



west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Wednesday, October 14, 2020
WELL WORK PERMIT
Horizontal 6A / Fracture

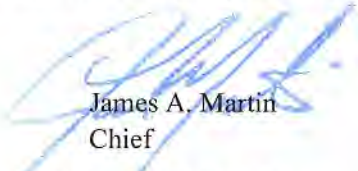
TUG HILL OPERATING, LLC
380 SOUTHPOINTE BOULEVARD, PLAZA II
SUITE 200
CANONSBURG, PA 15317

Re: Permit approval for HENDRICKSON NORTH 4H
47-051-01480-00-00

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: HENDRICKSON NORTH 4H
Farm Name: HENDRICKSON, LINDA L. & [redacted]
U.S. WELL NUMBER: 47-051-01480-00-00
Horizontal 6A Fracture
Date Issued: 10/14/2020

PERMIT CONDITIONS

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

CONDITIONS

1. 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.
2. 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.
3. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
4. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
5. 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.
6. 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.



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Austin Caperton, Cabinet Secretary
dep.wv.gov

**ORDER
ISSUED UNDER
WEST VIRGINIA CODE, CHAPTER 22, ARTICLE 6A**

TO: Tug Hill Operating, LLC
380 Southpointe Boulevard, Plaza II., Suite 200
Canonsburg, PA 15317

DATE: October 8, 2020
ORDER NO.: 2020-W-4

INTRODUCTION

This Order (hereinafter "Order") is issued by the Office of Oil and Gas (hereinafter "OOG"), by and through its Chief, pursuant to the authority of W. Va. Code §§ 22-1-1, 22-6-1 and 22-6A-1 *et seq.* to Tug Hill Operating, LLC (hereinafter "Tug Hill" or "Operator"), collectively the "Parties."

FINDINGS OF THE CHIEF

In support of this Order, the Chief hereby finds the following:

1. OOG, an office within the West Virginia Department of Environmental Protection, is the agency with the duty and authority to execute and enforce W. Va. Code §22-6-1 and §22-6A-1 *et seq.*, and the rules and regulations promulgated thereunder.
2. Tug Hill is a "person" as defined by W. Va. Code §22-6-1(n), with a corporate address as 380 Southpointe Boulevard, Plaza II., Suite 200, Canonsburg, PA 15317.
3. On June 24, 2020 Tug Hill submitted fracture permit applications for wells identified as API#s 47-51-01467, 47-51-01479, 47-51-01480, 47-51-01491 and 47-51-01492. The wells are located on the Hendrickson Pad in the Franklin District of Marshall County, West Virginia.
4. On June 24, 2020 Tug Hill requested a waiver for Wetland W02 as outlined in Attachment 1, from well location restriction requirements in W. Va. Code §22-6A-12(b) for the fracture permit applications for wells identified as API#s 47- 51-01467, 47-51-01479, 47-51-01480, 47-51-01491 and 47-51-01492.

CONCLUSIONS OF LAW

1. West Virginia Code §22-1-6(d) requires, in part, that “in addition to other powers, duties and responsibilities granted and assigned to the secretary by this chapter, the secretary is authorized and empowered to... (3) Enter private lands to make surveys and inspections for environmental protection purposes; to investigate for violations of statutes or rules which the Office of Oil and Gas is charged with enforcing; to serve and execute warrants and processes; to make arrests; issue orders, which for the purposes of this chapter include consent agreements; and to otherwise enforce the statutes or rules which the Office of Oil and Gas is charged with enforcing.”
2. West Virginia Code §22-6A-2(a)(6) requires, in part, that “Concomitant with the broad powers to condition the issuance of well work permits, the secretary should also have broad authority to waive certain minimum requirements of this article when, in his or her discretion, such waiver is appropriate: *Provided*, That the secretary shall submit a written report of the number of waivers granted to the Legislature commencing January 1, 2013, and each year thereafter.”
3. West Virginia Code §22-6A-12(b) requires, in part, that “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 Office of Oil and Gas 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 Office of Oil and Gas 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.”

ORDER

West Virginia Code §22-6A-12(b) requires, in part, that “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. The Office of Oil and Gas grants the request for a waiver for Wetland W02 from well location restriction requirements in W. Va. Code §22-6A-12(b) for the fracture permit applications for wells identified as API#s 47- 51-01467, 47-51-01479, 47-51-01480, 47-51-01491 and 47-51-01492. The Office of Oil and Gas hereby **ORDERS** that Tug Hill shall meet the following site construction and operational requirements for the Hendrickson Well Pad:

- a. A berm shall be constructed around the perimeter of the pad to contain any potential spills and storm water runoff. Berm is to be at least twenty-four inches (24”) in height;
- b. Erosion control blankets shall be installed on all slopes and down gradient locations of the pad as erosion and sediment controlling BMPs;
- c. Wetland W02 shall be protected by a layer of both Super Silt Fence and twenty four inch (24”) compost filter sock. This along with temporary and permanent vegetative cover will prevent sediment from reaching the wetlands
- d. Disturbed areas not used for operations shall be seeded and mulched per the seeding tables in the WVDEP-OOG Erosion and Sediment Control Manual;
- e. Drill cuttings and associated drilling mud shall be disposed of in a permitted landfill;
- f. Waste generated by the flowback treatment systems shall be sent to offsite disposal at a permitted landfill;
- g. Weekly site inspections shall be conducted to monitor and maintain the integrity of the BMP storm water controls;
- h. Weekly storm water and spill prevention inspections shall be conducted focusing on storm water and spill prevention BMPs and maintenance of these BMPs;
- i. Inspections of the storm water and spill prevention measures shall be conducted after any major storm event defined as a half inch (½”) rain within any twenty-four (24) hour period;
- j. Pad inspections shall be conducted no less than once a week to identify and mitigate potential deficiencies;
- k. All records from inspections shall be maintained on site for the life of the project and be available upon request.

Thus ORDERED, the 8th day of October, 2020.

IN THE NAME OF THE STATE OF WEST VIRGINIA:

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

By: **James Martin** Digitally signed by James Martin
Date: 2020.10.08 08:41:00 -04'00'

JAMES A. MARTIN, CHIEF

WW-6B
(04/15)

FRAC PERMIT

API NO. 47-051 - 014180 F
OPERATOR WELL NO. Hendrickson 4H
Well Pad Name: Hendrickson

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

1) Well Operator: Tug Hill Operating, LLC

<u>494510851</u>	<u>Marshall</u>	<u>Franklin</u>	<u>Wileyville 7.5'</u>
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Operator ID County District Quadrangle

2) Operator's Well Number: Hendrickson 4H Well Pad Name: Hendrickson

3) Farm Name/Surface Owner: Linda L. Hendrickson Public Road Access: CR 76 (Rines Ridge Road)

4) Elevation, current ground: 1220' Elevation, proposed post-construction: 1220'

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

(b) If Gas Shallow Deep _____
Horizontal

6) Existing Pad: Yes or No yes

Ju
6/6/2020

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Existing Marcellus was the target formation with a depth of 6600', 50' thickness and pressure of 4100 psi

8) Proposed Total Vertical Depth: 6,692'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 12,935'

11) Proposed Horizontal Leg Length: 4,986.22'

12) Approximate Fresh Water Strata Depths: 60'

13) Method to Determine Fresh Water Depths: Use shallow offset wells to determine deepest freshwater. Or determine using pre-drill tests, testing while drilling or petrophysical evaluation of resistivity.

14) Approximate Saltwater Depths: 1600'

15) Approximate Coal Seam Depths: Sewickley Coal - 935'; Pittsburgh Coal - 1090'

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

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

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

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WV Dept.
Environmental

WW-6B
(04/15)

4705101480F

API NO. 47- 051 - 014180
 OPERATOR WELL NO. Hendrickson 4H
 Well Pad Name: Hendrickson

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	20"	NEW	BW	BW	existing	40'	CTS
Fresh Water	13 3/8"	NEW	H40	48#	existing	1040'	958 ft^3(CTS)
Coal							
Intermediate	9 5/8"	NEW	J55	36#	existing	2,514'	958 ft^3 (CTS)
Production	5 1/2"	NEW	P110	20#	existing	12,935'	3303 ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,112'	
Liners							

Ju
6/6/2020

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	20"	24"	.25"		existing	Type 1 + 3%CaCl	1.2 cuft/sack
Fresh Water	13 3/8"	17"	.33"	1730 psi	existing	See #22	1.2 Cuft/sack
Coal							
Intermediate	9 5/8"	12 1/4"	.352"	3520 psi	existing	See #22	1.2 Cuft/sack
Production	5 1/2"	8 7/8" & 8 3/4"	.361"	12,640 psi	existing	See #22	1.18 Cuft/sack
Tubing	2 3/8"		.19"	11,200 psi	existing		
Liners							

PACKERS

Kind:	N/A			RECEIVED Office of Oil and Gas
Sizes:	N/A			JUN 24 2020
Depths Set:	N/A			WV Department of Environmental Protection

WW-6B
(10/14)

API NO. 47-051 - 014180 **4705101480F**
OPERATOR WELL NO. Hendrickson 4H
Well Pad Name: Hendrickson

Handwritten signature
6/10/2020

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

Prep and refrac existing well with estimated volumes in #20.

