



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

Tuesday, March 06, 2018
WELL WORK PERMIT
Horizontal 6A / New Drill

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

FORT WORTH , TX 76107

Re: Permit approval for TEN HIGH 1S-8HM
47-051-01975-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief



Operator's Well Number: TEN HIGH 1S-8HM
Farm Name: LAWRENCE & SHIRLEY CONKLE ESTS
U.S. WELL NUMBER: 47-051-01975-00-00
Horizontal 6A / New Drill
Date Issued: 3/6/2018

Promoting a healthy environment.

03/09/2018

PERMIT CONDITIONS

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

CONDITIONS

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

PERMIT CONDITIONS

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov.

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-8HM 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: 1323' Elevation, proposed post-construction: 1310'

5) Well Type (a) Gas X Oil Underground Storage

Other

(b) If Gas Shallow X Deep

Horizontal X

je
12/20/17

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6713' - 6765', thickness of 52' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,865'

9) Formation at Total Vertical Depth: Onondoga

10) Proposed Total Measured Depth: 17,354'

11) Proposed Horizontal Leg Length: 10,175'

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: 2180'

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 X 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	110'	100'	216FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	54.5#	1,086'	1,076'	1039ft^3(CTS)
Coal	13 3/8"	NEW	H40	54.5#	1,086'	1,076'	1039ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,814'	2,804'	932ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	17,364'	17,354'	4427ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,069'	
Liners	N/A						

Jan 12/20/17

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

PACKERS

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

WW-6B
(10/14)

API NO. 47-051 - 01975
OPERATOR WELL NO. Ten High 1S-8HM
Well Pad Name: Ten High

[Handwritten signature]
12/29/17

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

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

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

Well to be completed with approximately 25,437,500lb proppant and 393,282 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

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

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 other joint. Production casing will have one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

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

*See Attached

25) Proposed borehole conditioning procedures:

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

*Note: Attach additional sheets as needed.

WW-6B Attachment to #24

Conductor, Coal and Fresh Water Casing Cement:*Premium NE-1 + 2% CaCl*

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

Intermediate Casing:*Premium NE-1 + 2% bwoc CaCl₂ + 46.5% Fresh Water*

- Premium NE-1 – Class A Portland API spec
- CaCl₂ – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

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

- Class H – Increased Compressive Strength Cement
- Sodium Metasilicate – Free Water Control; Early Strength Additive
- R-3 – Cement Retarder
- FP-13L – Anti-Foaming Agent
- CaCl₂ – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

Production Casing Cement:*Lead: 50:50 (Poz:Premium NE-1) + .2% R-3 + .2% MPA-170 + .75 gal/100sk FP-13L**Tail: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L*

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

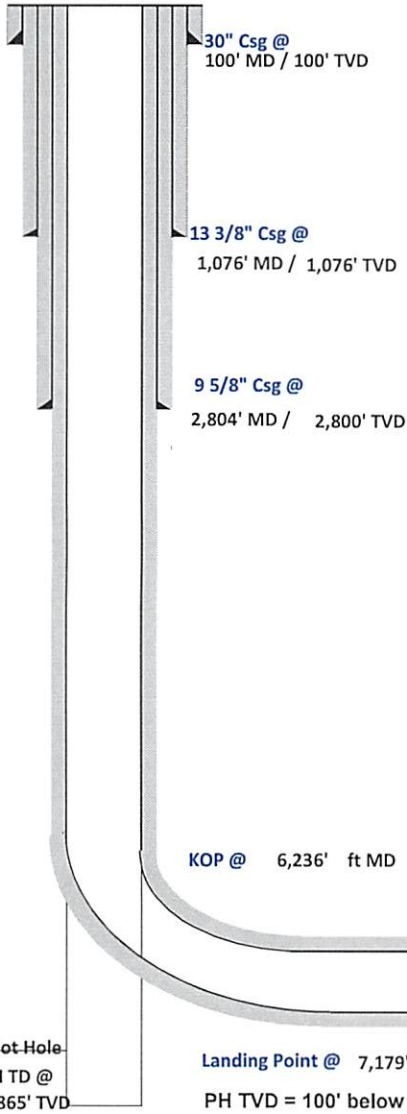


WELL NAME: Ten High 1S-8HM
STATE: West Virginia **COUNTY:** Marshall
DISTRICT: Meade
DF Elev: 1,310' **GL Elev:** 1,310'
TD: 17,354'
TH Latitude: 39.80676247
TH Longitude: -80.68075001
BH Latitude: 39.78325819
BH Longitude: -80.65933469

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	1026
Sewickley Coal	935
Pittsburgh Coal	1020
Big Lime	2049
Weir	2475
Berea	2673
Gordon	2935
Rhinestreet	6057
Geneseo/Burkett	6575
Tully	6606
Hamilton	6639
Marcellus	6713
Landing Depth	6748
Onondaga	6765
Pilot Hole Depth	6865

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	100'	100'	BW	BW	Surface
Surface	17.5	13 3/8	1,076'	1,076'	54.5	J55	Surface
Intermediate 1	17.4	9 5/8	2,804'	2,800'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	17,354'	6,926'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	291	A	15.6	Air	None
Surface	1,064	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	911	A	15	Air	1 Centralizer every other jt
Production	3,904	A	14.5	Air / SOB	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



Handwritten signature and date: 12/20/17

Pilot Hole
PH TD @
6,865' TVD

Landing Point @ 7,179' MD / 6,748' TVD
PH TVD = 100' below Onondaga Top

Lateral TD @ 17,354' ft MD
6,926 ft TVD

51-01975

WW-9
(4/16)

API Number 47 - 051 - 01975
Operator's Well No. Ten High 1S-8HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

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

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

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

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

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

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

Company Official Signature _____

Company Official (Typed Name) Sean Gasser

Company Official Title Engineer

Subscribed and sworn before me this 14th day of Sept, 2019

Kaitlin McCawley Kaitlin McCawley Notary Public

My commission expires 5/8/2021



91-01975

Form WW-9

Operator's Well No. Ten High 1S-8HM

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 16.20 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

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

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

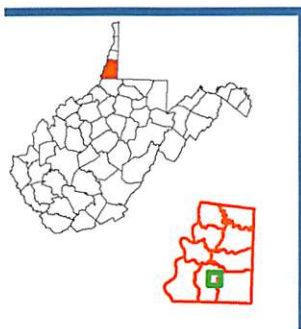
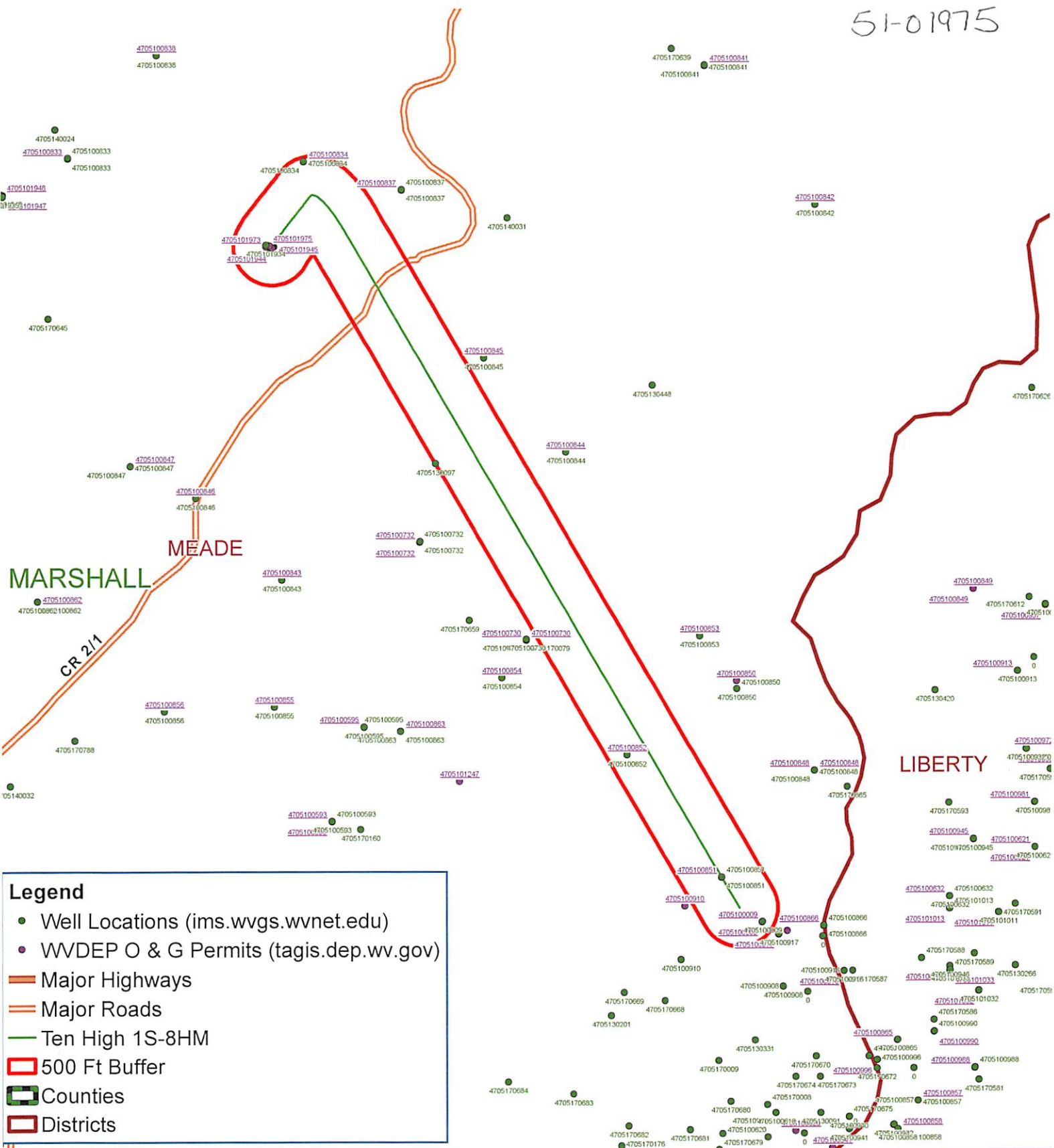
Plan Approved by: *Jim Washburn*

Comments: _____

Title: *Oil & Gas Inspector* Date: *9/20/17*

Field Reviewed? () Yes () No

51-01975



Ten High 1S - 8HM Meade District Marshall County, WV



Map Created: December 18, 2017
Map Content & C: December 18, 2017

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

51-01975

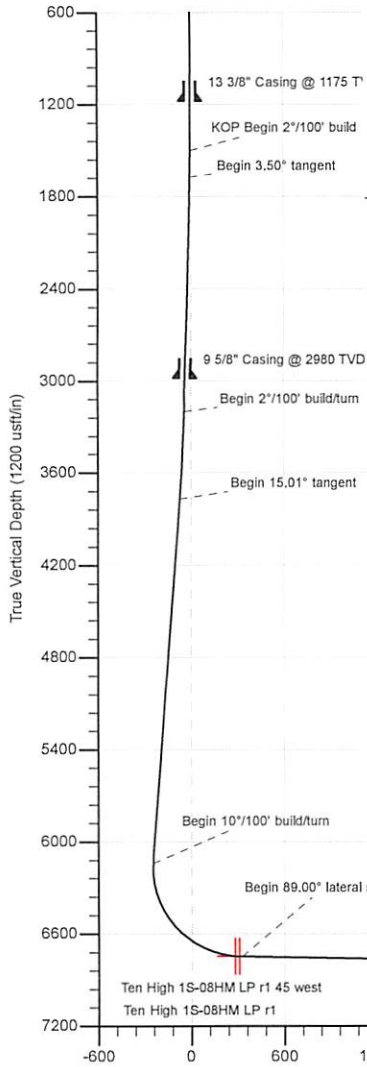


TUG HILL
OPERATING

Well: Ten High 1S-08HM (G)
Site: Ten High
Project: Marshall County, West Virginia
Design: rev2

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSEct	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1675.00	3.50	30.00	1674.89	4.63	2.67	2.00	30.00	-2.23	Begin 3.50° tangent
4	3202.96	3.50	30.00	3200.00	85.41	49.31	0.00	0.00	-41.19	Begin 2°/100' build/turn
5	3781.17	15.01	38.64	3769.74	159.44	105.09	2.00	11.19	-69.36	Begin 15.01° tangent
6	6235.51	15.01	38.64	6140.31	656.04	502.06	0.00	0.00	-245.13	Begin 10°/100' build/turn
7	7179.23	89.00	149.70	6748.42	247.30	914.05	10.00	110.65	326.55	Begin 89.00° lateral section
8	17354.23	89.00	149.70	6926.00	-8536.41	6046.84	0.00	0.00	0.461.10	PBHL/TD 17354.23 MD/6926.00 TVD

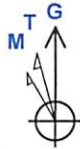


Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD83 West Virginia - HARN
Ellipsoid: GRS 1980
Zone: Zone 17N (84 W to 78 W)

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

Northing	Easting	Latitude	Longitude
14456528.97	1730074.52	39.80676247	-80.68075001

