT

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

**TEN HIGH 1S LEASE
UTICA UNIT - 295.39 AC ±
WELL 17HU
TUG HILL OPERATING**



05/10/2019

No.	Lease Name or No.	Tag	Parcel	Oil & Gas Royalty Owners	Deed Book/Page
101	10*17444	B	9-7-25.2	KELLY FOUNDS CAMPBELL	921 99
102	10*17449	B	9-7-25.2	PHYLLIS J BLAKE	921 150
103	10*17482	B	9-7-25.2	TERESA EZELLE RALYA AND DAVID L RALYA	927 487
104	10*17483	B	9-7-25.2	RICHARD I PYLE	921 359
105	10*17484	B	9-7-25.2	NELDA S JACKSON	921 330
106	10*17485	B	9-7-25.2	MARGIE ANN JACKSON ROBBINS GRAHAM	921 91
107	10*17526	B	9-7-25.2	JEFFREY L REEVES AND JODY L REEVES	921 370
108	10*17527	B	9-7-25.2	JAMES MICHAEL EZELL AND LUCILLE D EZELL	921 111
109	10*17552	B	9-7-25.2	JOHN BEVACQUA AND PATRICIA A BEVACQUA	921 144
110	10*17554	B	9-7-25.2	MICHAEL T RANKIN	921 361
111	10*17561	B	9-7-25.2	ROGER L TYRELL AND KATHRYN L TYRELL	921 519
112	10*17564	B	9-7-25.2	JAMES RONALD NICKOLSON AND TRACEY E NICKOLSON	921 340
113	10*17565	B	9-7-25.2	JESSE ALLEN JACKSON AND EUZABETH D JACKSON	921 327
114	10*17566	B	9-7-25.2	NATHAN P ERDOSSY AND BARBARA T ERDOSSY	921 108
115	10*17588	B	9-7-25.2	JAMES M JACKSON	921 325
116	10*17589	B	9-7-25.2	MARY CHRISTINE MCKENNA	921 332
117	10*17677	B	9-7-25.2	GEORGE M GONTA JR	921 89
118	10*17744	B	9-7-25.2	SAM PRESLEY EZELL	921 116
119	10*18021	B	9-7-25.2	CHRISTOPHER & JACKIE HANIFAN	927 267
120	10*18022	B	9-7-25.2	DALE P & CYNTHIA J WARD	927 264
121	10*47051.223.12	B	9-7-25.2	AUCE GORBY MARTIN	908 52
122	10*47051.223.13	B	9-7-25.2	JAMES A GORBY	908 42
123	10*47051.223.15	B	9-7-25.2	LARRY D TALUNT AND NANCY L TALUNT	908 14
124	10*47051.223.20	B	9-7-25.2	BARBARA A BUZZARD	908 34
125	10*47051.223.21	B	9-7-25.2	GARY T WARD AND SHARON D WARD	908 19
126	10*47051.223.30	B	9-7-25.2	LAURIE DRIGGERS MANDERSON	908 165
127	10*47051.223.33	B	9-7-25.2	NANCY CIAFFAGLIONE HOUSLEY	908 185
128	10*47051.223.35	B	9-7-25.2	DEBRA L CIAFFAGLIONE	908 190
129	10*47051.223.6	B	9-7-25.2	JOSHUA RINE AND REBECCA RINE	907 634
130	10*47051.223.9	B	9-7-25.2	UNDA DELBERT	908 32
131	10*47051.303.1	B	9-7-25.2	THOMAS R WHITFIELD	890 401
132	10*47051.303.2	B	9-7-25.2	KIMBERLY A WHITFIELD	890 403
133	10*15501	C	9-7-12.1	RONALD AND EDNA MOORE	661 449
134	10*19117	D	9-7-11	MARK H. FOX	864 163
135	10*18564	E	9-7-11.1	WVA DEPT OF HIGHWAY	947 566
136	10*19135	F	9-7-27	CAROL J ANDERSON ET AL - SEE ATTACHED DOCUMENT	772 228
137	10*19143	G	9-7-28	VICTOR CAMERON AND CLAIRE CAMERON	872 171
138	10*19135	H	9-7-29.1	CAROL J ANDERSON ET AL - SEE ATTACHED DOCUMENT	772 228
139	10*19183	I	9-7-28.1	EVELYN M WILLIAMS	720 180
140	10*19135	J	9-7-29	CAROL J ANDERSON ET AL - SEE ATTACHED DOCUMENT	772 228
141	10*47051.304.0	K	9-9-3	UNITED BANK INC	905 5
142	10*23386	L	9-9-2	EDITH CARMICHAEL HEIRS BY HERMAN LANTZ, SPECIAL COMMISSIONER	1008 68
143	10*47051.222.1	M	9-12-5	DONALD D MCCARDLE AND LUCY MCCARDLE	879 314
144	10*23386	N	9-9-1	EDITH CARMICHAEL HEIRS BY HERMAN LANTZ, SPECIAL COMMISSIONER	1008 68
145	10*47051.289.1	O	9-12-8	JANICE M HIXSON AND HARRY C HIXSON	898 461
146	10*47051.289.2	O	9-12-8	KENNETH D MCMECHEN	898 463
147	10*15999	P	9-12-9	CHARLES W DOBBS ET UX	702 171
148	10*16000	P	9-12-9	DAVID J KLUKAS ET UX	702 175
149	10*16001	P	9-12-9	MARLENE D GARIN	702 173
150	10*15494	Q	9-12-11	CHRISTOPHER SINGER AND SHEREA SINGER	898 433
151	10*16484	Q	9-12-11	PEGGY MARIE SIEBOLD	942 445
152	10*16485	Q	9-12-11	MICHELLE ANN KNALUFF	942 447
153	PENDING	Q	9-12-11	ELEANOR CHAMBERS BY HER AIF, MARK D CHAMBERS	1023 166
154	10*15474	R	9-12-22	CLARK C SAMPSON	907 495
155	10*15480	R	9-12-22	DOTTIE HERSMAN	907 487
156	10*15491	R	9-12-22	NORMAN L WOOD	907 507
157	10*15691	R	9-12-22	ALLIETTA J RUCKER AND RONALD R RUCKER	907 509
158	10*15692	R	9-12-22	EVA A COULTER	907 511
159	10*15693	R	9-12-22	EVERETT A WOOD	907 513
160	10*15732	R	9-12-22	JOAN R CUNNINGHAM AND MARK A CLNNINGHAM	907 515
161	10*15745	R	9-12-22	BRENDA L KING	907 517
162	10*16010	R	9-12-22	DONNA M RIGGS AND ROBERT H RIGGS	907 519
163	10*16012	R	9-12-22	PAULA K PAGE AND PHILLIP G PAGE	907 522
164	10*16013	R	9-12-22	HERBERT H BURKHART AND BETTY J BURKHART	907 524
165	10*16014	R	9-12-22	MARY KAY KESSLER AND ROY LEE KESSLER	907 526
166	10*16022	R	9-12-22	ALBERT D BURKHART	907 528
167	10*16023	R	9-12-22	BARBARA J BROWN	907 530
168	10*16057	R	9-12-22	CORA ALICE DAUBE	907 532
169	10*16119	R	9-12-22	JEFFREY L EWASKEY	907 569
170	10*16151	R	9-12-22	JOHN HARRIS AND HELEN VIRGINIA HARRIS	907 573
171	10*16193	R	9-12-22	NANCY L WOLFE	907 575
172	10*16195	R	9-12-22	DAVID P NIERATKO AND JUDY C NIERATKO	929 344
173	10*16245	R	9-12-22	MARGARET D STRAUSSER AND GREGORY L STRAUSSER	907 577
174	10*16293	R	9-12-22	DANIEL LEE AND DIANA M WEST	907 579
175	10*16294	R	9-12-22	DONNA G AND PAUL L CHMELYNSKI	907 581
176	10*16296	R	9-12-22	DOUGLAS E COURTWRIGHT AND JESSAMINE L COURTWRIGHT	907 583
177	10*16361	R	9-12-22	ROBERT M WOOD AND CAROL ANN WOOD	907 499
178	10*16371	R	9-12-22	VERA L APPLGARTH	907 503
179	10*16411	R	9-12-22	BONNIE L WOOD	907 501
180	10*16419	R	9-12-22	MELVIN B WOOD	907 505
181	10*16427	R	9-12-22	LURIA ALWANDA COOLEY	907 585
182	10*16430	R	9-12-22	BULELAH V RIDDLE	907 587
183	10*16449	R	9-12-22	BILLIE ALBERTA MIDDLETON	907 613
184	10*16450	R	9-12-22	JAMES D RAYNER AND PATRICIA ANN RAYNER	907 615
185	10*16451	R	9-12-22	JAMIE A SMITH AND JOSHUA C SMITH	907 617
186	10*16465	R	9-12-22	KAREN J AND MICHAEL E BRUGGEMAN	907 619
187	10*16467	R	9-12-22	CHARLES A AND GARY LYNN ECKHARDT	907 621
188	10*16542	R	9-12-22	CAROL ANN YEATER AND RICKEY A YEATER	907 623
189	10*16543	R	9-12-22	JERRY R AND JACQUELYNN E RUTHERS	907 625
190	10*16544	R	9-12-22	NORMA JEAN ROGERS AND DONALD L ROGERS SR	907 627
191	10*16681	R	9-12-22	BRENDA S THOMPSON	929 350
192	10*16682	R	9-12-22	CYNTHIA A AND WILLIAM D FETTY	929 616
193	10*16683	R	9-12-22	FRANKUN CLARK PATRICIA FENSTERMACHER	929 346
194	10*16846	R	9-12-22	PAMELA SUE BURGE	929 348
195	10*16847	R	9-12-22	WILLIAM L AND JENNIFER R EWASKEY	929 352
196	10*16889	R	9-12-22	HAROLD H CLARK JR	929 354
197	10*16921	R	9-12-22	HAZEL CLARK ROSEN LUND	929 356
198	10*16974	R	9-12-22	BRANDY L WOOD	929 360
199	10*16975	R	9-12-22	TIMOTHY J WOOD	929 358
200	10*16998	R	9-12-22	CHAD ERIC BENNETT AND MARY A BENNETT	929 584

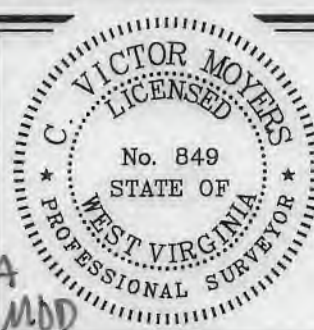
FILE NO. 8655P17HUR3.dwg

DATE AUGUST 29, 20 17

REVISED 01-15-2018, 02-15-2019

OPERATORS WELL NO.