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

Well to be completed with approximately 17,020,000 lb proppant and 263,142 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 30.63

22) Area to be disturbed for well pad only, less access road (acres): 4.21

23) Describe centralizer placement for each casing string:

well previously drilled

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

well previously drilled

25) Proposed borehole conditioning procedures:

well previously drilled

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Environmental Protection

*Note: Attach additional sheets as needed.



GASTAR EXPLORATION USA, INC.

Location: Marshall County, WV
 Field: Marshall
 Facility: Hendrickson

Slot: Slot #4
 Well: Hendrickson North 4H
 Wellbore: Hendrickson North 4H (PWB)



Location Information					
Facility Name		Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Hendrickson		1711272.660	14434047.230	39°44'42.671"N	80°44'52.525"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Longitude
Slot #4	33.05	22.55	1711295.200	14434060.270	39°44'42.967"N
Precision 823 (RT) to Mud line (At Slot: Slot #4)					13ft
Mean Sea Level to Mud line (At Slot: Slot #4)					-1225ft
Precision 823 (RT) to Mean Sea Level					1241ft

Well Profile Data								
Design Comment	MD (ft)	Inc (")	Az (")	TVD (ft)	Local N (ft)	Local E (ft)	DLS ("/100ft)	VS (ft)
Tie On	5543.00	0.710	347.120	5542.85	14.67	-21.09	0.00	-22.85
End of Tangent	5722.16	0.710	347.120	5722.00	16.84	-21.59	0.00	-23.62
End of 3D Arc	6365.63	65.000	10.000	6234.73	342.89	34.14	10.00	-11.44
End of Tangent	6601.63	65.000	10.000	6334.47	553.53	71.28	0.00	-2.44
End of 3D Arc	7588.68	89.503	109.849	6622.30	922.59	804.00	10.00	675.13
End of Tangent	12395.29	89.503	109.849	6664.00	-709.37	5324.90	0.00	5371.94

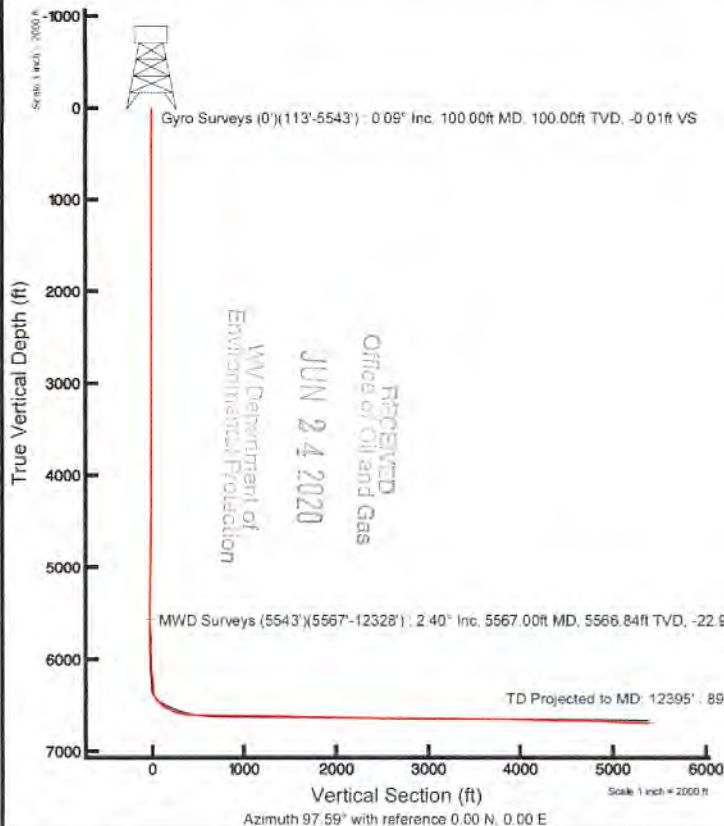
Targets								
Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Hendrickson 4H PWB, Rev.	12395.29	6664.00	-709.37	5324.90	1719617.99	14433371.18	39°44'35.833"N	80°43'44.062"W

Hole and Casing Sections										
Name	Start MD (ft)	End MD (ft)	Interval (ft)	Start TVD (ft)	End TVD (ft)	Start Local N (ft)	Start Local E (ft)	End Local N (ft)	End Local E (ft)	Wellbore
18.875 in Casing	13.00	1045.00	1032.00	13.00	1041.00	0.00	0.00	-0.66	-0.22	Hendrickson North 4H (AWB)
8.625 in Casing	13.00	2517.00	2504.00	13.00	2516.67	0.00	0.00	3.64	-3.35	Hendrickson North 4H (AWB)
5.5 in Casing	13.00	12409.00	12396.00	13.00	NA	0.00	0.00	NA	NA	Hendrickson North 4H (PWB)

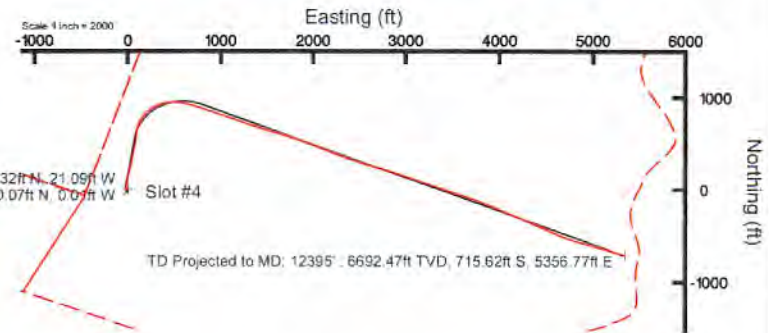
Tie-On Position									
MD (ft)	Inc (")	Az (")	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
5543.00	0.710	347.120	5542.85	14.67	-21.09	1711274.12	14434094.94	39°44'43.142"N	80°44'52.504"W

Bottom Hole Location									
MD (ft)	Inc (")	Az (")	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
12395.29	89.503	109.849	6664.00	-709.37	5324.90	1719617.99	14433371.18	39°44'35.833"N	80°43'44.062"W

API#: 47-051-01480-00
Rig: Precision 823
BHI Job#: 4040037
Duration: 08/28/2011-09/03/2011



MWD Surveys (5543°)(5567°-12328') : 5566.84ft TVD, 15.32ft N, 21.09ft W
 Gyro Surveys (0°)(113°-5543') : 100.00ft TVD, 0.07ft N, 0.07ft W



Scale 1 inch = 2000

BCGM (1948.0 to 2012.0) Dp: 87.44° Field: 52827.1 mT
 Magnetic North is 3.59 degrees West of True North (at 8/24/2011)
 Grid North is 0.16 degrees East of True North
 To correct azimuth from True to Grid subtract 0.16 degrees
 To correct azimuth from Magnetic to Grid subtract 8.75 degrees
 For example: if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 - 8.75 = 81.25

4705101480

WW-9
(4/16)

API Number 47 - 051 - 01480 **4705101480F**
Operator's Well No. Hendrickson 4H

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) Rocky Fork Quadrangle Wileyville 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

Will closed loop system be used? If so, describe: No

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

-If oil based, what type? Synthetic, petroleum, etc. n/a

Additives to be used in drilling medium? n/a

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. n/a

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

-Landfill or offsite name/permit number? n/a

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 James Pancake

Company Official (Typed Name) James Pancake

Company Official Title Vice President - Geoscience

Office of Oil and Gas

JUN 24 2020

WV Department of Environmental Protection

Subscribed and sworn before me this 10 day of JUNE, 2020

Maureen A Stead

Notary Public Commonwealth of Pennsylvania - Notary Seal
MAUREEN A STEAD - Notary Public
Washington County
My Commission Expires Jan 28, 2023
Commission Number 1259926

My commission expires 1/28/23

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 12.64 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

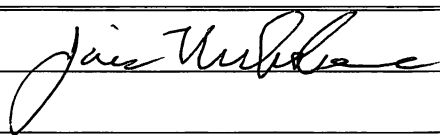
Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Orchard Grass	12
Spring Oats	96	Ladino	3
		White Clover	2

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: _____



Comments: _____

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JUN 24 2020

WV Department of
Environmental Protection

Title: Oil and Gas Inspector

Date: 6/6/2020

Field Reviewed? Yes No

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.