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.92°

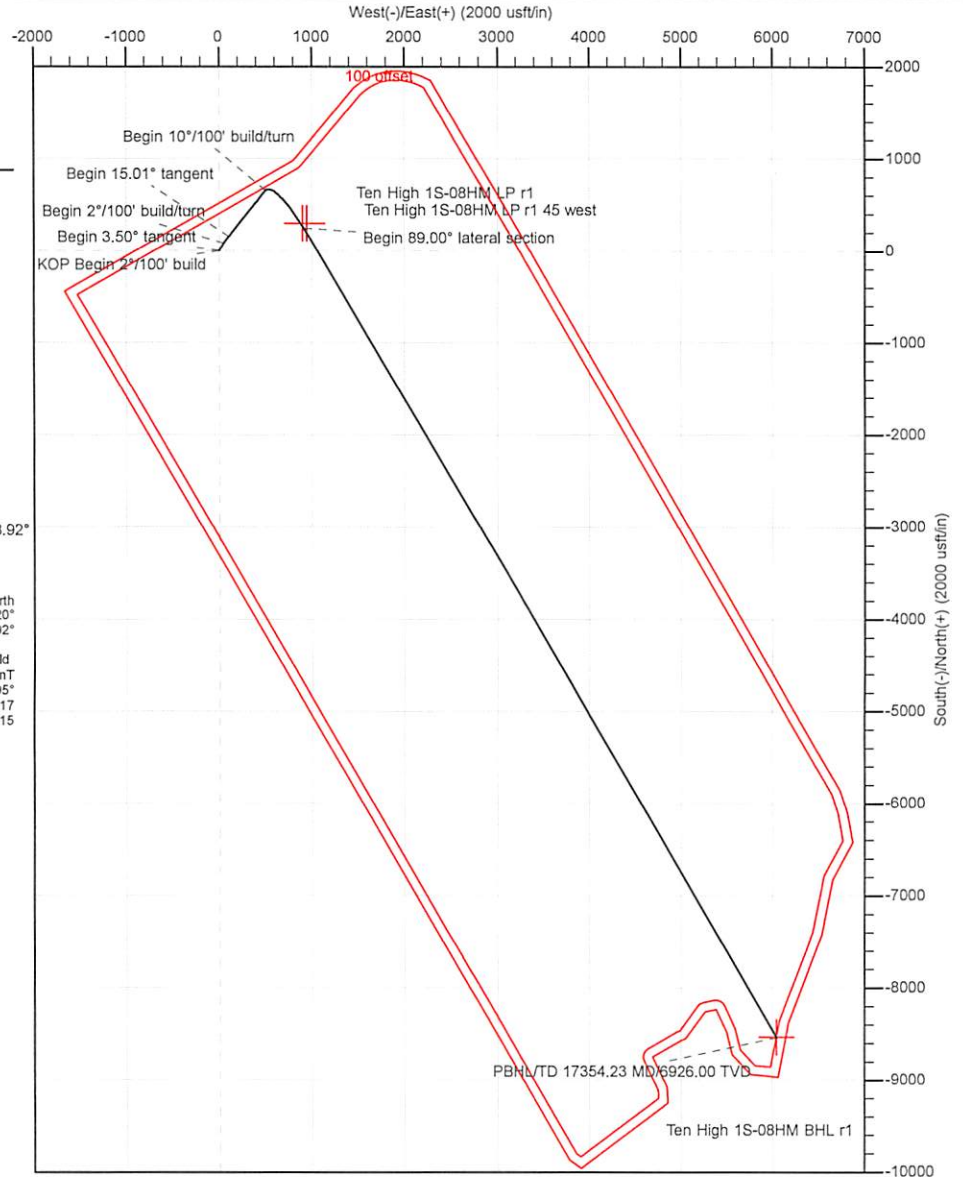


Azimuths to Grid North
True North: -0.20°
Magnetic North: -8.92°

Magnetic Field
Strength: 52156.4snT
Dip Angle: 66.95°
Date: 9/1/2017
Model: IGRF2015



Vertical Section at 144.69° (1200 usft/in)



PBHL/TD 17354.23 MD/6926.00 TVD

Ten High 1S-08HM BHL r1

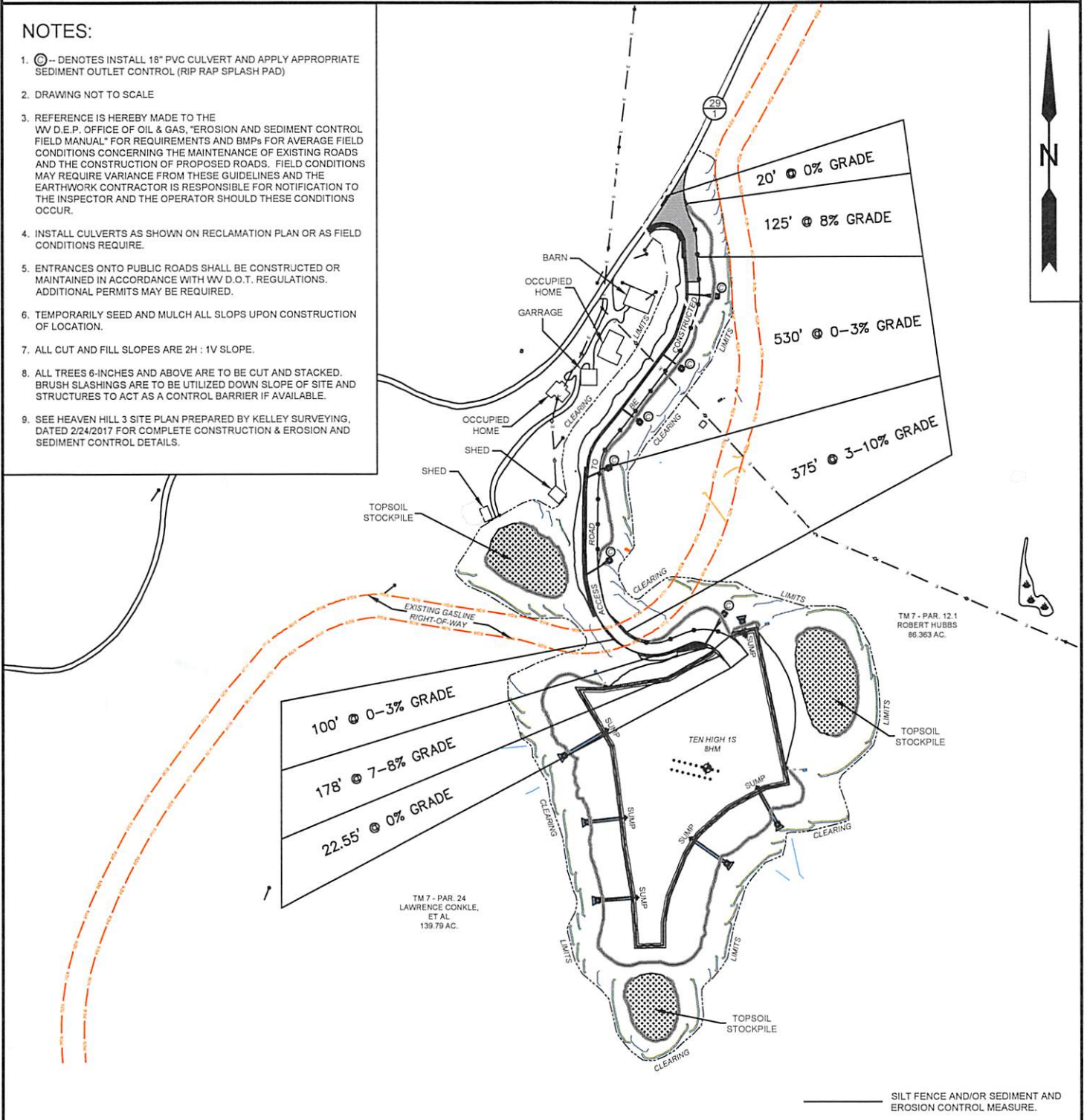
PBHL/TD 17354.23 MD/6926.00 TVD

Ten High 1S-08HM BHL r1

PROPOSED TEM HIGH 1S - 8HM

NOTES:

1. Ⓞ -- DENOTES INSTALL 18" PVC CULVERT AND APPLY APPROPRIATE SEDIMENT OUTLET CONTROL (RIP RAP SPLASH PAD)
2. DRAWING NOT TO SCALE
3. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
4. INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.
5. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
6. TEMPORARILY SEED AND MULCH ALL SLOPS UPON CONSTRUCTION OF LOCATION.
7. ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.
8. ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO BE UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.
9. SEE HEAVEN HILL 3 SITE PLAN PREPARED BY KELLEY SURVEYING, DATED 2/24/2017 FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.



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www.slsurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	MEADE		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8655	12-19-17	1" = 300'

TUG HILL
OPERATING



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-08HM (G)
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-08HM (G)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

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-08HM (G)					
Well Position	+N/-S	0.00 usft	Northing:	14,456,528.97 usft	Latitude:	39.80676247
	+E/-W	0.00 usft	Easting:	1,730,074.52 usft	Longitude:	-80.68075001
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	9/1/2017	-8.72	66.95	52,156.43714847

Design	rev2			
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	144.69

Plan Survey Tool Program	Date	11/26/2017		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,354.23 rev2 (Original Hole)	MWD	MWD - Standard

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	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,675.00	3.50	30.00	1,674.89	4.63	2.67	2.00	2.00	0.00	30.00	
3,202.96	3.50	30.00	3,200.00	85.41	49.31	0.00	0.00	0.00	0.00	
3,781.17	15.01	38.64	3,769.74	159.44	105.09	2.00	1.99	1.49	11.19	
6,235.51	15.01	38.64	6,140.31	656.04	502.06	0.00	0.00	0.00	0.00	
7,179.23	89.00	149.70	6,748.42	247.30	914.05	10.00	7.84	11.77	110.65	
17,354.23	89.00	149.70	6,926.00	-8,536.41	6,046.84	0.00	0.00	0.00	0.00	Ten High 1S-08HM BI



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-08HM (G)
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-08HM (G)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

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	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
100.00	0.00	0.00	100.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
200.00	0.00	0.00	200.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
300.00	0.00	0.00	300.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
400.00	0.00	0.00	400.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
500.00	0.00	0.00	500.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
600.00	0.00	0.00	600.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
700.00	0.00	0.00	700.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
800.00	0.00	0.00	800.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
900.00	0.00	0.00	900.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,456,528.97	1,730,074.52	39.80676247	-80.68075001	
KOP Begin 2°/100' build										
1,600.00	2.00	30.00	1,599.98	1.51	0.87	14,456,530.49	1,730,075.39	39.80676661	-80.68074688	
1,675.00	3.50	30.00	1,674.89	4.63	2.67	14,456,533.60	1,730,077.19	39.80677515	-80.68074044	
Begin 3.50° tangent										
1,700.00	3.50	30.00	1,699.84	5.95	3.43	14,456,534.92	1,730,077.96	39.80677878	-80.68073770	
1,800.00	3.50	30.00	1,799.66	11.24	6.49	14,456,540.21	1,730,081.01	39.80679327	-80.68072677	
1,900.00	3.50	30.00	1,899.47	16.52	9.54	14,456,545.50	1,730,084.06	39.80680776	-80.68071583	
2,000.00	3.50	30.00	1,999.29	21.81	12.59	14,456,550.78	1,730,087.11	39.80682224	-80.68070490	
2,100.00	3.50	30.00	2,099.10	27.10	15.64	14,456,556.07	1,730,090.17	39.80683673	-80.68069396	
2,200.00	3.50	30.00	2,198.91	32.38	18.70	14,456,561.36	1,730,093.22	39.80685122	-80.68068302	
2,300.00	3.50	30.00	2,298.73	37.67	21.75	14,456,566.65	1,730,096.27	39.80686571	-80.68067209	
2,400.00	3.50	30.00	2,398.54	42.96	24.80	14,456,571.93	1,730,099.32	39.80688020	-80.68066115	
2,500.00	3.50	30.00	2,498.35	48.24	27.85	14,456,577.22	1,730,102.38	39.80689469	-80.68065022	
2,600.00	3.50	30.00	2,598.17	53.53	30.91	14,456,582.51	1,730,105.43	39.80690918	-80.68063928	
2,700.00	3.50	30.00	2,697.98	58.82	33.96	14,456,587.79	1,730,108.48	39.80692367	-80.68062834	
2,800.00	3.50	30.00	2,797.79	64.11	37.01	14,456,593.08	1,730,111.53	39.80693816	-80.68061741	
2,900.00	3.50	30.00	2,897.61	69.39	40.06	14,456,598.37	1,730,114.59	39.80695265	-80.68060647	
3,000.00	3.50	30.00	2,997.42	74.68	43.12	14,456,603.65	1,730,117.64	39.80696714	-80.68059554	
3,100.00	3.50	30.00	3,097.23	79.97	46.17	14,456,608.94	1,730,120.69	39.80698163	-80.68058460	
3,200.00	3.50	30.00	3,197.05	85.25	49.22	14,456,614.23	1,730,123.74	39.80699612	-80.68057366	
3,202.96	3.50	30.00	3,200.00	85.41	49.31	14,456,614.38	1,730,123.83	39.80699655	-80.68057334	
Begin 2°/100' build/turn										
3,300.00	5.42	33.99	3,296.74	91.77	53.35	14,456,620.75	1,730,127.88	39.80701398	-80.68055887	
3,400.00	7.41	35.94	3,396.11	100.91	59.78	14,456,629.88	1,730,134.30	39.80703900	-80.68053588	
3,500.00	9.40	37.07	3,495.03	112.64	68.48	14,456,641.61	1,730,143.00	39.80707114	-80.68050474	
3,600.00	11.39	37.80	3,593.39	126.96	79.46	14,456,655.94	1,730,153.98	39.80711036	-80.68046547	
3,700.00	13.39	38.32	3,691.05	143.85	92.69	14,456,672.83	1,730,167.21	39.80715662	-80.68041813	
3,781.17	15.01	38.64	3,769.74	159.44	105.09	14,456,688.42	1,730,179.61	39.80719931	-80.68037380	
Begin 15.01° tangent										
3,800.00	15.01	38.64	3,787.93	163.25	108.13	14,456,692.23	1,730,182.65	39.80720974	-80.68036291	
3,900.00	15.01	38.64	3,884.51	183.49	124.31	14,456,712.46	1,730,198.83	39.80726515	-80.68030506	
4,000.00	15.01	38.64	3,981.10	203.72	140.48	14,456,732.69	1,730,215.00	39.80732056	-80.68024721	
4,100.00	15.01	38.64	4,077.69	223.95	156.66	14,456,752.93	1,730,231.18	39.80737596	-80.68018936	
4,200.00	15.01	38.64	4,174.27	244.19	172.83	14,456,773.16	1,730,247.35	39.80743137	-80.68013151	
4,300.00	15.01	38.64	4,270.86	264.42	189.00	14,456,793.39	1,730,263.53	39.80748678	-80.68007366	
4,400.00	15.01	38.64	4,367.45	284.65	205.18	14,456,813.63	1,730,279.70	39.80754218	-80.68001581	
4,500.00	15.01	38.64	4,464.03	304.89	221.35	14,456,833.86	1,730,295.87	39.80759759	-80.67995796	
4,600.00	15.01	38.64	4,560.62	325.12	237.53	14,456,854.09	1,730,312.05	39.80765300	-80.67990011	

