



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

Jim Justice , Governor
Austin Caperton , Cabinet Secretary
www.dep.wv.gov

Monday, July 17, 2017
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
550 BAILEY AVENUE, SUITE 510

FORT WORTH, TX 76107

Re: Permit approval for YODER E-5HM
47-051-01921-00-00

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: YODER E-5HM
Farm Name: NATHAN D. YODER, ET AL
U.S. WELL NUMBER: 47-051-01921-00-00
Horizontal 6A / New Drill
Date Issued: 7/17/2017

Promoting a healthy environment.

07/21/2017

PERMIT CONDITIONS

4705101921

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.

API Number: _____

PERMIT CONDITIONS 7 0 5 1 0 1 9 2 1

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.

07/21/2017

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

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Franklin Powhatan Point 7
Operator ID County District Quadrangle

2) Operator's Well Number: Yoder E-5HM Well Pad Name: Yoder

3) Farm Name/Surface Owner: Nathan D. Yoder, et al Public Road Access: Waynes Ridge Rd. - County Route 78

4) Elevation, current ground: 1,090' Elevation, proposed post-construction: 1,084'

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

(b) If Gas Shallow X Deep _____
Horizontal X _____

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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 6,129' - 6,184', thickness of 55' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,284'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 13,125'

11) Proposed Horizontal Leg Length: 6,350'

12) Approximate Fresh Water Strata Depths: 70', 661'

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: 1,740'

15) Approximate Coal Seam Depths: Sewickly Coal - 564' and Pittsburgh Coal - 654'

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

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

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

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18) **CASING AND TUBING PROGRAM**

TYPE	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	30"	NEW	BW	BW	125'	120'	259FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	48#	810'	800'	906ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	810'	800'	906ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,614'	2,604'	845ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	13,135'	13,125'	3,354ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,007'	
Liners							

JM
3/28/17

TYPE	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17.5"	.33	1,730	1,384	SEE #24	1.2
Coal	13 3/8"	17.5"	.33	1,730	1,384	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	10,112	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

PACKERS

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

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Environmental Protection
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WW-6B
(10/14)

API NO. 47- 051 - _____
OPERATOR WELL NO. Yoder E-5HM
Well Pad Name: Yoder

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3/28/17

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 15,600,000 lb proppant and 427,143 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

470570

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 19.66

22) Area to be disturbed for well pad only, less access road (acres): 4.36

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 Attachment

25) Proposed borehole conditioning procedures:

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

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*Note: Attach additional sheets as needed.

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 (7/15/2016) 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 - Yoder E-5HM
Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Comments
4705170805	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely, Probably an old shallow well Old well, records are incomplete, no record found on WVDEP website. A field survey was conducted to locate this well and it was found abandoned at the location shown on the well plat.
4705170804	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely, Probably an old shallow well Old well, records are incomplete, no record found on WVDEP website. A field survey was conducted to locate this well and no evidence of this well was found.

WV Geological & Economic Survey
Well: County = 61 Permit = 70805

Location Information: View Map
API: 4705170805 COUNTY: Marshall PERMIT: 70805 TAX DISTRICT: Franklin QUAD: 75 QUAD_16 LAY: 05 LON: 05 UTIME: UTMN
Position Point: Charleston, 39 77 12 79 -80 22 77 69 514750 S 440238 E

There is no Bottom Hole Location data for this well

Owner Information:
API: 4705170805 CMP_DY: SUFFIX: STATUS: SURFACE_OWNER: WELL_NUM: CO_NUM: LEASE: LEASE_NUM: MINERAL_OWN: OPERATOR: PROP_VO: PROP_TRGT_FM: YFM_EST_FR

Completion Information:
API: 4705170805 CMP_DY: SPUD_DT: ELEV DATUM FIELD DEEPEST_FM DEEPEST_FMT INITIAL_CLASS FINAL_CLASS TYPE RIG CMP_MTHD TVD TMD NEW_FTG G_BEFF G_AFT O_BEFF O_AFT

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

WV Geological & Economic Survey
Well: County = 61 Permit = 70804

Location Information: View Map
API: 4705170804 COUNTY: Marshall PERMIT: 70804 TAX DISTRICT: Franklin QUAD: 76 QUAD_16 LAY: 05 LON: 05 UTIME: UTMN
Position Point: Charleston, 39 77 02 50 -80 20 70 16 514815 S 440273 E

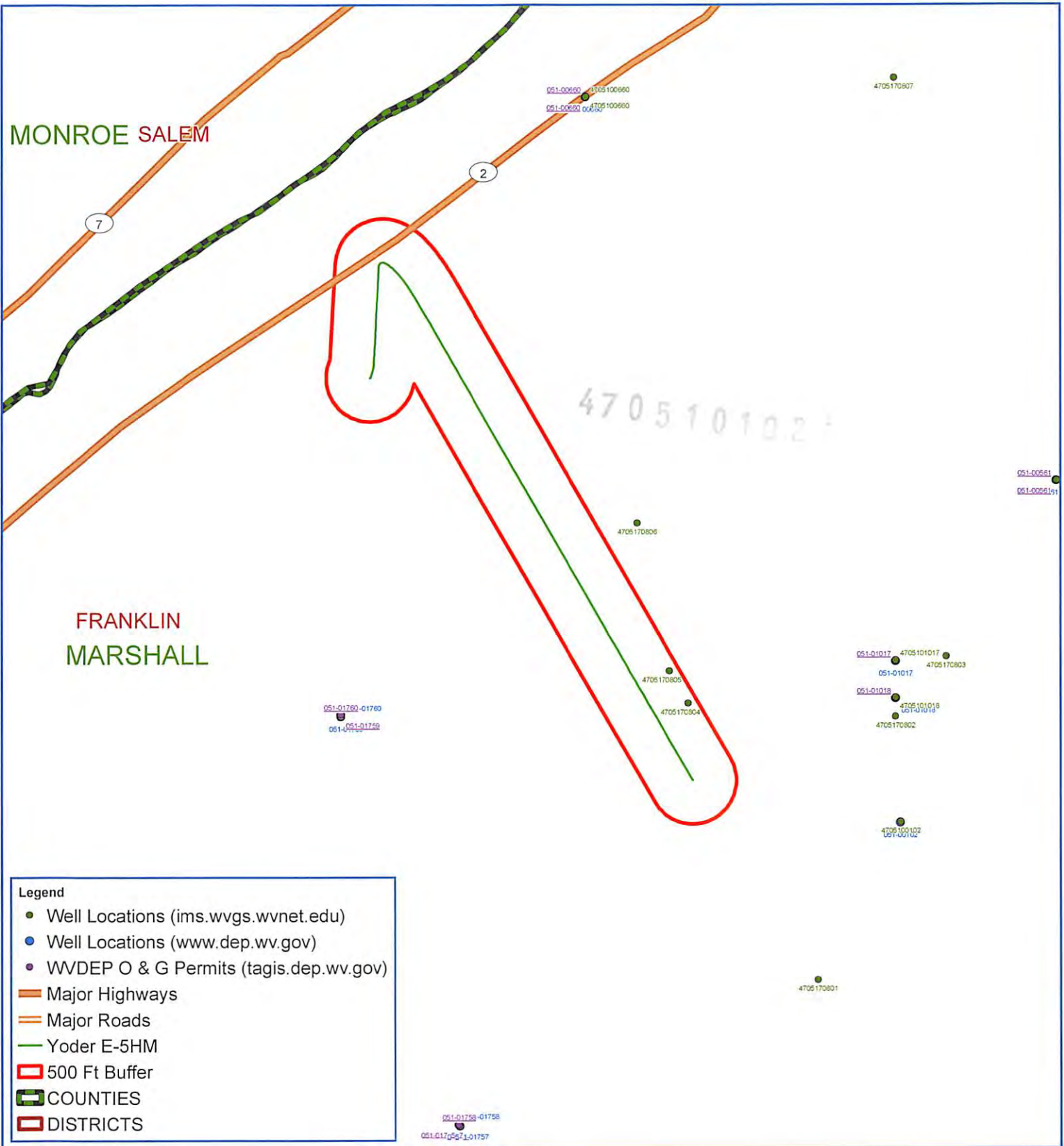
There is no Bottom Hole Location data for this well

Owner Information:
API: 4705170804 CMP_DY: SUFFIX: STATUS: SURFACE_OWNER: WELL_NUM: CO_NUM: LEASE: LEASE_NUM: MINERAL_OWN: OPERATOR: PROP_VO: PROP_TRGT_FM: YFM_EST_FR

Completion Information:
API: 4705170804 CMP_DY: SPUD_DT: ELEV DATUM FIELD DEEPEST_FM DEEPEST_FMT INITIAL_CLASS FINAL_CLASS TYPE RIG CMP_MTHD TVD TMD NEW_FTG G_BEFF G_AFT O_BEFF O_AFT NGL_BEFF NGL_AFT

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

5.11. Area of Review-- The permittee shall review the area surrounding the proposed well pad so as to identify and evaluate potential conduits for unintended fracture propagation, a report of which the permittee shall provide to the Office with the application for well work. All existing active, plugged, abandoned, and undocumented wells within a five hundred feet (500') radius of the surface location of the well that is the subject of the new application and within a five hundred feet (500') radius of the lateral section of the wellbore shall be considered for the potential of unintended fracture propagation. The report shall detail those wells that are known or reasonably expected to penetrate a depth that could be within the range of the fracture propagation. The detail shall include at a minimum the API number, operator name, total depth, perforated formation(s) and producing zones not perforated.



- Legend**
- Well Locations (ims.wvgs.wvnet.edu)
 - Well Locations (www.dep.wv.gov)
 - WVDEP O & G Permits (tagis.dep.wv.gov)
 - Major Highways
 - Major Roads
 - Yoder E-5HM
 - 500 Ft Buffer
 - COUNTIES
 - DISTRICTS



Yoder E-5HM Franklin District Marshall County, WV



Map Created: March 22, 2017
Map Current As Of: March 22, 2017

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

Conductor and Surface 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

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Production Casing Cement:

Lead: 50:50 (Poz:Premium NE-1) + .2% R-3 + .2% MPA-170 + .75 gal/100sk FP-13L

Tail: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L

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

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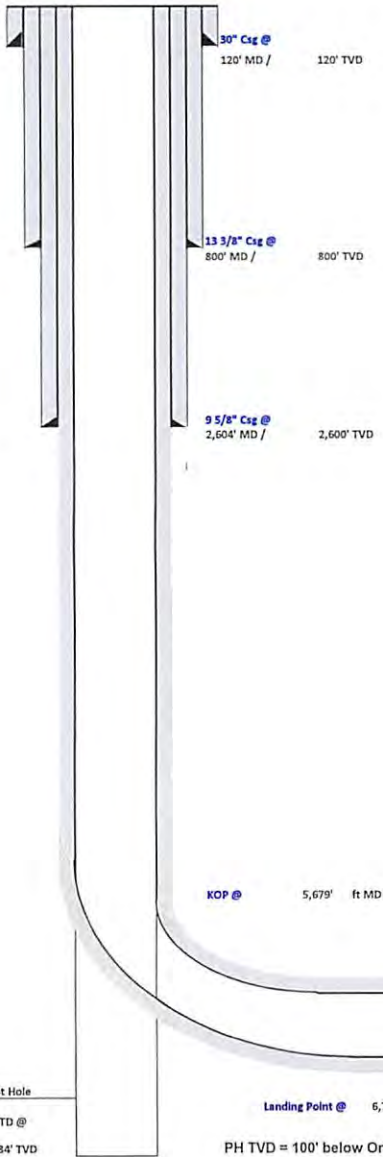


WELL NAME: **Yoder E-SHM**
 STATE: **West Virginia** COUNTY: **Marshall**
 DISTRICT: **Franklin**
 KB Elev: _____ GL Elev: **1,084'**
 TD: **13,125'**
 TH Latitude: **39.78049375**
 TH Longitude: **-80.83999435**
 BH Latitude: **39.76784151**
 BH Longitude: **-80.82684632**

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	661
Sewickley Coal	564
Pittsburgh Coal	654
Big Lime	1790
Weir	2140
Berea	2330
Gordon	2675
Rhinestreet	5589
Geneseo/Burkett	6072
Tully	6087
Hamilton	6100
Marcellus	6129
Landing Depth	6178
Onondaga	6184
Pilot Hole Depth	6284

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36"	30"	120'	120'	BW	BW	Surface
Surface	17 1/2"	13 3/8"	800'	800'	48	H30	Surface
Intermediate 1	12 1/4"	9 5/8"	2,604'	2,600'	36	J33	Surface
Production	8 7/8" x 8 3/4"	5 1/2"	13,125'	6,289'	20	P110	Surface

	CEMENT SUMMARY			DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	901	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	842	A	15	Air	1 Centralizer every other jt
Production	2,957	A	14.5	Air / SOBMM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