API WELL NO. 47 - OS1 - D2033H6A
NO. STATE COUNTY PERMIT



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



P.S. 849 *C. Victor Moyers*

WELL OPERATOR TUG HILL OPERATING, LLC
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107

DESIGNATED AGENT DIANNA STAMPER
ADDRESS CT CORPORATION SYSTEM 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

COUNTY NAME

PERMIT

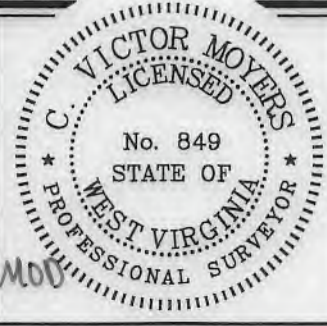
TEN HIGH 1S LEASE
 UTICA UNIT - 295.39 AC ±
 WELL 17HU
 TUG HILL OPERATING



No.	Lease Name or No.	Tag	Parcel	Oil & Gas Royalty Owners	Deed Book/Page
201	10*18998	R	9-12-22	MISTY JO WOOD AND GARY A MORRIS	929 362
202	10*17183	R	9-12-22	TARA E BENNETT	929 586
203	10*17277	R	9-12-22	GUY C ANDO AND WENDY PYLES ANDO	929 594
204	10*17280	R	9-12-22	BONNIE M KIDD AND CHARLES R KIDD	929 592
205	10*17281	R	9-12-22	STACY R BENNETT	929 590
206	10*17282	R	9-12-22	CARUS LEON CLARK	929 588
207	10*17423	R	9-12-22	LORI ANN WEST	929 596
208	10*17424	R	9-12-22	CAROL A CLARK	929 598
209	10*17446	R	9-12-22	GREGORY DEAN CLARK AND MARY ANN CLARK	929 600
210	10*17488	R	9-12-22	SUSANNA M DENIS	929 604
211	10*17495	R	9-12-22	KEVIN R CLARK AND NANCY G CLARK	929 608
212	10*17498	R	9-12-22	MICHAEL R DODD AND LISA M DODD	929 614
213	10*17521	R	9-12-22	BETTY LOU MCMILLAN AND WILLIAM A MCMILLAN	929 610
214	10*17522	R	9-12-22	RONALD D CLARK AND TAMMY C CLARK	929 612
215	10*17523	R	9-12-22	ROBERT R CLARK II	929 620
216	10*17529	R	9-12-22	HARRY C BURGE JR AND CAROL S BURGE	929 602
217	10*17558	R	9-12-22	SHIRLEY IRENE VANOVER	929 618
218	10*17585	R	9-12-22	DEBORAH L LUGO AND RONALD J LUGO	929 622
219	10*17587	R	9-12-22	DONNA SUE BEVERIDGE AND EARL P BEVERIDGE	929 626
220	10*17624	R	9-12-22	SHIRLEY E ELKINS	928 557
221	10*17704	R	9-12-22	BETTY L & ROY S PEARCE	929 628
222	10*17714	R	9-12-22	RUSSELL A CLARK AND CATHERINE CLARK	929 630
223	10*18106	R	9-12-22	TIMOTHY HEWITT	929 628
224	10*18237	R	9-12-22	CLARENCE LEE CLARK	930 3
225	10*18238	R	9-12-22	KATHRYN L ATWELL	930 1
226	10*18239	R	9-12-22	VERA S CAIN	929 649
227	10*18240	R	9-12-22	JODY CLARK ELLIOTT	929 647
228	10*18242	R	9-12-22	WILLIAM R DODD AND NANCY DODD	929 645
229	10*47051.289.1	R	9-12-22	JANICE M HIXSON AND HARRY C HIXSON	898 461
230	10*47051.289.2	R	9-12-22	KENNETH D MCMECHEN	898 463
231	10*47051.289.3	R	9-12-22	NELIJE JOANN CLARK	907 493
232	10*15579	S	9-12-20	WARREN J DOBBS	686 321
233	10*15580	S	9-12-20	SHARON KAY WADE	686 262
234	10*15581	S	9-12-20	RUTH NAOMI SAMPSON BY ATTORNEY IN FACT	686 284
235	10*47051.140.1	T	9-12-21	DAVID P CHAPMAN & DEBORAH BORCK-CHAPMAN	866 318
236	10*47051.140.2	T	9-12-21	DOROTHY SULLIVAN POA JAMES REID SULLIVAN	873 501
237	10*47051.140.1	U	9-12-32	DAVID P CHAPMAN & DEBORAH BORCK-CHAPMAN	866 318
238	10*47051.140.2	U	9-12-32	DOROTHY SULLIVAN POA JAMES REID SULLIVAN	873 501

05/10/2019

FILE NO. 8656P17HUR3.dwg
 DATE AUGUST 29, 20 17
 REVISED 01-15-2018, 02-15-2019
 OPERATORS WELL NO. _____
 API WELL NO. 47 — 051 — 020.33
 NO. STATE COUNTY PERMIT



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

P.S. 849 C. Victor Moyers

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

COUNTY NAME _____
 PERMIT _____

SI-D2033
05/10/2019
MOD

WW-6A1
(5/13)

Operator's Well No. Ten High 1S-17HU

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

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

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

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
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*See attached pages

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

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

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

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

Well Operator: Tug Hill Operating, LLC
 By: Amy L. Miller *Amy Miller*
 Its: Permitting Specialist - Appalachia Region