51-01975



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-08HM (G)
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-08HM (G)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,700.00	15.01	38.64	4,657.21	345.35	253.70	14,456,874.33	1,730,328.22	39.80770841	-80.67984226
4,800.00	15.01	38.64	4,753.79	365.59	269.88	14,456,894.56	1,730,344.40	39.80776381	-80.67978440
4,900.00	15.01	38.64	4,850.38	385.82	286.05	14,456,914.79	1,730,360.57	39.80781922	-80.67972655
5,000.00	15.01	38.64	4,946.97	406.05	302.22	14,456,935.03	1,730,376.75	39.80787463	-80.67966870
5,100.00	15.01	38.64	5,043.55	426.29	318.40	14,456,955.26	1,730,392.92	39.80793003	-80.67961085
5,200.00	15.01	38.64	5,140.14	446.52	334.57	14,456,975.49	1,730,409.09	39.80798544	-80.67955300
5,300.00	15.01	38.64	5,236.73	466.75	350.75	14,456,995.73	1,730,425.27	39.80804085	-80.67949515
5,400.00	15.01	38.64	5,333.31	486.99	366.92	14,457,015.96	1,730,441.44	39.80809625	-80.67943730
5,500.00	15.01	38.64	5,429.90	507.22	383.10	14,457,036.19	1,730,457.62	39.80815166	-80.67937945
5,600.00	15.01	38.64	5,526.49	527.45	399.27	14,457,056.43	1,730,473.79	39.80820707	-80.67932160
5,700.00	15.01	38.64	5,623.08	547.69	415.44	14,457,076.66	1,730,489.97	39.80826247	-80.67926374
5,800.00	15.01	38.64	5,719.66	567.92	431.62	14,457,096.90	1,730,506.14	39.80831788	-80.67920589
5,900.00	15.01	38.64	5,816.25	588.15	447.79	14,457,117.13	1,730,522.32	39.80837329	-80.67914804
6,000.00	15.01	38.64	5,912.84	608.39	463.97	14,457,137.36	1,730,538.49	39.80842869	-80.67909019
6,100.00	15.01	38.64	6,009.42	628.62	480.14	14,457,157.60	1,730,554.66	39.80848410	-80.67903234
6,200.00	15.01	38.64	6,106.01	648.85	496.32	14,457,177.83	1,730,570.84	39.80853951	-80.67897448
6,235.51	15.01	38.64	6,140.31	656.04	502.06	14,457,185.01	1,730,576.58	39.80855918	-80.67895394
Begin 10°/100' build/turn									
6,300.00	14.07	64.26	6,202.80	665.98	514.35	14,457,194.95	1,730,588.87	39.80858635	-80.67891006
6,400.00	17.79	98.80	6,299.15	668.93	540.45	14,457,197.90	1,730,614.98	39.80859420	-80.67881706
6,500.00	25.12	117.74	6,392.27	656.68	574.42	14,457,185.66	1,730,648.94	39.80856023	-80.67869628
6,600.00	33.78	128.02	6,479.32	629.61	615.21	14,457,158.59	1,730,689.73	39.80848549	-80.67855139
6,700.00	42.97	134.39	6,557.67	588.55	661.58	14,457,117.52	1,730,736.10	39.80837225	-80.67838679
6,800.00	52.41	138.86	6,624.92	534.72	712.13	14,457,063.70	1,730,786.65	39.80822395	-80.67820749
6,900.00	61.99	142.31	6,679.04	469.79	765.31	14,456,998.76	1,730,839.84	39.80804509	-80.67801893
7,000.00	71.63	145.19	6,718.37	395.70	819.53	14,456,924.68	1,730,894.05	39.80784111	-80.67782684
7,100.00	81.32	147.76	6,741.74	314.73	873.12	14,456,843.70	1,730,947.64	39.80761820	-80.67763706
7,179.23	89.00	149.70	6,748.42	247.30	914.05	14,456,776.28	1,730,988.58	39.80743263	-80.67749216
Begin 89.00° lateral section									
7,200.00	89.00	149.70	6,748.78	229.37	924.53	14,456,758.34	1,730,999.05	39.80738327	-80.67745508
7,300.00	89.00	149.70	6,750.53	143.04	974.98	14,456,672.02	1,731,049.50	39.80714570	-80.67727656
7,400.00	89.00	149.70	6,752.27	56.72	1,025.42	14,456,585.69	1,731,099.94	39.80690813	-80.67709805
7,500.00	89.00	149.70	6,754.02	-29.61	1,075.87	14,456,499.37	1,731,150.39	39.80667056	-80.67691954
7,600.00	89.00	149.70	6,755.77	-115.94	1,126.31	14,456,413.04	1,731,200.83	39.80643298	-80.67674103
7,700.00	89.00	149.70	6,757.51	-202.26	1,176.76	14,456,326.71	1,731,251.28	39.80619541	-80.67656252
7,800.00	89.00	149.70	6,759.26	-288.59	1,227.20	14,456,240.39	1,731,301.72	39.80595783	-80.67638402
7,900.00	89.00	149.70	6,761.00	-374.91	1,277.65	14,456,154.06	1,731,352.17	39.80572026	-80.67620551
8,000.00	89.00	149.70	6,762.75	-461.24	1,328.09	14,456,067.73	1,731,402.62	39.80548269	-80.67602701
8,100.00	89.00	149.70	6,764.49	-547.57	1,378.54	14,455,981.41	1,731,453.06	39.80524511	-80.67584850
8,200.00	89.00	149.70	6,766.24	-633.89	1,428.98	14,455,895.08	1,731,503.51	39.80500754	-80.67567000
8,300.00	89.00	149.70	6,767.98	-720.22	1,479.43	14,455,808.75	1,731,553.95	39.80476996	-80.67549150
8,400.00	89.00	149.70	6,769.73	-806.55	1,529.87	14,455,722.43	1,731,604.40	39.80453238	-80.67531300
8,500.00	89.00	149.70	6,771.47	-892.87	1,580.32	14,455,636.10	1,731,654.84	39.80429481	-80.67513450
8,600.00	89.00	149.70	6,773.22	-979.20	1,630.76	14,455,549.77	1,731,705.29	39.80405723	-80.67495600
8,700.00	89.00	149.70	6,774.96	-1,065.53	1,681.21	14,455,463.45	1,731,755.73	39.80381966	-80.67477751
8,800.00	89.00	149.70	6,776.71	-1,151.85	1,731.65	14,455,377.12	1,731,806.18	39.80358208	-80.67459901
8,900.00	89.00	149.70	6,778.45	-1,238.18	1,782.10	14,455,290.80	1,731,856.62	39.80334450	-80.67442052
9,000.00	89.00	149.70	6,780.20	-1,324.51	1,832.54	14,455,204.47	1,731,907.07	39.80310692	-80.67424203
9,100.00	89.00	149.70	6,781.94	-1,410.83	1,882.99	14,455,118.14	1,731,957.51	39.80286935	-80.67406354
9,200.00	89.00	149.70	6,783.69	-1,497.16	1,933.43	14,455,031.82	1,732,007.96	39.80263177	-80.67388505
9,300.00	89.00	149.70	6,785.43	-1,583.48	1,983.88	14,454,945.49	1,732,058.40	39.80239419	-80.67370656
9,400.00	89.00	149.70	6,787.18	-1,669.81	2,034.32	14,454,859.16	1,732,108.85	39.80215661	-80.67352807
9,500.00	89.00	149.70	6,788.92	-1,756.14	2,084.77	14,454,772.84	1,732,159.29	39.80191903	-80.67334958
9,600.00	89.00	149.70	6,790.67	-1,842.46	2,135.21	14,454,686.51	1,732,209.74	39.80168145	-80.67317110



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-08HM (G)
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-08HM (G)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
15,200.00	89.00	149.70	6,888.40	-6,676.74	4,960.14	14,449,852.23	1,735,034.66	39.78837659	-80.66317789	
15,300.00	89.00	149.70	6,890.15	-6,763.07	5,010.58	14,449,765.91	1,735,085.11	39.78813899	-80.66299947	
15,400.00	89.00	149.70	6,891.89	-6,849.40	5,061.03	14,449,679.58	1,735,135.55	39.78790140	-80.66282106	
15,500.00	89.00	149.70	6,893.64	-6,935.72	5,111.47	14,449,593.25	1,735,186.00	39.78766380	-80.66264265	
15,600.00	89.00	149.70	6,895.38	-7,022.05	5,161.92	14,449,506.93	1,735,236.44	39.78742620	-80.66246423	
15,700.00	89.00	149.70	6,897.13	-7,108.37	5,212.36	14,449,420.60	1,735,286.89	39.78718861	-80.66228582	
15,800.00	89.00	149.70	6,898.88	-7,194.70	5,262.81	14,449,334.27	1,735,337.33	39.78695101	-80.66210742	
15,900.00	89.00	149.70	6,900.62	-7,281.03	5,313.25	14,449,247.95	1,735,387.78	39.78671342	-80.66192901	
16,000.00	89.00	149.70	6,902.37	-7,367.35	5,363.70	14,449,161.62	1,735,438.22	39.78647582	-80.66175060	
16,100.00	89.00	149.70	6,904.11	-7,453.68	5,414.15	14,449,075.29	1,735,488.67	39.78623822	-80.66157220	
16,200.00	89.00	149.70	6,905.86	-7,540.01	5,464.59	14,448,988.97	1,735,539.11	39.78600062	-80.66139379	
16,300.00	89.00	149.70	6,907.60	-7,626.33	5,515.04	14,448,902.64	1,735,589.56	39.78576303	-80.66121539	
16,400.00	89.00	149.70	6,909.35	-7,712.66	5,565.48	14,448,816.31	1,735,640.00	39.78552543	-80.66103699	
16,500.00	89.00	149.70	6,911.09	-7,798.99	5,615.93	14,448,729.99	1,735,690.45	39.78528783	-80.66085859	
16,600.00	89.00	149.70	6,912.84	-7,885.31	5,666.37	14,448,643.66	1,735,740.89	39.78505023	-80.66068019	
16,700.00	89.00	149.70	6,914.58	-7,971.64	5,716.82	14,448,557.34	1,735,791.34	39.78481263	-80.66050179	
16,800.00	89.00	149.70	6,916.33	-8,057.97	5,767.26	14,448,471.01	1,735,841.78	39.78457503	-80.66032339	
16,900.00	89.00	149.70	6,918.07	-8,144.29	5,817.71	14,448,384.68	1,735,892.23	39.78433743	-80.66014500	
17,000.00	89.00	149.70	6,919.82	-8,230.62	5,868.15	14,448,298.36	1,735,942.67	39.78409983	-80.65996660	
17,100.00	89.00	149.70	6,921.56	-8,316.94	5,918.60	14,448,212.03	1,735,993.12	39.78386223	-80.65978821	
17,200.00	89.00	149.70	6,923.31	-8,403.27	5,969.04	14,448,125.70	1,736,043.56	39.78362463	-80.65960982	
17,300.00	89.00	149.70	6,925.05	-8,489.60	6,019.49	14,448,039.38	1,736,094.01	39.78338703	-80.65943142	
17,354.23	89.00	149.70	6,926.00	-8,536.41	6,046.84	14,447,992.57	1,736,121.36	39.78325819	-80.65933469	
PBHL/TD 17354.23 MD/6926.00 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-08HM LP r - hit/miss target - Shape - Point	0.00	0.00	6,747.00	293.49	948.90	14,456,822.46	1,731,023.42	39.80755911	-80.67736749	
- plan misses target center by 53.49usft at 7157.77usft MD (6747.66 TVD, 265.76 N, 903.15 E)										
Ten High 1S-08HM LP r - Point	0.00	0.00	6,747.00	293.49	903.90	14,456,822.46	1,730,978.42	39.80755956	-80.67752773	
- plan misses target center by 15.00usft at 7134.48usft MD (6745.95 TVD, 285.65 N, 891.15 E)										
Ten High 1S-08HM BHL - Point	0.00	0.00	6,926.00	-8,536.41	6,046.84	14,447,992.57	1,736,121.36	39.78325819	-80.65933469	
- plan hits target center										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,175.00	1,175.00	13 3/8" Casing @ 1175 TVD	13-3/8	17-1/2	
2,982.55	2,980.00	9 5/8" Casing @ 2980 TVD	9-5/8	12-1/4	

51-01975



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-08HM (G)
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-08HM (G)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,500.00	1,500.00	0.00	0.00	KOP Begin 2°/100' build
1,675.00	1,674.89	4.63	2.67	Begin 3.50° tangent
3,202.96	3,200.00	85.41	49.31	Begin 2°/100' build/turn
3,781.17	3,769.74	159.44	105.09	Begin 15.01° tangent
6,235.51	6,140.31	656.04	502.06	Begin 10°/100' build/turn
7,179.23	6,748.42	247.30	914.05	Begin 89.00° lateral section
17,354.23	6,926.00	-8,536.41	6,046.84	PBHL/TD 17354.23 MD/6926.00 TVD

Area of Review

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

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

Data Sources Reviewed:

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

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

Request maps for:

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

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

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

Permit well - Ten High 1S-8HM

Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	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	Comments
4705101934	Tug Hill Operating	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101944	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101945	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101943	Tug Hill Operating	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101964	Tug Hill Operating	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101973	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101974	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101975	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101976	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101960	Tug Hill Operating	11878' TVD planned	None	None	No, Permit submitted Utica well	Permit submitted Utica well. Not yet drilled
4705101961	Tug Hill Operating	11878' TVD planned	None	None	No, Permit submitted Utica well	Permit submitted Utica well. Not yet drilled
4705101965	Tug Hill Operating	11878' TVD planned	None	None	No, Permit submitted Utica well	Permit submitted Utica well. Not yet drilled
4705101966	Tug Hill Operating	11878' TVD planned	None	None	No, Permit submitted Utica well	Permit submitted Utica well. Not yet drilled
4705100834	McElroy Coal Company	Unknown	Unknown	Unknown	Unknown but unlikely, most likely an old shallow well	Well plugged in 11/6/1964 and then plugged again in 8/6/1998. A field survey was conducted to locate this well and no evidence of this well was found.
4705130097	I. H. Beren	3018	Gordon SS	Unknown	No, TVD of 3018' means that this well is not within the range of fracture propagation from a Marcellus well	Well was plugged 5/28/1939. A field survey was conducted to locate this well and no evidence of this well was found.
4705100852	Consolidated Coal Company	Unknown	Unknown	Unknown	Unknown but unlikely, most likely an old shallow well	Well was plugged 6/20/2001. A field survey was conducted to locate this well and it was found plugged at the location shown on the well plat.

4705100851	Consolidated Coal Company	Unknown	Unknown	Unknown	Unknown but unlikely, most likely an old shallow well	Well was plugged 5/26/2000. A field survey was conducted to locate this well and it was found plugged at the location shown on the well plat.
4705100009	Manufacturers Light and Heat Co	1908	Big Injun/3rd Salt Sand	Unknown	No, TVD of 1908' means that this well is not within the range of fracture propagation from a Marcellus well	Well was plugged 12/26/1941. A field survey was conducted to locate this well and no evidence of this well was found.