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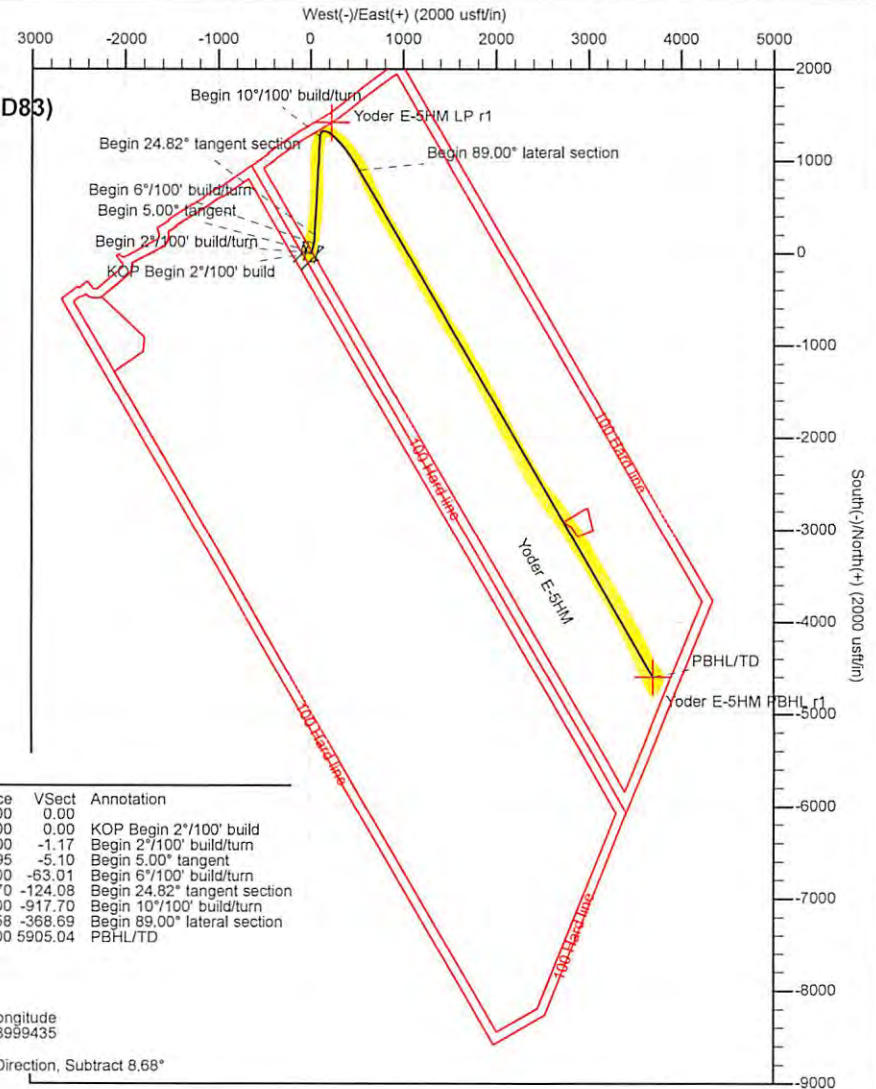
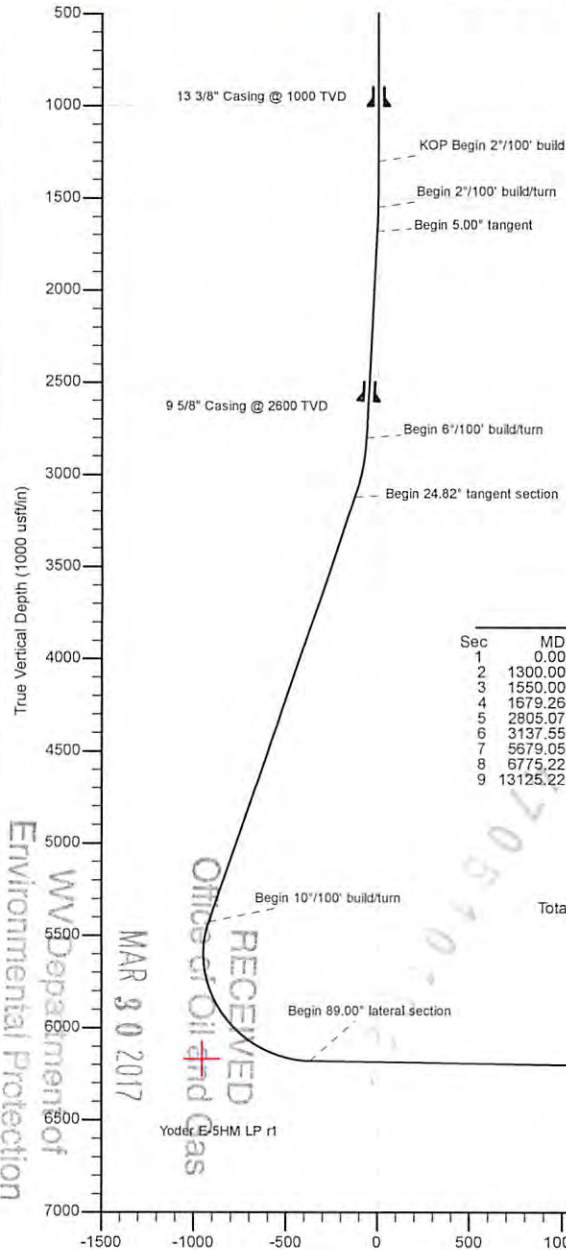
Pilot Hole
 PH TD @ 6,284' TVD
 Landing Point @ 6,775' MD / 6,178' TVD
 PH TVD = 100' below Onondaga Top

Lateral TD @ 13,125' ft MD
 6,289' ft TVD



TUG HILL
OPERATING

Tug Hill Operating LLC
Well: Yoder E-5HM
Site: Yoder
Project: Wetzel County, West Virginia (UTM17 NAD83)
Design: rev1



SECTION DETAILS

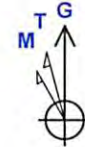
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	45.00	0.00	KOP Begin 2°/100' build
3	1550.00	5.00	45.00	1549.68	7.71	7.71	2.00	45.00	-1.17	Begin 2°/100' build/turn
4	1679.26	5.00	15.00	1678.47	17.13	13.15	2.00	-104.95	-5.10	Begin 5.00° tangent
5	2805.07	5.00	15.00	2800.00	111.91	38.55	0.00	0.00	-63.01	Begin 6°/100' build/turn
6	3137.55	24.82	3.09	3119.73	196.43	46.14	6.00	-14.70	-124.08	Begin 24.82° tangent section
7	5679.05	24.82	3.09	5426.55	1261.56	103.70	0.00	0.00	-917.70	Begin 10°/100' build/turn
8	6775.22	89.00	150.00	6178.18	898.55	528.27	10.00	144.58	-368.69	Begin 89.00° lateral section
9	13125.22	89.00	150.00	6289.00	-4599.87	3702.79	0.00	0.00	5905.04	PBHL/TD

Surface Location: GL @ 1086.00usft
 Universal Transverse Mercator (US Survey Feet)
 NAD83 West Virginia - HARN
 Zone 17N (84 W to 78 W)

Northing	Easting	Latitude	Longitude
14446843.79	1685369.56	39.78049300	-80.83999435

Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Subtract 8.68°

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Azimuths to Grid North
 True North: -0.10°
 Magnetic North: -8.68°

Magnetic Field
 Strength: 52257.4snT
 Dip Angle: 67.02°
 Date: 11/6/2016
 Model: IGRF2015





Planning Report - Geographic

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Yoder E-5HM
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1086.00usft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1086.00usft
Site:	Yoder	North Reference:	Grid
Well:	Yoder E-5HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Project	Wetzel County, West Virginia (UTM17 NAD83)		
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	Yoder				
Site Position:		Northing:	14,446,864.35 usft	Latitude:	39.78054955
From:	Lat/Long	Easting:	1,685,354.97 usft	Longitude:	-80.84004615
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.10 °

Well	Yoder E-5HM					
Well Position	+N-S	0.00 usft	Northing:	14,446,843.79 usft	Latitude:	39.78049300
	+E-W	0.00 usft	Easting:	1,685,369.56 usft	Longitude:	-80.83999435
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,086.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/6/2016	-8.57	67.02	52,257

Design	rev1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0.00	0.00	0.00	141.17	

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	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,550.00	5.00	45.00	1,549.68	7.71	7.71	2.00	2.00	0.00	45.00	
1,679.26	5.00	15.00	1,678.47	17.13	13.15	2.00	0.00	-23.21	-104.95	
2,805.07	5.00	15.00	2,800.00	111.91	38.55	0.00	0.00	0.00	0.00	
3,137.55	24.82	3.09	3,119.73	196.43	46.14	6.00	5.96	-3.58	-14.70	
5,679.05	24.82	3.09	5,426.55	1,261.56	103.70	0.00	0.00	0.00	0.00	
6,775.22	89.00	150.00	6,178.18	898.55	528.27	10.00	5.86	13.40	144.58	
13,125.22	89.00	150.00	6,269.00	-4,599.87	3,702.79	0.00	0.00	0.00	0.00	Yoder E-5HM PBHL r

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Office of Oil and Gas

MAR 30 2017



Planning Report - Geographic

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Yoder E-5HM
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1086.00usft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1086.00usft
Site:	Yoder	North Reference:	Grid
Well:	Yoder E-5HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
100.00	0.00	0.00	100.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
200.00	0.00	0.00	200.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
300.00	0.00	0.00	300.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
400.00	0.00	0.00	400.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
500.00	0.00	0.00	500.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
600.00	0.00	0.00	600.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
700.00	0.00	0.00	700.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
800.00	0.00	0.00	800.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
900.00	0.00	0.00	900.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,446,843.79	1,685,369.56	39.78049300	-80.83999435	
KOP Begin 2°/100' build										
1,400.00	2.00	45.00	1,399.98	1.23	1.23	14,446,845.02	1,685,370.79	39.78049638	-80.83998995	
1,500.00	4.00	45.00	1,499.84	4.93	4.93	14,446,848.72	1,685,374.49	39.78050653	-80.83997676	
1,550.00	5.00	45.00	1,549.68	7.71	7.71	14,446,851.50	1,685,377.27	39.78051413	-80.83996686	
Begin 2°/100' build/turn										
1,600.00	4.84	33.47	1,599.50	11.01	10.41	14,446,854.80	1,685,379.97	39.78052318	-80.83995722	
1,679.26	5.00	15.00	1,678.47	17.13	13.15	14,446,860.92	1,685,382.71	39.78053999	-80.83994744	
Begin 5.00° tangent										
1,700.00	5.00	15.00	1,699.13	18.88	13.62	14,446,862.67	1,685,383.18	39.78054479	-80.83994576	
1,800.00	5.00	15.00	1,798.75	27.30	15.87	14,446,871.09	1,685,385.43	39.78056789	-80.83993768	
1,900.00	5.00	15.00	1,898.37	35.72	18.13	14,446,879.51	1,685,387.69	39.78059100	-80.83992959	
2,000.00	5.00	15.00	1,997.99	44.14	20.39	14,446,887.92	1,685,389.95	39.78061411	-80.83992151	
2,100.00	5.00	15.00	2,097.61	52.55	22.64	14,446,896.34	1,685,392.20	39.78063722	-80.83991343	
2,200.00	5.00	15.00	2,197.23	60.97	24.90	14,446,904.76	1,685,394.46	39.78066033	-80.83990535	
2,300.00	5.00	15.00	2,296.85	69.39	27.15	14,446,913.18	1,685,396.71	39.78068344	-80.83989726	
2,400.00	5.00	15.00	2,396.47	77.81	29.41	14,446,921.60	1,685,398.97	39.78070655	-80.83988918	
2,500.00	5.00	15.00	2,496.09	86.23	31.66	14,446,930.02	1,685,401.22	39.78072966	-80.83988110	
2,600.00	5.00	15.00	2,595.71	94.65	33.92	14,446,938.44	1,685,403.48	39.78075276	-80.83987301	
2,700.00	5.00	15.00	2,695.33	103.07	36.18	14,446,946.85	1,685,405.74	39.78077587	-80.83986493	
2,800.00	5.00	15.00	2,794.95	111.48	38.43	14,446,955.27	1,685,407.99	39.78079898	-80.83985685	
2,805.07	5.00	15.00	2,800.00	111.91	38.55	14,446,955.70	1,685,408.11	39.78080015	-80.83985644	
Begin 6°/100' build/turn										
2,900.00	10.61	7.14	2,894.01	124.59	40.70	14,446,968.38	1,685,410.26	39.78083496	-80.83984868	
3,000.00	16.58	4.61	2,991.17	147.96	43.00	14,446,991.75	1,685,412.56	39.78089914	-80.83984037	
3,100.00	22.57	3.40	3,085.35	181.37	45.28	14,447,025.16	1,685,414.84	39.78099087	-80.83983201	
3,137.55	24.82	3.09	3,119.73	196.43	46.14	14,447,040.22	1,685,415.70	39.78103224	-80.83982888	
Begin 24.82° tangent section										
3,200.00	24.82	3.09	3,176.42	222.60	47.55	14,447,066.39	1,685,417.11	39.78110411	-80.83982368	
3,300.00	24.82	3.09	3,267.18	264.51	49.82	14,447,108.30	1,685,419.38	39.78121919	-80.83981535	
3,400.00	24.82	3.09	3,357.95	306.42	52.08	14,447,150.21	1,685,421.64	39.78133427	-80.83980702	
3,500.00	24.82	3.09	3,448.71	348.33	54.35	14,447,192.12	1,685,423.91	39.78144936	-80.83979869	
3,600.00	24.82	3.09	3,539.48	390.24	56.61	14,447,234.03	1,685,426.17	39.78156444	-80.83979036	
3,700.00	24.82	3.09	3,630.25	432.15	58.88	14,447,275.94	1,685,428.44	39.78167953	-80.83978204	
3,800.00	24.82	3.09	3,721.01	474.06	61.14	14,447,317.85	1,685,430.70	39.78179461	-80.83977371	
3,900.00	24.82	3.09	3,811.78	515.97	63.41	14,447,359.76	1,685,432.97	39.78190970	-80.83976538	
4,000.00	24.82	3.09	3,902.54	557.88	65.67	14,447,401.67	1,685,435.23	39.78202478	-80.83975705	
4,100.00	24.82	3.09	3,993.31	599.79	67.94	14,447,443.58	1,685,437.50	39.78213987	-80.83974872	
4,200.00	24.82	3.09	4,084.07	641.70	70.20	14,447,485.49	1,685,439.76	39.78225495	-80.83974039	
4,300.00	24.82	3.09	4,174.84	683.61	72.47	14,447,527.40	1,685,442.03	39.78237004	-80.83973206	

