



 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

Friday, February 8, 2019
 WELL WORK PERMIT
 Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
 380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit approval for WHISTLEPIG N-4HM
 47-051-02160-00-00

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: WHISTLEPIG N-4HM
 Farm Name: ROBERT L. & REBECCA SHI
 U.S. WELL NUMBER: 47-051-02160-00-00
 Horizontal 6A New Drill
 Date Issued: 2/8/2019

PERMIT CONDITIONS

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

CONDITIONS

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

PERMIT CONDITIONS

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

Area of Review

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

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

Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (12/10/2018) 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 - Whistlepig N-4HM

Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101568	Tug Hill Operating	11,932' MD 6,601' TVD	Marcellus	None	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101567	Tug Hill Operating	11,852' MD 6,603' TVD	Marcellus	None	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705100557	Mobay Chemical Corp	4,810' TVD	Benson	Unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation. The well is plugged	Well was plugged 10/30/1987

WV: County = #1 Permit = 01882

WV Oil and Gas Division

WV Statewide Gas Well Production Report

Production Report Information

Operator: Tug Hill Operating

Well Name: Whistlepig N-4HM

County: Boone

Permit Number: 01882

Production Report Summary

API No.	Well Name	Operator	Production Type	Production Volume	Production Date
4705101568	Whistlepig N-4HM	Tug Hill Operating	Gas	11,932'	2018-12-15
4705101567	Whistlepig N-4HM	Tug Hill Operating	Gas	11,852'	2018-12-15
4705100557	Whistlepig N-4HM	Mobay Chemical Corp	Gas	4,810'	2018-12-15

Production Report Details

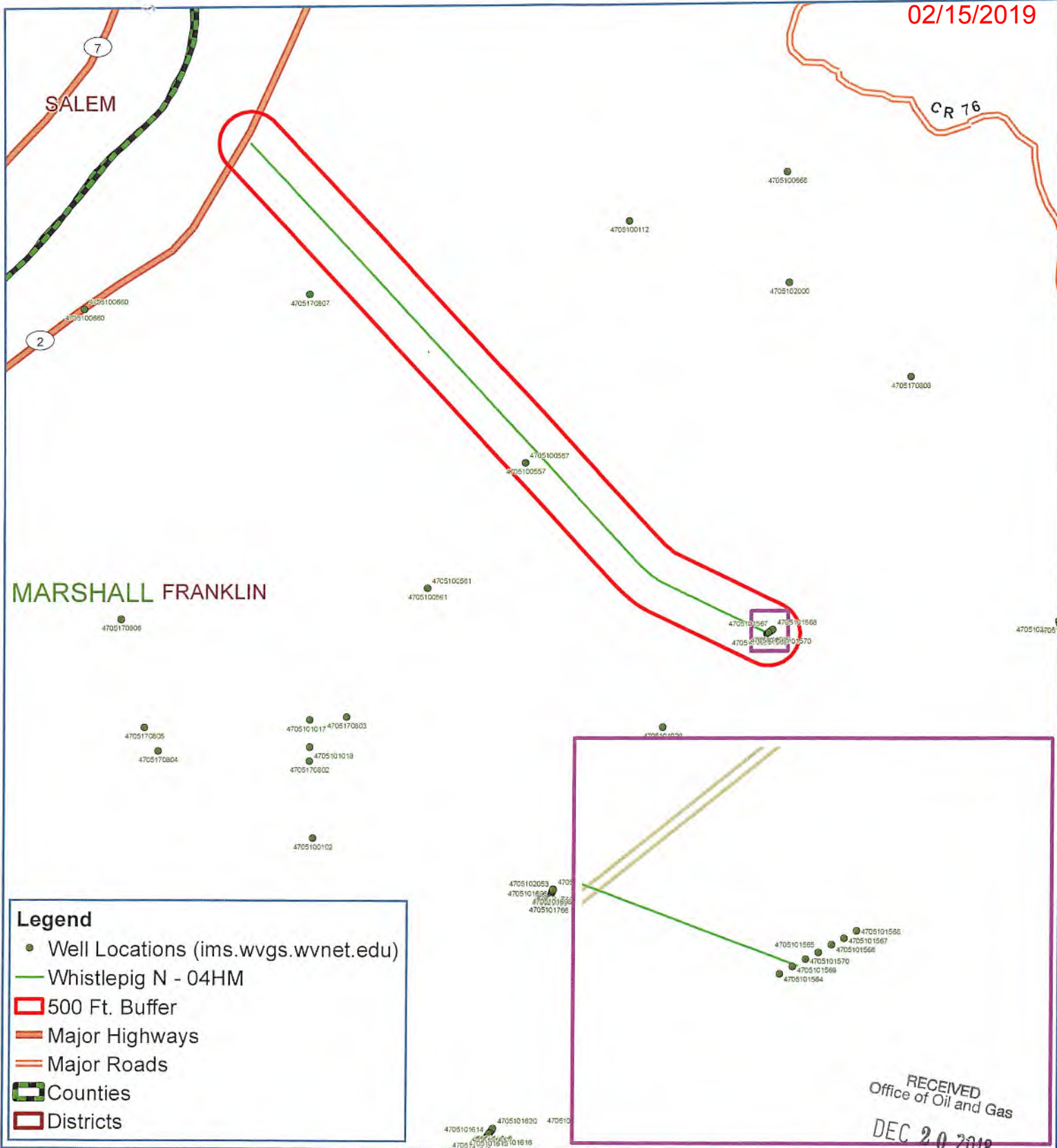
API No.	Well Name	Operator	Production Type	Production Volume	Production Date
4705101568	Whistlepig N-4HM	Tug Hill Operating	Gas	11,932'	2018-12-15
4705101567	Whistlepig N-4HM	Tug Hill Operating	Gas	11,852'	2018-12-15
4705100557	Whistlepig N-4HM	Mobay Chemical Corp	Gas	4,810'	2018-12-15