WV Geological & Economic Survey. Well: County = 51 Permit = 00834

Well Reassignment Information: Reassigned From
 OLD_COUNTY OLD_PERMIT NEW_COUNTY NEW_PERMIT
 51 33450 51 034

Location Information: View Map
 API COUNTY PERMIT TAX_DISTRICT QUAD_T5 QUAD_15 LAT_DD LONG_DD UTM_E UTM_N
 4725100834 Marshall 034 Meigs Don Eason Campton 39.824778 -80.673258 627454.3 4405963.7

There is no Bottom Hole Location data for this well

Owner Information:
 API CMP_ID SUFFIX STATUS SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_AT_COMPLETION PROF_VD PROF_TWT
 4725100834 --NCK Original Les. Consolidated Home Water/Fraction 96.7 (40-37) Reasent Meigs OPMI (H. Basant) Oper. (H. Basant) Fairbairn Energy (Oshon well plat) MidEnergy Coal Company

Completion Information:
 API CMP_ID SUFFIX ELEV DATUM FIELD DEEPEST_FM DEEPEST_FHT INITIAL_CLASS FINAL_CLASS TYPE ROQ CMP_MTHD TWD TMD NEW_FTS O_BEF_G_AFT O_BEF_C
 4725100834 --NCK --1904 -- FIELD DEEPEST_FM DEEPEST_FHT INITIAL_CLASS FINAL_CLASS TYPE ROQ CMP_MTHD TWD TMD NEW_FTS O_BEF_G_AFT O_BEF_C
 4725100834 8-5-1948 1221-1998 1102 Original Les. unclassified unclassified not available unconf unconf

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 FIELD_ID DEPTH_FHT
 4725100834 110-1204 0
 4725100834 8-5-1948

There is no Sample data for this well

WV Geological & Economic Survey. Well: County = 51 Permit = 30097

Location Information: View Map
 API COUNTY PERMIT TAX_DISTRICT QUAD_T5 QUAD_15 LAT_DD LONG_DD UTM_E UTM_N
 4725130097 Wayne 30097 Meigs Don Eason Campton 39.29045 -80.67324 62737.3 4405904.4

There is no Bottom Hole Location data for this well

Owner Information:
 API CMP_ID SUFFIX STATUS SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_AT_COMPLETION PROF_VD PROF_TWT
 4725130097 --JLJ Original Les. Consolidated Glenn Miller 135 J & C State (Don Miller) State Heirs/Don Miller Baker, L.H.

Completion Information:
 API CMP_ID SUFFIX ELEV DATUM FIELD DEEPEST_FM DEEPEST_FHT INITIAL_CLASS FINAL_CLASS TYPE ROQ CMP_MTHD TWD TMD NEW_FTS O_BEF_G_AFT O_BEF_C
 4725130097 --JLJ -- 1204 Original Les. Campton-Glenn Miller Garden Development Well unclassified Oil Catta Top unconf 2018 2518 6 0 0

Pay/Show Water Information:
 API CMP_ID ACTIVITY PRODUCT SECTION DEPTH_TOP FAI_TOP DEPTH_BOTTOM O_BEF_G_AFT O_BEF_C_AFT WATER_GAITY
 4725130097 --JLJ View Set Water Variable 1625 Set Range (unconf) 0 0
 4725130097 --JLJ Pay Oil Variable 2023 0-2000 0 0

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
4725130097	Original Les	Swankey coal	Well Record	625	Reasonable	6	Reasonable	1205 Ground Level
4725130097	Original Les	Presburg coal	Well Record	1016	Reasonable	6	Reasonable	1205 Ground Level
4725130097	Original Les	Mahanog Saig Dunk	Well Record	1543	Reasonable	21	Reasonable	1205 Ground Level
4725130097	Original Les	San Sables Lunenburg	Well Record	1803	Reasonable	40	Reasonable	1205 Ground Level
4725130097	Original Les	Martins	Well Record	2018	Reasonable	20	Reasonable	1205 Ground Level
4725130097	Original Les	Bg Lime	Well Record	2093	Reasonable	20	Reasonable	1205 Ground Level
4725130097	Original Les	Bg msh (unconf)	Well Record	2119	Reasonable	200	Reasonable	1205 Ground Level
4725130097	Original Les	Swankey	Well Record	2287	Reasonable	30	Reasonable	1205 Ground Level

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

Plugging Information:
 API FIELD_ID DEPTH_FHT
 4725130097 523-1219 0

There is no Sample data for this well

WV Geological & Economic Survey

Well: County = 51 Permit = 00852

Well Reassignment Information: Reassigned From
 OLD_COUNTY OLD_PERMIT NEW_COUNTY NEW_PERMIT
 51 00852 51 00852

Location Information: [View Map](#)
 API: COUNTY PERMIT TAX DISTRICT QUAD_78 QUAD_18 LAT_DD LONG_DD UTM_E UTM_N
 470100852 51-00852 51-00852 51-00852 78 18 442118.9 441218.9

There is no Bottom Hole Location data for this well

Owner Information:
 API: CWP_DT SUFFIX STATUS SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_AT_COMPLETION PROP_YD PROP_FRD_FM TFM_EST_FR
 470100852 6-20-2000 Plugging Completed Carl Richard Chapman Jr M-51 Commission Coal Co. Mine Notice Dist Company

Completion Information:
 API: CWP_DT SPOD_DT ELEV DATUM FIELD DEEPT_FTM DEEPT_FMT INITIAL_CLASS FINAL_CLASS TYPE RIG CWP_MTHD TWD TMD NEW_FTO O_BEF O_APT O_BEF
 470100852 6-20-2000 6-20-2000 1208 Ground Level unset/unset unset/unset not available unset/unset unset/unset

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: PLO_DT DEPTH_FBT
 470100852 6-20-2000 0

There is no Sample data for this well

WV Geological & Economic Survey

Well: County = 51 Permit = 00851

Well Reassignment Information: Reassigned From
 OLD_COUNTY OLD_PERMIT NEW_COUNTY NEW_PERMIT
 51 00851 51 00851

Location Information: [View Map](#)
 API: COUNTY PERMIT TAX DISTRICT QUAD_78 QUAD_18 LAT_DD LONG_DD UTM_E UTM_N
 470100851 51-00851 51-00851 51-00851 78 18 442118.9 441218.9

There is no Bottom Hole Location data for this well

Owner Information:
 API: CWP_DT SUFFIX STATUS SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_AT_COMPLETION PROP_YD PROP_FRD_FM TFM_EST_FR
 470100851 6-24-2000 Plugging Completed Carl Richard Chapman Jr M-45 Commission Coal Co. Mine Notice Dist Company

Completion Information:
 API: CWP_DT SPOD_DT ELEV DATUM FIELD DEEPT_FTM DEEPT_FMT INITIAL_CLASS FINAL_CLASS TYPE RIG CWP_MTHD TWD TMD NEW_FTO O_BEF O_APT O_BEF
 470100851 6-24-2000 6-24-2000 1245 Ground Level unset/unset unset/unset not available unset/unset unset/unset

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: PLO_DT DEPTH_FBT
 470100851 6-24-2000 0

There is no Sample data for this well

WV Geological & Economic Survey

Well: County = 51 Permit = 00009

Location Information: [View Map](#)
 API: COUNTY PERMIT TAX DISTRICT QUAD_78 QUAD_18 LAT_DD LONG_DD UTM_E UTM_N
 470100009 51-00009 51-00009 51-00009 78 18 442118.9 441218.9

There is no Bottom Hole Location data for this well

Owner Information:
 API: CWP_DT SUFFIX STATUS SURFACE_OWNER WELL_NUM CO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR_AT_COMPLETION PROP_YD PROP_FRD_FM TFM_EST_FR
 470100009 12-12-00 Original Log Completed S W Boone 1 1421 C W Carpenter 2002 MacArthur LLC Mac C MacArthur LLC & Mac C

Completion Information:
 API: CWP_DT SPOD_DT ELEV DATUM FIELD DEEPT_FTM DEEPT_FMT INITIAL_CLASS FINAL_CLASS TYPE RIG CWP_MTHD TWD TMD NEW_FTO O_BEF O_APT O_BEF
 470100009 12-12-00 11-19-00 945 Ground Level Station Big Spring (Flooded) Big Spring (Flooded) Development Dist Development Dist Gas unoperator unoperator

Pay/Show/Water Information:
 API: CWP_DT ACTIVITY PRODUCT SECTION DEPTH_TOP FTM_TOP DEPTH_BOTTOM FTM_BOT O_BEF O_APT O_BEF O_APT WATER_QNTY
 470100009 12-12-00 Water unoperator Water Vertical 1795 3rd Salt Sand 0 0
 470100009 12-12-00 Pay Gas Vertical 1795 3rd Salt Sand 0 0
 470100009 12-12-00 Pay Gas Vertical 1800 Big Spring (Flooded) 0 0

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	FILE	FILE_QUALITY	DEPTH_TOP	DEPTH_BOTTOM	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
470100009	Orig-Log	unclassified case	Wvl Record	300	Reservoir	0	Reservoir	040 Ground Level
470100009	Orig-Log	Unreworked case	Wvl Record	470	Reservoir	0	Reservoir	040 Ground Level
470100009	Orig-Log	Secondary case	Wvl Record	680	Reservoir	0	Reservoir	040 Ground Level
470100009	Orig-Log	Production case	Wvl Record	718	Reservoir	2	Reservoir	040 Ground Level
470100009	Orig-Log	Burns Salt Cap Rn	Wvl Record	1140	Reservoir	17	Reservoir	040 Ground Level
470100009	Orig-Log	Wynona Salt Cap	Wvl Record	1205	Reservoir	25	Reservoir	040 Ground Level
470100009	Orig-Log	La Pigeon Pk	Wvl Record	1402	Reservoir	17	Reservoir	040 Ground Level
470100009	Orig-Log	1st Salt Sand	Wvl Record	1405	Reservoir	50	Reservoir	040 Ground Level
470100009	Orig-Log	2nd Salt Sand	Wvl Record	1505	Reservoir	50	Reservoir	040 Ground Level
470100009	Orig-Log	3rd Salt Sand	Wvl Record	1505	Reservoir	50	Reservoir	040 Ground Level
470100009	Orig-Log	Maclure	Wvl Record	1510	Reservoir	10	Reservoir	040 Ground Level
470100009	Orig-Log	Big Lume	Wvl Record	1540	Reservoir	42	Reservoir	040 Ground Level
470100009	Orig-Log	Maclure Group	Wvl Record	1540	Reservoir	42	Reservoir	040 Ground Level
470100009	Orig-Log	Big Spring (Flooded)	Wvl Record	1800	Reservoir	0	Reservoir	040 Ground Level

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

Plugging Information:
 API: PLO_DT DEPTH_FBT
 470100009 12-20-04 0

There is no Sample data for this well



Well Site Safety Plan

Tug Hill Operating, LLC

Jan
12/20/17

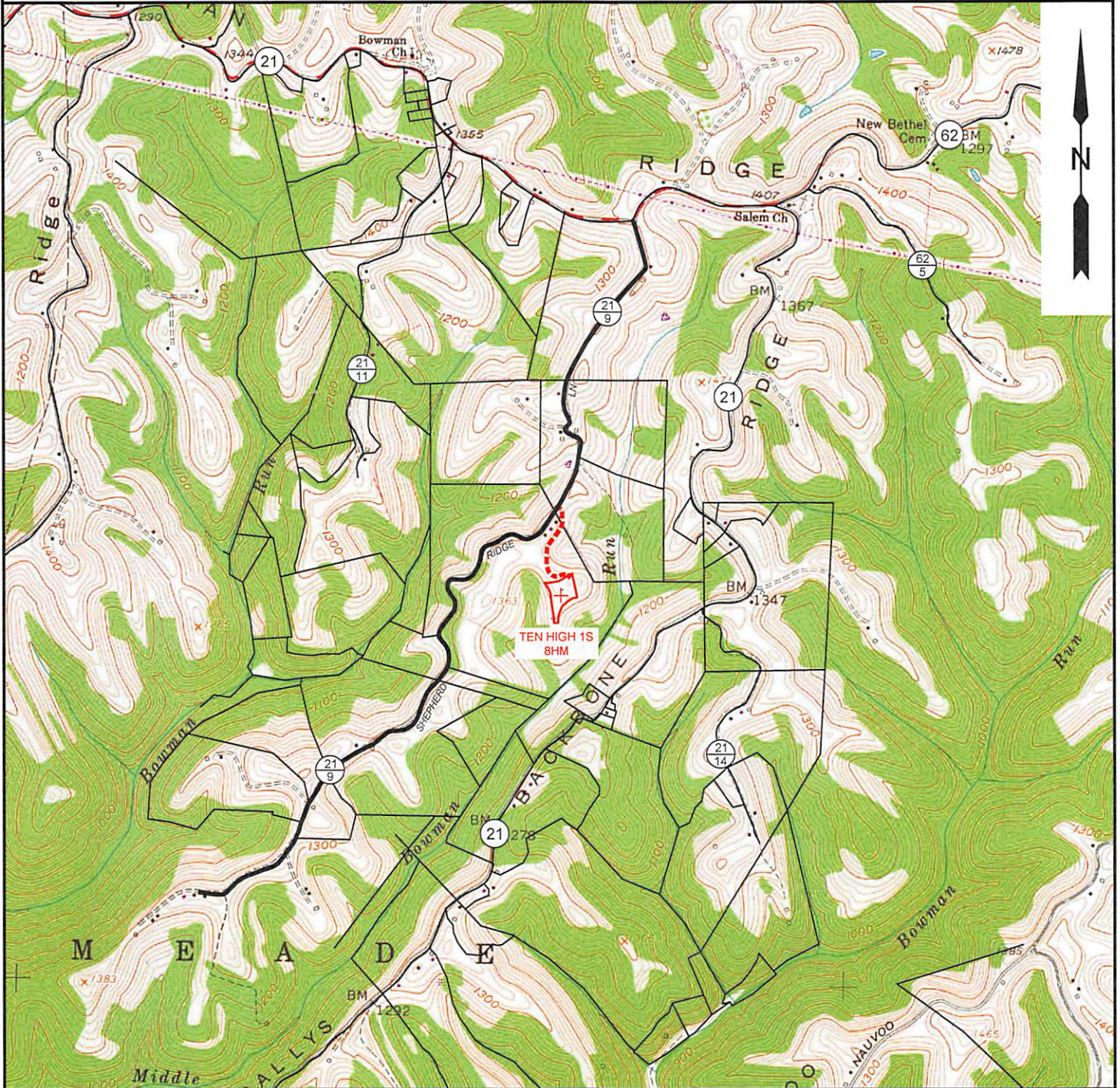
Well Name: Ten High 1S-8HM

Pad Location: Ten High
Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:
Northing-4,406,358.84
Easting -527,327.77

December 2017

PROPOSED TEN HIGH 1S - 8HM



NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN PUBLIC SERVICE DISTRICT
PROCTOR, WV