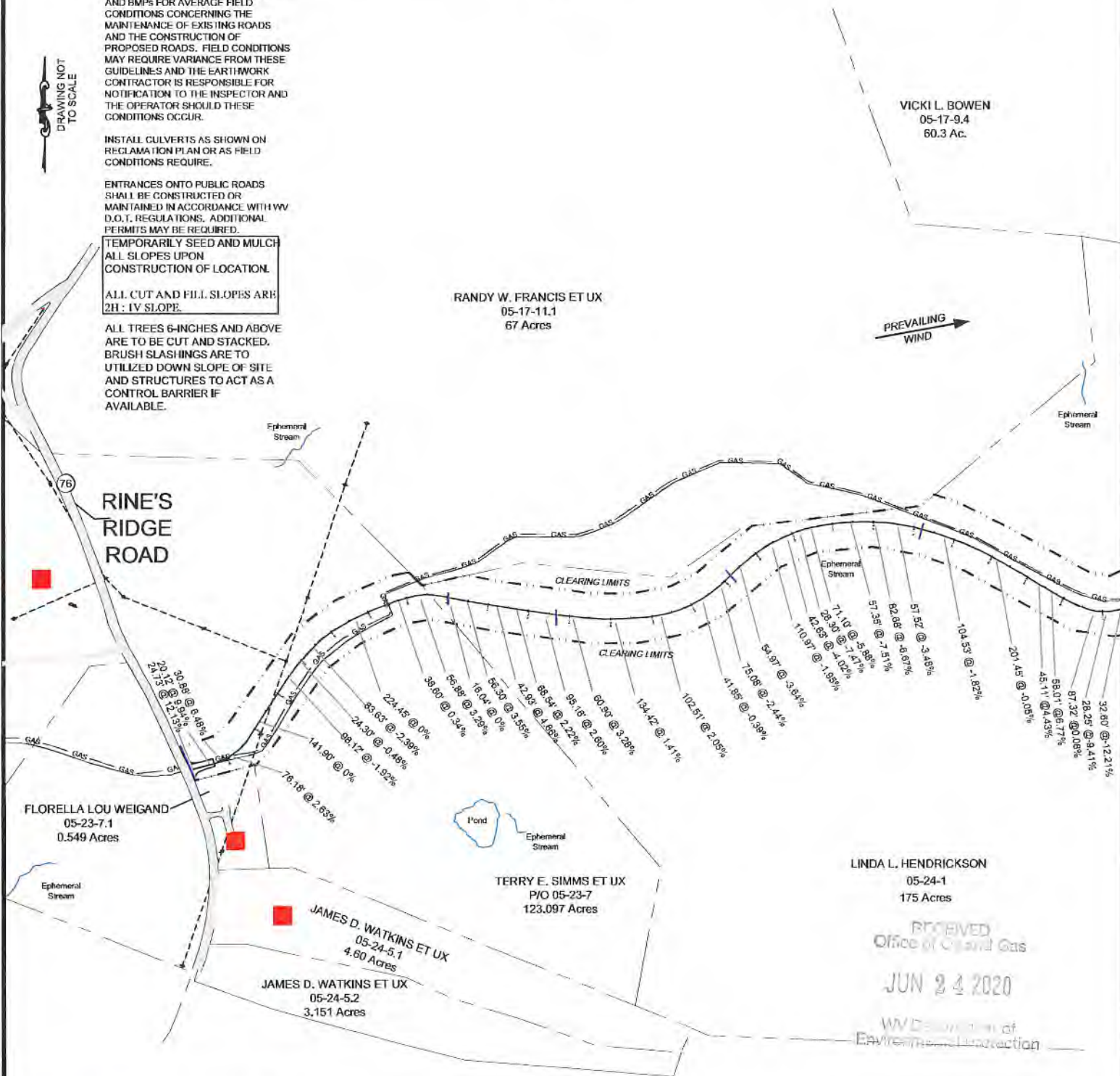
ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

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.

DRAWING NOT TO SCALE



LINDA L. HENDRICKSON
05-24-1
175 Acres

RECEIVED
Office of Oil and Gas
JUN 24 2020
WV Department of Environmental Protection

ROBERT C. FRANCIS ET UX (LIFE)
05-24-5
145.78 Ac.

LEGEND

- Overhead Electric
- Existing 18" HDPE Pipe
- Silt Fence and or Sediment and Erosion Control Measure.
- Surface Boundary



Jackson Surveying Inc.
3413 E. Pike St.
Clarksburg, WV 26301
Phone: 304-623-5951

TOPO SECTION:		OPERATOR:	
WILEYVILLE 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
MARSHALL	FRANKLIN	DATE	SCALE
DRAWN BY	_JOB NO.	05-11-2020	NONE
J.D.C.	4,94510851		



WW-9

PROPOSED HENDRICKSON 4H

SUPPLEMENT PG 1



VICKI L. BOWEN
05-17-9.4
60.3 Ac.

ROGER H. HALL JR.
05-17-8
257.5 Ac.



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.

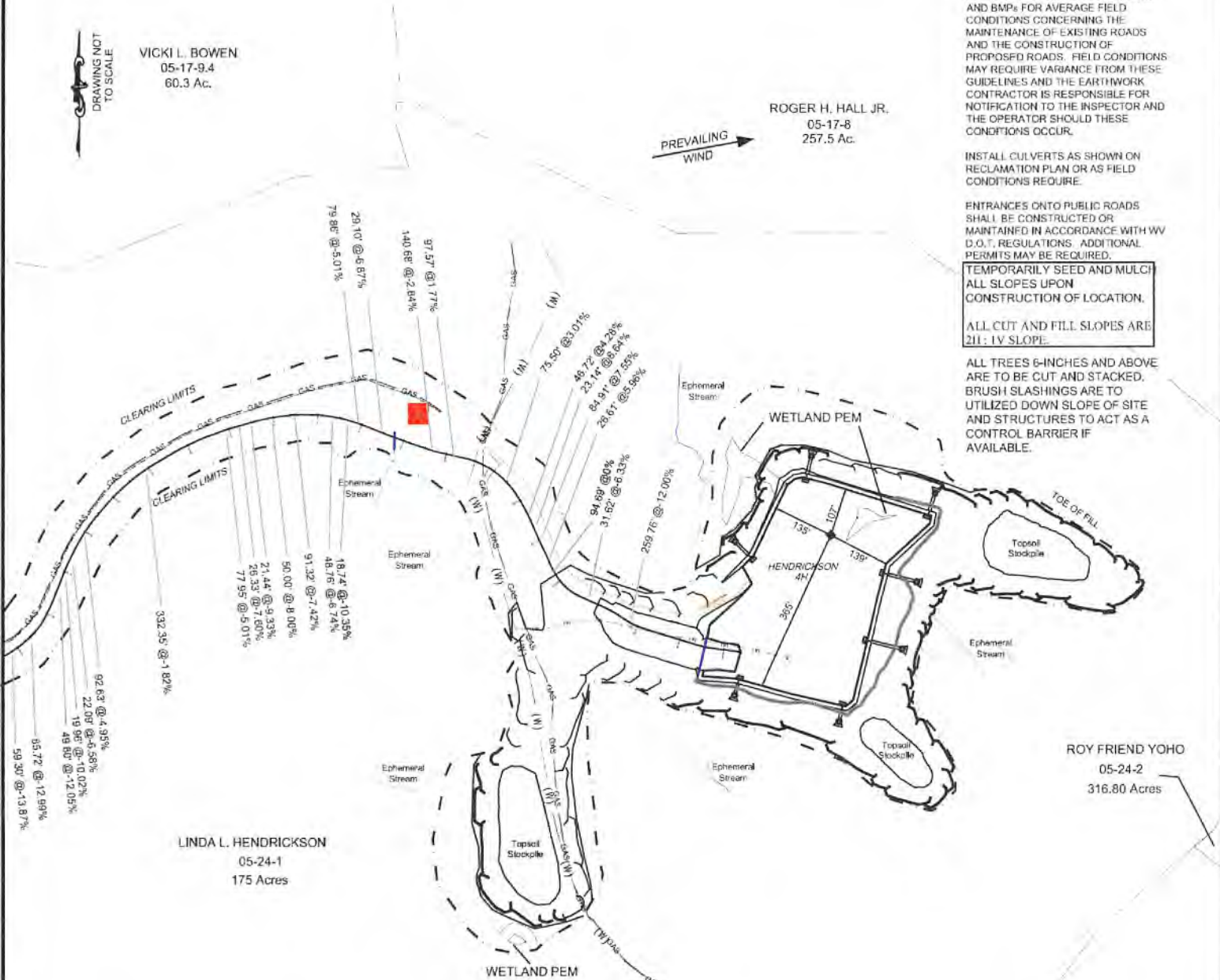
INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

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.



LINDA L. HENDRICKSON
05-24-1
175 Acres

ROY FRIEND YOHO
05-24-2
316.80 Acres

ROBERT C. FRANCIS ET UX (LIFE)
05-24-5
145.78 Ac.