Production Report Summary

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4705101568	Whistlepig N-4HM	Tug Hill Operating	Gas	11,932'	2018-12-15
4705101567	Whistlepig N-4HM	Tug Hill Operating	Gas	11,852'	2018-12-15
4705100557	Whistlepig N-4HM	Mobay Chemical Corp	Gas	4,810'	2018-12-15

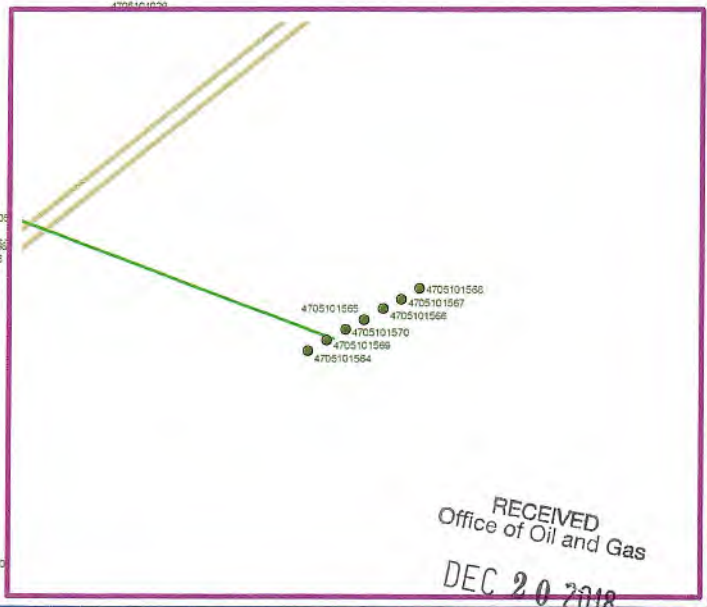
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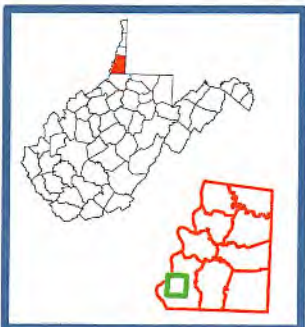


Legend

- Well Locations (ims.wvgs.wvnet.edu)
- Whistlepig N - 04HM
- 500 Ft. Buffer
- Major Highways
- Major Roads
- ▭ Counties
- ▭ Districts



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Whistlepig N - 04HM

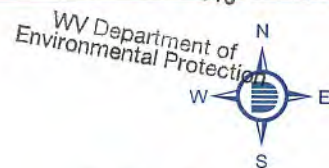
Franklin District

Marshall County, WV



Notes:

All locations are approximate and are for visualization purposes only.