Office of the State Auditor
 and
 State Treasurer
 WV Department of Environmental Protection
 COMPASS 5000.1 Build 81B
 07/21/2017



Planning Report - Geographic

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Yoder E-5HM
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1086.00usft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1086.00usft
Site:	Yoder	North Reference:	Grid
Well:	Yoder E-5HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,400.00	24.82	3.09	4,265.61	725.52	74.73	14,447,569.31	1,685,444.29	39.78248512	-80.83972373	
4,500.00	24.82	3.09	4,356.37	767.43	76.99	14,447,611.22	1,685,446.56	39.78260020	-80.83971541	
4,600.00	24.82	3.09	4,447.14	809.34	79.26	14,447,653.13	1,685,448.82	39.78271529	-80.83970708	
4,700.00	24.82	3.09	4,537.90	851.25	81.52	14,447,695.04	1,685,451.08	39.78283037	-80.83969875	
4,800.00	24.82	3.09	4,628.67	893.16	83.79	14,447,736.95	1,685,453.35	39.78294546	-80.83969042	
4,900.00	24.82	3.09	4,719.44	935.07	86.05	14,447,778.86	1,685,455.61	39.78306054	-80.83968209	
5,000.00	24.82	3.09	4,810.20	976.98	88.32	14,447,820.77	1,685,457.88	39.78317563	-80.83967376	
5,100.00	24.82	3.09	4,900.97	1,018.89	90.58	14,447,862.68	1,685,460.14	39.78329071	-80.83966543	
5,200.00	24.82	3.09	4,991.73	1,060.80	92.85	14,447,904.59	1,685,462.41	39.78340580	-80.83965710	
5,300.00	24.82	3.09	5,082.50	1,102.71	95.11	14,447,946.49	1,685,464.67	39.78352088	-80.83964878	
5,400.00	24.82	3.09	5,173.27	1,144.62	97.38	14,447,988.40	1,685,466.94	39.78363597	-80.83964045	
5,500.00	24.82	3.09	5,264.03	1,186.53	99.64	14,448,030.31	1,685,469.20	39.78375105	-80.83963212	
5,600.00	24.82	3.09	5,354.80	1,228.43	101.91	14,448,072.22	1,685,471.47	39.78386613	-80.83962379	
5,679.05	24.82	3.09	5,426.55	1,261.56	103.70	14,448,105.35	1,685,473.26	39.78395711	-80.83961720	
Begin 10°/100' build/turn										
5,700.00	23.14	6.18	5,445.69	1,270.05	104.38	14,448,113.84	1,685,473.94	39.78398040	-80.83961473	
5,800.00	16.43	28.52	5,539.87	1,302.09	113.27	14,448,145.87	1,685,482.83	39.78406835	-80.83958287	
5,900.00	14.15	66.18	5,636.55	1,319.49	131.25	14,448,163.28	1,685,500.81	39.78411606	-80.83951876	
6,000.00	18.07	100.03	5,732.81	1,321.73	157.77	14,448,165.52	1,685,527.33	39.78412208	-80.83942433	
6,100.00	25.47	118.49	5,825.72	1,308.74	192.03	14,448,152.53	1,685,561.59	39.78408624	-80.83930247	
6,200.00	34.16	128.56	5,912.46	1,280.92	232.99	14,448,124.71	1,685,602.55	39.78400962	-80.83915686	
6,300.00	43.36	134.85	5,990.38	1,239.10	279.40	14,448,082.89	1,685,648.96	39.78389456	-80.83899193	
6,400.00	52.81	139.28	6,057.13	1,184.57	329.85	14,448,028.35	1,685,699.41	39.78374453	-80.83881271	
6,500.00	62.38	142.71	6,110.68	1,118.97	382.80	14,447,962.75	1,685,752.36	39.7836412	-80.83862462	
6,600.00	72.02	145.58	6,149.39	1,044.30	436.66	14,447,888.08	1,685,806.22	39.78335878	-80.83843339	
6,700.00	81.71	148.16	6,172.09	962.82	489.78	14,447,806.61	1,685,859.34	39.78313478	-80.83824483	
6,775.22	89.00	150.00	6,178.18	898.55	528.28	14,447,742.34	1,685,897.84	39.78295807	-80.83810823	
Begin 89.00° lateral section										
6,800.00	89.00	150.00	6,178.61	877.09	540.66	14,447,720.88	1,685,910.22	39.78289909	-80.83806427	
6,900.00	89.00	150.00	6,180.36	790.51	590.66	14,447,634.29	1,685,960.22	39.78266104	-80.83788688	
7,000.00	89.00	150.00	6,182.10	703.92	640.65	14,447,547.70	1,686,010.21	39.78242299	-80.83770949	
7,100.00	89.00	150.00	6,183.85	617.33	690.64	14,447,461.12	1,686,060.20	39.78218494	-80.83753210	
7,200.00	89.00	150.00	6,185.59	530.74	740.63	14,447,374.53	1,686,110.19	39.78194689	-80.83735472	
7,300.00	89.00	150.00	6,187.34	444.15	790.63	14,447,287.94	1,686,160.19	39.78170884	-80.83717733	
7,400.00	89.00	150.00	6,189.08	357.56	840.62	14,447,201.35	1,686,210.18	39.78147080	-80.83699995	
7,500.00	89.00	150.00	6,190.83	270.97	890.61	14,447,114.76	1,686,260.17	39.78123275	-80.83682256	
7,600.00	89.00	150.00	6,192.57	184.38	940.60	14,447,028.17	1,686,310.16	39.78099470	-80.83664518	
7,700.00	89.00	150.00	6,194.32	97.79	990.59	14,446,941.58	1,686,360.16	39.78075665	-80.83646780	
7,800.00	89.00	150.00	6,196.06	11.20	1,040.59	14,446,854.99	1,686,410.15	39.78051860	-80.83629042	
7,900.00	89.00	150.00	6,197.81	-75.39	1,090.58	14,446,768.40	1,686,460.14	39.78028055	-80.83611304	
8,000.00	89.00	150.00	6,199.55	-161.98	1,140.57	14,446,681.81	1,686,510.13	39.78004250	-80.83593566	
8,100.00	89.00	150.00	6,201.30	-248.57	1,190.56	14,446,595.22	1,686,560.12	39.77980445	-80.83575829	
8,200.00	89.00	150.00	6,203.04	-335.16	1,240.56	14,446,508.63	1,686,610.12	39.77956639	-80.83558091	
8,300.00	89.00	150.00	6,204.79	-421.75	1,290.55	14,446,422.04	1,686,660.11	39.77932834	-80.83540354	
8,400.00	89.00	150.00	6,206.53	-508.34	1,340.54	14,446,335.45	1,686,710.10	39.77909029	-80.83522617	
8,500.00	89.00	150.00	6,208.28	-594.92	1,390.53	14,446,248.86	1,686,760.09	39.77885224	-80.83504879	
8,600.00	89.00	150.00	6,210.02	-681.51	1,440.53	14,446,162.27	1,686,810.09	39.77861419	-80.83487142	
8,700.00	89.00	150.00	6,211.77	-768.10	1,490.52	14,446,075.69	1,686,860.08	39.77837613	-80.83469406	
8,800.00	89.00	150.00	6,213.51	-854.69	1,540.51	14,445,989.10	1,686,910.07	39.77813808	-80.83451669	
8,900.00	89.00	150.00	6,215.26	-941.28	1,590.50	14,445,902.51	1,686,960.06	39.77790003	-80.83433932	
9,000.00	89.00	150.00	6,217.01	-1,027.87	1,640.50	14,445,815.92	1,687,010.06	39.77766198	-80.83416196	
9,100.00	89.00	150.00	6,218.75	-1,114.46	1,690.49	14,445,729.33	1,687,060.05	39.77742392	-80.83398459	
9,200.00	89.00	150.00	6,220.50	-1,201.05	1,740.48	14,445,642.74	1,687,110.04	39.77718587	-80.83380723	