51-02033 MOD

WW - 6A1 Supplement

Operator's Well No. Ten High 1S - 17HU

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	Assignment	Assignment	Assignment	Assignment
10*15662	A	9-7-24	LARRY LEE CONKLE	CHEVRON U.S.A. INC.	1/8+	863 354	N/A	N/A	N/A	Chevron to Tug Hill: 36/148 ✓
10*15663	A	9-7-24	ROY A CONKLE SR	CHEVRON USA INC	1/8+	863 311	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15664	A	9-7-24	THERESA ANNE HUGHES	CHEVRON USA INC	1/8+	863 343	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*15666	A	9-7-24	BRENDA J WHETZEL	CHEVRON USA INC	1/8+	863 635	N/A	N/A	N/A	Chevron to Tug Hill: 36/148
10*16049	A	9-7-24	DANNY SHAWN KERNS AND AMY LYNN KERNS	TH EXPLORATION LLC	1/8+	905 518	N/A	N/A	N/A	
10*16138	A	9-7-24	LARRY W KUHN AND VICKIE B KUHN, HUSBAND AND WIFE	TH EXPLORATION LLC	1/8+	905 522	N/A	N/A	N/A	
10*16139	A	9-7-24	HUBERT DEAN KUHN AND ANDREA KUHN	TH EXPLORATION LLC	1/8+	905 524	N/A	N/A	N/A	
10*16140	A	9-7-24	ANDY PAUL & JACKIE KUHN	TH EXPLORATION LLC	1/8+	905 526	N/A	N/A	N/A	
10*16141	A	9-7-24	HOWARD L KUHN AND MARY L KUHN	TH EXPLORATION LLC	1/8+	905 528	N/A	N/A	N/A	
10*16820	A	9-7-24	ROBERTA ANN AND DAVID S GIBB	TH EXPLORATION LLC	1/8+	919 237	N/A	N/A	N/A	
10*17365	A	9-7-24	MYSTI JOANNE GOODMAN	TH EXPLORATION LLC	1/8+	927 268	N/A	N/A	N/A	
10*17370	A	9-7-24	KELLY JUNE GOODMAN	TH EXPLORATION LLC	1/8+	927 470	N/A	N/A	N/A	
10*18256	A	9-7-24	JEFFREY STEPHEN GOODMAN	TH EXPLORATION LLC	1/8+	929 1	N/A	N/A	N/A	
10*47051.295.10	A	9-7-24	DEENA J PALOMO	TH EXPLORATION LLC	1/8+	905 470	N/A	N/A	N/A	
10*47051.295.11	A	9-7-24	REGINA D FIGUEROA AND DAVID FIGUEROA	TH EXPLORATION LLC	1/8+	905 435	N/A	N/A	N/A	
10*47051.295.12	A	9-7-24	EARL D WELLMAN	TH EXPLORATION LLC	1/8+	905 432	N/A	N/A	N/A	
10*47051.295.13	A	9-7-24	THE DOLLYE F WOOD REVOCABLE TRUST BY NICHOLAS CHARLES WOOD AS TRUSTEE	TH EXPLORATION LLC	1/8+	904 641	N/A	N/A	N/A	
10*47051.295.3	A	9-7-24	HAZEL ARIZONA MOORE REYNOLDS	TH EXPLORATION LLC	1/8+	904 632	N/A	N/A	N/A	
10*47051.295.4	A	9-7-24	LLOYD D MOORE	TH EXPLORATION LLC	1/8+	904 459	N/A	N/A	N/A	
10*47051.295.5	A	9-7-24	DALE R MOORE	TH EXPLORATION LLC	1/8+	904 635	N/A	N/A	N/A	
10*47051.295.6	A	9-7-24	MARY I BURKHART	TH EXPLORATION LLC	1/8+	904 638	N/A	N/A	N/A	
10*47051.295.7	A	9-7-24	JEANNE V MELCHIORI	TH EXPLORATION LLC	1/8+	904 462	N/A	N/A	N/A	
10*47051.295.9	A	9-7-24	JAMES E HIMELRICK JR AND KAREN HIMELRICK	TH EXPLORATION LLC	1/8+	904 465	N/A	N/A	N/A	
10*15481	B	9-7-25.2	DEAN P RIGBY AND SUSAN RIGBY	TH EXPLORATION LLC	1/8+	908 197	N/A	N/A	N/A	
10*15482	B	9-7-25.2	SUSAN NELSON	TH EXPLORATION LLC	1/8+	908 203	N/A	N/A	N/A	
10*15686	B	9-7-25.2	JOHN OMER BOLTZ	TH EXPLORATION LLC	1/8+	908 160	N/A	N/A	N/A	
10*15750	B	9-7-25.2	SANDRA K TRULL	TH EXPLORATION LLC	1/8+	908 229	N/A	N/A	N/A	
10*16058	B	9-7-25.2	MATTIE RUTH JACKSON PRESCOTT	TH EXPLORATION LLC	1/8+	908 231	N/A	N/A	N/A	
10*16118	B	9-7-25.2	RUBY RIDDLE JACKSON	TH EXPLORATION LLC	1/8+	908 233	N/A	N/A	N/A	
10*16297	B	9-7-25.2	ROBERT A LEADBETTER AND M REBECCA LEADBETTER	TH EXPLORATION LLC	1/8+	908 235	N/A	N/A	N/A	
10*16298	B	9-7-25.2	GEOFFREY A SHIEFER AND STEPHANIE L SCHIEFER	TH EXPLORATION LLC	1/8+	908 238	N/A	N/A	N/A	
10*16383	B	9-7-25.2	ROBERT STEPHEN DRIGGERS	TH EXPLORATION LLC	1/8+	908 224	N/A	N/A	N/A	
10*16414	B	9-7-25.2	MARY ELIZABETH DRIGGERS	TH EXPLORATION LLC	1/8+	908 208	N/A	N/A	N/A	
10*16415	B	9-7-25.2	TERENCE J ANDERSON AND NANCY J ANDERSON	TH EXPLORATION LLC	1/8+	908 213	N/A	N/A	N/A	
10*16416	B	9-7-25.2	CYNTHIA HUDSON	TH EXPLORATION LLC	1/8+	908 219	N/A	N/A	N/A	
10*16424	B	9-7-25.2	ROBERT J RIGBY	TH EXPLORATION LLC	1/8+	908 241	N/A	N/A	N/A	
10*16448	B	9-7-25.2	RALPH L AND JUANITA L CRIM	TH EXPLORATION LLC	1/8+	908 584	N/A	N/A	N/A	
10*16478	B	9-7-25.2	MARION L AND EMILY CAMPBELL	TH EXPLORATION LLC	1/8+	908 245	N/A	N/A	N/A	
10*16514	B	9-7-25.2	ALEX RUSSELL AND JOYCE A CAMPBELL	TH EXPLORATION LLC	1/8+	908 248	N/A	N/A	N/A	
10*16515	B	9-7-25.2	ANNA MARIE JACKSON	TH EXPLORATION LLC	1/8+	908 251	N/A	N/A	N/A	
10*16516	B	9-7-25.2	WILSON ANDREW JACKSON	TH EXPLORATION LLC	1/8+	908 253	N/A	N/A	N/A	
10*16545	B	9-7-25.2	ROBERT G & ELLEN FOUNDS	TH EXPLORATION LLC	1/8+	908 260	N/A	N/A	N/A	
10*16662	B	9-7-25.2	RICHARD THOMAS AND VICKI J MIMS	TH EXPLORATION LLC	1/8+	908 863	N/A	N/A	N/A	
10*16666	B	9-7-25.2	MICHAEL P PYLE	TH EXPLORATION LLC	1/8+	908 255	N/A	N/A	N/A	
10*16667	B	9-7-25.2	CHARLES F AND GAIL ANN PYLE	TH EXPLORATION LLC	1/8+	908 266	N/A	N/A	N/A	
10*16668	B	9-7-25.2	JACK I AND MERRILEE PYLE	TH EXPLORATION LLC	1/8+	908 257	N/A	N/A	N/A	
10*16669	B	9-7-25.2	JOHN S AND PATRICIA S DADO	TH EXPLORATION LLC	1/8+	908 269	N/A	N/A	N/A	
10*16686	B	9-7-25.2	CHERYLE M TRACEY	TH EXPLORATION LLC	1/8+	927 475	N/A	N/A	N/A	
10*16688	B	9-7-25.2	SHERRYL PYLE BAIR	TH EXPLORATION LLC	1/8+	927 481	N/A	N/A	N/A	
10*16689	B	9-7-25.2	JOHN C FOUNDS	TH EXPLORATION LLC	1/8+	927 478	N/A	N/A	N/A	
10*16690	B	9-7-25.2	RICARDO ORTIZ	TH EXPLORATION LLC	1/8+	921 352	N/A	N/A	N/A	
10*16720	B	9-7-25.2	DONNA ELAINE BRASKETT	TH EXPLORATION LLC	1/8+	921 152	N/A	N/A	N/A	
10*16738	B	9-7-25.2	CHARLES A RINE AND RUTH K RINE	TH EXPLORATION LLC	1/8+	908 274	N/A	N/A	N/A	