Map Prepared by:



WW-6B
(04/15)

API NO. 47-051 -

OPERATOR WELL NO. Whistlepig N-4HM

Well Pad Name: Hoyt

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

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

2) Operator's Well Number: Whistlepig N-4HM Well Pad Name: Hoyt

3) Farm Name/Surface Owner: Ula F. Nelson Public Road Access: Burch Ridge Road (CR 29)

4) Elevation, current ground: 1367.40' Elevation, proposed post-construction: 1367.40'

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

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No Yes

JW
12/18/18

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6515' - 6565', thickness of 50' and an anticipated approx. pressure of 3800 psi.

8) Proposed Total Vertical Depth: 6665'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 16,121'

11) Proposed Horizontal Leg Length: 8,831'

12) Approximate Fresh Water Strata Depths: 70', 973'

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

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 867' and Pittsburgh Coal - 967'

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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18) **CASING AND TUBING PROGRAM**

TYPE	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	30"	NEW	BW	BW	120'	120'	259ft^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	1070'	1070'	1093ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	1070'	1070'	1093ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2848'	2848'	925ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	16,121'	16,121'	3776ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#	7,044'		
Liners							

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TYPE	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17.5"	.33	2,740	2,192	SEE#24	1.2
Coal	13 3/8"	17.5"	.33	2,740	2,192	SEE #24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE #24	1.19
Production	5 1/2"	8 7/8_ 8 3/4	.361	12,640	10,112	SEE #24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

PACKERS

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

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WW-6B
(10/14)

API NO. 47-051 - **02/15/2019**

OPERATOR WELL NO. Whistlepig N-4HM

Well Pad Name: Hoyt

Handwritten signature and date: 12/18/18

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

Drill through the Marcellus tagging less than 100' from the top of the Onondata to get depths and log data. Plug back to proposed kick off point. Drill the horizontal section to planned and proposed TD. Run casing and cement to surface. Run Bond Log from app. 60 deg to surface. Make clean out run and stimulate.

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

Well to be completed with approximately 22,077,500 lb. proppant and 341,334 barrels of water. Max rate = 80bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 21.74 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.58 acres

23) Describe centralizer placement for each casing string:

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

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

*See attachment

25) Proposed borehole conditioning procedures:

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

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*Note: Attach additional sheets as needed.

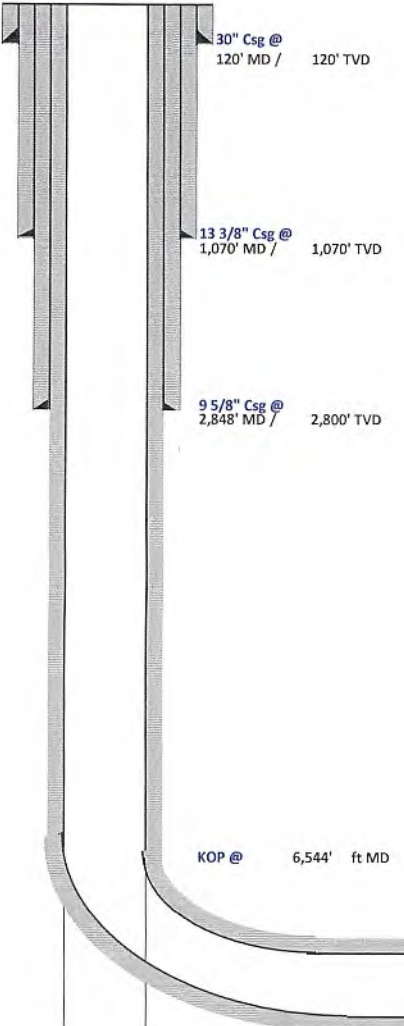


WELL NAME: Whistlepig N-4HM
STATE: WV **COUNTY:** Marshall
DISTRICT: #N/A
DF Elev: 1,367' **GL Elev:** 1,367'
TD: 16,121'
TH Latitude: 39.77530063
TH Longitude: -80.79294605
BH Latitude: 39.79636354
BH Longitude: -80.82181762