LAT: 39.7137712
LON: -80.8258327
LOCATED: S 51°03'40" W AT 52,970' FROM TEN HIGH 1S - 8HM SURFACE LOCATION

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
DRAWN BY		DATE	SCALE
K.G.M.		09-13-17	1" - 2000'

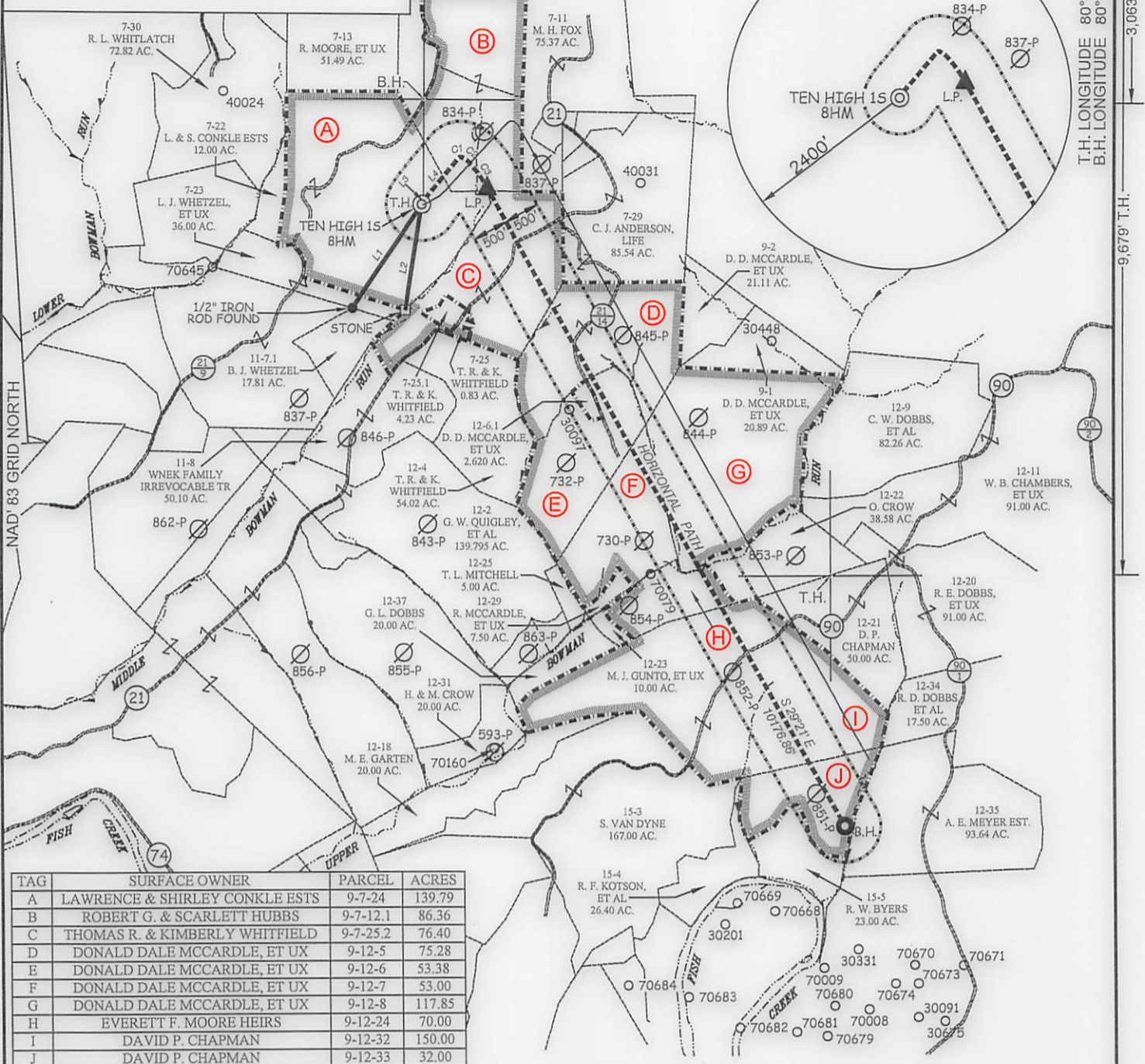
03/09/2018

9,649' B.H. 3,957' T.H.

**TEN HIGH 1S LEASE
WELL 8HM
TUG HILL OPERATING**

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

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°37'30"



TAG	SURFACE OWNER	PARCEL	ACRES
A	LAWRENCE & SHIRLEY CONKLE ESTS	9-7-24	139.79
B	ROBERT G. & SCARLETT HUBBS	9-7-12.1	86.36
C	THOMAS R. & KIMBERLY WHITFIELD	9-7-25.2	76.40
D	DONALD DALE MCCARDLE, ET UX	9-12-5	75.28
E	DONALD DALE MCCARDLE, ET UX	9-12-6	53.38
F	DONALD DALE MCCARDLE, ET UX	9-12-7	53.00
G	DONALD DALE MCCARDLE, ET UX	9-12-8	117.85
H	EVERETT F. MOORE HEIRS	9-12-24	70.00
I	DAVID P. CHAPMAN	9-12-32	150.00
J	DAVID P. CHAPMAN	9-12-33	32.00

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	38.63'	43.38'	N 75°15' E	37.36'
C2	146.91'	297.14'	S 55°28' E	145.42'
C3	425.69'	1750.31'	S 35°32' E	424.64'

LINE	BEARING	DISTANCE
L1	S 34°00' W	1730.51'
L2	S 08°50' W	1475.13'
L3	N 31°08' E	106.20'
L4	N 39°28' E	724.85'

P.S.
677

Gregory A. Smith

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

NAD'83 S.P.C.(FT)	N. 478,143.88	E. 1,636,794.50
NAD'83 GEO.	LAT-(N) 39.806762	LONG-(W) 80.680750
NAD'83 UTM (M)	N. 4,406,358.84	E. 527,327.77

LANDING POINT

NAD'83 S.P.C.(FT)	N. 478,376.0	E. 1,637,712.9
NAD'83 GEO.	LAT-(N) 39.807433	LONG-(W) 80.677492
NAD'83 UTM (M)	N. 4,406,434.2	E. 527,606.4

BOTTOM HOLE

NAD'83 S.P.C.(FT)	N. 469,504.7	E. 1,642,699.8
NAD'83 GEO.	LAT-(N) 39.783258	LONG-(W) 80.659335
NAD'83 UTM (M)	N. 4,403,756.9	E. 529,170.8

GREGORY A. SMITH
LICENSED
No. 677
STATE OF
WEST VIRGINIA
PROFESSIONAL SURVEYOR

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

LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE WW-6A1)

SCALE 1" = 2000' FILE NO. 8655P8HMR.dwg

DATE SEPTEMBER 13, 20 17

REVISED DECEMBER 18, 20 17

OPERATORS WELL NO. TEN HIGH 1S-8HM

API WELL NO. 47 - 051 - 01975H6A

NO. STATE COUNTY PERMIT

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

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

COUNTY NAME PERMIT

03/09/2018

9,649' B.H.

3,957' T.H.

TEN HIGH 1S LEASE
WELL 8HM
TUG HILL OPERATING

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

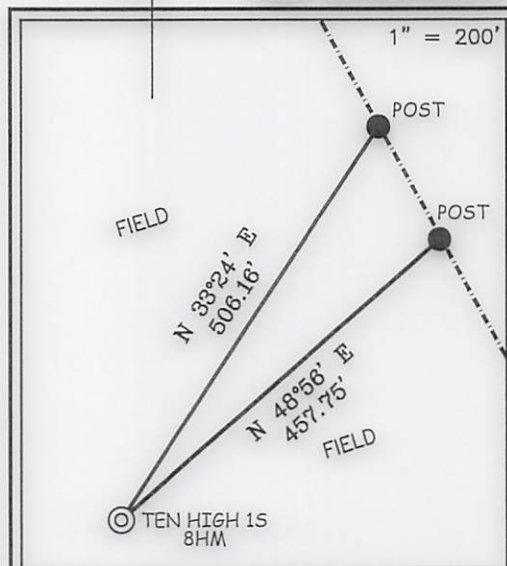
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD'83 S.P.C.(FT)	N. 478,143.88	E. 1,636,794.50	
NAD'83 GEO.	LAT-(N) 39.806762	LONG-(W) 80.680750	
NAD'83 UTM (M)	N. 4,406,358.84	E. 527,327.77	
<u>LANDING POINT</u>			
NAD'83 S.P.C.(FT)	N. 478,376.0	E. 1,637,712.9	
NAD'83 GEO.	LAT-(N) 39.807433	LONG-(W) 80.677492	
NAD'83 UTM (M)	N. 4,406,434.2	E. 527,606.4	
<u>BOTTOM HOLE</u>			
NAD'83 S.P.C.(FT)	N. 469,504.7	E. 1,642,699.8	
NAD'83 GEO.	LAT-(N) 39.783258	LONG-(W) 80.659335	
NAD'83 UTM (M)	N. 4,403,756.9	E. 529,170.8	

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°37'30"
3,063' B.H.

B.H.

T.H.

REFERENCES



NOTES ON SURVEY

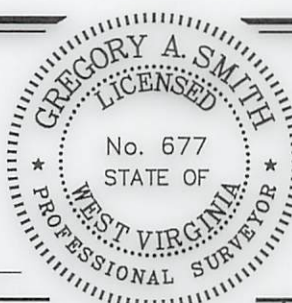
1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'

P.O. Box 150 | 12 Vanhorn Drive | Glenville, WV 26351 | (304) 462-5634
www.slsurveys.com

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.
677

Gregory A. Smith



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

DATE SEPTEMBER 13, 20 17
REVISED DECEMBER 18, 20 17
OPERATORS WELL NO. TEN HIGH 1S-8HM
API WELL NO. 47-051-087546A
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8655P8HMR.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 = 1,320.20' 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 - WW-6A1 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 MARCELLUS

ESTIMATED DEPTH TVD: 6,865' / TMD: 17,354'

LEASE NO. SEE WW-6A1

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

03/09/2018

51-01975

WW-6A1
(5/13)

Operator's Well No. Ten High 1S-8HM

**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: Permit Specialist - Appalachia

Page 1 of 2

WW-6A1 Supplement

Operator's Well No. Ten High 1S - 8HM

SI-D1975

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	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	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	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	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	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*15501	B	9-7-12.1	RONALD AND EDNA MOORE	TRIENERGY INC	1/8+	661 449	TriEnergy to AB Resources: 20/252	AB Resources to Chevron: 756/379	Chevron to Tug Hill: 36/148
10*15481	C	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	C	9-7-25.2	SUSAN NELSON	TH EXPLORATION LLC	1/8+	908 203	N/A	N/A	N/A
10*15686	C	9-7-25.2	JOHN OMER BOLTZ	TH EXPLORATION LLC	1/8+	908 160	N/A	N/A	N/A
10*15750	C	9-7-25.2	SANDRA K TRULL	TH EXPLORATION LLC	1/8+	908 229	N/A	N/A	N/A
10*16058	C	9-7-25.2	MATTIE RUTH JACKSON PRESCOTT	TH EXPLORATION LLC	1/8+	908 231	N/A	N/A	N/A
10*16118	C	9-7-25.2	RUBY RIDDLE JACKSON	TH EXPLORATION LLC	1/8+	908 233	N/A	N/A	N/A
10*16297	C	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	C	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	C	9-7-25.2	ROBERT STEPHEN DRIGGERS	TH EXPLORATION LLC	1/8+	908 224	N/A	N/A	N/A
10*16414	C	9-7-25.2	MARY ELIZABETH DRIGGERS	TH EXPLORATION LLC	1/8+	908 208	N/A	N/A	N/A
10*16415	C	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	C	9-7-25.2	CYNTHIA HUDSON	TH EXPLORATION LLC	1/8+	908 219	N/A	N/A	N/A
10*16424	C	9-7-25.2	ROBERT J RIGBY	TH EXPLORATION LLC	1/8+	908 241	N/A	N/A	N/A
10*16448	C	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	C	9-7-25.2	MARION L AND EMILY CAMPBELL	TH EXPLORATION LLC	1/8+	908 245	N/A	N/A	N/A
10*16514	C	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	C	9-7-25.2	ANNA MARIE JACKSON	TH EXPLORATION LLC	1/8+	908 251	N/A	N/A	N/A
10*16516	C	9-7-25.2	WILSON ANDREW JACKSON	TH EXPLORATION LLC	1/8+	908 253	N/A	N/A	N/A
10*16545	C	9-7-25.2	ROBERT G & ELLEN FOUNDS	TH EXPLORATION LLC	1/8+	908 260	N/A	N/A	N/A
10*16662	C	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	C	9-7-25.2	MICHAEL P PYLE	TH EXPLORATION LLC	1/8+	908 255	N/A	N/A	N/A
10*16667	C	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	C	9-7-25.2	JACK I AND MERRILEE PYLE	TH EXPLORATION LLC	1/8+	908 257	N/A	N/A	N/A
10*16669	C	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	C	9-7-25.2	CHERYLE M TRACEY	TH EXPLORATION LLC	1/8+	927 475	N/A	N/A	N/A
10*16688	C	9-7-25.2	SHERRYL PYLE BAIR	TH EXPLORATION LLC	1/8+	927 481	N/A	N/A	N/A
10*16689	C	9-7-25.2	JOHN C FOUNDS	TH EXPLORATION LLC	1/8+	927 478	N/A	N/A	N/A