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	Assignment	Assignment	Assignment	Assignment
10*16742	B	9-7-25.2	PAUL C WILSON	TH EXPLORATION LLC	1/8+	927 490	N/A	N/A	N/A	N/A
10*16747	B	9-7-25.2	WILLIAM DALE BRASKETT	TH EXPLORATION LLC	1/8+	921 96	N/A	N/A	N/A	N/A
10*16798	B	9-7-25.2	PATRICK A RANKIN AND ROBIN A RANKIN	TH EXPLORATION LLC	1/8+	921 364	N/A	N/A	N/A	N/A
10*16800	B	9-7-25.2	JAMES KENNETH JACKSON AND JULIE JACKSON	TH EXPLORATION LLC	1/8+	921 93	N/A	N/A	N/A	N/A
10*16802	B	9-7-25.2	CHRISTOPHER AND TAMMY RICHARDSON	TH EXPLORATION LLC	1/8+	921 495	N/A	N/A	N/A	N/A
10*16804	B	9-7-25.2	WILLIAM N AND SHERRY D TAYLOR	TH EXPLORATION LLC	1/8+	921 510	N/A	N/A	N/A	N/A
10*16806	B	9-7-25.2	VIRGINIA WHITMAN TRUST DTD 7-25-1984 JON WHITMAN TRUSTEE	TH EXPLORATION LLC	1/8+	921 528	N/A	N/A	N/A	N/A
10*16807	B	9-7-25.2	DAVID TULLER AND SUSAN STORTS TULLER	TH EXPLORATION LLC	1/8+	921 513	N/A	N/A	N/A	N/A
10*16808	B	9-7-25.2	MICHAEL L ORTIZ	TH EXPLORATION LLC	1/8+	921 349	N/A	N/A	N/A	N/A
10*16815	B	9-7-25.2	HAROLD W PYLE	TH EXPLORATION LLC	1/8+	921 357	N/A	N/A	N/A	N/A
10*16819	B	9-7-25.2	TERESA ORTIZ BIGGS	TH EXPLORATION LLC	1/8+	921 147	N/A	N/A	N/A	N/A
10*16821	B	9-7-25.2	SHEILA BRASKETT WEICHEY	TH EXPLORATION LLC	1/8+	921 516	N/A	N/A	N/A	N/A
10*16836	B	9-7-25.2	RICK A AND LENORE A STORTS	TH EXPLORATION LLC	1/8+	921 507	N/A	N/A	N/A	N/A
10*16837	B	9-7-25.2	TERRY L AND THELMA A POFF	TH EXPLORATION LLC	1/8+	927 472	N/A	N/A	N/A	N/A
10*16838	B	9-7-25.2	ROBERT G FUNARI	TH EXPLORATION LLC	1/8+	921 82	N/A	N/A	N/A	N/A
10*16839	B	9-7-25.2	JAMES B FOUNDS AND LYNN M MOWERY	TH EXPLORATION LLC	1/8+	921 73	N/A	N/A	N/A	N/A
10*16863	B	9-7-25.2	TINA MOORE	TH EXPLORATION LLC	1/8+	921 334	N/A	N/A	N/A	N/A
10*16868	B	9-7-25.2	MICHAEL W STORTS AND JESSICA M STORTS	TH EXPLORATION LLC	1/8+	921 504	N/A	N/A	N/A	N/A
10*16879	B	9-7-25.2	MARK E AND LESLEY A STORTS	TH EXPLORATION LLC	1/8+	921 501	N/A	N/A	N/A	N/A
10*16880	B	9-7-25.2	BEVERLY ANN STORTS	TH EXPLORATION LLC	1/8+	921 498	N/A	N/A	N/A	N/A
10*16902	B	9-7-25.2	MARY BARCAW DUKE	TH EXPLORATION LLC	1/8+	921 105	N/A	N/A	N/A	N/A
10*16962	B	9-7-25.2	DENNIS P AND BARBARA EZELL FLORY	TH EXPLORATION LLC	1/8+	921 70	N/A	N/A	N/A	N/A
10*16976	B	9-7-25.2	LESTER G AND CONSTANCE B NICKOLSON	TH EXPLORATION LLC	1/8+	921 343	N/A	N/A	N/A	N/A
10*16977	B	9-7-25.2	JEREMY COCHENOUR	TH EXPLORATION LLC	1/8+	921 102	N/A	N/A	N/A	N/A
10*16987	B	9-7-25.2	LAURIE EZELL PERRY	TH EXPLORATION LLC	1/8+	921 355	N/A	N/A	N/A	N/A
10*16989	B	9-7-25.2	BRITTANY RICHARDSON	TH EXPLORATION LLC	1/8+	921 376	N/A	N/A	N/A	N/A
10*16991	B	9-7-25.2	MARYELLEN FOUNDS AND LAUREN FOUNDS	TH EXPLORATION LLC	1/8+	921 79	N/A	N/A	N/A	N/A
10*16996	B	9-7-25.2	THOMAS RANKIN	TH EXPLORATION LLC	1/8+	917 75	N/A	N/A	N/A	N/A
10*17130	B	9-7-25.2	CINDY L BARGER	TH EXPLORATION LLC	1/8+	921 137	N/A	N/A	N/A	N/A
10*17155	B	9-7-25.2	JESSE LEON JR AND TERESA GAIL EZELLE	TH EXPLORATION LLC	1/8+	921 118	N/A	N/A	N/A	N/A
10*17156	B	9-7-25.2	HENRI NELL JACKSON KENT BARNES	TH EXPLORATION LLC	1/8+	921 139	N/A	N/A	N/A	N/A
10*17157	B	9-7-25.2	JAMES N REEVES JR AND RITA M REEVES	TH EXPLORATION LLC	1/8+	921 367	N/A	N/A	N/A	N/A
10*17198	B	9-7-25.2	THOMAS G AND DIANE W WAYLESS	TH EXPLORATION LLC	1/8+	921 141	N/A	N/A	N/A	N/A
10*17205	B	9-7-25.2	SANDRA JEAN WILSON	TH EXPLORATION LLC	1/8+	921 524	N/A	N/A	N/A	N/A
10*17208	B	9-7-25.2	PATRICK S GALLAGHER AND JOYCE ANN FOUNDS	TH EXPLORATION LLC	1/8+	921 86	N/A	N/A	N/A	N/A
10*17274	B	9-7-25.2	DAVID H WILSON	TH EXPLORATION LLC	1/8+	921 474	N/A	N/A	N/A	N/A
10*17275	B	9-7-25.2	JOHN R REEVES AND MONA G REEVES	TH EXPLORATION LLC	1/8+	921 373	N/A	N/A	N/A	N/A
10*17276	B	9-7-25.2	BERTHA EZELL WYATT	TH EXPLORATION LLC	1/8+	921 526	N/A	N/A	N/A	N/A
10*17278	B	9-7-25.2	MICHAEL L EZELLE	TH EXPLORATION LLC	1/8+	921 121	N/A	N/A	N/A	N/A
10*17339	B	9-7-25.2	JOSEPH W FOUNDS	TH EXPLORATION LLC	1/8+	921 76	N/A	N/A	N/A	N/A
10*17377	B	9-7-25.2	MILTON HOWARD EZELLE JR AND ELIZABETH A EZELLE	TH EXPLORATION LLC	1/8+	921 123	N/A	N/A	N/A	N/A
10*17416	B	9-7-25.2	ANDREW M ORTIZ	TH EXPLORATION LLC	1/8+	921 346	N/A	N/A	N/A	N/A
10*17438	B	9-7-25.2	DENNIS M WILSON	TH EXPLORATION LLC	1/8+	921 476	N/A	N/A	N/A	N/A
10*17440	B	9-7-25.2	KENDRA WALISA	TH EXPLORATION LLC	1/8+	927 484	N/A	N/A	N/A	N/A
10*17441	B	9-7-25.2	RALPH J WILSON	TH EXPLORATION LLC	1/8+	921 522	N/A	N/A	N/A	N/A
10*17442	B	9-7-25.2	SHANE ALLEN AND MENDY JEAN ALLEN	TH EXPLORATION LLC	1/8+	921 134	N/A	N/A	N/A	N/A
10*17443	B	9-7-25.2	MICHELLE MORROW-BACK	TH EXPLORATION LLC	1/8+	921 337	N/A	N/A	N/A	N/A
10*17444	B	9-7-25.2	KELLY FOUNDS CAMPBELL	TH EXPLORATION LLC	1/8+	921 99	N/A	N/A	N/A	N/A
10*17449	B	9-7-25.2	PHYLLIS J BLAKE	TH EXPLORATION LLC	1/8+	921 150	N/A	N/A	N/A	N/A
10*17482	B	9-7-25.2	TERESA EZELLE RALYA AND DAVID L RALYA	TH EXPLORATION LLC	1/8+	927 487	N/A	N/A	N/A	N/A
10*17483	B	9-7-25.2	RICHARD I PYLE	TH EXPLORATION LLC	1/8+	921 359	N/A	N/A	N/A	N/A
10*17484	B	9-7-25.2	NELDA S JACKSON	TH EXPLORATION LLC	1/8+	921 330	N/A	N/A	N/A	N/A
10*17485	B	9-7-25.2	MARGIE ANN JACKSON ROBBINS GRAHAM	TH EXPLORATION LLC	1/8+	921 91	N/A	N/A	N/A	N/A