Planning Report - Geographic

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Yoder E-5HM
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1086.00usft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1086.00usft
Site:	Yoder	North Reference:	Grid
Well:	Yoder E-5HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,300.00	89.00	150.00	6,222.24	-1,287.64	1,790.47	14,445,556.15	1,687,160.03	39.77694781	-80.83362987	
9,400.00	89.00	150.00	6,223.99	-1,374.23	1,840.47	14,445,469.56	1,687,210.03	39.77670976	-80.83345251	
9,500.00	89.00	150.00	6,225.73	-1,460.82	1,890.46	14,445,382.97	1,687,260.02	39.77647170	-80.83327515	
9,600.00	89.00	150.00	6,227.48	-1,547.41	1,940.45	14,445,296.38	1,687,310.01	39.77623365	-80.83309779	
9,700.00	89.00	150.00	6,229.22	-1,634.00	1,990.44	14,445,209.79	1,687,360.00	39.77599559	-80.83292043	
9,800.00	89.00	150.00	6,230.97	-1,720.59	2,040.44	14,445,123.20	1,687,410.00	39.77575754	-80.83274308	
9,900.00	89.00	150.00	6,232.71	-1,807.18	2,090.43	14,445,036.61	1,687,459.99	39.77551948	-80.83256573	
10,000.00	89.00	150.00	6,234.46	-1,893.76	2,140.42	14,444,950.02	1,687,509.98	39.77528143	-80.83238837	
10,100.00	89.00	150.00	6,236.20	-1,980.35	2,190.41	14,444,863.43	1,687,559.97	39.77504337	-80.83221102	
10,200.00	89.00	150.00	6,237.95	-2,066.94	2,240.40	14,444,776.85	1,687,609.96	39.77480531	-80.83203367	
10,300.00	89.00	150.00	6,239.69	-2,153.53	2,290.40	14,444,690.26	1,687,659.96	39.77456726	-80.83185632	
10,400.00	89.00	150.00	6,241.44	-2,240.12	2,340.39	14,444,603.67	1,687,709.95	39.77432920	-80.83167897	
10,500.00	89.00	150.00	6,243.18	-2,326.71	2,390.38	14,444,517.08	1,687,759.94	39.77409114	-80.83150163	
10,600.00	89.00	150.00	6,244.93	-2,413.30	2,440.37	14,444,430.49	1,687,809.93	39.77385308	-80.83132428	
10,700.00	89.00	150.00	6,246.67	-2,499.89	2,490.37	14,444,343.90	1,687,859.93	39.77361503	-80.83114694	
10,800.00	89.00	150.00	6,248.42	-2,586.48	2,540.36	14,444,257.31	1,687,909.92	39.77337697	-80.83096959	
10,900.00	89.00	150.00	6,250.16	-2,673.07	2,590.35	14,444,170.72	1,687,959.91	39.77313891	-80.83079225	
11,000.00	89.00	150.00	6,251.91	-2,759.66	2,640.34	14,444,084.13	1,688,009.90	39.77290085	-80.83061491	
11,100.00	89.00	150.00	6,253.66	-2,846.25	2,690.34	14,443,997.54	1,688,059.90	39.77266279	-80.83043757	
11,200.00	89.00	150.00	6,255.40	-2,932.84	2,740.33	14,443,910.95	1,688,109.89	39.77242473	-80.83026023	
11,300.00	89.00	150.00	6,257.15	-3,019.43	2,790.32	14,443,824.36	1,688,159.88	39.77218667	-80.83008290	
11,400.00	89.00	150.00	6,258.89	-3,106.02	2,840.31	14,443,737.77	1,688,209.87	39.77194861	-80.82990556	
11,500.00	89.00	150.00	6,260.64	-3,192.61	2,890.31	14,443,651.18	1,688,259.87	39.77171055	-80.82972823	
11,600.00	89.00	150.00	6,262.38	-3,279.19	2,940.30	14,443,564.59	1,688,309.86	39.77147249	-80.82955089	
11,700.00	89.00	150.00	6,264.13	-3,365.78	2,990.29	14,443,478.00	1,688,359.85	39.77123443	-80.82937356	
11,800.00	89.00	150.00	6,265.87	-3,452.37	3,040.28	14,443,391.42	1,688,409.84	39.77099637	-80.82919623	
11,900.00	89.00	150.00	6,267.62	-3,538.96	3,090.28	14,443,304.83	1,688,459.84	39.77075831	-80.82901890	
12,000.00	89.00	150.00	6,269.36	-3,625.55	3,140.27	14,443,218.24	1,688,509.83	39.77052025	-80.82884157	
12,100.00	89.00	150.00	6,271.11	-3,712.14	3,190.26	14,443,131.65	1,688,559.82	39.77028218	-80.82866424	
12,200.00	89.00	150.00	6,272.85	-3,798.73	3,240.25	14,443,045.06	1,688,609.81	39.77004412	-80.82848692	
12,300.00	89.00	150.00	6,274.60	-3,885.32	3,290.24	14,442,958.47	1,688,659.80	39.76980606	-80.82830959	
12,400.00	89.00	150.00	6,276.34	-3,971.91	3,340.24	14,442,871.88	1,688,709.80	39.76956800	-80.82813227	
12,500.00	89.00	150.00	6,278.09	-4,058.50	3,390.23	14,442,785.29	1,688,759.79	39.76932993	-80.82795495	
12,600.00	89.00	150.00	6,279.83	-4,145.09	3,440.22	14,442,698.70	1,688,809.78	39.76909187	-80.82777762	
12,700.00	89.00	150.00	6,281.58	-4,231.68	3,490.21	14,442,612.11	1,688,859.77	39.76885381	-80.82760030	
12,800.00	89.00	150.00	6,283.32	-4,318.27	3,540.21	14,442,525.52	1,688,909.77	39.76861574	-80.82742299	
12,900.00	89.00	150.00	6,285.07	-4,404.86	3,590.20	14,442,438.93	1,688,959.76	39.76837768	-80.82724567	
13,000.00	89.00	150.00	6,286.81	-4,491.45	3,640.19	14,442,352.34	1,689,009.75	39.76813961	-80.82706835	
13,100.00	89.00	150.00	6,288.56	-4,578.03	3,690.18	14,442,265.75	1,689,059.74	39.76790155	-80.82689104	
13,125.21	89.00	150.00	6,289.00	-4,599.86	3,702.79	14,442,243.92	1,689,072.35	39.76784153	-80.82684634	
PBHL/TD										
13,125.22	89.00	150.00	6,289.00	-4,599.87	3,702.79	14,442,243.92	1,689,072.35	39.76784151	-80.82684632	

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Planning Report - Geographic

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Yoder E-5HM
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1086.00usft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1086.00usft
Site:	Yoder	North Reference:	Grid
Well:	Yoder E-5HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Design Targets										
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
- Shape										
Yoder E-5HM LP r1	0.00	359.15	6,168.00	1,412.27	231.68	14,448,256.06	1,685,601.24	39.78437035	-80.83916068	
- plan misses target center by 252.60usft at 6300.04usft MD (5990.42 TVD, 1239.08 N, 279.42 E)										
- Point										
Yoder E-5HM PBHL r1	0.00	359.16	6,289.00	-4,599.87	3,702.79	14,442,243.92	1,689,072.35	39.76784151	-80.82684632	
- plan hits target center										
- Point										

Casing Points						
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter		
(usft)	(usft)		(")	(")		
120.00	120.00	Conductor @ 120 TVD	200	200		
1,000.00	1,000.00	13 3/8" Casing @ 1000 TVD	13-3/8	17-1/2		
2,604.31	2,600.00	9 5/8" Casing @ 2600 TVD	9-5/8	12-1/4		

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)		
1,300.00	1,300.00	0.00	0.00	KOP Begin 2°/100' build	
1,550.00	1,549.68	7.71	7.71	Begin 2°/100' build/turn	
1,679.26	1,678.47	17.13	13.15	Begin 5.00° tangent	
2,805.07	2,800.00	111.91	38.55	Begin 6°/100' build/turn	
3,137.55	3,119.73	196.43	46.14	Begin 24.82° tangent section	
5,679.05	5,426.55	1,261.56	103.70	Begin 10°/100' build/turn	
6,775.22	6,178.18	898.55	528.28	Begin 89.00° lateral section	
13,125.21	6,289.00	-4,599.86	3,702.79	PBHL/TD	

4705101921

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Yoder E-5HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

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

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

Will a pit be used? Yes No

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

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

4705101921

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 / WV0109195) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386420)

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 [Signature]

Company Official (Typed Name) Sean Gasser

Company Official Title Engineer

Subscribed and sworn before me this 27 day of March, 2017

Robin Bock

Notary Public

My commission expires 10-05-2020

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Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 19.66 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	26	Tall Fescue	40
Spring Oats	64	Ladino Clover	5

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *James Anderson*

Comments: _____

Title: Oil & Gas Inspector

Date: 3/28/17

Field Reviewed? () Yes () No

4705101321

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07/21/2017

PROPOSED YODER E-5HM

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

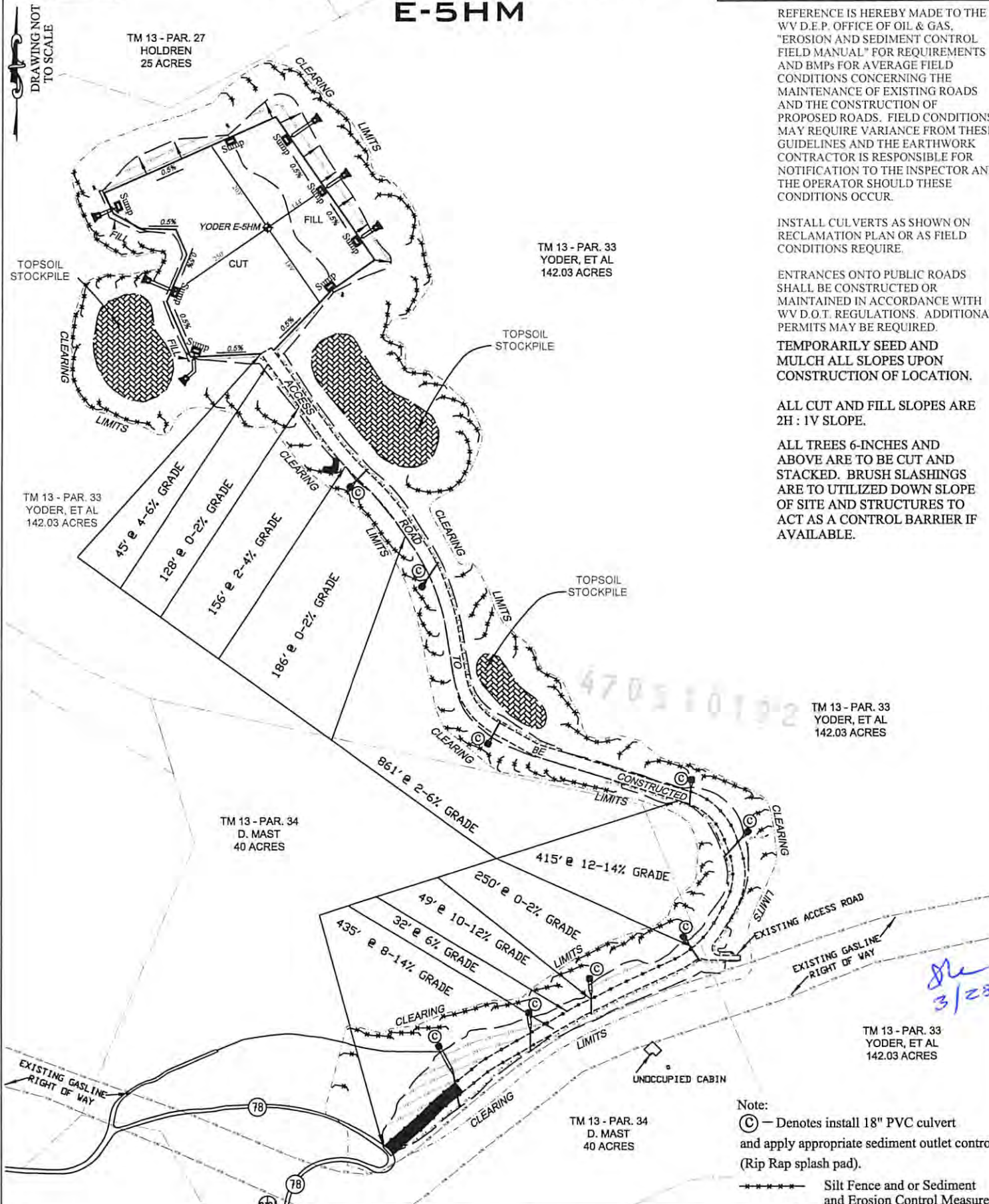
INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

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

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

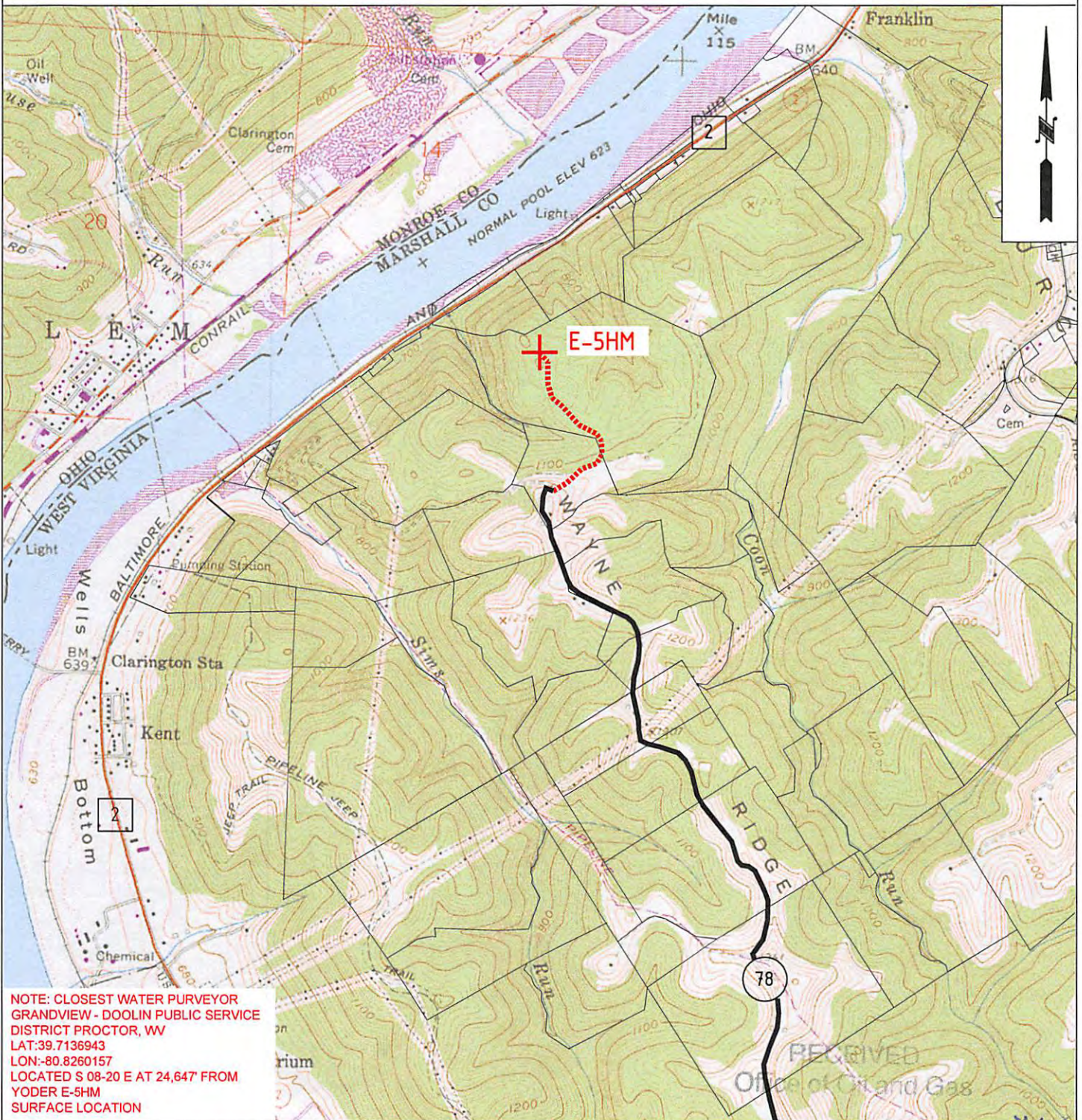


Note:
 (C) - Denotes install 18" PVC culvert and apply appropriate sediment outlet control (Rip Rap splash pad).
 - - - - - Silt Fence and or Sediment and Erosion Control Measure.