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TERRY E. SIMMS
ET UX
05-24-4
84.05 Acres

T.H. EXPLORATION II, LLC
05-24-3.2
49 Acres

LEGEND	
	3" Gastar Legacy Condy
	6" Gastar Legacy Pipeline
	Overhead Electric
	Existing 18" HDPE Pipe
	Silt Fence and or Sediment and Erosion Control Measure.
	Surface Boundary

Jackson Surveying Inc.
3413 E. Pike St.
Clarksburg, WV 26301
Phone: 304-623-5851

TOPO SECTION:		OPERATOR:	
WILEYVILLE 75'		PREPARED FOR:	
COUNTY:	DISTRICT:	TUG HILL OPERATING LLC	
MARSHALL	FRANKLIN	380 SOUTHPOINTE BLVD	
DRAWN BY:	JOB NO:	SUITE 200	
J.D.C.	494510851	CANDYSBURG, PA 15317	
		DATE:	SCALE:
		05-11-2020	NONE

TUG HILL OPERATING



Well Site Safety Plan

Tug Hill Operating, LLC

Ju
6/6/2020

Well Name: Hendrickson 4H

Pad Name: Hendrickson

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:
Northing: 4,399,515.51
Easting: 521,604.31

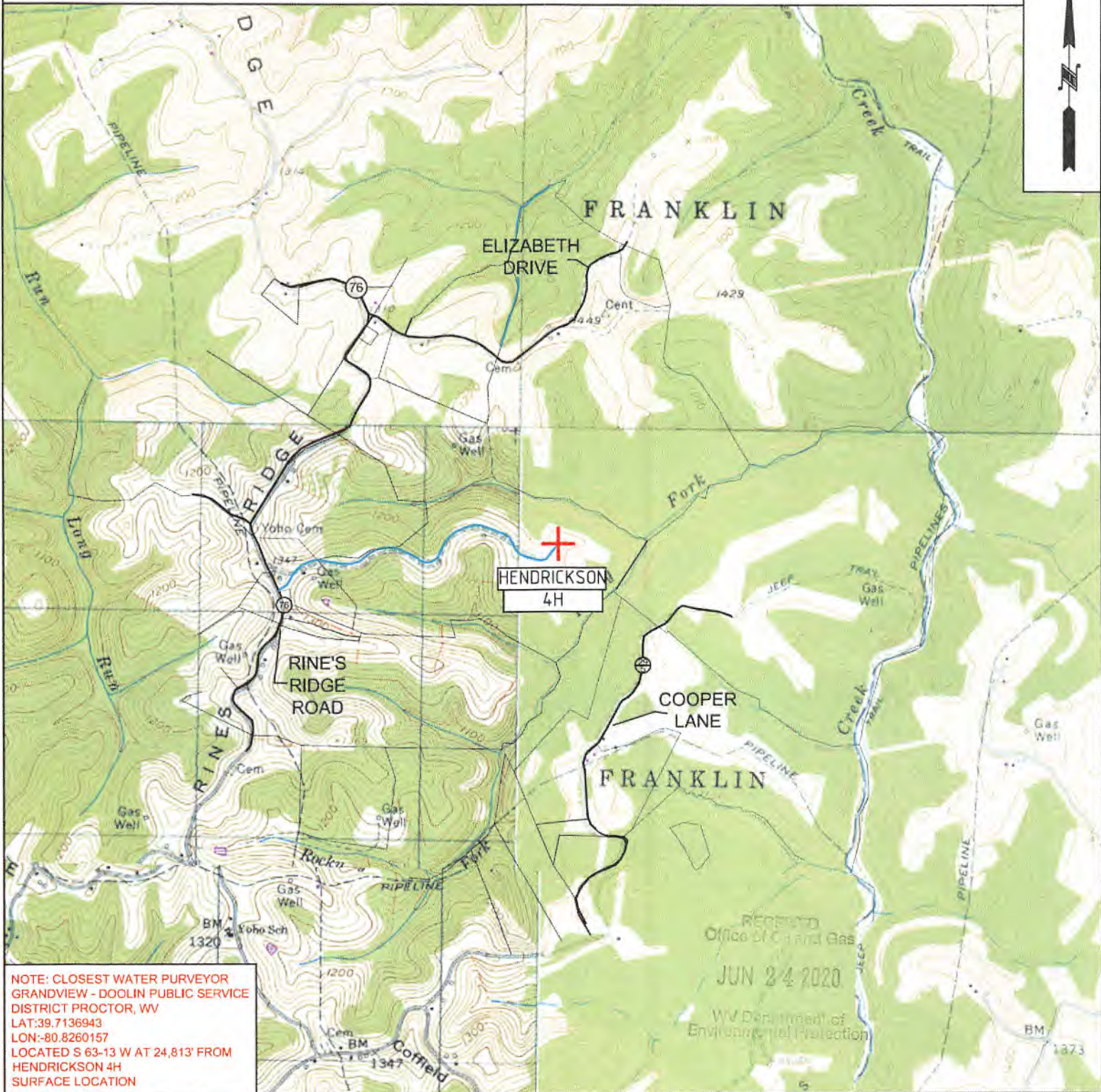
June 2020

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PROPOSED HENDRICKSON 4H



NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN PUBLIC SERVICE
DISTRICT PROCTOR, WV
LAT:39.7136943
LON:-80.8260157
LOCATED S 63-13 W AT 24,813' FROM
HENDRICKSON 4H
SURFACE LOCATION

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TUG HILL
OPERATING

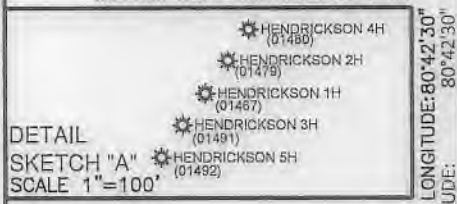
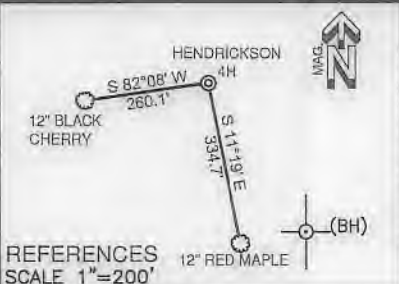
OPERATOR	494510851	TOPO SECTION	LEASE NAME
TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		WILEYVILLE 7.5'	HENDRICKSON
		SCALE:	DATE:
		1" = 2000'	DATE: 5-11-2020

HENDRICKSON LEASE WELL 4H 749.3± ACRES

TOP HOLE LATITUDE: 39°45'00"
BOTTOM HOLE LATITUDE: 39°45'00"

LEGEND

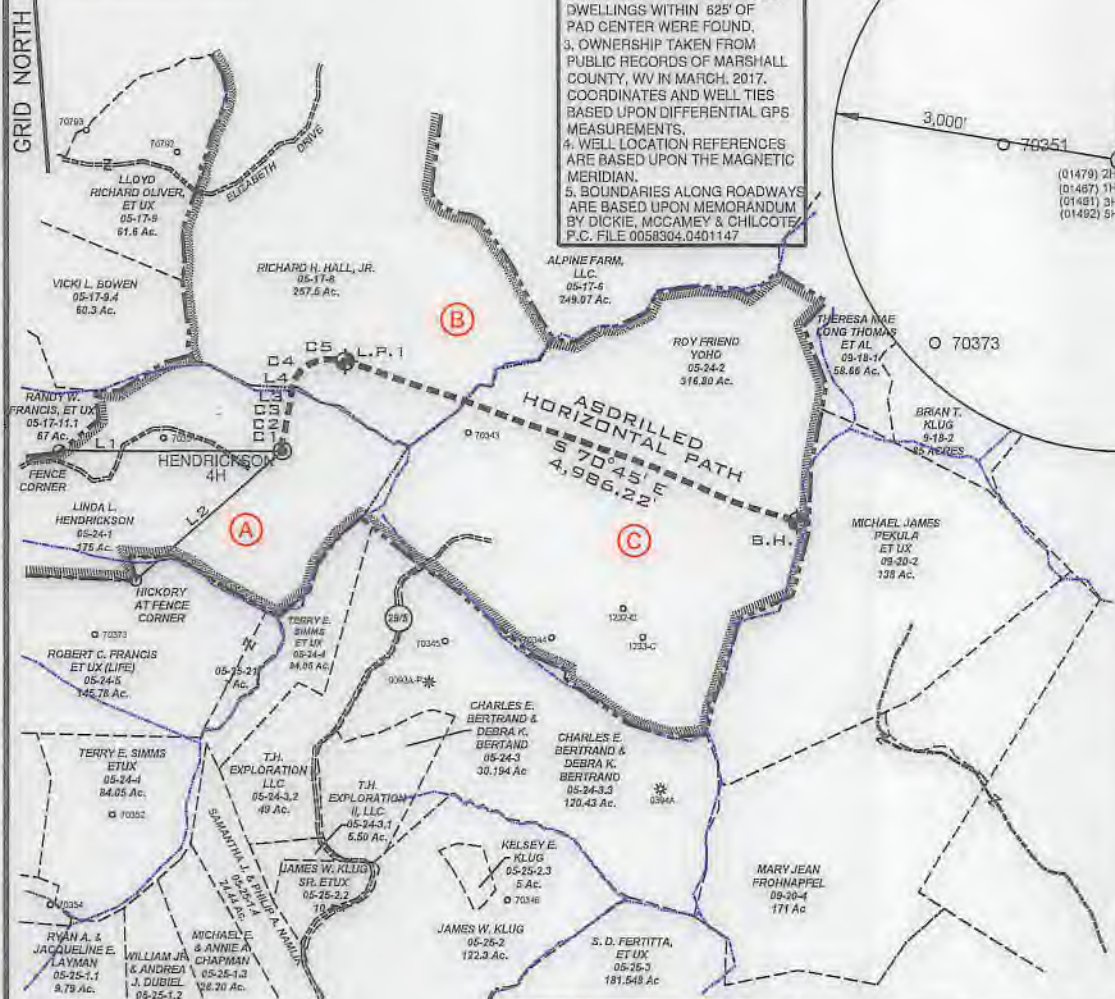
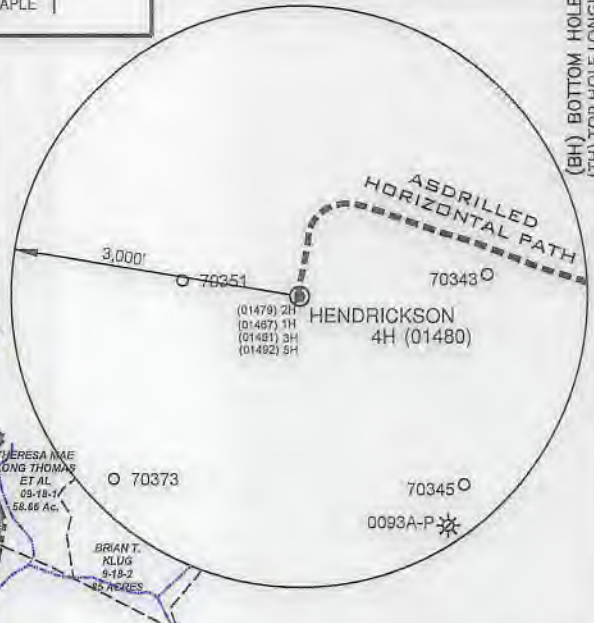
- LEASE TRACTS
- SURFACE TRACTS
- UNIT BOUNDARY
- (A) LEASE # (SEE 6A1 FORM)