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	Assignment	Assignment	Assignment	Assignment
10*17526	B	9-7-25.2	JEFFREY L REEVES AND JODY L REEVES	TH EXPLORATION LLC	1/8+	921 370	N/A	N/A	N/A	N/A
10*17527	B	9-7-25.2	JAMES MICHAEL EZELL AND LUCILLE D EZELL	TH EXPLORATION LLC	1/8+	921 111	N/A	N/A	N/A	N/A
10*17552	B	9-7-25.2	JOHN BEVACQUA AND PATRICIA A BEVACQUA	TH EXPLORATION LLC	1/8+	921 144	N/A	N/A	N/A	N/A
10*17554	B	9-7-25.2	MICHAEL T RANKIN	TH EXPLORATION LLC	1/8+	921 361	N/A	N/A	N/A	N/A
10*17561	B	9-7-25.2	ROGER L TYRELL AND KATHRYN L TYRELL	TH EXPLORATION LLC	1/8+	921 519	N/A	N/A	N/A	N/A
10*17564	B	9-7-25.2	JAMES RONALD NICKOLSON AND TRACEY E NICKOLSON	TH EXPLORATION LLC	1/8+	921 340	N/A	N/A	N/A	N/A
10*17565	B	9-7-25.2	JESSE ALLEN JACKSON AND ELIZABETH D JACKSON	TH EXPLORATION LLC	1/8+	921 327	N/A	N/A	N/A	N/A
10*17566	B	9-7-25.2	NATHAN P ERDOSSY AND BARBARA T ERDOSSY	TH EXPLORATION LLC	1/8+	921 108	N/A	N/A	N/A	N/A
10*17588	B	9-7-25.2	JAMES M JACKSON	TH EXPLORATION LLC	1/8+	921 325	N/A	N/A	N/A	N/A
10*17589	B	9-7-25.2	MARY CHRISTINE MCKENNA	TH EXPLORATION LLC	1/8+	921 332	N/A	N/A	N/A	N/A
10*17677	B	9-7-25.2	GEORGE M GONTA JR	TH EXPLORATION LLC	1/8+	921 89	N/A	N/A	N/A	N/A
10*17744	B	9-7-25.2	SAM PRESLEY EZELL	TH EXPLORATION LLC	1/8+	921 116	N/A	N/A	N/A	N/A
10*18021	B	9-7-25.2	CHRISTOPHER & JACKIE HANIFAN	TH EXPLORATION, LLC	1/8+	927 267	N/A	N/A	N/A	N/A
10*18022	B	9-7-25.2	DALE P & CYNTHIA J WARD	TH EXPLORATION, LLC	1/8+	927 264	N/A	N/A	N/A	N/A
10*47051.223.12	B	9-7-25.2	ALICE GORBY MARTIN	TH EXPLORATION LLC	1/8+	908 52	N/A	N/A	N/A	N/A
10*47051.223.13	B	9-7-25.2	JAMES A GORBY	TH EXPLORATION LLC	1/8+	908 42	N/A	N/A	N/A	N/A
10*47051.223.15	B	9-7-25.2	LARRY D TAUNT AND NANCY L TAUNT	TH EXPLORATION LLC	1/8+	908 14	N/A	N/A	N/A	N/A
10*47051.223.20	B	9-7-25.2	BARBARA A BUZZARD	TH EXPLORATION LLC	1/8+	908 24	N/A	N/A	N/A	N/A
10*47051.223.21	B	9-7-25.2	GARY T WARD AND SHARON D WARD	TH EXPLORATION LLC	1/8+	908 19	N/A	N/A	N/A	N/A
10*47051.223.30	B	9-7-25.2	LAURIE DRIGGERS MANDERSON	TH EXPLORATION LLC	1/8+	908 165	N/A	N/A	N/A	N/A
10*47051.223.33	B	9-7-25.2	NANCY CIAFFAGLIONE HOUSLEY	TH EXPLORATION LLC	1/8+	908 185	N/A	N/A	N/A	N/A
10*47051.223.35	B	9-7-25.2	DEBRA L CIAFFAGLIONE	TH EXPLORATION LLC	1/8+	908 190	N/A	N/A	N/A	N/A
10*47051.223.6	B	9-7-25.2	JOSHUA RINE AND REBECCA RINE	TH EXPLORATION LLC	1/8+	907 634	N/A	N/A	N/A	N/A
10*47051.223.9	B	9-7-25.2	LINDA DELBERT	TH EXPLORATION LLC	1/8+	908 32	N/A	N/A	N/A	N/A
10*47051.303.1	B	9-7-25.2	THOMAS R WHITFIELD	TH EXPLORATION LLC	1/8+	890 401	N/A	N/A	N/A	N/A
10*47051.303.2	B	9-7-25.2	KIMBERLY A WHITFIELD	TH EXPLORATION LLC	1/8+	890 403	N/A	N/A	N/A	N/A
10*15501	C ✓	9-7-12.1	RONALD AND EDNA MOORE	TRIENERGY INC	1/8+	661 449	TRIENERGY TO AB RESOURCES: 20/252	AB RES. TO CHIEF EXPL ET AL: 24/319	CHIEF EXPL ET AL TO CHEVRON: 25/105	CHEVRON TO TUG HILL: 40/127
10*19117	D ✓	9-7-11	MARK H. FOX	TH EXPLORATION LLC	1/8+	864 163	N/A	N/A	TUG HILL TO CHEVRON: 36/168	CHEVRON TO TUG HILL: 40/127
10*19564	E ✓	9-7-11.1	W VA DEPT OF HIGHWAY	TH EXPLORATION LLC	1/8+	947 566	N/A	N/A	N/A	N/A
10*19135	F ✓	9-7-27	CAROL J ANDERSON ET AL - SEE ATTACHED DOCUMENT	CHEVRON U.S.A. INC.	1/8+	772 228	N/A	N/A	N/A	CHEVRON TO TUG HILL: 40/127
10*19143	G ✓	9-7-28	VICTOR CAMERON AND CLAIRE CAMERON	CHEVRON U.S.A. INC.	1/8+	872 171	N/A	N/A	N/A	CHEVRON TO TUG HILL: 40/127
10*19135	H ✓	9-7-29.1	CAROL J ANDERSON ET AL - SEE ATTACHED DOCUMENT	CHEVRON U.S.A. INC.	1/8+	772 228	N/A	N/A	N/A	CHEVRON TO TUG HILL: 40/127
10*19183	I ✓	9-7-28.1	EVELYN M WILLIAMS	TRIENERGY HOLDINGS LLC	1/8+	720 180	N/A	TRIENERGY TO NPAR: 24/430	NPAR TO CHEVRON: 756/332	CHEVRON TO TUG HILL: 40/127
10*19135	J ✓	9-7-29	CAROL J ANDERSON ET AL - SEE ATTACHED DOCUMENT	CHEVRON U.S.A. INC.	1/8+	772 228	N/A	N/A	N/A	CHEVRON TO TUG HILL: 40/127
10*47051.304.0	K ✓	9-9-3	UNITED BANK INC	TH EXPLORATION LLC	1/8+	905 5	N/A	N/A	N/A	N/A
10*23386	L ✓	9-9-2	EDITH CARMICHAEL HEIRS BY HERMAN LANTZ, SPECIAL COMMISSIONER	TH EXPLORATION LLC	1/8+	1008 68	N/A	N/A	N/A	N/A
10*47051.222.1	M	9-12-5	DONALD D MCCARDLE AND LUCY MCCARDLE	TH EXPLORATION LLC	1/8+	879 314	N/A	N/A	N/A	N/A
10*23386	N	9-9-1	EDITH CARMICHAEL HEIRS BY HERMAN LANTZ, SPECIAL COMMISSIONER	TH EXPLORATION LLC	1/8+	1008 68	N/A	N/A	N/A	N/A
10*47051.289.1	O	9-12-8	JANICE M HIXSON AND HARRY C HIXSON	TH EXPLORATION LLC	1/8+	898 461	N/A	N/A	N/A	N/A
10*47051.289.2	O	9-12-8	KENNETH D MCMECHEN	TH EXPLORATION LLC	1/8+	898 463	N/A	N/A	N/A	N/A
10*15999	P	9-12-9	CHARLES W DOBBS ET UX	TRIENERGY HOLDINGS, LLC	1/8+	702 171	TRIENERGY TO CHEVRON: 28/356	CHEVRON TO CHESAPEAKE: 30/532	CHESAPEAKE TO SWN: 33/110	SWN TO TUG HILL: 36/431
10*16000	P	9-12-9	DAVID J KLUKAS ET UX	TRIENERGY HOLDINGS, LLC	1/8+	702 175	TRIENERGY TO CHEVRON: 28/356	CHEVRON TO CHESAPEAKE: 30/532	CHESAPEAKE TO SWN: 33/110	SWN TO TUG HILL: 36/431
10*16001	P	9-12-9	MARLENE D GARIN	TRIENERGY HOLDINGS, LLC	1/8+	702 173	TRIENERGY TO CHEVRON: 28/356	CHEVRON TO CHESAPEAKE: 30/532	CHESAPEAKE TO SWN: 33/110	SWN TO TUG HILL: 36/431
10*15494	Q	9-12-11	CHRISTOPHER SINGER AND SHEREA SINGER	TH EXPLORATION LLC	1/8+	898 433	N/A	N/A	N/A	N/A
10*16484	Q	9-12-11	PEGGY MARIE SIEBOLD	TH EXPLORATION LLC	1/8+	942 445	N/A	N/A	N/A	N/A
10*16485	Q	9-12-11	MICHELLE ANN KNAUFF	TH EXPLORATION LLC	1/8+	942 447	N/A	N/A	N/A	N/A
PENDING	Q	9-12-11	ELEANOR CHAMBERS BY HER AIF, MARK D CHAMBERS	TH EXPLORATION LLC	1/8+	1023 166	N/A	N/A	N/A	N/A
10*15474	R	9-12-22	CLARK C SAMPSON	TH EXPLORATION LLC	1/8+	907 495	N/A	N/A	N/A	N/A
10*15480	R	9-12-22	DOTTIE HERSMAN	TH EXPLORATION LLC	1/8+	907 497	N/A	N/A	N/A	N/A
10*15491	R	9-12-22	NORMAN L WOOD	TH EXPLORATION LLC	1/8+	907 507	N/A	N/A	N/A	N/A
10*15691	R	9-12-22	ALLIETTA J RUCKER AND RONALD R RUCKER	TH EXPLORATION LLC	1/8+	907 509	N/A	N/A	N/A	N/A
10*15692	R	9-12-22	EVA A COULTER	TH EXPLORATION LLC	1/8+	907 511	N/A	N/A	N/A	N/A
10*15693	R	9-12-22	EVERETT A WOOD	TH EXPLORATION LLC	1/8+	907 513	N/A	N/A	N/A	N/A