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	973
Sewickley Coal	867
Pittsburgh Coal	967
Big Lime	2042
Weir	2396
Berea	2591
Gordon	2936
Rhinestreet	5909
Geneseo/Burkett	6399
Tully	6434
Hamilton	6469
Marcellus	6515
Landing Depth	6550
Onondaga	6565
Pilot Hole Depth	6665

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	17.5	13 3/8	1,070'	1,070'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,848'	2,800'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	16,121'	6,396'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,105	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	925	A	15	Air	1 Centralizer every other jt
Production	3,776	A	14.5	Air / SOBMs	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



DM
12/18/18

Pilot Hole TD @ 6665' TVD
 Landing Point @ 7,290' MD / 6,550' TVD
 BH TD = 100' below Onondaga Top

Lateral TD @ 16,121' ft MD
 6,396 ft TVD

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Tug Hill Operating, LLC Casing and Cement Program

Whistlepig N-4HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	1,070'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,848'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4	16,121'	CTS

Cement

Conductor:	Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2
Surface:	Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
Intermediate:	Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.19
Kick Off Plug:	Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug
Production:	50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.19

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Well: Whistlepig N-04HM (slot C)
 Site: Whistlepig
 Project: Marshall County, West Virginia
 Design: rev1
 Rig:

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2'/100' build
3	2741.20	24.82	295.63	2702.73	114.50	-238.66	2.00	295.63	252.25	Begin 24.82° tangent
4	6544.03	24.82	295.63	6154.19	805.08	-1678.13	0.00	0.00	1773.68	Begin 8°/100' build/turn
5	6872.71	50.00	308.81	6413.54	915.77	-1841.31	8.00	23.22	1968.36	Begin 10°/100' build/turn
6	7289.69	91.00	317.13	6550.00	1180.44	-2119.99	10.00	12.56	2352.70	Begin 91.00° lateral
7	16121.09	91.00	317.13	6396.00	7652.15	-8127.24	0.00	0.00	1162.77	PBHL/TD 16121.09 MD/6396.00 TVD

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

System Datum: Mean Sea Level
 Depth Reference: GL @ 1367.00ft

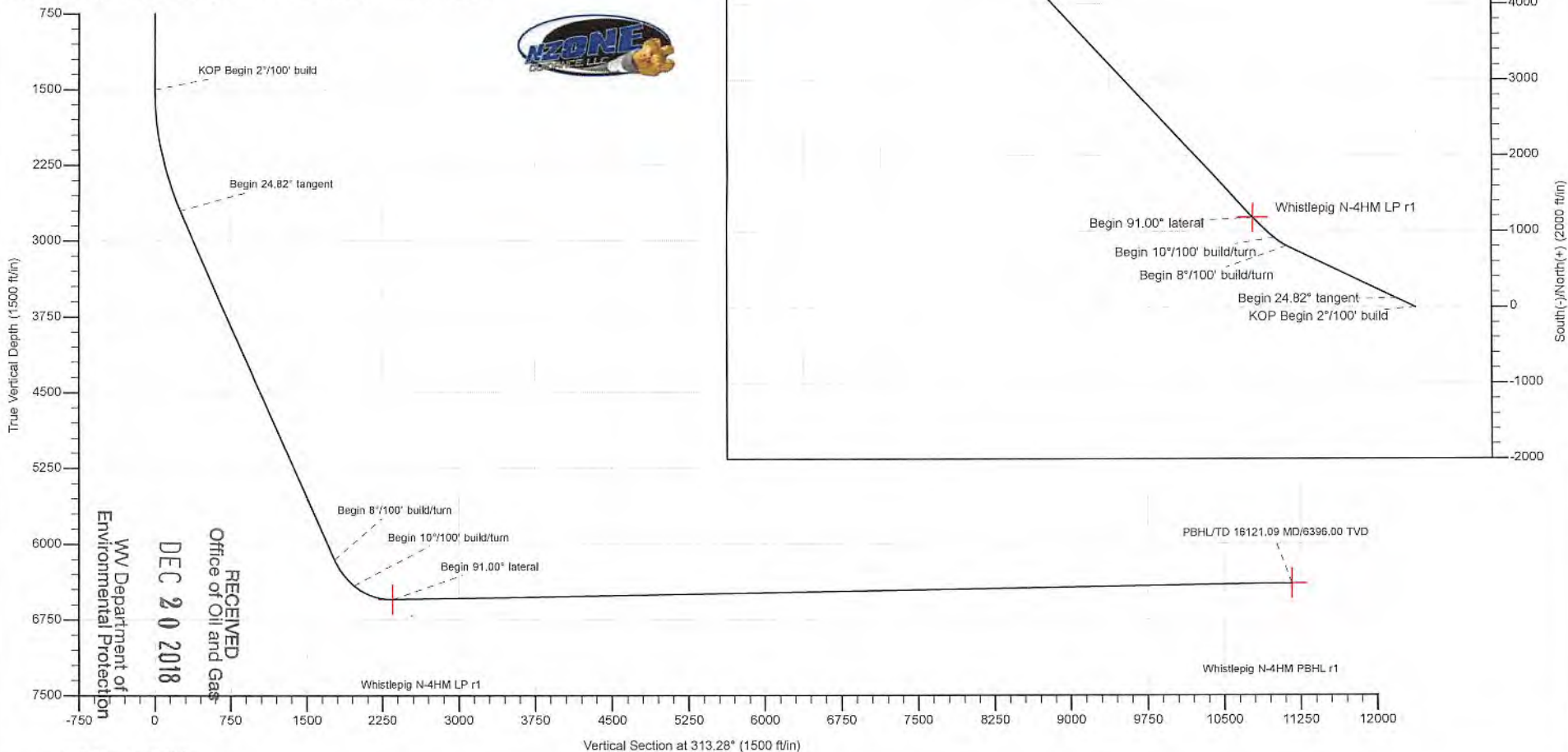
Northing: 14444980.20
 Easting: 1698591.96
 Latitude: 39.77530063
 Longitude: -80.79254605