(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

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.
- BOUNDARIES ALONG ROADWAYS ARE BASED UPON MEMORANDUM BY DICKIE, MCCAMEY & CHILCOTE, P.C. FILE 0058304.0401147



SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,399,515.51
E) 521,604.31

LANDING POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,399,801.60
E) 521,797.40

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,399,324.76
E) 523,239.92

LINE	BEARING	DISTANCE
L1	S 89°50' W	2327.03'
L2	S 48°30' W	2039.39'
L3	N 11°46' E	316.81'
L4	N 08°33' E	202.67'

CURVE	CHORD BEARING	CHORD LENGTH	RADIUS	ARC LENGTH
C1	N 55°11' W	25.69'	31.05'	26.49'
C2	N 17°40' E	55.57'	142.53'	55.93'
C3	N 06°49' E	68.82'	754.64'	68.84'
C4	N 44°37' E	409.09'	386.10'	434.07'
C5	S 87°55' E	263.54'	505.12'	266.63'

FILE NUMBER _____

DRAWING NUMBER HENDRICKSON_WP_4H

SCALE 1" = 2000'

MINIMUM DEGREE OF ACCURACY 1/200

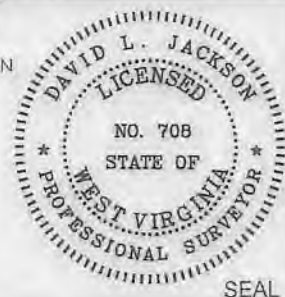
PROVEN SOURCE OF ELEVATION SUBMETER MAPPING
GRADE GPS

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

P.S. 708

David L Jackson

JACKSON SURVEYING INC.
P.O. Box 1460
Clarksburg, WV 26302
304-623-5851



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



DATE: MAY 12, 2020

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

OPERATORS WELL NO. HENDRICKSON 4H
API WELL NO. 47-051-01480F
STATE COUNTY PERMIT

LOCATION ELEVATION 1220.33' WATERSHED (HUC 10) Rocky Fork of Fish Creek (HUC-10)

DISTRICT Franklin COUNTY Marshall
QUADRANGLE Wileyville 7.5' LEASE NUMBER SEE WW-6A1 Form

SURFACE OWNER LINDA L. HENDRICKSON ACREAGE 175.0
OIL & GAS ROYALTY OWNER LINDA L. HENDRICKSON LEASE ACREAGE 175.0
PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___
PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) _____

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD: 6,692' TMD: 12,395'

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

COUNTY NAME PERMIT

WW-6A1
(5/13)

Operator's Well No. Hendrickson 4H

**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 pages

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

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

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

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

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

Lease	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
14138	5-24-1	A	LINDA AND DONALD HENDRICKSON	TRIENERGY, INC.	1/8+	666	528	TriEnergy Inc to AB Resources LLC: 20/348	TriEnergy Inc to TriEnergy Holdings LLC: 21/148	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000 LP: 21/491	Chief E&D LLC, and Radler 2000 LP to Enerplus Resources (USA): 685/643	TriEnergy Holdings LLC to AB Resources LLC: 720/214	AB Resources LLC, Chief E&D LLC, Radler 2000 LP, Enerplus Resources to Gastar Exploration USA Inc & Atinum Marcellus I LLC: 24/39	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14460	5-17-8	B	GERTRUD GODDARD, H G WELLS AIF	GASTAR EXPLORATION USA INC	1/8+	735	515	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9
1-288082-001	5-17-8	B	RONALD GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	690	611	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-002	5-17-8	B	FRANCIS R GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	689	175	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-003	5-17-8	B	WAYNE GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	690	610	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-004	5-17-8	B	MARTHA L BAILEY	CHESAPEAKE APPALACHIA LLC	1/8+	695	366	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-005	5-17-8	B	PAULETTE F PARKER A/K/A PAULETTE FAY DANCY	CHESAPEAKE APPALACHIA LLC	1/8+	695	368	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-006	5-17-8	B	JUDY PROCK A/K/A JUDITH ANN PROCK	CHESAPEAKE APPALACHIA LLC	1/8+	722	339	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-007	5-17-8	B	BRUCE GODDARD SR A/K/A BRUCE EDWARD GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	732	489	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10

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1-288082-008	5-17-8	B	RONALD W GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	695	223	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-009	5-17-8	B	CLIFFORD GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	694	473	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-010	5-17-8	B	WANDA SUE SAYERS	CHESAPEAKE APPALACHIA LLC	1/8+	695	531	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-011	5-17-8	B	LINDA LEE COX	CHESAPEAKE APPALACHIA LLC	1/8+	696	613	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-012	5-17-8	B	KENNETH ALAN GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	696	611	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-013	5-17-8	B	HARRY C CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	696	607	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-014	5-17-8	B	JERRY J CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	696	621	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-015	5-17-8	B	DONALD P CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	698	216	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-016	5-17-8	B	RICHARD P CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	696	596	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-017	5-17-8	B	BRIAN D CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	696	609	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-018	5-17-8	B	PAUL D CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	698	234	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10

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1-288081-019	5-17-8	B	BOBBY D CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	698	232	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
1-288082-020	5-17-8	B	KAREN L CAMPBELL	CHESAPEAKE APPALACHIA LLC	1/8+	698	609	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
1-288082-021	5-17-8	B	EDWARD F SOLTIS REVOCABLE TRUST DATED 9/16/2000 BY DAVID J SCARPONE	CHESAPEAKE APPALACHIA LLC	1/8+	700	325	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
10*14024	5-24-2	C	ROY FRIEND YOHO AND DARLENE J YOHO	GASTAR EXPLORATION USA INC	1/8+	665	508	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14025	5-24-2	C	NANCY CAROL GIBSON	GASTAR EXPLORATION USA INC	1/8+	697	87	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14026	5-24-2	C	CONRAD S YEATER	GASTAR EXPLORATION USA INC	1/8+	697	91	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14027	5-24-2	C	HILDA R CONNER RUNYAN	GASTAR EXPLORATION USA INC	1/8+	697	89	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14028	5-24-2	C	WILDA L CLARK	GASTAR EXPLORATION USA INC	1/8+	697	83	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14029	5-24-2	C	MARY MAXINE CLARKE	GASTAR EXPLORATION USA INC	1/8+	697	85	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9

WW5A1 Supplement
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Lease	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10*14138	5-24-1	A	LINDA AND DONALD HENDRICKSON	TRIENERGY, INC.	1/8+	666	528	TriEnergy Inc to AB Resources LLC: 20/348	TriEnergy Inc to TriEnergy Holdings LLC: 21/148	AB Resources LLC to Chief Exploration & Development LLC & Radler 2000 LP: 21/491	Chief E&D LLC, and Radler 2000 LP to Enerplus Resources (USA): 685/643	TriEnergy Holdings LLC to AB Resources LLC: 720/214	AB Resources LLC, Chief E&D LLC, Radler 2000 LP, Enerplus Resources to Gastar Exploration USA Inc & Atinum Marcellus I LLC: 24/39	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14460	5-17-8	B	GERTRUD GODDARD, H G WELLS AIF	GASTAR EXPLORATION USA INC	1/8+	735	515	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9
1-288082-001	5-17-8	B	RONALD GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	690	611	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
1-288082-002	5-17-8	B	FRANCIS R GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	689	175	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
1-288082-003	5-17-8	B	WAYNE GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	690	610	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
1-288082-004	5-17-8	B	MARTHA L BAILEY	CHESAPEAKE APPALACHIA LLC	1/8+	695	366	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
1-288082-005	5-17-8	B	PAULETTE F PARKER A/K/A PAULETTE FAY DANCY	CHESAPEAKE APPALACHIA LLC	1/8+	695	368	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
1-288082-006	5-17-8	B	JUDY PROCK A/K/A JUDITH ANN PROCK	CHESAPEAKE APPALACHIA LLC	1/8+	722	339	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
1-288082-007	5-17-8	B	BRUCE GODDARD SR A/K/A BRUCE EDWARD GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	732	489	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10