WW-6A1 Supplement

Operator's Well No. Ten High 1S - 8HM

SI-D197S

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	Assignment	Assignment	Assignment
10*16690	C	9-7-25.2	RICARDO ORTIZ	TH EXPLORATION LLC	1/8+	921 352	N/A	N/A	N/A
10*16720	C	9-7-25.2	DONNA ELAINE BRASKETT	TH EXPLORATION LLC	1/8+	921 152	N/A	N/A	N/A
10*16738	C	9-7-25.2	CHARLES A RINE AND RUTH K RINE	TH EXPLORATION LLC	1/8+	908 274	N/A	N/A	N/A
10*16742	C	9-7-25.2	PAUL C WILSON	TH EXPLORATION LLC	1/8+	927 490	N/A	N/A	N/A
10*16747	C	9-7-25.2	WILLIAM DALE BRASKETT	TH EXPLORATION LLC	1/8+	921 96	N/A	N/A	N/A
10*16798	C	9-7-25.2	PATRICK A RANKIN AND ROBIN A RANKIN	TH EXPLORATION LLC	1/8+	921 364	N/A	N/A	N/A
10*16800	C	9-7-25.2	JAMES KENNETH JACKSON AND JULIE JACKSON	TH EXPLORATION LLC	1/8+	921 93	N/A	N/A	N/A
10*16802	C	9-7-25.2	CHRISTOPHER AND TAMMY RICHARDSON	TH EXPLORATION LLC	1/8+	921 495	N/A	N/A	N/A
10*16804	C	9-7-25.2	WILLIAM N AND SHERRY D TAYLOR	TH EXPLORATION LLC	1/8+	921 510	N/A	N/A	N/A
10*16806	C	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
10*16807	C	9-7-25.2	DAVID TULLER AND SUSAN STORTS TULLER	TH EXPLORATION LLC	1/8+	921 513	N/A	N/A	N/A
10*16808	C	9-7-25.2	MICHAEL L ORTIZ	TH EXPLORATION LLC	1/8+	921 349	N/A	N/A	N/A
10*16815	C	9-7-25.2	HAROLD W PYLE	TH EXPLORATION LLC	1/8+	921 357	N/A	N/A	N/A
10*16819	C	9-7-25.2	TERESA ORTIZ BIGGS	TH EXPLORATION LLC	1/8+	921 147	N/A	N/A	N/A
10*16821	C	9-7-25.2	SHEILA BRASKETT WEICHEY	TH EXPLORATION LLC	1/8+	921 516	N/A	N/A	N/A
10*16836	C	9-7-25.2	RICK A AND LENORE A STORTS	TH EXPLORATION LLC	1/8+	921 507	N/A	N/A	N/A
10*16837	C	9-7-25.2	TERRY L AND THELMA A POFF	TH EXPLORATION LLC	1/8+	927 472	N/A	N/A	N/A
10*16838	C	9-7-25.2	ROBERT G FUNARI	TH EXPLORATION LLC	1/8+	921 82	N/A	N/A	N/A
10*16839	C	9-7-25.2	JAMES B FOUNDS AND LYNN M MOWERY	TH EXPLORATION LLC	1/8+	921 73	N/A	N/A	N/A
10*16863	C	9-7-25.2	TINA MOORE	TH EXPLORATION LLC	1/8+	921 334	N/A	N/A	N/A
10*16868	C	9-7-25.2	MICHAEL W STORTS AND JESSICA M STORTS	TH EXPLORATION LLC	1/8+	921 504	N/A	N/A	N/A
10*16879	C	9-7-25.2	MARK E AND LESLEY A STORTS	TH EXPLORATION LLC	1/8+	921 501	N/A	N/A	N/A
10*16880	C	9-7-25.2	BEVERLY ANN STORTS	TH EXPLORATION LLC	1/8+	921 498	N/A	N/A	N/A
10*16902	C	9-7-25.2	MARY BARCAW DUKE	TH EXPLORATION LLC	1/8+	921 105	N/A	N/A	N/A
10*16962	C	9-7-25.2	DENNIS P AND BARBARA EZELL FLORY	TH EXPLORATION LLC	1/8+	921 70	N/A	N/A	N/A
10*16976	C	9-7-25.2	LESTER G AND CONSTANCE B NICKOLSON	TH EXPLORATION LLC	1/8+	921 343	N/A	N/A	N/A
10*16977	C	9-7-25.2	JEREMY COCHENOUR	TH EXPLORATION LLC	1/8+	921 102	N/A	N/A	N/A
10*16987	C	9-7-25.2	LAURIE EZELL PERRY	TH EXPLORATION LLC	1/8+	921 355	N/A	N/A	N/A
10*16989	C	9-7-25.2	BRITTANY RICHARDSON	TH EXPLORATION LLC	1/8+	921 376	N/A	N/A	N/A
10*16991	C	9-7-25.2	MARYELLEN FOUNDS AND LAUREN FOUNDS	TH EXPLORATION LLC	1/8+	921 79	N/A	N/A	N/A
10*16996	C	9-7-25.2	THOMAS RANKIN	TH EXPLORATION LLC	1/8+	917 75	N/A	N/A	N/A
10*17130	C	9-7-25.2	CINDY L BARGER	TH EXPLORATION LLC	1/8+	921 137	N/A	N/A	N/A
10*17155	C	9-7-25.2	JESSE LEON JR AND TERESA GAIL EZELLE	TH EXPLORATION LLC	1/8+	921 118	N/A	N/A	N/A
10*17156	C	9-7-25.2	HENRI NELL JACKSON KENT BARNES	TH EXPLORATION LLC	1/8+	921 139	N/A	N/A	N/A
10*17157	C	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
10*17198	C	9-7-25.2	THOMAS G AND DIANE W BAYLESS	TH EXPLORATION LLC	1/8+	921 141	N/A	N/A	N/A
10*17205	C	9-7-25.2	SANDRA JEAN WILSON	TH EXPLORATION LLC	1/8+	921 524	N/A	N/A	N/A
10*17208	C	9-7-25.2	PATRICK S GALLAGHER AND JOYCE ANN FOUNDS	TH EXPLORATION LLC	1/8+	921 86	N/A	N/A	N/A
10*17274	C	9-7-25.2	DAVID H WILSON	TH EXPLORATION LLC	1/8+	921 474	N/A	N/A	N/A
10*17275	C	9-7-25.2	JOHN R REEVES AND MONA G REEVES	TH EXPLORATION LLC	1/8+	921 373	N/A	N/A	N/A
10*17276	C	9-7-25.2	BERTHA EZELL WYATT	TH EXPLORATION LLC	1/8+	921 526	N/A	N/A	N/A
10*17278	C	9-7-25.2	MICHAEL L EZELLE	TH EXPLORATION LLC	1/8+	921 121	N/A	N/A	N/A
10*17339	C	9-7-25.2	JOSEPH W FOUNDS	TH EXPLORATION LLC	1/8+	921 76	N/A	N/A	N/A
10*17377	C	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
10*17416	C	9-7-25.2	ANDREW M ORTIZ	TH EXPLORATION LLC	1/8+	921 346	N/A	N/A	N/A
10*17438	C	9-7-25.2	DENNIS M WILSON	TH EXPLORATION LLC	1/8+	921 476	N/A	N/A	N/A
10*17440	C	9-7-25.2	KENDRA WALISA	TH EXPLORATION LLC	1/8+	927 484	N/A	N/A	N/A
10*17441	C	9-7-25.2	RALPH J WILSON	TH EXPLORATION LLC	1/8+	921 522	N/A	N/A	N/A
10*17442	C	9-7-25.2	SHANE ALLEN AND MENDY JEAN ALLEN	TH EXPLORATION LLC	1/8+	921 134	N/A	N/A	N/A
10*17443	C	9-7-25.2	MICHELLE MORROW-BACK	TH EXPLORATION LLC	1/8+	921 337	N/A	N/A	N/A
10*17444	C	9-7-25.2	KELLY FOUNDS CAMPBELL	TH EXPLORATION LLC	1/8+	921 99	N/A	N/A	N/A

WW-6A1 Supplement

Operator's Well No. Ten High 1S - 8HM

51-01975

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	Assignment	Assignment	Assignment
10*17449	C	9-7-25.2	PHYLLIS J BLAKE	TH EXPLORATION LLC	1/8+	921 150	N/A	N/A	N/A
10*17482	C	9-7-25.2	TERESA EZELLE RALYA AND DAVID L RALYA	TH EXPLORATION LLC	1/8+	927 487	N/A	N/A	N/A
10*17483	C	9-7-25.2	RICHARD I PYLE	TH EXPLORATION LLC	1/8+	921 359	N/A	N/A	N/A
10*17484	C	9-7-25.2	NELDA S JACKSON	TH EXPLORATION LLC	1/8+	921 330	N/A	N/A	N/A
10*17485	C	9-7-25.2	MARGIE ANN JACKSON ROBBINS GRAHAM	TH EXPLORATION LLC	1/8+	921 91	N/A	N/A	N/A
10*17526	C	9-7-25.2	JEFFREY L REEVES AND JODY L REEVES	TH EXPLORATION LLC	1/8+	921 370	N/A	N/A	N/A
10*17527	C	9-7-25.2	JAMES MICHAEL EZELL AND LUCILLE D EZELL	TH EXPLORATION LLC	1/8+	921 111	N/A	N/A	N/A
10*17552	C	9-7-25.2	JOHN BEVACQUA AND PATRICIA A BEVACQUA	TH EXPLORATION LLC	1/8+	921 144	N/A	N/A	N/A
10*17554	C	9-7-25.2	MICHAEL T RANKIN	TH EXPLORATION LLC	1/8+	921 361	N/A	N/A	N/A
10*17561	C	9-7-25.2	ROGER L TYRELL AND KATHRYN L TYRELL	TH EXPLORATION LLC	1/8+	921 519	N/A	N/A	N/A
10*17564	C	9-7-25.2	JAMES RONALD NICKOLSON AND TRACEY E NICKOLSON	TH EXPLORATION LLC	1/8+	921 340	N/A	N/A	N/A
10*17565	C	9-7-25.2	JESSE ALLEN JACKSON AND ELIZABETH D JACKSON	TH EXPLORATION LLC	1/8+	921 327	N/A	N/A	N/A
10*17566	C	9-7-25.2	NATHAN P ERDOSSY AND BARBARA T ERDOSSY	TH EXPLORATION LLC	1/8+	921 108	N/A	N/A	N/A
10*17588	C	9-7-25.2	JAMES M JACKSON	TH EXPLORATION LLC	1/8+	921 325	N/A	N/A	N/A
10*17589	C	9-7-25.2	MARY CHRISTINE MCKENNA	TH EXPLORATION LLC	1/8+	921 332	N/A	N/A	N/A
10*17677	C	9-7-25.2	GEORGE M GONTA JR	TH EXPLORATION LLC	1/8+	921 89	N/A	N/A	N/A
10*17744	C	9-7-25.2	SAM PRESLEY EZELL	TH EXPLORATION LLC	1/8+	921 116	N/A	N/A	N/A
10*18021	C	9-7-25.2	CHRISTOPHER & JACKIE HANIFAN	TH EXPLORATION, LLC	1/8+	927 267	N/A	N/A	N/A
10*18022	C	9-7-25.2	DALE P & CYNTHIA J WARD	TH EXPLORATION, LLC	1/8+	927 264	N/A	N/A	N/A
10*47051.223.12	C	9-7-25.2	ALICE GORBY MARTIN	TH EXPLORATION LLC	1/8+	908 52	N/A	N/A	N/A
10*47051.223.13	C	9-7-25.2	JAMES A GORBY	TH EXPLORATION LLC	1/8+	908 42	N/A	N/A	N/A
10*47051.223.15	C	9-7-25.2	LARRY D TAUNT AND NANCY L TAUNT	TH EXPLORATION LLC	1/8+	908 14	N/A	N/A	N/A
10*47051.223.20	C	9-7-25.2	BARBARA A BUZZARD	TH EXPLORATION LLC	1/8+	908 24	N/A	N/A	N/A
10*47051.223.21	C	9-7-25.2	GARY T WARD AND SHARON D WARD	TH EXPLORATION LLC	1/8+	908 19	N/A	N/A	N/A
10*47051.223.30	C	9-7-25.2	LAURIE DRIGGERS MANDERSON	TH EXPLORATION LLC	1/8+	908 165	N/A	N/A	N/A
10*47051.223.33	C	9-7-25.2	NANCY CIAFFAGLIONE HOUSLEY	TH EXPLORATION LLC	1/8+	908 185	N/A	N/A	N/A
10*47051.223.35	C	9-7-25.2	DEBRA L CIAFFAGLIONE	TH EXPLORATION LLC	1/8+	908 190	N/A	N/A	N/A
10*47051.223.6	C	9-7-25.2	JOSHUA RINE AND REBECCA RINE	TH EXPLORATION LLC	1/8+	907 634	N/A	N/A	N/A
10*47051.223.9	C	9-7-25.2	LINDA DELBERT	TH EXPLORATION LLC	1/8+	908 32	N/A	N/A	N/A
10*47051.303.1	C	9-7-25.2	THOMAS R WHITFIELD	TH EXPLORATION LLC	1/8+	890 401	N/A	N/A	N/A
10*47051.303.2	C	9-7-25.2	KIMBERLY A WHITFIELD	TH EXPLORATION LLC	1/8+	890 403	N/A	N/A	N/A
10*47051.222.1	D	9-12-5	DONALD D MCCARDLE AND LUCY MCCARDLE	TH EXPLORATION LLC	1/8+	879 314	N/A	N/A	N/A
10*47051.222.1	E	9-12-6	DONALD D MCCARDLE AND LUCY MCCARDLE	TH EXPLORATION LLC	1/8+	879 314	N/A	N/A	N/A
10*47051.222.1	F	9-12-7	DONALD D MCCARDLE AND LUCY MCCARDLE	TH EXPLORATION LLC	1/8+	879 314	N/A	N/A	N/A
10*47051.222.10	F	9-12-7	CHRISTINA CAIN	TH EXPLORATION LLC	1/8+	905 27	N/A	N/A	N/A
10*47051.222.11	F	9-12-7	MARK DAVID HUNT	TH EXPLORATION LLC	1/8+	904 451	N/A	N/A	N/A
10*47051.222.12	F	9-12-7	MELISSA ELAINE SCHROTH	TH EXPLORATION LLC	1/8+	904 453	N/A	N/A	N/A
10*47051.222.13	F	9-12-7	BRETT J LAUSIN SR	TH EXPLORATION LLC	1/8+	907 205	N/A	N/A	N/A
10*47051.222.14	F	9-12-7	MICHAEL E LAUSIN AND SHARON G LAUSIN	TH EXPLORATION LLC	1/8+	913 526	N/A	N/A	N/A
10*47051.222.2	F	9-12-7	PATRICIA A GULUTZ AND THOMAS L GULUTZ	TH EXPLORATION LLC	1/8+	888 640	N/A	N/A	N/A
10*47051.222.3	F	9-12-7	SHARON L SMITH	TH EXPLORATION LLC	1/8+	894 487	N/A	N/A	N/A
10*47051.222.4	F	9-12-7	KENNETH M MCCARDLE AND DELORES MCCARDLE	TH EXPLORATION LLC	1/8+	888 642	N/A	N/A	N/A
10*47051.222.5	F	9-12-7	DONALD B WESLEY AND SUSAN J WESLEY	TH EXPLORATION LLC	1/8+	895 76	N/A	N/A	N/A
10*47051.222.6	F	9-12-7	DIANA S GRAFTON AND TIMOTHY A GRAFTON	TH EXPLORATION LLC	1/8+	898 571	N/A	N/A	N/A
10*47051.222.7	F	9-12-7	FREDRICK M YEATER AND SHERI C YEATER	TH EXPLORATION LLC	1/8+	898 626	N/A	N/A	N/A
10*47051.222.8	F	9-12-7	LEONARD O HABERBOSCH	TH EXPLORATION LLC	1/8+	902 442	N/A	N/A	N/A
10*47051.222.9	F	9-12-7	TERRIE L LAUSIN	TH EXPLORATION LLC	1/8+	904 591	N/A	N/A	N/A
10*47051.289.1	G	9-12-8	JANICE M HIXSON AND HARRY C HIXSON	TH EXPLORATION LLC	1/8+	898 461	N/A	N/A	N/A
10*47051.289.2	G	9-12-8	KENNETH D MCMECHEN	TH EXPLORATION LLC	1/8+	898 463	N/A	N/A	N/A

WW-6A1 Supplement

Operator's Well No. Ten High 1S - 8HM

51-01975

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	Assignment	Assignment	Assignment
10*19724	H	9-12-24	VENABLE ROYALTY LTD AND VENRO LTD	AMERICAN PETROLEUM PARTNERS OPERATING LLC	1/8+	935 216	N/A	N/A	APP to Tug Hill: 40/418
10*47051.140.1	I	9-12-32	DAVID P CHAPMAN & DEBORAH BORCK-CHAPMAN	TH EXPLORATION LLC	1/8+	866 318	N/A	N/A	N/A
10*47051.140.2	I	9-12-32	DOROTHY SULLIVAN POA JAMES REID SULLIVAN	TH EXPLORATION LLC	1/8+	873 501	N/A	N/A	N/A
10*47051.140.1	J	9-12-33	DAVID P CHAPMAN & DEBORAH BORCK-CHAPMAN	TH EXPLORATION LLC	1/8+	866 318	N/A	N/A	N/A
10*47051.140.2	J	9-12-33	DOROTHY SULLIVAN POA JAMES REID SULLIVAN	TH EXPLORATION LLC	1/8+	873 501	N/A	N/A	N/A

COPY

AFFIDAVIT

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

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

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

FURTHER, AFFIANT SAITH NOT.