WW-9

PROPOSED YODER E-5HM

4705101 SUPPLEMENT PG 2



NOTE: CLOSEST WATER PURVEYOR
 GRANDVIEW - DOOLIN PUBLIC SERVICE
 DISTRICT PROCTOR, WV
 LAT: 39.7136943
 LON: -80.8260157
 LOCATED S 08-20 E AT 24,647' FROM
 YODER E-5HM
 SURFACE LOCATION

 TUG HILL OPERATING	OPERATOR 163-697(CEC)	TOPO SECTION MAR 30 2017	LEASE NAME YODER	
	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	SCALE: Environmental Protection 1" = 2000'	DATE: 01/10/17	RECEIVED Office of Oil and Gas
				3/28/17
				07/21/2017



TUG HILL
OPERATING

4705101921

Well Site Safety Plan

Tug Hill Operating, LLC

John
3/28/17

Well Name: Yoder E-5HM

Pad Location: Yoder Pad

Marshall County, West Virginia

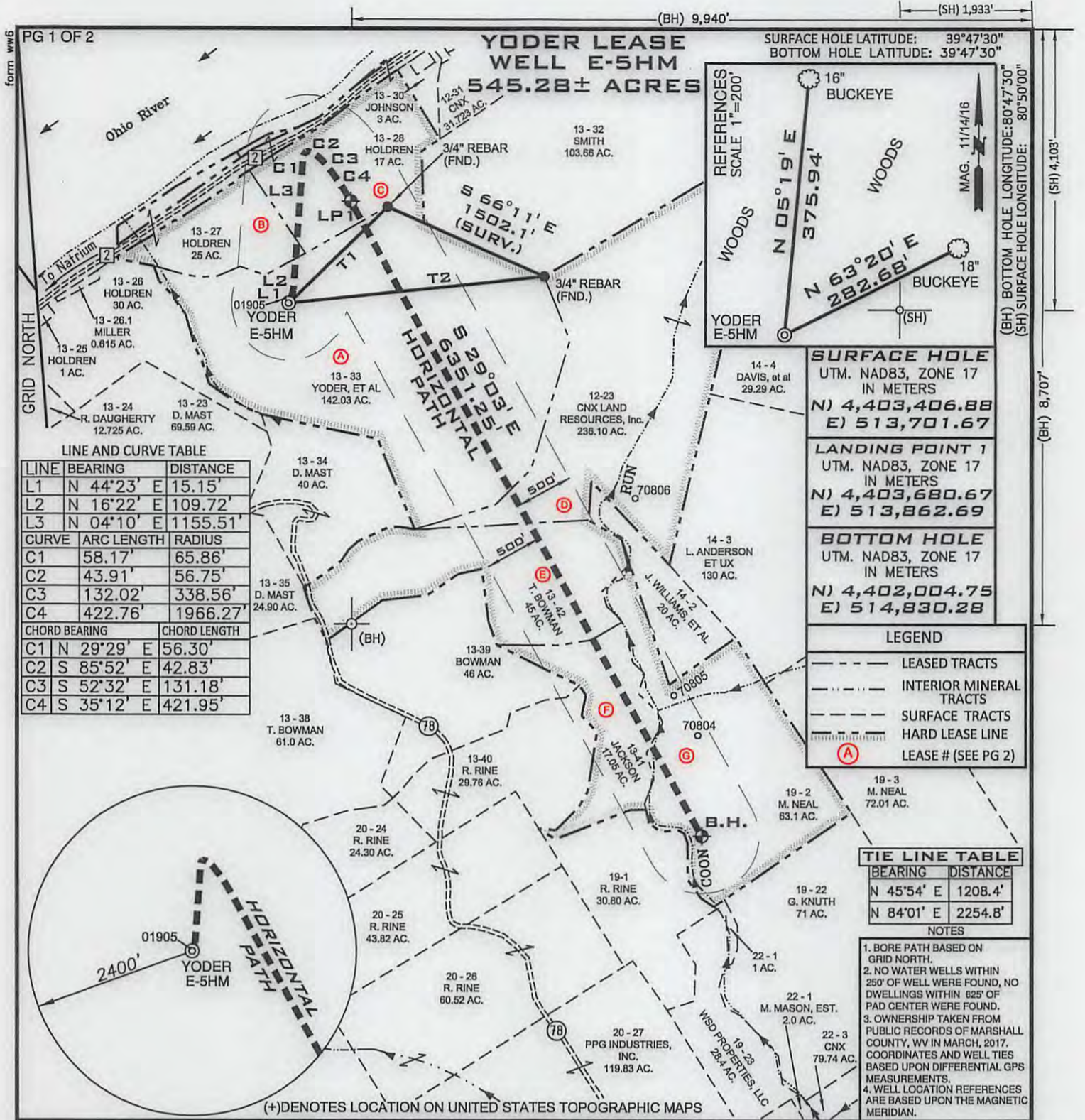
UTM (meters), NAD83, Zone 17:
Northing-4,403,406.88
Easting -513,701.67

March 2017

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LINE AND CURVE TABLE

LINE	BEARING	DISTANCE
L1	N 44°23' E	15.15'
L2	N 16°22' E	109.72'
L3	N 04°10' E	1155.51'

CURVE	ARC LENGTH	RADIUS
C1	58.17'	65.86'
C2	43.91'	56.75'
C3	132.02'	338.56'
C4	422.76'	1966.27'

CHORD BEARING	CHORD LENGTH
C1 N 29°29' E	56.30'
C2 S 85°52' E	42.83'
C3 S 52°32' E	131.18'
C4 S 35°12' E	421.95'

SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,403,406.88
E) 513,701.67

LANDING POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,403,680.67
E) 513,862.69

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,402,004.75
E) 514,830.28

LEGEND

- LEASED TRACTS
- INTERIOR MINERAL TRACTS
- SURFACE TRACTS
- HARD LEASE LINE
- (A) LEASE # (SEE PG 2)

TIE LINE TABLE

BEARING	DISTANCE
N 45°54' E	1208.4'
N 84°01' E	2254.8'

- NOTES**
- BORE PATH BASED ON GRID NORTH.
 - NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
 - OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2017. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
 - WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

FILE NUMBER YODER

DRAWING NUMBER YODER_WP_E-5HM

SCALE 1" = 1200'

MINIMUM DEGREE OF ACCURACY 1/2500

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING
GRADE GPS

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

P.S. 2122 *Jonathan N. White*



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



DATE: MARCH 22, 2017

OPERATORS WELL NO. YODER E-5HM

API WELL NO. 47-051-01921 HGA

STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL

(IF "GAS") PRODUCTION STORAGE DEEP SHALLOW

LOCATION ELEVATION 1084' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER

DISTRICT FRANKLIN COUNTY MARSHALL

QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER SEE ATTACHED PG 2 OF 2

SURFACE OWNER NATHAN D. YODER, et al ACREAGE 142.03

OIL & GAS ROYALTY OWNER NATHAN D. YODER, et al - SEE PG 2 LEASE ACREAGE 545.28

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION

PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE (SPECIFY) _____

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 6,284' TMD:13,125'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER

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

07/21/2017

COUNTY NAME PERMIT

**YODER WELL E-5HM
WELL PLAT LEASE INFORMATION**

LEASE NO.	TAG	PARCEL	Oil & Gas Royalty Owner	DEED BOOK / PG	
10*14701	A	5-13-33	ROSEITA THORNTON	885	600
10*14702	A	5-13-33	NATHAN D. YODER	708	71
10*16538	B	5-13-27	AMP FUND III LP	915	187
10*14942	C	5-13-28	AARON PAUL HOLDREN	720	132
10*14652	C	5-13-28	CANDICE GUTIERREZ	842	388
10*14644	C	5-13-28	CHERYL HILL	809	517
10*14651	C	5-13-28	DAVID V CALDWELL	842	386
10*14649	C	5-13-28	DONALD GARY GROVES II	842	382
10*14639	C	5-13-28	GARY PARSONS	794	521
10*14638	C	5-13-28	HUGH YOHO	794	478
10*14647	C	5-13-28	JAMES W ROBINSON III	836	102
10*14635	C	5-13-28	KATHY JO RUNYON & ROBERT PATRICK KIRWIN	775	21
10*14654	C	5-13-28	KATHY JO RUNYON & ROBERT PATRICK KIRWIN	854	607
10*14637	C	5-13-28	KIMBERLY S. DENNY	794	511
10*14653	C	5-13-28	KRISTIN DOUGLAS	842	390
10*14641	C	5-13-28	LORA LANGLEY	800	621
10*14648	C	5-13-28	LORI ANN ROBINSON	836	104
10*14643	C	5-13-28	MARTHA RENEE ROBINSON	809	541
10*14642	C	5-13-28	MARY B. FERRIS BY REBECCA R. F	808	457
10*14645	C	5-13-28	RANDY BERISFORD	810	328
10*14640	C	5-13-28	SHERRI SNYDER	799	545
10*14650	C	5-13-28	TIMOTHY DWIGHT GROVES	842	384
10*14636	C	5-13-28	WANDA RIDING	794	503
10*14699	D	5-12-23	CNX GAS COMPANY LLC AND NOBLE	833	514
10*14526	E	5-13-42	THOMAS WILLIAM BOWMAN	761	432
10*14527	E	5-13-42	VICTORIA BOWMAN	761	434
10*14461	F	5-13-41	RODNEY JACKSON	739	411
10*14040	G	5-19-2	MILTON R NEAL AND LINDA L NEAL	665	498
10*14041	G	5-19-2	SHIBEN ESTATES INC	718	496

07/21/2017

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

**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
----------------------	-----------------------	-----------------------	---------	-----------

*See Attached

**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: Jonathan White
 Its: Regulatory Analyst- Appalachia Region

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WV Department of
Environmental Protection

470510

LEASE NAME OR NUMBER	TAG	PARCEL	GRANTOR, LESSOR, ETC.	GRANTEE, LESSEE, ETC.	ROYALTY	BOOK	PG	ASSIGNMENT	ASSIGNMENT	ASSIGNMENT
10*14701	A	5-13-33	ROSEITA THORNTON	GASTAR EXPLORATION INC	1/8+	885	600	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14702	A	5-13-33	NATHAN D. YODER	CHESAPEAKE APPALACHIA LLC	1/8+	708	71	27/321 Chesapeake	21/41 Cert. of Merger Gastar	36/009 Gastar
10*16538	B	5-13-27	AMP FUND III LP	TH EXPLORATION LLC	1/8+	915	187	N/A	N/A	N/A
10*14942	C	5-13-28	AARON PAUL HOLDREN	TRIENERGY HOLDINGS LLC	1/8+	720	132	28/356 TriEnergy Holdings, LLC and TriEnergy Inc to Chevron U.S.A Inc	32/355 Chevron U.S.A Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14652	C	5-13-28	CANDICE GUTIERREZ	GASTAR EXPLORATION INC	1/8+	842	388	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14644	C	5-13-28	CHERYL HILL	GASTAR EXPLORATION USA INC	1/8+	809	517	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14651	C	5-13-28	DAVID V CALDWELL	GASTAR EXPLORATION INC	1/8+	842	386	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14649	C	5-13-28	DONALD GARY GROVES II	TH EXPLORATION LLC	1/8+	842	382	N/A	N/A	N/A
10*14639	C	5-13-28	GARY PARSONS	GASTAR EXPLORATION USA INC	1/8+	794	521	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14638	C	5-13-28	HUGH YOHO	GASTAR EXPLORATION USA INC	1/8+	794	478	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14647	C	5-13-28	JAMES W ROBINSON III	GASTAR EXPLORATION INC	1/8+	836	102	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14635	C	5-13-28	KATHY JO RUNYON & ROBERT PATRICK KIRWIN	GASTAR EXPLORATION USA INC	1/8+	775	21	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14654	C	5-13-28	KATHY JO RUNYON & ROBERT PATRICK KIRWIN	GASTAR EXPLORATION INC	1/8+	854	607	36/009 Gastar Exploration Inc	N/A	N/A
10*14637	C	5-13-28	KIMBERLY S. DENNY	GASTAR EXPLORATION USA INC	1/8+	794	511	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14653	C	5-13-28	KRISTIN DOUGLAS	GASTAR EXPLORATION INC	1/8+	842	390	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14641	C	5-13-28	LORA LANGLEY	GASTAR EXPLORATION USA INC	1/8+	800	621	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14648	C	5-13-28	LORI ANN ROBINSON	GASTAR EXPLORATION INC	1/8+	836	104	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14643	C	5-13-28	MARTHA RENEE ROBINSON	GASTAR EXPLORATION USA INC	1/8+	809	541	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14642	C	5-13-28	MARY B. FERRIS BY REBECCA R. F	GASTAR EXPLORATION USA INC	1/8+	808	457	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14645	C	5-13-28	RANDY BERISFORD	GASTAR EXPLORATION USA INC	1/8+	810	328	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14640	C	5-13-28	SHERRI SNYDER	GASTAR EXPLORATION USA INC	1/8+	799	545	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14650	C	5-13-28	TIMOTHY DWIGHT GROVES	GASTAR EXPLORATION INC	1/8+	842	384	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14636	C	5-13-28	WANDA RIDING	GASTAR EXPLORATION USA INC	1/8+	794	503	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14699	D	5-12-23	CNX GAS COMPANY LLC AND NOBLE	GASTAR EXPLORATION INC	1/8+	833	514	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14526	E	5-13-42	THOMAS WILLIAM BOWMAN	GASTAR EXPLORATION USA INC	1/8+	761	432	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14527	E	5-13-42	VICTORIA BOWMAN	GASTAR EXPLORATION USA INC	1/8+	761	434	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14461	F	5-13-41	RODNEY JACKSON	GASTAR EXPLORATION USA INC	1/8+	739	411	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14040	G	5-19-2	MILTON R NEAL AND LINDA L NEAL	GASTAR EXPLORATION USA INC	1/8	665	498	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14041	G	5-19-2	SHIBEN ESTATES INC	GASTAR EXPLORATION USA INC	1/8+	718	496	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A