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 Environmental

1-288082-008	5-17-8	B	RONALD W GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	695	223	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-009	5-17-8	B	CLIFFORD GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	694	473	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-010	5-17-8	B	WANDA SUE SAYERS	CHESAPEAKE APPALACHIA LLC	1/8+	695	531	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-011	5-17-8	B	LINDA LEE COX	CHESAPEAKE APPALACHIA LLC	1/8+	696	613	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-012	5-17-8	B	KENNETH ALAN GODDARD	CHESAPEAKE APPALACHIA LLC	1/8+	696	611	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-013	5-17-8	B	HARRY C CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	696	607	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-014	5-17-8	B	JERRY J CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	696	621	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-015	5-17-8	B	DONALD P CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	698	216	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-016	5-17-8	B	RICHARD P CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	696	596	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-017	5-17-8	B	BRIAN D CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	696	609	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10
1-288082-018	5-17-8	B	PAUL D CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	698	234	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Chesapeake/Statoil (Equinor): 740/10

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1-288082-019	5-17-8	B	BOBBY D CRONE	CHESAPEAKE APPALACHIA LLC	1/8+	698	232	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
1-288082-020	5-17-8	B	KAREN L CAMPBELL	CHESAPEAKE APPALACHIA LLC	1/8+	698	609	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
1-288082-021	5-17-8	B	EDWARD F SOLTIS REVOCABLE TRUST DATED 9/16/2000 BY DAVID J SCARPONE	CHESAPEAKE APPALACHIA LLC	1/8+	700	325	N/A	N/A	N/A	N/A	N/A	N/A	Memo of Operating Agreement between Gastar/Atinum and Cheasapeake/Statoil (Equinor): 740/10
10*14024	5-24-2	C	ROY FRIEND YOHO AND DARLENE J YOHO	GASTAR EXPLORATION USA INC	1/8+	665	508	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14025	5-24-2	C	NANCY CAROL GIBSON	GASTAR EXPLORATION USA INC	1/8+	697	87	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14026	5-24-2	C	CONRAD S YEATER	GASTAR EXPLORATION USA INC	1/8+	697	91	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14027	5-24-2	C	HILDA R CONNER RUNYAN	GASTAR EXPLORATION USA INC	1/8+	697	89	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14028	5-24-2	C	WILDA L CLARK	GASTAR EXPLORATION USA INC	1/8+	697	83	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9
10*14029	5-24-2	C	MARY MAXINE CLARKE	GASTAR EXPLORATION USA INC	1/8+	697	85	N/A	N/A	N/A	N/A	N/A	N/A	Certificate of Merger - Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41 Gastar Exploration Inc to TH Exploration II LLC: 36/9

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4705101480F
 MARSHALL COUNTY 01:22:38 PM
 Instrument No 1403489
 Date Recorded 04/27/2016
 Document Type ASN
 Pages Recorded 77
 Book-Page 36-9
 Recording Fee \$77.00
 Additional \$13.00

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

Execution Version

ASSIGNMENT AND BILL OF SALE

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

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

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

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

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

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

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

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BOOK 0740 PAGE 0410

MEMORANDUM OF OPERATING AGREEMENT AND FINANCING STATEMENT

STATE OF WEST VIRGINIA §

COUNTY OF MARSHALL §

GASTAR EXPLORATION LTD
1331 LAMAR SUITE 650
HOUSTON, TX 77010-3025

ATTN : JACOB ARRESTRONS

This Memorandum of Operating Agreement and Financing Statement (hereinafter referred to as "Memorandum") is executed to be effective concurrently with that certain Operating Agreement (the "Operating Agreement") by and between Gastar Exploration USA, Inc., as Operator, and Altium Marcellus I LLC and Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc., as Non-Operator(s), covering, among other things, the development and production of crude oil, natural gas and associated substances from the lands and leases (hereinafter called the "Contract Area") described on Exhibit "A-1" attached hereto and owned by Operator and Non-Operator(s) in the respective percentages of shares indicated on Exhibit "A" to the Operating Agreement.

The Operating Agreement contains an Accounting Procedure, along with provisions giving the parties hereto mutual liens and security interests which one or more parties hereto are or may become Debtors to one or more other parties hereto. This Memorandum incorporates by reference all of the terms and conditions of the Operating Agreement, including but not limited to the lien and security interest provisions.

The purpose of this Memorandum is to place third parties on notice of the Operating Agreement, and to secure and perfect the mutual liens and security interests of the parties hereto.

The Operating Agreement specifically provides and the parties do hereby confirm and agree that:

1. The Operator shall conduct and direct and have full control of all operations on the Contract Area as permitted and required by, and within the limits of, the Operating Agreement.

2. The liability of the parties under the Operating Agreement shall be several, not joint or collective. Each party shall be responsible only for its obligations and shall be liable only for its proportionate share of costs.

3. Each Non-Operator grants to Operator a lien upon its oil and gas rights, oil and gas leases and mineral interests in the Contract Area, and a security interest in its share of oil and/or gas when extracted and its interest in all fixtures, inventory, personal property and equipment located on or used on the Contract Area and in all its contract rights and receivables related thereto and arising therefrom to secure payment of its present and future share of costs and expenses, together with interest thereon at the rate provided in the Accounting Procedure referred to above. To the extent that Operator has a security interest under the Uniform Commercial Code ("Code") of the state or states in which the Contract Area is located, Operator without prejudice and in addition to all other legal, equitable and contractual remedies which are expressly reserved, shall be entitled to exercise the rights and remedies of a secured party under the Code. The bringing of a suit and the obtaining of judgment by Operator for the secured indebtedness shall not be deemed an election of remedies or otherwise affect the rights or security interests for the payment thereof.

4. The Operator grants to Non-Operator(s) a lien and security interest equivalent to that granted to Operator as described in Paragraph 3 above, to secure payment by Operator of its own share of costs and expenses when due.

As reflected above, either or both Operator and Non-Operator(s) may become Debtors if they default in their payment obligations under the terms of the Operating Agreement. On default, the non-defaulting party(ies) will be considered secured party(ies).

The Operating Agreement contains other provisions which do not conflict but supplement the above-described

Jan Pest
MARSHALL County 12:04:41 PM
Instrument No 1308890
Date Recorded 08/03/2011
Document Type ACK
Pages Recorded 8
Book-Page 740-410
Recording Fee \$8.00
Additional \$6.00

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June 18, 2020

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

RE: Hendrickson 4H

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 Hendrickson 4H well plat.

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

Sincerely,

Amy L. Miller
Permitting Specialist – Appalachia Region

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

Date of Notice Certification: 06/19/2020

API No. 47- 051 - 01480

Operator's Well No. Hendrickson 4H

Well Pad Name: Hendrickson

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>521,604.31</u>
County:	<u>Marshall</u>	UTM NAD 83 Northing:	<u>4,399,515.51</u>
District:	<u>Franklin</u>	Public Road Access:	<u>CR 76 (Rines Ridge Road)</u>
Quadrangle:	<u>Wileyville 7.5'</u>	Generally used farm name:	<u>Linda L. Hendrickson</u>
Watershed:	<u>Rocky Fork of Fish Creek (HUC-10)</u>		

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

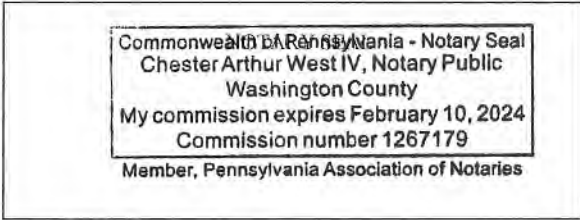
Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following: *PLEASE CHECK ALL THAT APPLY		DOG OFFICE USE ONLY <input type="checkbox"/> RECEIVED/ NOT REQUIRED <input type="checkbox"/>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

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

Certification of Notice is hereby given:

THEREFORE, I Amy L. Miller, 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 Boulevard, Plaza II, Suite 200</u>
By:	<u>Amy L. Miller <i>Amy Miller</i></u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Permitting Specialist</u>	Facsimile:	<u>724-838-2030</u>
Telephone:	<u>724-749-8388</u>	Email:	<u>amiller@tug-hillop.com</u>



Subscribed and sworn before me this 19th day of June 2020.

[Signature] Notary Public

My Commission Expires 2-10-2024

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 deprivacyofficer@wv.gov.

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WW-6A
(9-13)

API NO. 47- 051 -
OPERATOR WELL NO. Hendrickson 4H
Well Pad Name: Hendrickson

**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: 6/16/2020 **Date Permit Application Filed:** 6/20/2020

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: Linda L. Pickering Hendrickson & Donald Ray Hendrickson
 Address: 10 Susquehanna Road (Access Road and Well Pad)
Wellsburg, WV 26070
 Name: _____
 Address: _____

COAL OWNER OR LESSEE
 Name: CONSOL Energy
 Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

COAL OPERATOR
 Name: _____
 Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
 Name: Terry E. Simms & Deborah L. Simms (Access Road)
 Address: 7175 Rines Ridge Road
Proctor, WV 26055
 Name: _____
 Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
 Name: Linda L. Pickering Hendrickson & Donald Ray Hendrickson
 Address: 10 Susquehanna Road
Wellsburg, WV 26070

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

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

*Please attach additional forms if necessary

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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.