Azimuths to Grid North
 True North: -0.13°
 Magnetic North: -8.80°

Magnetic Field
 Strength: 52017.85nT
 Dip Angle: 66.84°
 Date: 11/1/2018
 Model: IGRF2015

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.80°



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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Whistlepig N-04HM (slot C)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1367.00ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1367.00ft
Site:	Whistlepig	North Reference:	Grid
Well:	Whistlepig N-04HM (slot C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Project	Marshall County, West Virginia		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD83 West Virginia - HARN		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	Whistlepig				
Site Position:		Northing:	14,444,965.96 usft	Latitude:	39.77526165
From:	Lat/Long	Easting:	1,698,572.65 usft	Longitude:	-80.79301490
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.13 °

Well	Whistlepig N-04HM (slot C)					
Well Position	+N/-S	0.00 ft	Northing:	14,444,980.20 usft	Latitude:	39.77530063
	+E/-W	0.00 ft	Easting:	1,698,591.96 usft	Longitude:	-80.79294605
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	1,367.00 ft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/1/2018	-8.67	66.84	52,017.81461726

Design	rev1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	313.28

Plan Survey Tool Program	Date	12/10/2018		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	16,121.09 rev1 (Original Hole)	MWD MWD - Standard	

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Plan Sections	WV Department of Environmental Protection									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,741.20	24.82	295.63	2,702.73	114.50	-238.66	2.00	2.00	0.00	295.63	
6,544.03	24.82	295.63	6,154.19	805.08	-1,678.13	0.00	0.00	0.00	0.00	
6,872.71	50.00	308.81	6,413.54	915.77	-1,841.31	8.00	7.66	4.01	23.22	
7,289.69	91.00	317.13	6,550.00	1,180.44	-2,119.99	10.00	9.83	2.00	12.56	
16,121.09	91.00	317.13	6,396.00	7,652.15	-8,127.24	0.00	0.00	0.00	0.00	Whistlepig N-4HM PB



Planning Report - Geographic

02/15/2019

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Whistlepig N-04HM (slot C)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1367.00ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1367.00ft
Site:	Whistlepig	North Reference:	Grid
Well:	Whistlepig N-04HM (slot C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