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

David D. Kalish
Affiant: David D. Kalish

JURAT

Jan Pest
MARSHALL County 03:44:28 PM
Instrument No 1416299
Date Recorded 10/19/2016
Document Type HIS
Pages Recorded 1
Book-Page 20-62
Recording Fee \$5.00
Additional \$5.00

STATE OF TEXAS §
§ SS
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

51-01975

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

Jan Pest
MARSHALL County 12:43:01 PM
Instrument No 1404876
Date Recorded 05/20/2016
Document Type ASR
Pages Recorded 20
Book-Page 36-148
Recording Fee \$20.00
Additional \$8.00

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "**Assignment**") is made and entered into this 17th day of May, 2016 (the "**Effective Date**"), by and between **CHEVRON U.S.A. INC.** (hereinafter "**Assignor**") and **TH EXPLORATION, LLC** (hereinafter "**Assignee**") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated May 2, 2016 (the "**Acreage Trade Agreement**"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in **Exhibit "A"**, and as depicted in **Exhibits "A-1"** and **"A-2"**, attached hereto and made a part hereof (hereinafter the "**Leases**"); and

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases as described below.

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

1. **Assignment.** Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon, except that Assignor accepts and reserves from this Assignment the Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia.

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

2. **Special Warranty.** Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the Conveyed Interests since the time that Assignor obtained its interests in the Leases. Assignor does covenant, promise and agree, to and with the Assignee, its respective successors and assigns, to forever specially warrant and defend the title to the Leases or portions thereof included under this Assignment, unto the Assignee and its respective successors and assigns, against the lawful claims of Assignor, and all persons claiming, or to claim, the same or any part thereof, by, through or under Assignor.

217
for now



September 24, 2017

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

RE: Ten High 1S-8HM

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 21/9 and 21/11 in the area reflected on the Ten High 1S-8HM well plat. THO has conducted a full title search in the relevant Court House to confirm its' ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

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

Sincerely,

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

Amy L. Miller
Permit Specialist – Appalachia

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

Date of Notice Certification: 12/21/2017

API No. 47- 051 - 01975
Operator's Well No. Ten High 1S-8HM
Well Pad Name: Ten High

Notice has been given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>527,327.77</u>
County:	<u>Marshall</u>		Northing:	<u>4,406,358.84</u>
District:	<u>Meade</u>	Public Road Access:	<u>Shepherd Ridge Lane (Co. Rt. 21/9)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>LAWRENCE & SHIRLEY CONKLE, ESTS</u>	
Watershed:	<u>(HUC 10) Fish Creek</u>			

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

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

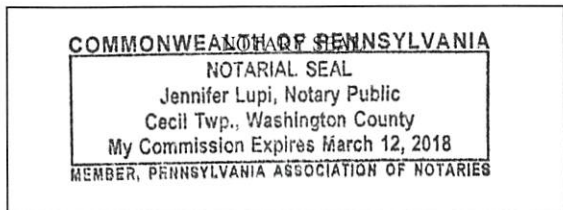
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

Certification of Notice is hereby given:

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

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

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



Subscribed and sworn before me this 21st day of Dec 2017.
Jennifer Lupi Notary Public
My Commission Expires March 12, 2018

Oil and Gas Privacy Notice:

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

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

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

Date of Notice: 12/20/2017 Date Permit Application Filed: 12/21/2017

Notice of:

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

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

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

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

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

SURFACE OWNER(s)

Name: Estate of Lawrence & Shirley Mae Conkle c/o Roy Conkle
Address: 75 Arlington Avenue
Moundsville, WV 26041

Name: Roy A. Conkle, Sr., and Lorie A.
Address: 75 Arlington Avenue
Moundsville, WV 26041 *See Attached*

SURFACE OWNER(s) (Road and/or Other Disturbance)

Name: Robert G. Hubbs and Scarlett E. Otte
Address: 132 Shepherds Ridge Lane
Glen Easton, WV 26039

Name: None
Address:

SURFACE OWNER(s) (Impoundments or Pits)

Name: None
Address:

COAL OWNER OR LESSEE

Name: Murray Energy Corporation
Address: 46226 National Road
St. Clairsville, OH 43950

COAL OPERATOR

Name: Same as above coal owner
Address:

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)

Name:
Address:

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: None
Address:

*Please attach additional forms if necessary

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

WW-6A
(8-13)

API NO. 47- 051 - 01975
OPERATOR WELL NO. Ten High 1S-8HM
Well Pad Name: Ten High

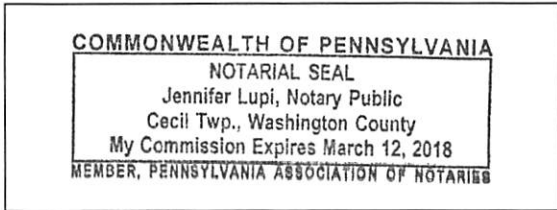
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 20th day of Dec, 2017.

Jennifer Lupi Notary Public

My Commission Expires March 12, 2018

WW-6A Notice of Application Attachment 1 of 1

Surface Owner(s):

Name: Teresa Anne Hughes and Michael J.
Address: 252 Conkle Drive
Glen Easton, WV 26039

Brenda Joyce Whetzel
1863 Shepherds Ridge Lane
Glen Easton, WV 26039

Larry Lee Conkle and Donna D.
154 Conkle Drive
Glen Easton, WV 26039

Exhibit WW-6A

Tug Hill Operating, LLC
 380 Southpointe Blvd, Suite 200
 Cannonsburg, PA 15137

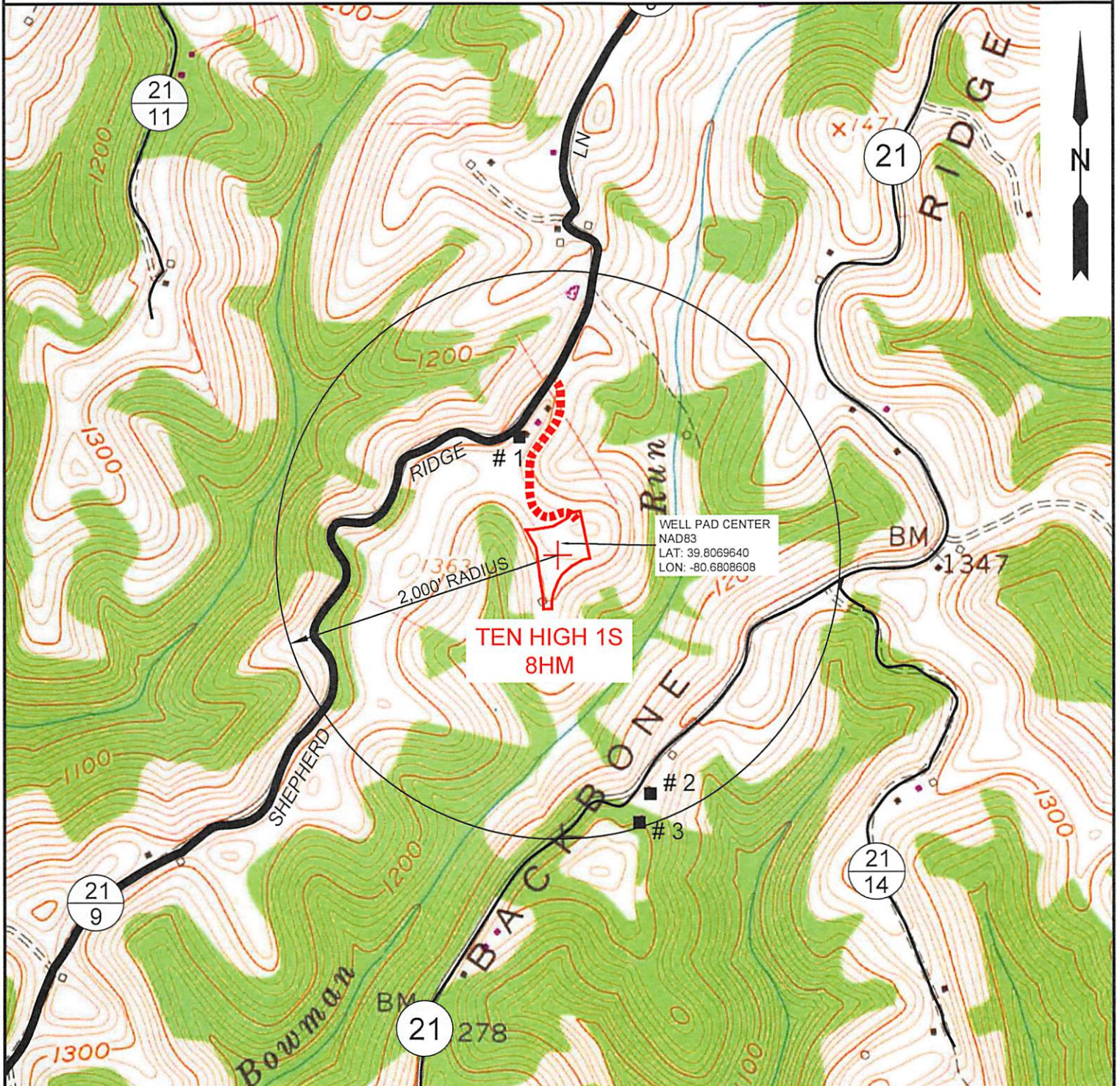
Residences within Two-Thousand Feet (2,000')

Well: Ten High 1S – 8HM
 District: Meade (House #'s 1-3)
 State: WV



There are three (3) residences, no businesses, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

<p>House 1 TM 7 Pcl. 24 Lawrence & Shirley Conkle Ests Phone: 304-845-1808; 304-848-1808 Physical Address: 77B Shepards Lane 932 Shepherd Ridge Ln. Glen Easton, WV 26039 Tax Address: 75 Arlington Ave. Moundsville, WV 26041</p>	<p>House 2 TM 7 Pcl. 25 Thomas R. & Kimberly Whitfield Phone: 304-843-1753 Physical Address: 53 Sallys Backbone Rd. 1834 Sally's Backbone Rd. Glen Easton, WV 26039 Tax Address: 1838 Sallys Backbone Rd. Glen Easton, WV 26039</p>	<p>House 3 TM 7 Pcl. 25 Thomas R. & Kimberly Whitfield Phone: 304-843-1753 Physical Address: 53 Sallys Backbone Rd. 1838 Sally's Backbone Rd. Glen Easton, WV 26039 Tax Address: Same</p>
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PROPOSED TEN HIGH 1S - 8HM



NOTE: THERE APPEARS TO BE THREE (3) POSSIBLE WATER SOURCES WITHIN 2,000'.

 <p>SLS Land & Energy Development <i>Solutions from the ground up.</i> P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 462-5634 www.slsurveys.com</p>	TOPO SECTION: GLEN EASTON 7.5'		OPERATOR: PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		
	COUNTY MARSHALL	DISTRICT MEADE	DRAWN BY: K.G.M.	JOB NO.: 8655	DATE: 09-13-17
	SCALE: 1" = 1000'				
	 <p>TUG HILL OPERATING</p>		<p>03/09/2018</p>		

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

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

Date of Notice: December 9, 2016 **Date of Planned Entry:** December 20, 2016

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

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

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

Notice is hereby provided to:

SURFACE OWNER(s)

Name: ESTATE OF LAWRENCE & SHIRLEY MAE CONKLE c/o Roy Conkle
Address: 75 ARLINGTON AVENUE
MOUNDSVILLE, WV 26041

Name: ROY A CONKLE, SR.
Address: 75 ARLINGTON AVENUE
MOUNDSVILLE, WV 26041

Name: LARRY CONKLE
Address: 154 CONKLE DRIVE
GLEN EASTON, WV 26039 **SEE ATTACHED**

COAL OWNER OR LESSEE

Name: MURRAY ENERGY CORPORATION
Address: 46226 NATIONAL ROAD
ST. CLAIRSVILLE, OH 43950

MINERAL OWNER(s)

Name: ESTATE OF LAWRENCE & SHIRLEY MAE CONKLE c/o Roy Conkle
Address: 75 ARLINGTON AVENUE
MOUNDSVILLE, WV 26041 **SEE ATTACHED**

*please attach additional forms if necessary

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State: <u>WEST VIRGINIA</u>	Approx. Latitude & Longitude: <u>LAT 39.8067775 LONG -80.6809192</u>
County: <u>MARSHALL</u>	Public Road Access: <u>SHEPHERD RIDGE LANE (Co. RT. 21/9)</u>
District: <u>MEADE</u>	Watershed: <u>HUC-10 FISH CREEK</u>
Quadrangle: <u>GLEN EASTON 7.5'</u>	Generally used farm name: <u>LAWRENCE CONKLE, SR.</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: <u>TUG HILL OPERATING, LLC</u>	Address: <u>380 SOUTHPOINTE BLVD., SOUTHPOINTE PLAZA II, SUITE 200</u>
Telephone: <u>(724) 749-8388</u>	<u>CANONSBURG, PA15317</u>
Email: <u>jwhite@tug-hilltop.com</u>	Facsimile: <u>(724) 388-2030</u>