JUN 24 2020

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

WW-6A
(8-13)

API NO. 47-051 **4705101480F**
OPERATOR WELL NO. Hendrickson 4H
Well Pad Name: Hendrickson

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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Environmental Protection

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.**

WW-6A
(8-13)

API NO. 47-051 -
OPERATOR WELL NO. Hendrickson 4H
Well Pad Name: Hendrickson

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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Employment, Insurance, and Pension

WW-6A
(8-13)

4705101480F

API NO. 47-051 -
OPERATOR WELL NO. Hendrickson 4H
Well Pad Name: Hendrickson

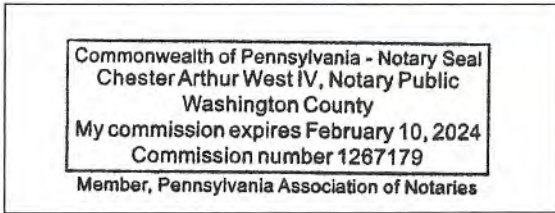
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 16th day of June, 2020.

[Signature]

Notary Public

My Commission Expires 2-10-2024

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WW-6A

Supplement Pg. 1A

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

WATER WELL REPORT

Well: HENDRICKSON 4H
District: Franklin
County: Marshall
State: WV

There appears to be One (1) possible water source within 2,000 feet of the above referenced well location.

Topo Spot # 1 05-24-1 Linda L. Hendrickson 304-737-3468 (H) 171 Navajo Rd. Wellsburg, WV 26070		

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PROPOSED HENDRICKSON 4H

SUPPLEMENT PG 1

There appears to be one (1) possible water source within 2,000'.



 TUG HILL OPERATING	OPERATOR	494510851	TOPO SECTION	LEASE NAME
	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		WILEYVILLE 7.5'	HENDRICKSON
			SCALE:	DATE:
			1" = 1000'	DATE: 5-11-2020

**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: 6/10/2020 **Date of Planned Entry:** 6/17/2020

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: Terry E. Simms & Deborah L. Simms (Access Road)
 Address: 7175 Rines Ridge Road
Proctor, WV 26055

Name: Linda L. Pickering Hendrickson & Donald Ray Hendrickson
 Address: 10 Susquehanna Road (Access Road and Well Pad)
Wellsburg, WV 26070

Name: _____
 Address: _____

COAL OWNER OR LESSEE

Name: CONSOL Energy
 Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

MINERAL OWNER(s)

Name: Linda L. Pickering Hendrickson & Donald Ray Hendrickson
 Address: 10 Susquehanna Road
Wellsburg, WV 26070

*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:

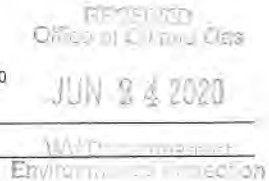
State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>39.74329244</u>
County: <u>Marshall</u>	Public Road Access: <u>-80.76243058</u>
District: <u>Franklin</u>	Watershed: <u>Rocky Fork of Fish Creek (HUC-10)</u>
Quadrangle: <u>Wileyville 7.5'</u>	Generally used farm name: <u>Linda L. Hendrickson</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: Tug Hill Operating, LLC
 Telephone: 724-749-8388
 Email: amiller@tug-hill.com

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



Oil and Gas Privacy Notice:

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

**Additional Parties to Notice (WW-6A3)
Hendrickson Pad**

Mineral Owners

Evelyn C. Lady 2003-5 Meadowlark Rd Manhattan, KS 66502	Sharon S. Darwish 113 Leatherwood Dr Moundsville, WV 26041
Shelly Mysliwicz 73 Durwood Ct Moundsville, WV 26041	Trudi Blake 302 9th St. Glen Dale, WV 26038

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WW-6A5
(1/12)

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

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

Date of Notice: 06/17/2020 **Date Permit Application Filed:** 06/19/2020

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: Linda L. Pickering Hendrickson & Donald Ray Hendrickson
Address: 10 Susquehanna Road
Wellsburg, WV 26070

Name: Terry E. Simms & Deborah L. Simms
Address: 7175 Rines Ridge Road
Proctor, WV 26055

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>521,604.31</u>
County:	<u>Marshall</u>		Northing:	<u>4,399,515.51</u>
District:	<u>Franklin</u>	Public Road Access:	<u>CR 76 (Rines Ridge Road)</u>	
Quadrangle:	<u>Wileyville 7.5'</u>	Generally used farm name:	<u>Linda L. Hendrickson</u>	
Watershed:	<u>Rocky Fork of Fish Creek (HUC-10)</u>			

This Notice Shall Include:

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

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

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

Oil and Gas Privacy Notice:

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

Office of Oil and Gas
JUN 24 2020
WV DEPT. OF ENVIRONMENTAL PROTECTION



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways

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

Byrd E. White, III
 Secretary of Transportation/
 Commissioner of Highways

June 22, 2020

Jimmy Wriston, P. E.
 Deputy Secretary/
 Deputy Commissioner

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 Hendrickson Pad, Marshall County
 Hendrickson 4H Well Site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2011-0175 which has been issued to Tug Hill Operating for access to the State Road for a well site located off Marshall County Route 76 SLS.

This operator is in compliance with §22-6A-20 of the WV Code. Operator has signed a STATEWIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated October 1, 2018.

Very Truly Yours,

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

Cc: Amy Miller
 Tug Hill Operating
 CH, OM, D-6
 File



TUG HILL

4705101480F

PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Hendrickson 4H

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

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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 Adam Picard (724) 485-9331, apicard@dpslandservices.com, DPS GIS (06/18/2020) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

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

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

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

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Permit well - Hendrickson 4H

Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
47-051-01480	Tug Hill Operating, LLC	12395' TVD 6692' MD	Marcellus	Unknown	Yes, this is a producing Marcellus horizontal well. Proper casing and cement should prevent migration of fluids between wellbores.	Hendrickson 4H
47-051-01479	Tug Hill Operating, LLC	11924' TVD 6676' MD	Marcellus	Unknown	Yes, this is a producing Marcellus horizontal well. Proper casing and cement should prevent migration of fluids between wellbores.	Hendrickson 2H
47-051-01467	Tug Hill Operating, LLC	11434' TVD 6670' MD	Marcellus	Unknown	Yes, this is a producing Marcellus horizontal well. Proper casing and cement should prevent migration of fluids between wellbores.	Hendrickson 1H
47-051-01491	Tug Hill Operating, LLC	11518' TVD 6675' MD	Marcellus	Unknown	Yes, this is a producing Marcellus horizontal well. Proper casing and cement should prevent migration of fluids between wellbores.	Hendrickson 3H
47-051-01492	Tug Hill Operating, LLC	12410' TVD 6672' MD	Marcellus	Unknown	Yes, this is a producing Marcellus horizontal well. Proper casing and cement should prevent migration of fluids between wellbores.	Hendrickson 5H
47-051-70343	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the Marcellus well.	State records are incomplete.
47-051-30491	Manufacturers Light & Heat Co.	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the Marcellus well.	Well was plugged 9/1/1967.

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License Information - Well Map
License Number: 01460
Well Name: ...

Region Name and Location Information
Region: ...

Production Data by Well Summary
Columns: Well ID, Licensee Name, Product, Volume, etc.

Production Data by Well Summary (continued)
Columns: Well ID, Licensee Name, Product, Volume, etc.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

Production Data by Well Summary (continued)
Columns: Well ID, Licensee Name, Product, Volume, etc.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

Production Data by Well Summary (continued)
Columns: Well ID, Licensee Name, Product, Volume, etc.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

Production Data by Well Summary (continued)
Columns: Well ID, Licensee Name, Product, Volume, etc.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

Production Data by Well Summary (continued)
Columns: Well ID, Licensee Name, Product, Volume, etc.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

There is no Volume (C/L) data for this well

There is no Flugging data for this well

There is no Sample data for this well

License Information - Well Map
License Number: 01479
Well Name: ...

Region Name and Location Information
Region: ...

Production Data by Well Summary
Columns: Well ID, Licensee Name, Product, Volume, etc.

Production Data by Well Summary (continued)
Columns: Well ID, Licensee Name, Product, Volume, etc.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

Production Data by Well Summary (continued)
Columns: Well ID, Licensee Name, Product, Volume, etc.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

Production Data by Well Summary (continued)
Columns: Well ID, Licensee Name, Product, Volume, etc.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

Production Data by Well Summary (continued)
Columns: Well ID, Licensee Name, Product, Volume, etc.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

Production Data by Well Summary (continued)
Columns: Well ID, Licensee Name, Product, Volume, etc.

Table with columns: Well ID, Licensee Name, Product, Volume, etc. for various wells.

There is no Volume (C/L) data for this well

There is no Flugging data for this well

There is no Sample data for this well

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Location Information: Well Name: ...

Well Information: ...

Operator Information: ...

Completion Information: ...

Table with columns: Well ID, Date, Type, Location, etc.

Table with columns: Well ID, Date, Type, Location, etc.

Table with columns: Well ID, Date, Type, Location, etc.

Table with columns: Well ID, Date, Type, Location, etc.

Table with columns: Well ID, Date, Type, Location, etc.

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

Location Information: Well Name: ...

Well Information: ...

Operator Information: ...

Completion Information: ...

There is no Production Gas data for this well.
There is no Production Oil data for this well.
There is no Production NGL data for this well.
There is no Production Water data for this well.
There is no Stragraphy data for this well.
There is no Wellbore (E-Log) data for this well.
There is no Plugging data for this well.
There is no Sample data for this well.