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DEC 20 2018

WV Department of
Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
100.00	0.00	0.00	100.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
200.00	0.00	0.00	200.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
300.00	0.00	0.00	300.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
400.00	0.00	0.00	400.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
500.00	0.00	0.00	500.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
600.00	0.00	0.00	600.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
700.00	0.00	0.00	700.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
800.00	0.00	0.00	800.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
900.00	0.00	0.00	900.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,444,980.20	1,698,591.96	39.77530063	-80.79294605	
KOP Begin 2°/100' build										
1,600.00	2.00	295.63	1,599.98	0.75	-1.57	14,444,980.95	1,698,590.38	39.77530271	-80.79295164	
1,700.00	4.00	295.63	1,699.84	3.02	-6.29	14,444,983.22	1,698,585.67	39.77530896	-80.79296842	
1,800.00	6.00	295.63	1,799.45	6.79	-14.15	14,444,986.99	1,698,577.81	39.77531936	-80.79299636	
1,900.00	8.00	295.63	1,898.70	12.06	-25.14	14,444,992.26	1,698,566.82	39.77533391	-80.79303542	
2,000.00	10.00	295.63	1,997.47	18.83	-39.24	14,444,999.02	1,698,552.72	39.77535258	-80.79308556	
2,100.00	12.00	295.63	2,095.62	27.08	-56.44	14,445,007.28	1,698,535.51	39.77537535	-80.79314672	
2,200.00	14.00	295.63	2,193.06	36.81	-76.72	14,445,017.01	1,698,515.23	39.77540220	-80.79321882	
2,300.00	16.00	295.63	2,289.64	48.00	-100.06	14,445,028.20	1,698,491.90	39.77543309	-80.79330178	
2,400.00	18.00	295.63	2,385.27	60.65	-126.42	14,445,040.85	1,698,465.54	39.77546799	-80.79339549	
2,500.00	20.00	295.63	2,479.82	74.73	-155.77	14,445,054.93	1,698,436.19	39.77550685	-80.79349984	
2,600.00	22.00	295.63	2,573.17	90.23	-188.08	14,445,070.43	1,698,403.88	39.77554962	-80.79361470	
2,700.00	24.00	295.63	2,665.21	107.13	-223.31	14,445,087.33	1,698,368.65	39.77559626	-80.79373994	
2,741.20	24.82	295.63	2,702.73	114.50	-238.66	14,445,094.69	1,698,353.30	39.77561658	-80.79379453	
Begin 24.82° tangent										
2,800.00	24.82	295.63	2,756.10	125.17	-260.92	14,445,105.37	1,698,331.04	39.77564604	-80.79387365	
2,900.00	24.82	295.63	2,846.86	143.33	-298.77	14,445,123.53	1,698,293.19	39.77569616	-80.79400823	
3,000.00	24.82	295.63	2,937.62	161.49	-336.62	14,445,141.69	1,698,255.34	39.77574627	-80.79414280	
3,100.00	24.82	295.63	3,028.38	179.65	-374.47	14,445,159.85	1,698,217.48	39.77579638	-80.79427738	
3,200.00	24.82	295.63	3,119.14	197.81	-412.33	14,445,178.01	1,698,179.63	39.77584649	-80.79441195	
3,300.00	24.82	295.63	3,209.90	215.97	-450.18	14,445,196.17	1,698,141.78	39.77589660	-80.79454653	
3,400.00	24.82	295.63	3,300.66	234.13	-488.03	14,445,214.33	1,698,103.93	39.77594671	-80.79468110	
3,500.00	24.82	295.63	3,391.42	252.29	-525.88	14,445,232.49	1,698,066.07	39.77599682	-80.79481568	
3,600.00	24.82	295.63	3,482.18	270.45	-563.74	14,445,250.65	1,698,028.22	39.77604693	-80.79495025	
3,700.00	24.82	295.63	3,572.94	288.61	-601.59	14,445,268.81	1,697,990.37	39.77609704	-80.79508483	
3,800.00	24.82	295.63	3,663.70	306.77	-639.44	14,445,286.97	1,697,952.52	39.77614714	-80.79521940	
3,900.00	24.82	295.63	3,754.46	324.93	-677.30	14,445,305.13	1,697,914.66	39.77619725	-80.79535398	
4,000.00	24.82	295.63	3,845.22	343.09	-715.15	14,445,323.29	1,697,876.81	39.77624736	-80.79548855	
4,100.00	24.82	295.63	3,935.98	361.25	-753.00	14,445,341.45	1,697,838.96	39.77629747	-80.79562313	
4,200.00	24.82	295.63	4,026.74	379.41	-790.85	14,445,359.61	1,697,801.11	39.77634758	-80.79575771	
4,300.00	24.82	295.63	4,117.50	397.57	-828.71	14,445,377.77	1,697,763.25	39.77639769	-80.79589228	
4,400.00	24.82	295.63	4,208.26	415.73	-866.56	14,445,395.93	1,697,725.40	39.77644780	-80.79602686	
4,500.00	24.82	295.63	4,299.02	433.89	-904.41	14,445,414.09	1,697,687.55	39.77649791	-80.79616144	
4,600.00	24.82	295.63	4,389.78	452.05	-942.26	14,445,432.25	1,697,649.70	39.77654801	-80.79629601	
4,700.00	24.82	295.63	4,480.54	470.21	-980.12	14,445,450.40	1,697,611.84	39.77659812	-80.79643059	
4,800.00	24.82	295.63	4,571.30	488.37	-1,017.97	14,445,468.56	1,697,573.99	39.77664823	-80.79656517	
4,900.00	24.82	295.63	4,662.06	506.53	-1,055.82	14,445,486.72	1,697,536.14	39.77669834	-80.79669975	
5,000.00	24.82	295.63	4,752.82	524.69	-1,093.68	14,445,504.88	1,697,498.28	39.77674844	-80.79683433	