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10*15732	R	9-12-22	JOAN R CUNNINGHAM AND MARK A CUNNINGHAM	TH EXPLORATION LLC	1/8+	907 515	N/A	N/A	N/A	N/A
10*15745	R	9-12-22	BRENDA L KING	TH EXPLORATION LLC	1/8+	907 517	N/A	N/A	N/A	N/A
10*16010	R	9-12-22	DONNA M RIGGS AND ROBERT H RIGGS	TH EXPLORATION LLC	1/8+	907 519	N/A	N/A	N/A	N/A
10*16012	R	9-12-22	PAULA K PAGE AND PHILLIP G PAGE	TH EXPLORATION LLC	1/8+	907 522	N/A	N/A	N/A	N/A
10*16013	R	9-12-22	HERBERT H BURKHART AND BETTY J BURKHART	TH EXPLORATION LLC	1/8+	907 524	N/A	N/A	N/A	N/A
10*16014	R	9-12-22	MARY KAY KESSLER AND ROY LEE KESSLER	TH EXPLORATION LLC	1/8+	907 526	N/A	N/A	N/A	N/A
10*16022	R	9-12-22	ALBERT D BURKHART	TH EXPLORATION LLC	1/8+	907 528	N/A	N/A	N/A	N/A
10*16023	R	9-12-22	BARBARA J BROWN	TH EXPLORATION LLC	1/8+	907 530	N/A	N/A	N/A	N/A
10*16057	R	9-12-22	CORA ALICE DAUBE	TH EXPLORATION LLC	1/8+	907 532	N/A	N/A	N/A	N/A
10*16119	R	9-12-22	JEFFREY L EWASKEY	TH EXPLORATION LLC	1/8+	907 569	N/A	N/A	N/A	N/A
10*16151	R	9-12-22	JOHN HARRIS AND HELEN VIRGINIA HARRIS	TH EXPLORATION LLC	1/8+	907 573	N/A	N/A	N/A	N/A
10*16193	R	9-12-22	NANCY L WOLFE	TH EXPLORATION LLC	1/8+	907 575	N/A	N/A	N/A	N/A
10*16195	R	9-12-22	DAVID P NIERATKO AND JUDY C NIERATKO	TH EXPLORATION LLC	1/8+	929 344	N/A	N/A	N/A	N/A
10*16245	R	9-12-22	MARGARET D STRAUSSER AND GREGORY L STRAUSSER	TH EXPLORATION LLC	1/8+	907 577	N/A	N/A	N/A	N/A
10*16293	R	9-12-22	DANIEL LEE AND DIANA M WEST	TH EXPLORATION LLC	1/8+	907 579	N/A	N/A	N/A	N/A
10*16294	R	9-12-22	DONNA G AND PAUL L CHMELYNSKI	TH EXPLORATION LLC	1/8+	907 581	N/A	N/A	N/A	N/A
10*16296	R	9-12-22	DOUGLAS E COURTWRIGHT AND JESSAMINE L COURTWRIGHT	TH EXPLORATION LLC	1/8+	907 583	N/A	N/A	N/A	N/A
10*16361	R	9-12-22	ROBERT M WOOD AND CAROL ANN WOOD	TH EXPLORATION LLC	1/8+	907 499	N/A	N/A	N/A	N/A
10*16371	R	9-12-22	VERA L APPELGARTH	TH EXPLORATION LLC	1/8+	907 503	N/A	N/A	N/A	N/A
10*16411	R	9-12-22	BONNIE L WOOD	TH EXPLORATION LLC	1/8+	907 501	N/A	N/A	N/A	N/A
10*16419	R	9-12-22	MELVIN B WOOD	TH EXPLORATION LLC	1/8+	907 505	N/A	N/A	N/A	N/A
10*16427	R	9-12-22	LURIA ALWANDA COOLEY	TH EXPLORATION LLC	1/8+	907 585	N/A	N/A	N/A	N/A
10*16430	R	9-12-22	EULELAH V RIDDLE	TH EXPLORATION LLC	1/8+	907 587	N/A	N/A	N/A	N/A
10*16449	R	9-12-22	BILLIE ALBERTA MIDDLETON	TH EXPLORATION LLC	1/8+	907 613	N/A	N/A	N/A	N/A
10*16450	R	9-12-22	JAMES D RAYNER AND PATRICIA ANN RAYNER	TH EXPLORATION LLC	1/8+	907 615	N/A	N/A	N/A	N/A
10*16451	R	9-12-22	JAMIE A SMITH AND JOSHUA C SMITH	TH EXPLORATION LLC	1/8+	907 617	N/A	N/A	N/A	N/A
10*16466	R	9-12-22	KAREN J AND MICHAEL E BRUGGEMAN	TH EXPLORATION LLC	1/8+	907 619	N/A	N/A	N/A	N/A
10*16467	R	9-12-22	CHARLES A AND GARY LYNN ECKHARDT	TH EXPLORATION LLC	1/8+	907 621	N/A	N/A	N/A	N/A
10*16542	R	9-12-22	CAROL ANN YEATER AND RICKEY A YEATER	TH EXPLORATION LLC	1/8+	907 623	N/A	N/A	N/A	N/A
10*16543	R	9-12-22	JERRY R AND JACQUELYNN E RUTHERS	TH EXPLORATION LLC	1/8+	907 625	N/A	N/A	N/A	N/A
10*16544	R	9-12-22	NORMA JEAN ROGERS AND DONALD L ROGERS SR	TH EXPLORATION LLC	1/8+	907 627	N/A	N/A	N/A	N/A
10*16681	R	9-12-22	BRENDA S THOMPSON	TH EXPLORATION LLC	1/8+	929 350	N/A	N/A	N/A	N/A
10*16682	R	9-12-22	CYNTHIA A AND WILLIAM D FETTY	TH EXPLORATION LLC	1/8+	929 616	N/A	N/A	N/A	N/A
10*16683	R	9-12-22	FRANKLIN CLARK PATRICIA FENSTERMACHER	TH EXPLORATION LLC	1/8+	929 346	N/A	N/A	N/A	N/A
10*16846	R	9-12-22	PAMELA SUE BURGE	TH EXPLORATION LLC	1/8+	929 348	N/A	N/A	N/A	N/A
10*16847	R	9-12-22	WILLIAM L AND JENNIFER R EWASKEY	TH EXPLORATION LLC	1/8+	929 352	N/A	N/A	N/A	N/A
10*16889	R	9-12-22	HAROLD H CLARK JR	TH EXPLORATION LLC	1/8+	929 354	N/A	N/A	N/A	N/A
10*16921	R	9-12-22	HAZEL CLARK ROSENLUND	TH EXPLORATION LLC	1/8+	929 356	N/A	N/A	N/A	N/A
10*16974	R	9-12-22	BRANDY L WOOD	TH EXPLORATION LLC	1/8+	929 360	N/A	N/A	N/A	N/A
10*16975	R	9-12-22	TIMOTHY J WOOD	TH EXPLORATION LLC	1/8+	929 358	N/A	N/A	N/A	N/A
10*16988	R	9-12-22	CHAD ERIC BENNETT AND MARY A BENNETT	TH EXPLORATION LLC	1/8+	929 584	N/A	N/A	N/A	N/A
10*16998	R	9-12-22	MISTY JO WOOD AND GARY A MORRIS	TH EXPLORATION LLC	1/8+	929 362	N/A	N/A	N/A	N/A
10*17183	R	9-12-22	TARA E BENNETT	TH EXPLORATION LLC	1/8+	929 586	N/A	N/A	N/A	N/A
10*17277	R	9-12-22	GUY C ANDO AND WENDY PYLES ANDO	TH EXPLORATION LLC	1/8+	929 594	N/A	N/A	N/A	N/A
10*17280	R	9-12-22	BONNIE M KIDD AND CHARLES R KIDD	TH EXPLORATION LLC	1/8+	929 592	N/A	N/A	N/A	N/A
10*17281	R	9-12-22	STACY R BENNETT	TH EXPLORATION LLC	1/8+	929 590	N/A	N/A	N/A	N/A
10*17282	R	9-12-22	CARLIS LEON CLARK	TH EXPLORATION LLC	1/8+	929 588	N/A	N/A	N/A	N/A
10*17423	R	9-12-22	LORI ANN WEST	TH EXPLORATION LLC	1/8+	929 596	N/A	N/A	N/A	N/A
10*17424	R	9-12-22	CAROL A CLARK	TH EXPLORATION LLC	1/8+	929 598	N/A	N/A	N/A	N/A
10*17446	R	9-12-22	GREGORY DEAN CLARK AND MARY ANN CLARK	TH EXPLORATION LLC	1/8+	929 600	N/A	N/A	N/A	N/A
10*17488	R	9-12-22	SUSANNA M DENIS	TH EXPLORATION LLC	1/8+	929 604	N/A	N/A	N/A	N/A
10*17495	R	9-12-22	KEVIN R CLARK AND NANCY G CLARK	TH EXPLORATION LLC	1/8+	929 608	N/A	N/A	N/A	N/A
10*17498	R	9-12-22	MICHAEL R DODD AND LISA M DODD	TH EXPLORATION LLC	1/8+	929 614	N/A	N/A	N/A	N/A