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4700
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WV Department of
Environmental Protection

07/21/2017

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.

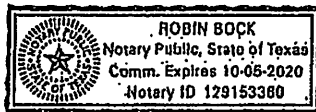
David D. Kalish
Affiant: David D. Kalish

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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

Office of Gas
MAR 30 2017
Carroll's Heritage
WETAZ County 7:49:29 AM
Instrument No. 21095
Date Recorded 10/28/2016
Document Type 0301
Pages Recorded 1
Book Page 129-291
Recorded Fee \$5.00
Additional \$5.00

WV Department of
Environmental Protection



March 25, 2017

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

RE: Yoder E-5HM

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Yoder E-5HM well plat.

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 304-689-7676, or by email at Jwhite@tug-hilop.com.

Sincerely,

Jonathan White
Regulatory Analyst – Appalachia Region
Cell 304-689-7676
Email: jwhite@tug-hilop.com

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MAR 30 2017
WV Department of
Environmental Protection

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

Date of Notice Certification: 03/28/2017

API No. 47- 051 -
Operator's Well No. Yoder E-5HM
Well Pad Name: Yoder

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>513,701.67</u>
County: <u>Marshall</u>		Northing: <u>4,403,406.88</u>
District: <u>Franklin</u>	Public Road Access: <u>Wayne Ridge Road (County Route 78)</u>	
Quadrangle: <u>Powhatan Point 7.5'</u>	Generally used farm name: <u>Nathan D. Yoder</u>	
Watershed: <u>(HUC 10) French Creek - Ohio River</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.

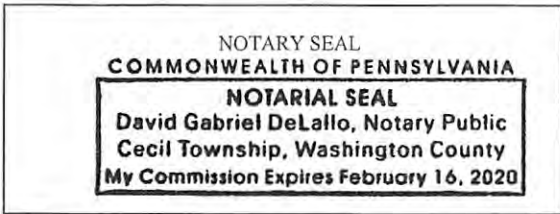
<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" 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 style="text-align: center;">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> <div style="text-align: center;"> <p>RECEIVED</p> <p>Office of Oil and Gas</p> <p>MAR 29 2017</p> <p>WV Department of Environmental Protection</p> </div>
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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 Jonathan White, 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:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Blvd, Southpointe Plaza II, Suite 200</u>
By:	<u>Jonathan White</u> <i>Jonathan White</i>		<u>Canonsburg, PA 15317</u>
Its:	<u>Regulatory Analyst - Appalachia</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>(724) 749-8388</u>	Email:	<u>jwhite@tug-hillop.com</u>



Subscribed and sworn before me this 28 day of MARCH, 2017.
David Gabriel DeLallo
 _____ Notary Public
 My Commission Expires 2/16/2020

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.

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

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

Date of Notice: 03/28/17 **Date Permit Application Filed:** 03/29/17

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: Nathan D. Yoder
Address: 2150 County Road 150
Millersburg, OH 44654

Name: Roseita Thornton
Address: 2550 State Road 580, Lot 392
Clearwater, FL 33761

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: David J. Mast and Miriam A. Mast
Address: 7271 TR 664
Dundee, OH 44625

Name: NONE
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)
Name: NONE
Address: _____

COAL OWNER OR LESSEE
Name: Appalachia Power Company
Address: 1 Riverside Place
Columbus, OH 43215 **SEE SUPPLEMENT PAGE**

COAL OPERATOR
Name: NONE
Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: David J. Mast and Miriam A. Mast
Address: 271 TR 664
Dundee, OH 44625

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: NONE
Address: _____

*Please attach additional forms if necessary

7705/101021
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Office of Oil and Gas
MAR 30 2017
WV Department of Environmental Protection

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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.**

RECEIVED
Office of Oil and Gas
MAR 30 2017
WV Department of Environmental Protection

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.

6705101323
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Office of Oil and Gas
MAR 30 2017
WV Department of
Environmental Protection

WW-6A
(8-13)

API NO. 47- 051 -
OPERATOR WELL NO. Yoder E-5HM
Well Pad Name: Yoder

Notice is hereby given by:

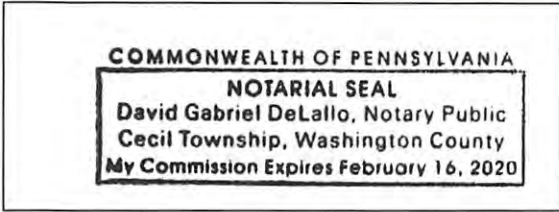
Well Operator: Tug Hill Operating, LLC
Telephone: 724-338-2026
Email: jwhite@tug-hilop.com

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

Oil and Gas Privacy Notice:

Jonathan White

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 deprivacyofficer@wv.gov.



Subscribed and sworn before me this 28 day of March, 2017.

[Signature] Notary Public

My Commission Expires 2/16/2020

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MAR 30 2017
WV Department of
Environmental Protection

07/21/2017

WW-6A Notice of ApplicationOperator Well No. Yoder E-5HM
Supplement Page

Coal Owner(s):

Name: CNX Land, LLC
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

/

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(S):

Name: Aaron Paul Holdren, et ux
110 Ridgemont Drive
Mars, PA 16066-5402

/

4703101001

WW-6A

Supplement Pg. 1A

March 25, 2017
Tug Hill Operating, LLC
380 Southpointe BLVD
Suite 200
Canonsburg, PA 15317

WATER WELL REPORT

Well: Yoder E-5HM
District: Franklin
County: Marshall
State: WV

47001075

There appears to be three (3) possible water sources within 2,000 feet of the above referenced well location.

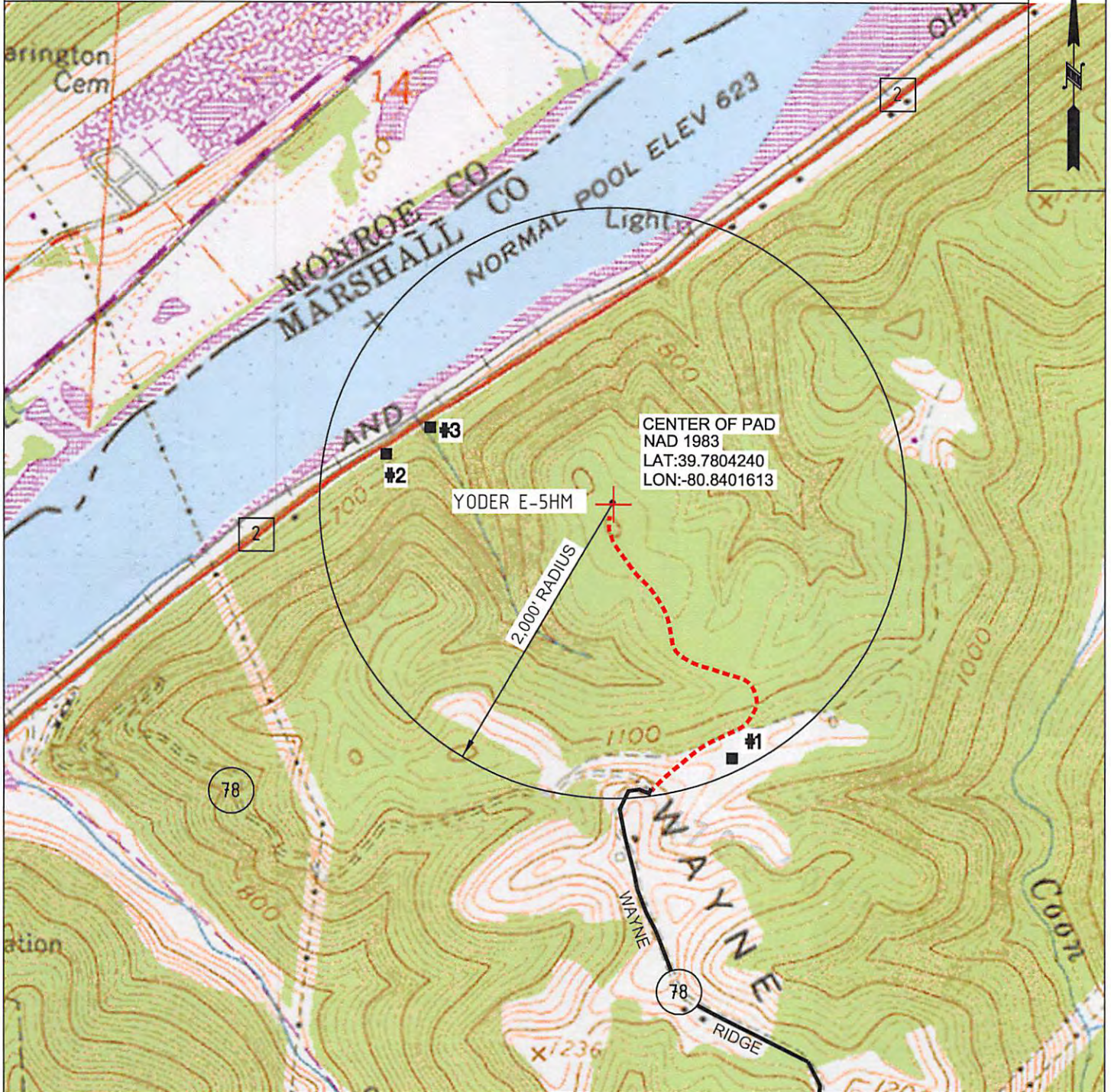
House 1 TM 13 Par. 34 (Hunting Cabin) David Mast Phone 330-359-5622 / 7271 TR 664 Dundee, OH 44626	House 2 TM 13 Par. 26 (Old House Foundation) Aaron Paul Holdren, et ux Phone Unisted 110 Ridgemont Drive Mars, PA 16066-5402 /	House 3 TM 13 Par. 27 (Old House Foundation) Aaron Paul Holdren, et ux Phone Unisted 110 Ridgemont Drive Mars, PA 16066-5402 /
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MAR 30 2017
WV Department of
Environmental Protection

07/21/2017

PROPOSED YODER E-5HM

There appears to be Three (3) possible water source within 2,000'.



TUG HILL
OPERATING

OPERATOR 163-697(CEC)
TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD
SUITE 200
CANONSBURG, PA 15317

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

LEASE NAME
YODER
DATE:
DATE: 03/25/17

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: November 2, 2016 **Date of Planned Entry:** November 9, 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: Nathan D. Yoder

Address: 2150 County Road 150
Millersburg, OH 44654

Name: Roseita Thornton

Address: 2550 State Road 580, Lot 392
Clearwater, FL 33761

Name: David J. Mast and Miriam A. Mast ✓

Address: 7271 TR 664
Dundee, OH 44624

COAL OWNER OR LESSEE

Name: Appalachia Power Company

Address: 1 Riverside Place
Columbus, OH 43215 *See Attached

MINERAL OWNER(s) ✓

Name: Nathan D. Yoder

Address: 2150 County Road 150
Millersburg, OH 44654 *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: 39.7804937, LONG: -80.8399944</u>
County: <u>MARSHALL</u>	Public Road Access: <u>WAYNE RIDGE ROAD (COUNTY ROUTE 78)</u>
District: <u>FRANKLIN</u>	Watershed: <u>(HUC 10) FRENCH CREEK- OHIO RIVER</u>
Quadrangle: <u>POWHATAN POINT 7.5'</u>	Generally used farm name: <u>Nathan Yoder</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, PA 15317</u>
Email: <u>JWHITE@TUG-HILLOP.COM</u>	Facsimile: <u>724-338-2030</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.