Oil and Gas Privacy Notice:

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

WW-6A3 Notice of Entry for Plat Survey Attachment 1 of 1

Surface Owner(s):

Name: Teresa Hughes
Address: 252 Conkle Drive
Glen Easton, WV 26039

Brenda Joyce Wetzel
RD 1, Box 79
Glen Easton, WV 26039

Surface Owner(s) Access Road:

Name: Robert G. Hubbs and Scarlett E. Otte
132 Shepherd Ridge Lane
Glen Easton, WV 26039

Mineral Owner(s):

Name: Roy A. Conkle, Sr.
75 Arlington Avenue
Moundsville, WV 26041

Larry Conkle
154 Conkle Drive
Glen Easton, WV 26039

Teresa Hughes
252 Conkle Drive
Glen Easton, WV 26039

Brenda Joyce Wetzel
RD 1, Box 79
Glen Easton, WV 26039

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

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

Date of Notice: 09/11/2017 **Date Permit Application Filed:** 09/15/2017

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

- | | |
|--|-------------------------------|
| <input checked="" type="checkbox"/> CERTIFIED MAIL | <input type="checkbox"/> HAND |
| RETURN RECEIPT REQUESTED | DELIVERY |

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

Notice is hereby provided to the SURFACE OWNER(s)

(at the address listed in the records of the sheriff at the time of notice):

Name: Estate of Lawrence & Shirley Mae Conkle c/o Roy Conkle
Address: 75 Arlington Avenue
Moundsville, WV 26041

Name: Roy A. Conkle, Sr., and Lorie A.
Address: 75 Arlington Avenue
Moundsville, WV 26041 ****See Attached****

Notice is hereby given:

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

State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>527,316.63</u>
County: <u>Marshall</u>	Northing: <u>4,406,361.38</u>
District: <u>Meade</u>	Public Road Access: <u>Shepherd Ridge Lane (Co. Rt. 21/9)</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>LAWRENCE & SHIRLEY CONKLE, ESTS</u>
Watershed: <u>(HUC 10) Fish Creek</u>	

This Notice Shall Include:

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

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

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

Oil and Gas Privacy Notice:

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

51-01975

Operator Well Nos. TEN HIGH 1S-8HM

WW-6A5 Notice of Planned Operation Attachment 1 of 1

Surface Owner(s):

Name: Teresa Anne Hughes and Michael J.
Address: 252 Conkle Drive
Glen Easton, WV 26039

Brenda Joyce Whetzel
1863 Shepherds Ridge Lane
Glen Easton, WV 26039

Larry Lee Conkle and Donna D.
154 Conkle Drive
Glen Easton, WV 26039

Robert G. Hubbs and Scarlett E. Otte
132 Shepherds Ridge Lane
Glen Easton, WV 26039

03/09/2018

51-01975



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Jim Justice
Governor

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

May 16, 2017

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

Subject: DOH Permit for the Ten High 1N Pad, Marshall County
Ten High 1S Unit-8HM Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2017-0127 which has been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off of Marshall County Route 21/9 SLS.

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

Very Truly Yours,

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

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

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

51-01975



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Ten High 1S-8HM

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

WEST VIRGINIA COUNTY MAP



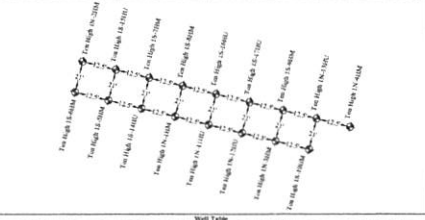
APPROVED WVDEP OOG 5/18/2017

Ten High Well Site Site Design, Construction Plan, & Erosion and Sediment Control Plans Tug Hill Operating Marshall County Meade District Latitude 39.80696402° Longitude -80.68086081° Middle Fish Creek Watershed

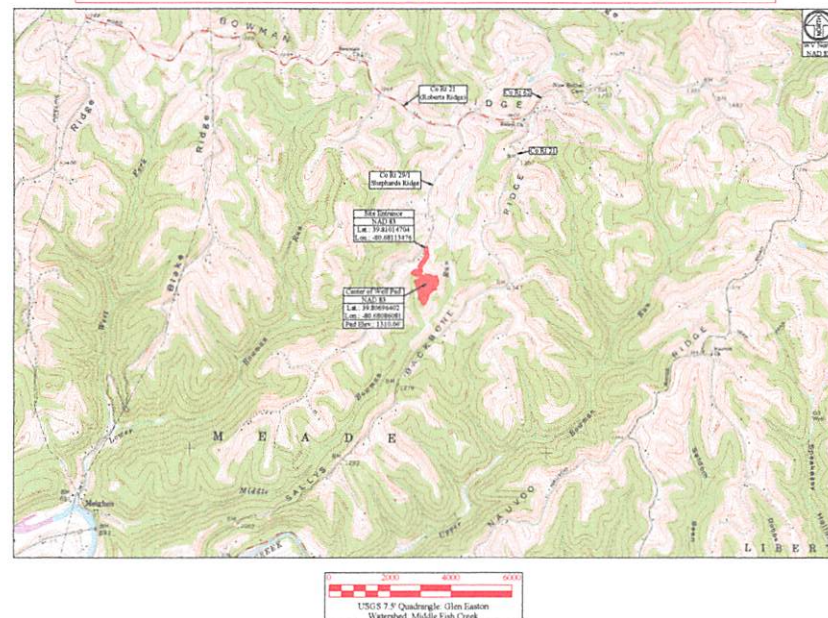
Pertinent Site Information Ten High Well Site Emergency Number: 304-845-1920 Meade District, Marshall County, WV Watershed: Middle Fish Creek Watershed Tug Hill Contact Number: 1-817-632-3400

Exhibit A: Final Design: Issue for Permitting

Table with 2 columns: Site Location, Center of Well Pad. Lists coordinates for various sites.



Grid of well pad locations with columns for different site locations (e.g., Ten High 14, Ten High 15) and rows for individual well pads.



WV State Plane Coordinate System North Line, NAD 83

Property Owner Information - Ten High Well Site. Table with columns for Owner, Address, and other details.

Access Road. Table with columns for Access Road, Type, and other details.

Disturbed Area. Table with columns for Disturbed Area, Type, and other details.

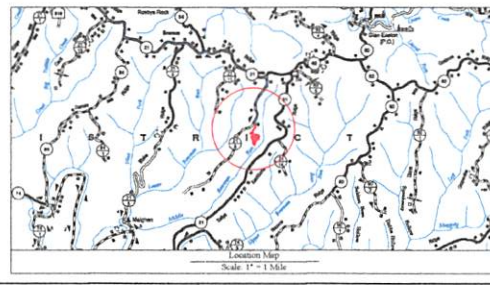
Ten High Well Site Quantities. Table with columns for Quantity, Unit, and other details.

USGS 7.5 Quadrangle (Glen Echo) Watershed: Middle Fish Creek

Site Locations (NAD 27) and Site Locations (NAD 83). Tables with columns for Structure, Latitude (DEC), Longitude (DEC), and other details.

Approach Routes:

From the intersection of WV Rt 2 and OH Rt 7 near New Martinsville, WV... Turn Right onto Co Rt 21 (Tug Hill Creek)...



Well Location Restrictions:

- All Pad construction complies with the following restrictions: *10' from an existing well or developed spring used for human or domestic animals...

Design Conditions:

The drawings, contract to construct and release drawings attached herein have been prepared in accordance with the West Virginia Code of Public Works, Division of Environmental Protection, Office of Oil and Gas (20)20-1.

Project Contacts:

Tug Hill Operating, LLC 300 Sandhollow Drive New Martinsville, PA 15301

Survey and Engineer: Kenneth Kelly, 304-394-0496

Environmental:

Wetland Delineations are provided by Allstate Ecology dated January 11, 2017.

Terrapin Information:

The terrapin information shown herein is based on aerial photography by the Missouri Natural Heritage, Boone, WV.

Tug Hill Operating will obtain an Encroachment Permit (Form MM-109) from the WV Department of Transportation, Division of Highways...

The WV Mines Website was consulted. Previous (Current) mining activities are within the ACE.

WVDEP Wetland Files show that there are no active and/or abandoned gas wells within the ACE.

Floodplain Conditions table with columns for Structure, Floodplain Conditions, and other details.

Vertical Datum: Design: NAVD83 Construction: NAD 83

Scale: 1" = 100'



THIS DOCUMENT PREPARED FOR TUG HILL OPERATING



11/20/2017

Ten High Well Site Meade District Marshall County, WV

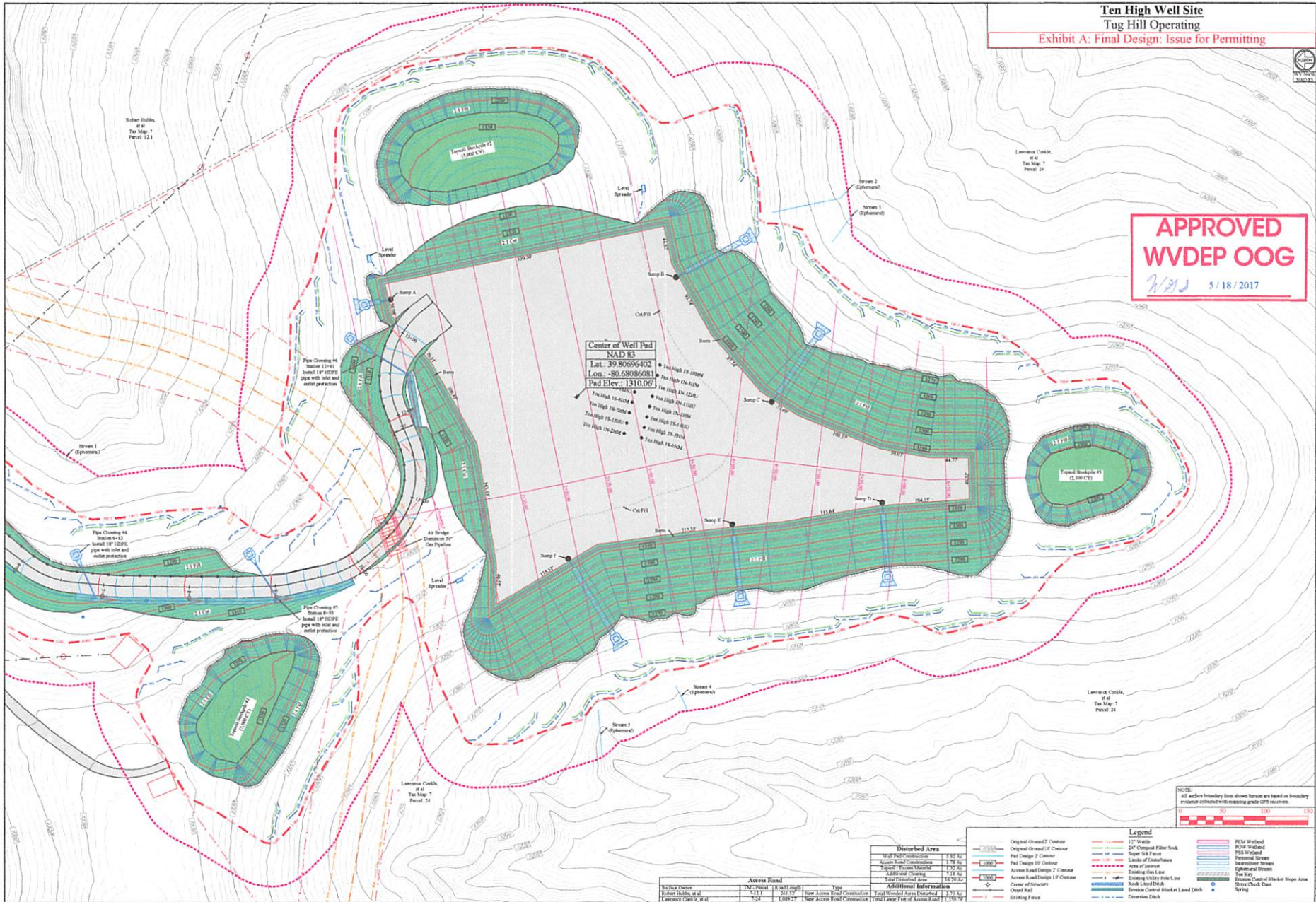
Sheet Description table with columns for Sheet, Description, and other details.

Draw: 8/17/2017 Scale: 1" = 100' Designer: JZS

Ten High Well Site
Tug Hill Operating
Exhibit A: Final Design: Issue for Permitting



APPROVED
WVDEP OOG
5/18/2017



Center of Well Pad
NAD 83
Lat.: 39.80696402
Lon.: -80.68086081
Pad Elev.: 1310.06'

Access Road	Type	Total
180' Access Road	New Access Road Construction	1,150' x 12' x 18" (11,500 sq ft)
180' Access Road	Existing Access Road	1,150' x 12' x 18" (11,500 sq ft)
Total Disturbed Area		23,000 sq ft

Disturbed Area	Area
Original Ground 2' Contour	1,150 sq ft
Original Ground 10' Contour	1,150 sq ft
Pad Design 2' Contour	1,150 sq ft
Pad Design 10' Contour	1,150 sq ft
Access Road Design 2' Contour	1,150 sq ft
Access Road Design 10' Contour	1,150 sq ft
Center of Structure	1,150 sq ft
Overall Footprint	1,150 sq ft

Legend

Original Ground 2' Contour	12" Waste	PEM Wetland
Original Ground 10' Contour	24" Compact Fiber Rock	P2W Wetland
Pad Design 2' Contour	36" Waste	P3W Wetland
Pad Design 10' Contour	Limit of Disturbance	Perennial Stream
Access Road Design 2' Contour	Area of Cultural Resources	Intermittent Stream
Access Road Design 10' Contour	Existing Gas Line	Epifaunal Stream
Center of Structure	Existing Utility Pole Line	Tree Key
Overall Footprint	Eviction Control Blanket Land Check	Eviction Control Blanket Slope Area
Blanket	Stream Check Dam	Spring
Blanket Fence	Stream Check Dam	

TUG HILL OPERATING
 THIS DOCUMENT PREPARED FOR TUG HILL OPERATING
 K&S CONSULTING
 Site Plan
 Ten High Well Site
 Meigs District
 Marshall County, WV
 Date: 05/18/2017
 Scale: As Shown
 Drawn By: ZS
 File No:
 Sheet 10 of 13