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	Assignment	Assignment	Assignment	Assignment
10*17521	R	9-12-22	BETTY LOU MCMILLAN AND WILLIAM A MCMILLAN	TH EXPLORATION LLC	1/8+	929 610	N/A	N/A	N/A	N/A
10*17522	R	9-12-22	RONALD D CLARK AND TAMMY C CLARK	TH EXPLORATION LLC	1/8+	929 612	N/A	N/A	N/A	N/A
10*17523	R	9-12-22	ROBERT R CLARK II	TH EXPLORATION LLC	1/8+	929 620	N/A	N/A	N/A	N/A
10*17529	R	9-12-22	HARRY C BURGE JR AND CAROL S BURGE	TH EXPLORATION LLC	1/8+	929 602	N/A	N/A	N/A	N/A
10*17558	R	9-12-22	SHIRLEY IRENE VANOVER	TH EXPLORATION LLC	1/8+	929 618	N/A	N/A	N/A	N/A
10*17585	R	9-12-22	DEBORAH L LUGO AND RONALD J LUGO	TH EXPLORATION LLC	1/8+	929 622	N/A	N/A	N/A	N/A
10*17587	R	9-12-22	DONNA SUE BEVERIDGE AND EARL P BEVERIDGE	TH EXPLORATION LLC	1/8+	929 626	N/A	N/A	N/A	N/A
10*17624	R	9-12-22	SHIRLEY E ELKINS	TH EXPLORATION LLC	1/8+	928 557	N/A	N/A	N/A	N/A
10*17704	R	9-12-22	BETTY L & ROY S PEARCE	TH EXPLORATION LLC	1/8+	929 628	N/A	N/A	N/A	N/A
10*17714	R	9-12-22	RUSSELL A CLARK AND CATHERINE CLARK	TH EXPLORATION LLC	1/8+	929 630	N/A	N/A	N/A	N/A
10*18106	R	9-12-22	TIMOTHY HEWITT	TH EXPLORATION, LLC	1/8+	929 628	N/A	N/A	N/A	N/A
10*18237	R	9-12-22	CLARENCE LEE CLARK	TH EXPLORATION, LLC	1/8+	930 3	N/A	N/A	N/A	N/A
10*18238	R	9-12-22	KATHRYN L ATWELL	TH EXPLORATION LLC	1/8+	930 1	N/A	N/A	N/A	N/A
10*18239	R	9-12-22	VERA S CAIN	TH EXPLORATION LLC	1/8+	929 649	N/A	N/A	N/A	N/A
10*18240	R	9-12-22	JODY CLARK ELLIOTT	TH EXPLORATION LLC	1/8+	929 647	N/A	N/A	N/A	N/A
10*18242	R	9-12-22	WILLIAM R DODD AND NANCY DODD	TH EXPLORATION LLC	1/8+	929 645	N/A	N/A	N/A	N/A
10*47051.289.1	R	9-12-22	JANICE M HIXSON AND HARRY C HIXSON	TH EXPLORATION LLC	1/8+	898 461	N/A	N/A	N/A	N/A
10*47051.289.2	R	9-12-22	KENNETH D MCMECHEN	TH EXPLORATION LLC	1/8+	898 463	N/A	N/A	N/A	N/A
10*47051.289.3	R	9-12-22	NELLIE JOANN CLARK	TH EXPLORATION LLC	1/8+	907 493	N/A	N/A	N/A	N/A
10*15579	S	9-12-20	WARREN J DOBBS	CHESAPEAKE APPALACHIA LLC	1/8+	686 321	N/A	N/A	CHESAPEAKE TO CHEVRON: 30/461	CHEVRON TO TUG HILL: 36/148
10*15580	S	9-12-20	SHARON KAY WADE	CHESAPEAKE APPALACHIA LLC	1/8+	686 262	N/A	N/A	CHESAPEAKE TO CHEVRON: 30/461	CHEVRON TO TUG HILL: 36/148
10*15581	S	9-12-20	RUTH NAOMI SAMPSON BY ATTORNEY IN FACT	CHESAPEAKE APPALACHIA LLC	1/8+	686 284	N/A	N/A	CHESAPEAKE TO CHEVRON: 30/461	CHEVRON TO TUG HILL: 36/148
10*47051.140.1	T	9-12-21	DAVID P CHAPMAN & DEBORAH BORCK-CHAPMAN	TH EXPLORATION LLC	1/8+	866 318	N/A	N/A	N/A	N/A
10*47051.140.2	T	9-12-21	DOROTHY SULLIVAN POA JAMES REID SULLIVAN	TH EXPLORATION LLC	1/8+	873 501	N/A	N/A	N/A	N/A
10*47051.140.1	U	9-12-32	DAVID P CHAPMAN & DEBORAH BORCK-CHAPMAN	TH EXPLORATION LLC	1/8+	866 318	N/A	N/A	N/A	N/A
10*47051.140.2	U	9-12-32	DOROTHY SULLIVAN POA JAMES REID SULLIVAN	TH EXPLORATION LLC	1/8+	873 501	N/A	N/A	N/A	N/A

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

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

FURTHER, AFFIANT SAITH NOT.

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

David D. Kalish
Affiant: David D. Kalish

JURAT

Jan Pest
MARSHALL County 03:44:28 PM
Instrument No 1416299
Date Recorded 10/19/2016
Document Type HIS
Pages Recorded 1
Book-Page 28-62
Recording Fee \$5.00
Additional \$5.00

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COUNTY OF TARRANT §

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

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

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



ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "*Assignment*") is from SWN PRODUCTION COMPANY, LLC, a Delaware corporation ("*Assignor*"), to TH Exploration, LLC, a Texas limited liability company ("*Assignee*"), and is executed on August 22, 2016 (the "*Effective Date*"). Assignor and Assignee may be referred to herein collectively as the "*Parties*," or individually as a "*Party*." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated June 19, 2016 (the "*Acreage Trade Agreement*").

**ARTICLE 1
ASSIGNMENT OF ASSETS**

Section 1.1 Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on Exhibit A attached hereto (the "*Leases*") INsofar AND ONLY INsofar as they cover the Target Formations and INsofar AND ONLY INsofar as they cover those lands described on Exhibit A (the "*Leasehold Rights*") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "*Conveyed Assets*"). Assignor does hereby reserve unto itself the right and subsurface easement to drill through the Leasehold Rights to access the those depths and formations in the Leases other than the Target Formations and (y) to shoot seismic, sonic, or other energy or waves through the Leasehold Rights and to receive, record and evaluate such energy or waves, including those reflected from or in any way pertaining to the reserved depths, and to utilize any and all other exploration technologies that image the subsurface of the leasehold including the reserved depths and to receive, record and evaluate all images resulting therefrom.

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Section 1.4 Assignment Subject to Acreage Trade Agreement. This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignor, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

**ARTICLE 2
SPECIAL WARRANTY OF TITLE AND DISCLAIMERS**

Section 2.1 Special Warranty of Title. Assignor hereby agrees to warrant and defend Defensible Title to the Leases 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 or any of its Affiliates, but not otherwise.

Section 2.2 Disclaimers of Warranties and Representations.

(a) EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN SECTION VI OF THE ACREAGE TRADE AGREEMENT OR THIS ASSIGNMENT, ASSIGNOR MAKES NO, AND HEREBY EXPRESSLY DISCLAIMS, ANY REPRESENTATION OR WARRANTY, EXPRESS, IMPLIED OR STATUTORY, INCLUDING AS TO (I) TITLE TO THE LEASEHOLD RIGHTS, (II) THE CONTENTS, CHARACTER OR NATURE OF ANY DESCRIPTIVE MEMORANDUM, OR ANY REPORT OF ANY OF ITS PETROLEUM

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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.

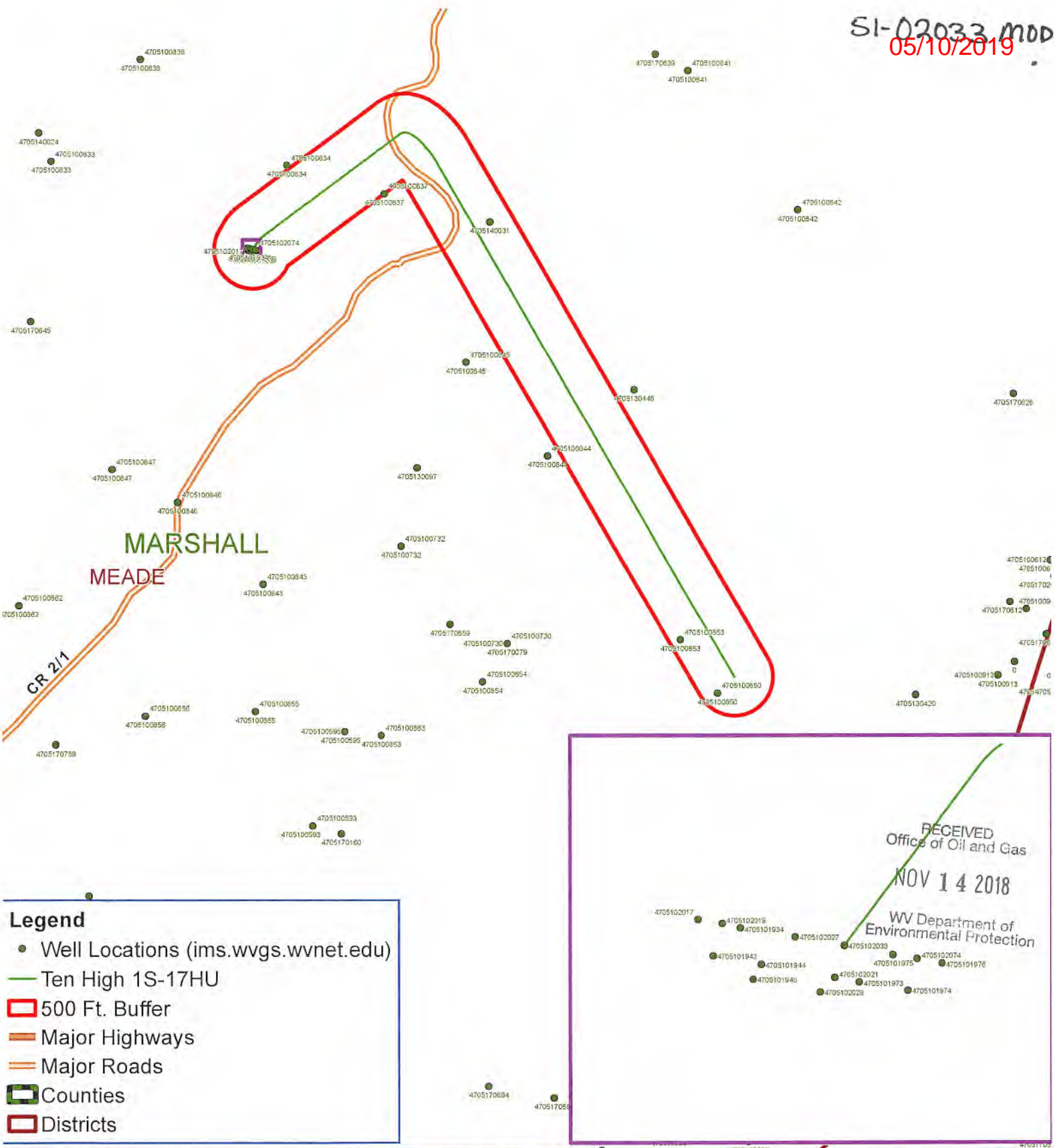
Request maps for:

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 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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Legend

- Well Locations (ims.wvgs.wvnet.edu)
- Ten High 1S-17HU
- 500 Ft. Buffer
- Major Highways
- Major Roads
- Counties
- Districts

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The inset map provides a detailed view of the well locations within the 500-foot buffer area. It shows several well locations (black dots) with their IDs, including 4705102017, 4705102018, 4705101934, 4705102037, 4705102033, 4705101943, 4705101944, 4705101945, 4705102021, 4705101973, 4705102028, 4705101974, 4705102074, and 4705101976.