07/21/2017

**WW-6A3 Notice of Entry for Plat Survey
Supplement Page**

Operator Well No. Yoder E-5HM

Mineral Owner(s):

Name: Bounty Minerals, LLC
Address: 777 Main Street, Suite 850
Fort Worth, TX 76102

Name: Roseita Thornton
Address: 2550 State Road 580, Lot 392
Clearwater, FL 33761

Name: David J. Mast and Miriam A. Mast
Address: 7271 TR 664
Dundee, OH 44624

Coal Owner(s):

Name: CNX Land LLC
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

4705 0905

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: 03/28/2017 **Date Permit Application Filed:** 03/29/2017

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

CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

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

Notice is hereby provided to the SURFACE OWNER(s)
(at the address listed in the records of the sheriff at the time of notice):

Name: Nathan D. Yoder
Address: 2150 County Road 150
Millersburg, OH 44654

Name: Roseita Thornton
Address: 2550 State Road 580, Lot 392
Clearwater, FL 33761 ****SEE ATTACHED PAGE****

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>513,701.67</u>
County:	<u>MARSHALL</u>		Northing:	<u>4,403,406.88</u>
District:	<u>FRANKLIN</u>	Public Road Access:	<u>WAYNE RIDGE ROAD (COUNTY ROUTE 78)</u>	
Quadrangle:	<u>POWHATAN POINT 7.5'</u>	Generally used farm name:	<u>NATHAN D. YODER</u>	
Watershed:	<u>(HUC 10) FRENCH CREEK - OHIO RIVER</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) 338-2026
Email: JWHITE@TUG-HILLOP.COM

Address: 380 SOUTHPOINTE BLVD., SOUTEPOINTE 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.

WW-6A5 Notice of Planned OperationsOperator Well No. Yoder E-5HM
Supplement Page

Surface Owner(s):

Name: David J. Mast and Miriam A. Mast
Address: 7271 TR 664
Dundee, OH 44624



2007-00001



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Earl Ray Tomblin
Governor

Paul A. Mattox, Jr., P. E.
Secretary of Transportation/
Commissioner of Highways

November 21, 2016

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 Yoder Pad, Marshall County
Yoder E-5HM Well site 47-051-01921

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2016-0506 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 78 SLS.

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

Very Truly Yours,



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

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



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Yoder E-5HM

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

RECEIVED
 Office of Environmental Protection
 07/21/2017
 4705

**APPROVED
WVDEP OOG**

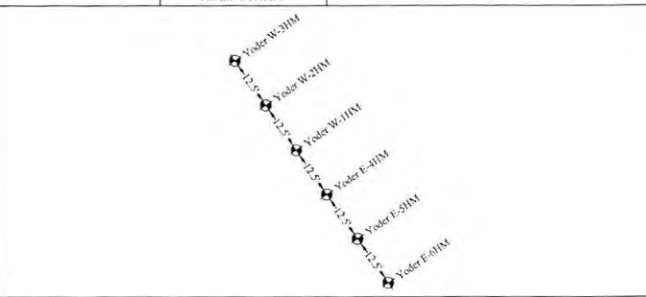
WJS 2/24/2017

**WEST VIRGINIA
COUNTY MAP**

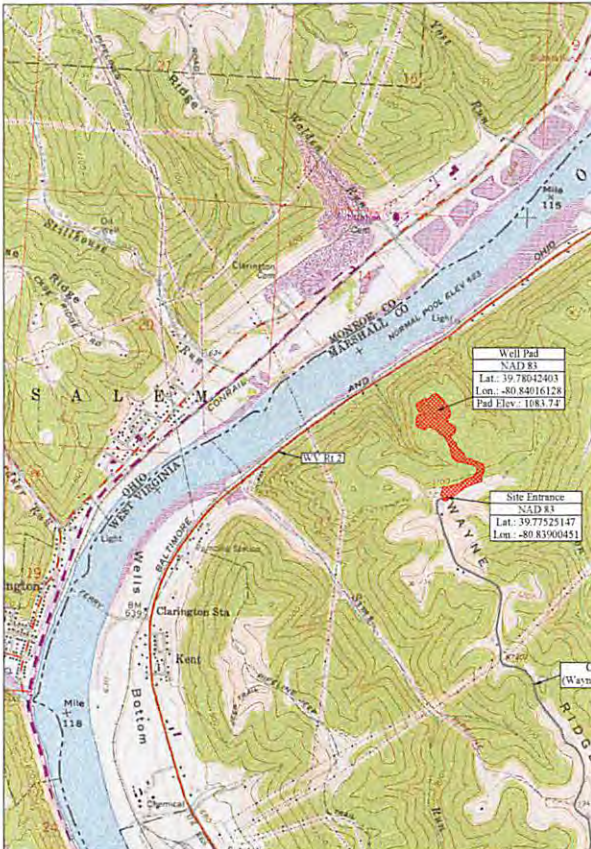


Exhibit A: Final Des

Site Entrance WV-NAD 83 N: 467290.66 WV-NAD 83 E: 1592168.44 WV-NAD 27 N: 467254.85 WV-NAD 27 E: 1623606.29 Lat. NAD 83: 39.77525147 Lon. NAD 83: -80.83900451 Lat. NAD 27: 39.77517556 Lon. NAD 27: -80.83918919 UTM 17 NAD 83 N: 4402825.21 UTM 17 NAD 83 E: 513787.48	Center of Well Pad WV-NAD 83 N: 469179.41 WV-NAD 83 E: 1591871.45 WV-NAD 27 N: 469143.60 WV-NAD 27 E: 1623309.29 Lat. NAD 83: 39.78042803 Lon. NAD 83: -80.84016128 Lat. NAD 27: 39.78034821 Lon. NAD 27: -80.84034601 UTM 17 NAD 83 N: 4403399.11 UTM 17 NAD 83 E: 513687.39 Pad Elev.: 1083.74
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Well Table		
Yoder W-3HM	Yoder W-2HM	Yoder W-1HM
WV-NAD 83 N: 469245.18 WV-NAD 83 E: 1591890.37 WV-NAD 27 N: 469209.37 WV-NAD 27 E: 1623328.07 Lat. NAD 83: 39.78060534 Lon. NAD 83: -80.84009795 Lat. NAD 27: 39.78052952 Lon. NAD 27: -80.84028269 UTM 17 NAD 83 (m) N: 4403419.24 UTM 17 NAD 83 (m) E: 513692.78	WV-NAD 83 N: 469234.91 WV-NAD 83 E: 1591897.36 WV-NAD 27 N: 469199.10 WV-NAD 27 E: 1623335.19 Lat. NAD 83: 39.78057744 Lon. NAD 83: -80.84007205 Lat. NAD 27: 39.78050182 Lon. NAD 27: -80.84025679 UTM 17 NAD 83 (m) N: 4403416.15 UTM 17 NAD 83 (m) E: 513695.00	WV-NAD 83 N: 469224.64 WV-NAD 83 E: 1591904.49 WV-NAD 27 N: 469188.83 WV-NAD 27 E: 1623342.32 Lat. NAD 83: 39.78054954 Lon. NAD 83: -80.84004615 Lat. NAD 27: 39.78047372 Lon. NAD 27: -80.84025089 UTM 17 NAD 83 (m) N: 4403413.06 UTM 17 NAD 83 (m) E: 513697.22
Yoder E-3HM	Yoder E-2HM	Yoder E-1HM
WV-NAD 83 N: 469214.37 WV-NAD 83 E: 1591911.61 WV-NAD 27 N: 469178.56 WV-NAD 27 E: 1623349.45 Lat. NAD 83: 39.78052164 Lon. NAD 83: -80.84020255 Lat. NAD 27: 39.78044582 Lon. NAD 27: -80.84020499 UTM 17 NAD 83 (m) N: 4403409.97 UTM 17 NAD 83 (m) E: 513699.45	WV-NAD 83 N: 469204.11 WV-NAD 83 E: 1591918.74 WV-NAD 27 N: 469168.29 WV-NAD 27 E: 1623356.57 Lat. NAD 83: 39.78049374 Lon. NAD 83: -80.8399435 Lat. NAD 27: 39.78041793 Lon. NAD 27: -80.84017909 UTM 17 NAD 83 (m) N: 4403406.88 UTM 17 NAD 83 (m) E: 513701.67	WV-NAD 83 N: 469193.84 WV-NAD 83 E: 1591925.87 WV-NAD 27 N: 469158.02 WV-NAD 27 E: 1623363.70 Lat. NAD 83: 39.78046385 Lon. NAD 83: -80.83996845 Lat. NAD 27: 39.78039063 Lon. NAD 27: -80.84015119 UTM 17 NAD 83 (m) N: 4403403.78 UTM 17 NAD 83 (m) E: 513703.89



Project Contacts	Survey and Engineer
Tug Hill Operating Jonathan White - Regulatory Analyst 724-485-2000 Off. 304-639-7676 Cell Geoff Radler - V.P. Production 817-632-5200 Off.	Kenneth Kelly 304-338-6985 Off. John P. See 304-442-0220 Off. Zackary Summerfield 304-338-6987 Off.
Tug Hill Operating, LLC 380 Southpointe Blvd Southpointe Plaza II, Suite 200 Canonsburg, PA 15317	Geotechnical Engineer American Geotech. Inc. Kanti Patel 301-340-4277 Off.

Environmental:
Wetland Delineations as provided by Allstar Ecology dated December 7, 2016.

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

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

Know what's below. Call before you dig.

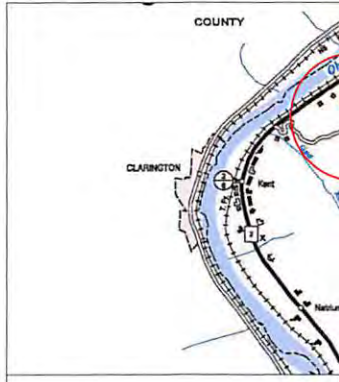
Tug Hill Operating will obtain an Encroachment Permit (Form MM-109) from the WV Department of Transportation, Division of Highways, prior to the commencement of any construction activities

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

WVDEP Website files show that there are no active and/or abandoned gas wells within the AOI

Floodplain Conditions	
Do site construction activities take place in a floodplain:	NO
Permit needed from county floodplain coordinator:	NO
Flood Hazard Zone:	X
THE C-IRAS Study completed:	N/A
Floodplain shown on drawings:	N/A
FIRM Map Number(s) for site:	34051C 0140E
Acres/ages of construction in floodplain:	N/A

Site Locations (NAD 27)		
Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.77517556	-80.83918919
Center of Well Pad	39.78034821	-80.84034601



07/21/2017

Well Site

Construction Plan, &
 Erosion Control Plans
 for an Operating
 Well in Marshall County
 in District
 39.78042403°
 -80.84016128°
 Ohio River Watershed

Pertinent Site Information
 Yoder Well Site
 Emergency Number: 304-845-1920
 Franklin District, Marshall County, WV
 Watershed: Stillhouse Run - Ohio River Watershed
 Tug Hill Contact Number: 1-817-632-3400

Design: Issue for Permitting



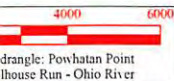
WV State Plane Coordinate System
 North Zone, NAD 83
 Elevations Based on NAV 88
 Established by Survey Grade GPS
 and OPUS Post-Processing

Property Owner Information - Yoder Well Site					
Franklin District - Marshall County					
Owner	TM - Parcel	Well Pad	Access Road	Topsoil Excess	Total Disturbed
David Mast	13-34	0.00	1.39	0.00	2.27
Yoder	13-33	4.36	1.63	1.67	16.00
Site Totals (Ac)		4.36	3.02	1.67	10.61

Access Road			
Surface Owner	TM - Parcel	Road Length	Type
David Mast	13-34	805.24'	New Access Road Construction
Yoder	13-33	1,846.92'	New Access Road Construction

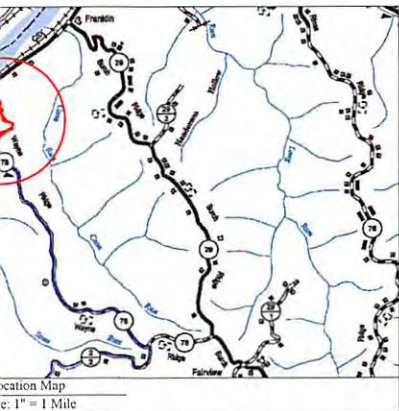
Disturbed Area	
Well Pad Construction	4.36 Ac
Access Road Construction	3.02 Ac
Topsoil / Excess Material	1.67 Ac
Additional Clearing	10.61 Ac
Total Disturbed Area	19.66 Ac
Additional Information	
Total Wooded Acres Disturbed	19.39 Ac
Total Linear Feet of Access Road	2,652.16'

Yoder Well Site Quantities						
Description	Cut (CY)	Fill (CY)	Spoil (CY)	Borrow (CY)	Max. Slope	Length of Slope
Well Pad	37,569.10	13,959.13	23,999.97	N/A	N/A	N/A
Well Pad Access Road	2,578.10	16,451.93		14.07% ⁸³	10.00%	428.58'
Access Road Tie	259.31	1.32	257.99		10.00%	50.13'
Topsoil Excess Material Stockpile	0.00	14,009.75			N/A	N/A
Totals	39,706.51	43,532.13	24,257.96	28,083.58		
	Total Spoil (CY) =		-3,825.62	(Excess Spoil Capacity)		



Triangle: Powhatan Point
 Square: Stillhouse Run - Ohio River

Site Locations (NAD 83)		
Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.77525147	-80.83900451
Center of Well Pad	39.78042403	-80.84016128

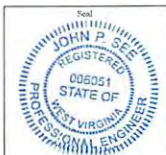


Well Location Restrictions

All Pad construction complies with the following restrictions:

- *250' from an existing well or developed spring used for human or domestic animals.
- *625' from an occupied dwelling or barn greater than 2,500 SF used for poultry or dairy measured from the center of the pad.
- *100' from the edge of disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir.
- *100' from the edge of disturbance to a naturally reproducing trout stream.
- *1,000' of a surface or ground water intake to a public water supply.