Location Information: Well Name: ...

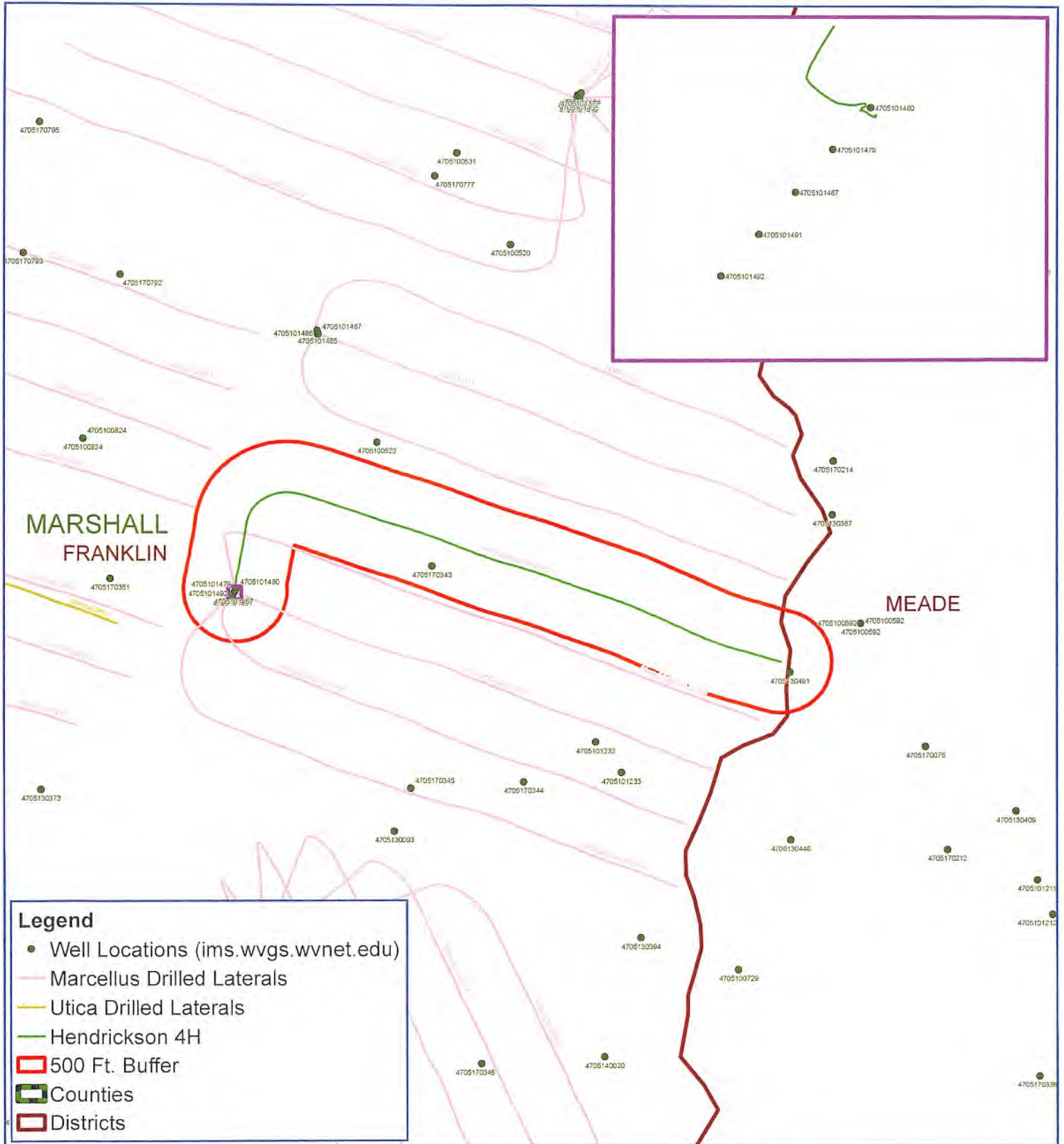
Well Information: ...

Operator Information: ...

Completion Information: ...

There is no Production Gas data for this well.
There is no Production Oil data for this well.
There is no Production NGL data for this well.
There is no Production Water data for this well.
There is no Stragraphy data for this well.
There is no Wellbore (E-Log) data for this well.
There is no Plugging data for this well.
There is no Sample data for this well.

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WV Department of Environmental Protection



Legend

- Well Locations (ims.wvgs.wvnet.edu)
- Marcellus Drilled Laterals
- Utica Drilled Laterals
- Hendrickson 4H
- 500 Ft. Buffer
- Counties
- Districts



Hendrickson 4H Franklin District Marshall County, WV

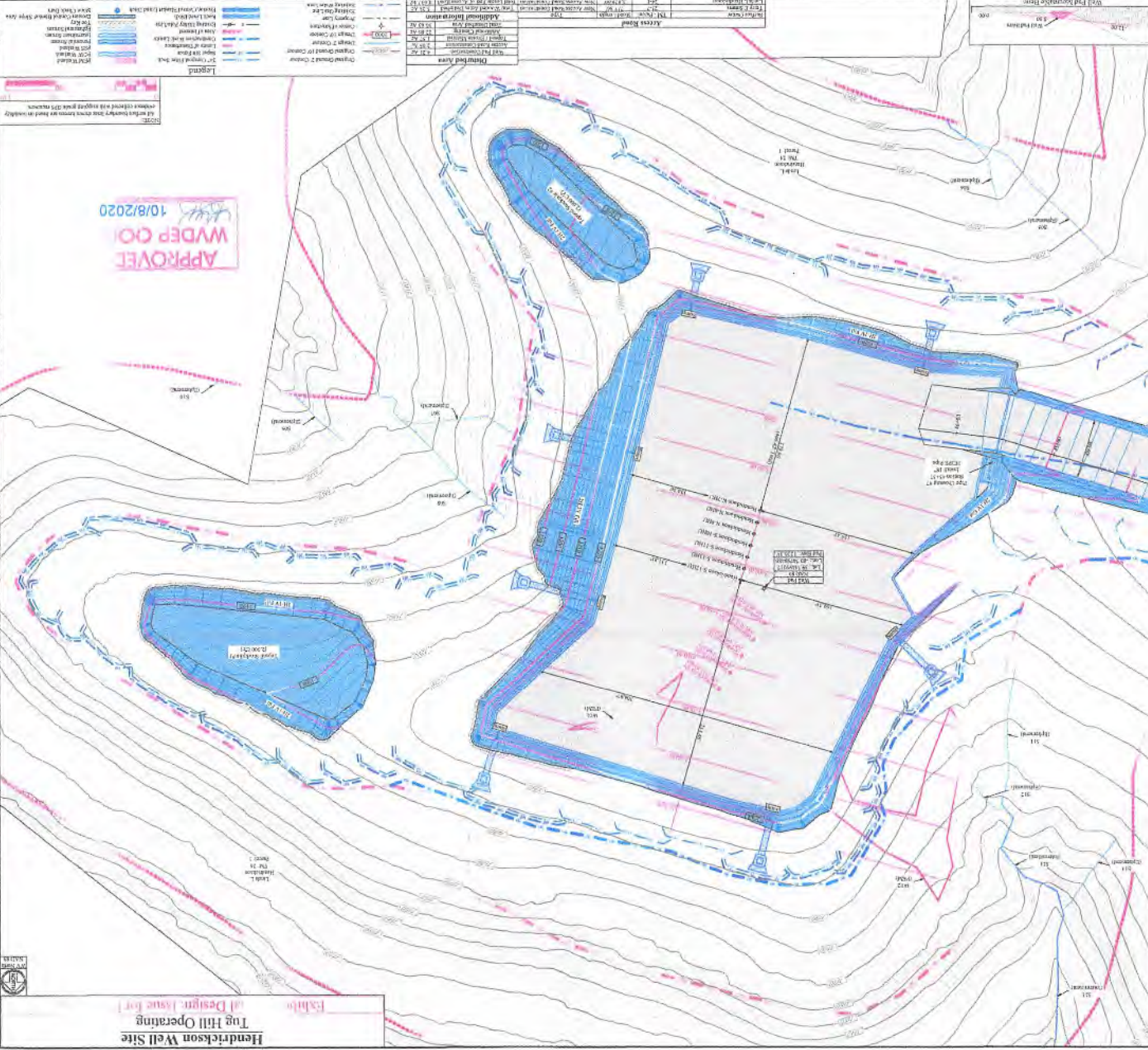
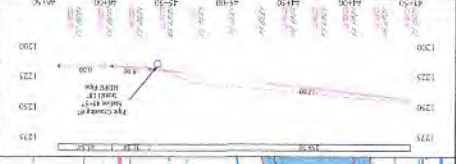
RECEIVED
Office of Oil & Gas
JUN 24 2020
WV Department of Environmental Protection



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



Map Created: June 18, 2020
Map Current As Of: June 18, 2020



Hendrickson Well Site
Tug Hill Operating
Fabric
10/8/2020
APPROVE
W/DEP COI

Hendrickson Well Site
Franklin County, WV

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OPERATING

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DATE: 10/15/2019
DRAWN BY: JCS
CHECKED BY: JCS
SCALE: AS SHOWN
SHEET NO. 25
SHEET TOTAL: 25