Ten High 1S - 17HU Meade District Marshall County, WV



Permit well - Ten High 1S-17HU

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
4705100834	McElroy Coal Co	Unknown	Unknown	Unknown	Well records are incomplete. Well has been plugged. Well was plugged 8/6/1998
4705100837	McElroy Coal Co	Unknown	Unknown	Unknown	Well records are incomplete. Well has been plugged. Well was plugged 9/16/1998
4705140031	Unknown	Unknown	Unknown	Unknown	Well records incomplete. Pittsburgh Coal listed under Stratigraphy Info.
4705100853	Consolidation Coal Company	Unknown	Unknown	Unknown	Well records are incomplete. Well has been plugged. Well was plugged 8/25/2000
4705100850	Consolidation Coal Company	Unknown	Unknown	Unknown	Well records are incomplete. Well has been plugged. Well was plugged 5/3/2000

WV Geological & Economic Survey Well: County = 51 Permit = 00834 Report Time: Monday, 1

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	20466	51	834

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_16	LAT_DD	LONG_DD	UTME	UTMN
4705100834	Marshall	534	Meade	Glen Easton	Cameron	39.859775	-80.679258	E274543	44066937

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100834	4/19/94	Original Loc	Completed	Norma Wilson/Franklin	1				OP: M W Bissett	Oper in Min. owner fld no code assign (Orphan well prod)			
4705100834	8/8/1998	Plugging	Completed	Ronald & Theresa Moore			96-7 (M-33): Ronald Moore			McElroy Coal Company			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NGL_BEF	NG
4705100834	4/19/94	4/19/94	1162	Ground Level			unclassified	unclassified	not available	Gas	unknown	unknown									
4705100834	8/8/1998	7/28/1998	1162	Ground Level						unknown	unknown										

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL Under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_FBT
4705100834	11/8/1994	0
4705100834	8/8/1998	0

There is no Sample data for this well

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WVGES
"Pipeline"

Select County: (051) Marshall
Enter Permit #: 00837
Get Data Reset

Select datatypes: (Check All)
 Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/Show/Water Logs Blm Hole Loc

Table Descriptions
[County Code Translations](#)
[Permit Numbering System](#)
[Lease Notes](#)
[Contact Information](#)
[Database](#)
[WVGES Main](#)
[Pipeline-Plug- New](#)

WV Geological & Economic Survey: **Well: County = 51 Permit = 00837**

Well Reassignment Information: Reassigned From
 OLD_COUNTY OLD_PERMIT NEW_COUNTY NEW_PERMIT
 51 70542 51 337

Location Information: [View Map](#)
 API COUNTY PERMIT TAX_DISTRICT QUAD_75 QUAD_15 LAT_DD LON_DD UTMN UTMN
 4705100837 Marshall 537 Meade Glen Easton Cameron 39.85676 -80.67478 227841 446562.4

There is no Bottom Hole Location data for this well

Owner Information:
 API CMP_DT SUFFIX STATUS SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_AT_COMPLETION P
 4705100837 8/19/1999 Plugging Completed James L Rhoads 90-9 (M-37) Motrey Coal Company unknown

Completion Information:
 API CMP_DT SPUD_DT ELEV DATUM FIELD DEEPEST_FM DEEPEST_FMT INITIAL_CLASS FINAL_CLASS TYPE RIG CMP_MTHD TVL
 4705100837 8/19/1998 6/5/1998 1237 Ground Level unclassified unclassified not available unknown unknown

There is no Pay data for this well
 There is no Production Gas data for this well
 There is no Production Oil data for this well ** some operators may have reported NGL under Oil
 There is no Production NGL data for this well ** some operators may have reported NGL under Oil
 There is no Production Water data for this well
 There is no Stratigraphy data for this well
 There is no Wireline (E-Log) data for this well

Plugging Information:
 API PUG_DT DEPTH_FBT
 4705100837 8/19/1998 0

There is no Sample data for this well

WVGES
"Pipeline"

Select County: (051) Marshall
Enter Permit #: 40031
Get Data Reset

Select datatypes: (Check All)
 Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/Show/Water Logs Blm Hole Loc

Table Descriptions
[County Code Translations](#)
[Permit Numbering System](#)
[Lease Notes](#)
[Contact Information](#)
[Database](#)
[WVGES Main](#)
[Pipeline-Plug- New](#)

WV Geological & Economic Survey: **Well: County = 51 Permit = 40031**

Location Information: [View Map](#)
 API COUNTY PERMIT TAX_DISTRICT QUAD_75 QUAD_15 LAT_DD LON_DD UTMN UTMN
 4705140031 Marshall 40031 Meade Glen Easton Cameron 39.93748 -80.96387 421569.8 449471.3

There is no Bottom Hole Location data for this well
 There is no Owner/Completion data for this well
 There is no Owner/Completion data for this well
 There is no Pay data for this well
 There is no Production Gas data for this well
 There is no Production Oil data for this well ** some operators may have reported NGL under Oil
 There is no Production NGL data for this well ** some operators may have reported NGL under Oil
 There is no Production Water data for this well

Stratigraphy Information:
 API SUFFIX FM FM_QUALITY DEPTH_TOP DEPTH_QUALITY THICKNESS THICKNESS_QUALITY ELEV DATUM
 4705140031 Original Loc Pittsburgh coal CBM Drill Hole 1000 Reasonable 0 Manp/Repeated 1342 unknown

There is no Wireline (E-Log) data for this well
 There is no Plugging data for this well
 There is no Sample data for this well

WVGES
"Pipeline"

Select County: (051) Marshall
Enter Permit #: 00853
Get Data Reset

Select datatypes: (Check All)
 Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/Show/Water Logs Blm Hole Loc

Table Descriptions
[County Code Translations](#)
[Permit Numbering System](#)
[Lease Notes](#)
[Contact Information](#)
[Database](#)
[WVGES Main](#)
[Pipeline-Plug- New](#)

WV Geological & Economic Survey: **Well: County = 51 Permit = 00853**

Well Reassignment Information: Reassigned From
 OLD_COUNTY OLD_PERMIT NEW_COUNTY NEW_PERMIT
 51 70550 51 853

Location Information: [View Map](#)
 API COUNTY PERMIT TAX_DISTRICT QUAD_75 QUAD_15 LAT_DD LON_DD UTMN UTMN
 4705100853 Marshall 853 Meade Glen Easton Cameron 39.782919 -80.661099 229010.2 440429.5

There is no Bottom Hole Location data for this well

Owner Information:
 API CMP_DT SUFFIX STATUS SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_AT_COMPLETION P
 4705100853 8/25/2000 Plugging Completed Clear-Crow Heav M-89 Hope Natural Gas Company
 4705100853 unknown Pappy Map J & S Clark 541

Completion Information:
 API CMP_DT SPUD_DT ELEV DATUM FIELD DEEPEST_FM DEEPEST_FMT INITIAL_CLASS FINAL_CLASS TYPE RIG CMP_MTHD TVL
 4705100853 8/25/2000 8/10/2000 unclassified unclassified not available unknown unknown
 4705100853 unclassified unclassified not available unknown unknown

There is no Pay data for this well
 There is no Production Gas data for this well
 There is no Production Oil data for this well ** some operators may have reported NGL under Oil
 There is no Production NGL data for this well ** some operators may have reported NGL under Oil
 There is no Production Water data for this well
 There is no Stratigraphy data for this well
 There is no Wireline (E-Log) data for this well

Plugging Information:
 API PUG_DT DEPTH_FBT
 4705100853 8/25/2000 0


There is no Sample data for this well

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WV Department of
Environmental Protection

51-02033
05/10/2019
MOB



Select County: (051) Marshall
 Enter Permit #: 00850
 Get Data Reset

Select datatypes: (Check All)
 Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/Show Water Logs Btm Hole Loc.

Table Descriptions:
[County Code Translations](#)
[Permit-Burmesco Series](#)
[Lease Notes](#)
[Contact Information](#)
[WVGES Main](#)
["Pipeline-Plus" New](#)

WV Geological & Economic Survey: Well: County = 61 Permit = 00850

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
61	70861	61	850

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100850	Marshall	850	Meade	Oren Easton	Cameron	39.75102	-80.050391	529162.8	4404613.4

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PRC
4705100850	5/3/2000		Plugging Completed	Carl Richard Chapman Jr	M-71					Consolidation Coal Co.	
4705100850		unknown	Prpty. Map	L.E Chambers			725			Hope Natural Gas Company	

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD
4705100850	5/3/2000	3/10/2000	1399	Ground Level				unclassified	unclassified	not available	unknown	unknown	
4705100850										not available	unknown	unknown	

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100850	6/3/2000	9

There is no Sample data for this well

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Well Site Safety Plan

Tug Hill Operating, LLC

JW
11/7/18

Well Name: Ten High 1S-17HU

Pad Location: Ten High
Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

NORTHING -4,406,360.53

EASTING -527,320.34

April 2018

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