(Well Location Restrictions of WV Code 22-6A-12)



Design Certification
 The drawings, specifications notes and reference diagrams attached hereto have been prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection, Office of Oil and Gas 95C30-8.
 All Plans, Notes, and/or Reference Diagrams included in this design constitute a complete set of plans. A complete set of plans is necessary to construct the site in accordance with the design.
 John P. See RPE 6051
 Kelly Surveying PLLC
 CVVA 03423-216
 Date: 11/29/2016

Sheet	Description
1	Cover Sheet
V1	Schedule of Quantities
N1-N3	Site Notes
2	Pre-Construction Site Conditions
3	Site Soil Map
4	Clearing Exhibit
5	Overall Plan View
7	E&S Plan View
8	Toe Key Exhibit
9	Plan View
10	Cross Sections - Well Pad
11	Cross Sections - Tank Pad
12	Cross Sections - Access Road
G1-G4	Geotechnical Exhibit
L1	Landowner Disturbed Area Exhibit
S1	Site Reclamation
M1-M3	Production Exhibit
D1-D2	Erosion and Sediment Control Details
R1	Access Road Details
P1	Pad Details

Date: 11-29-2016
 Revision: Design

TUG HILL OPERATING



THIS DOCUMENT PREPARED FOR TUG HILL OPERATING

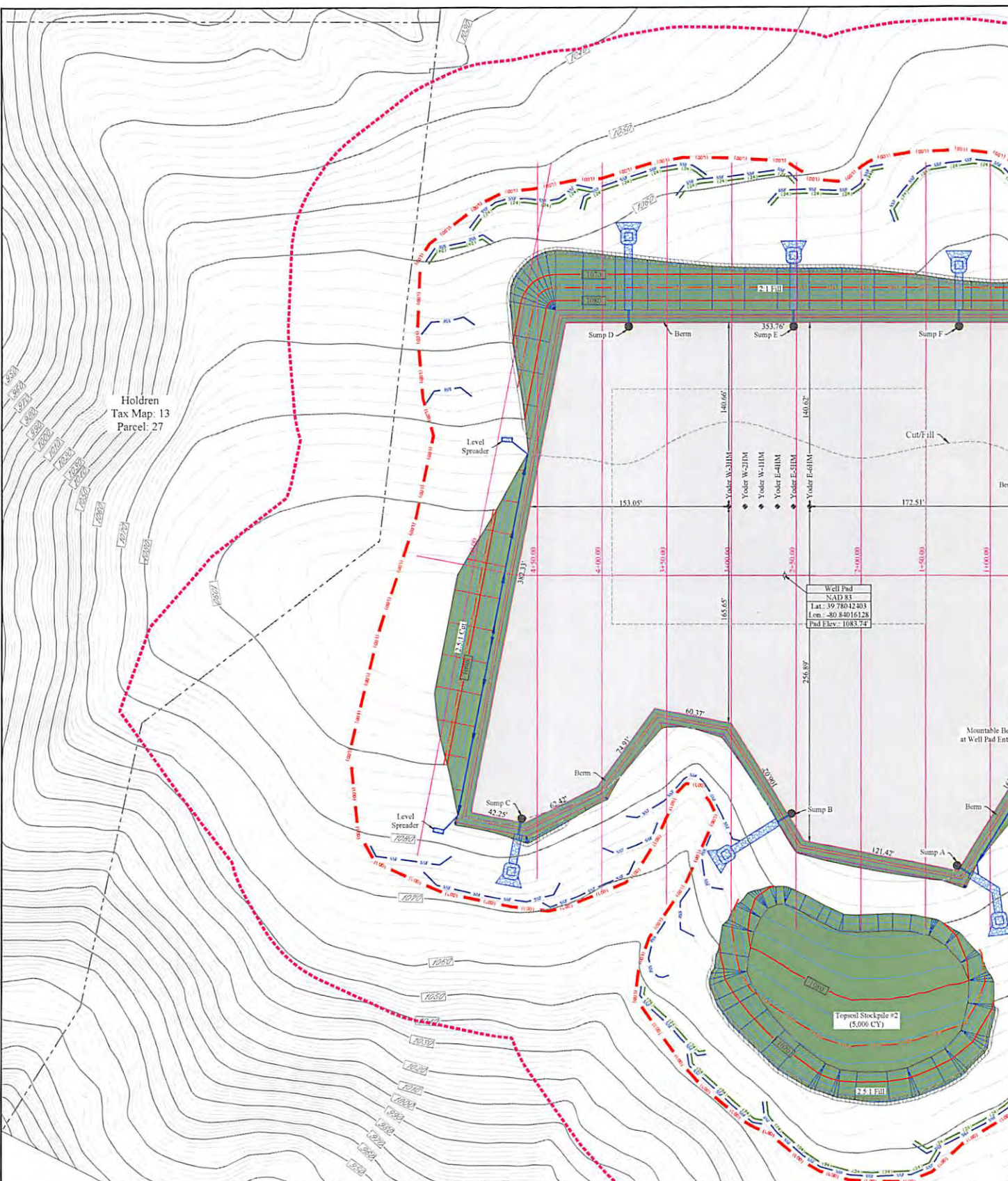
Kelly Surveying
 P.O. Box 234
 Delmar, WV 26039
 304-338-0085

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 Office of Oil and Gas
 MAR 30 2017
 WV Department of Environmental Protection
 Environmental Protection

Cover Sheet
 Yoder Well Site
 Franklin District
 Marshall County, WV

Date: 11/29/2016
 Scale: As Shown
 Designed By: ZS

07/2/2017



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



Legend	
	Original Ground 2' Contour
	Original Ground 10' Contour
	Pad Design 2' Contour
	Pad Design 10' Contour
	Access Road Design 2' Contour
	Access Road Design 10' Contour
	Center of Structure
	Guard Rail
	12" Wattle
	24" Compost Filter Sock
	Super Silt Fence
	Limits of Disturbance
	Area of Interest
	Existing Gas Line
	Existing Utility Pole Line
	Rock Lined Ditch
	Erosion Control Blanket Lined Ditch
	Blue Racer Pipeline
	Blue Racer Pipeline ROW
	PEM Wetland
	POW Wetland
	PSS Wetland
	Perennial Stream
	Intermittent Stream
	Ephemeral Stream
	Tee Key
	Erosion Control Blanket Slope Area
	Stone Check Dam
	EQT Pipeline
	EQT Pipeline ROW

Disturbed Area	
Well Pad Construction	4.36 Ac
Access Road Construction	3.02 Ac
Topsoil / Excess Material	1.67 Ac
Additional Clearing	10.61 Ac
Total Disturbed Area	19.66 Ac

Access Road	
Total Wooded Acres Disturbed	19.39 Ac
Total Linear Feet of Access Road	2,632.16'
Surface Owner	IM - Parcel 13-34
	David Mast
	Yoder

07/21/2017

Yoder Well Site
Tug Hill Operating

Exhibit A: Final Design: Issue for Permitting



Yoder
Tax Map: 13
Parcel: 33

Revision
Design

Date
11-29-2016

TUG HILL
OPERATING



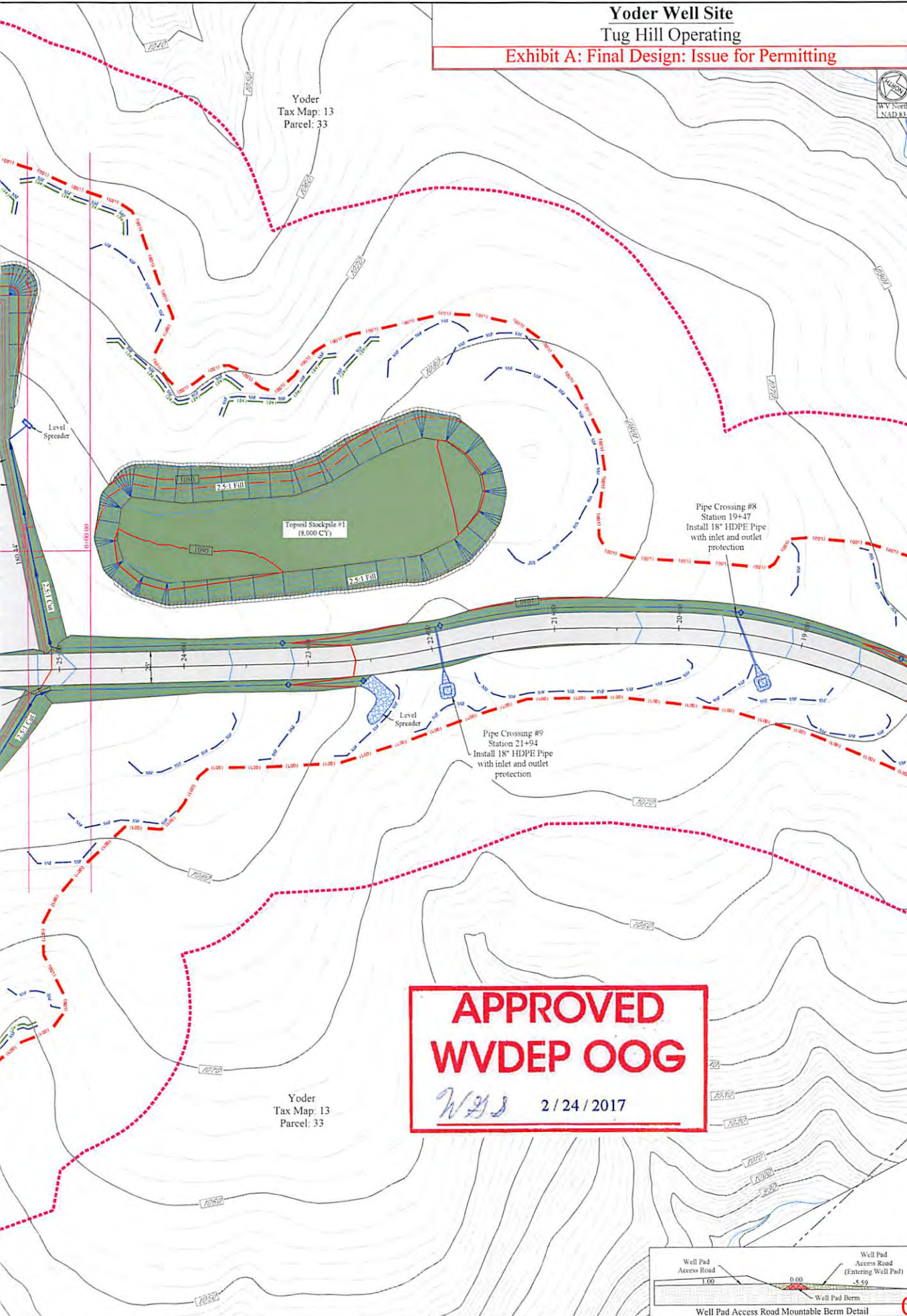
THIS DOCUMENT
PREPARED FOR
TUG HILL
OPERATING

Kelly S. Surveying
P.O. Box 204
Delmar, WV 26219
004338-6082

Site Plan
Yoder Well Site
Franklin District
Marshall County, WV

Date: 11/29/2016
Scale: As Shown
Designed By: ZS

07/21/2017



APPROVED
WVDEP OOG
ZS 2/24/2017

Yoder
Tax Map: 13
Parcel: 33