Planning Report - Geographic

Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Whistlepig
 Well: Whistlepig N-04HM (slot C)
 Wellbore: Original Hole
 Design: rev1

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

Well Whistlepig N-04HM (slot C)
 GL @ 1367.00ft
 GL @ 1367.00ft
 Grid
 Minimum Curvature

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 Office of Oil and Gas
 DEC 20 2018

WV Department of
 Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,100.00	24.82	295.63	4,843.58	542.85	-1,131.53	14,445,523.04	1,697,460.43	39.77679855	-80.79696890
5,200.00	24.82	295.63	4,934.34	561.01	-1,169.38	14,445,541.20	1,697,422.58	39.77684866	-80.79710348
5,300.00	24.82	295.63	5,025.10	579.17	-1,207.23	14,445,559.36	1,697,384.73	39.77689877	-80.79723806
5,400.00	24.82	295.63	5,115.86	597.32	-1,245.09	14,445,577.52	1,697,346.87	39.77694887	-80.79737264
5,500.00	24.82	295.63	5,206.62	615.48	-1,282.94	14,445,595.68	1,697,309.02	39.77699898	-80.79750722
5,600.00	24.82	295.63	5,297.38	633.64	-1,320.79	14,445,613.84	1,697,271.17	39.77704909	-80.79764180
5,700.00	24.82	295.63	5,388.14	651.80	-1,358.64	14,445,632.00	1,697,233.32	39.77709919	-80.79777638
5,800.00	24.82	295.63	5,478.90	669.96	-1,396.50	14,445,650.16	1,697,195.46	39.77714930	-80.79791096
5,900.00	24.82	295.63	5,569.66	688.12	-1,434.35	14,445,668.32	1,697,157.61	39.77719940	-80.79804554
6,000.00	24.82	295.63	5,660.42	706.28	-1,472.20	14,445,686.48	1,697,119.76	39.77724951	-80.79818012
6,100.00	24.82	295.63	5,751.18	724.44	-1,510.06	14,445,704.64	1,697,081.91	39.77729962	-80.79831470
6,200.00	24.82	295.63	5,841.94	742.60	-1,547.91	14,445,722.80	1,697,044.05	39.77734972	-80.79844928
6,300.00	24.82	295.63	5,932.70	760.76	-1,585.76	14,445,740.96	1,697,006.20	39.77739983	-80.79858386
6,400.00	24.82	295.63	6,023.46	778.92	-1,623.61	14,445,759.12	1,696,968.35	39.77744993	-80.79871844
6,500.00	24.82	295.63	6,114.22	797.08	-1,661.47	14,445,777.28	1,696,930.50	39.77750004	-80.79885302
6,544.03	24.82	295.63	6,154.19	805.08	-1,678.13	14,445,785.27	1,696,913.83	39.77752210	-80.79891228
Begin 8°/100' build/turn									
6,600.00	28.99	299.27	6,204.09	816.80	-1,700.57	14,445,796.99	1,696,891.39	39.77755442	-80.79899204
6,700.00	36.60	303.84	6,288.10	845.29	-1,746.54	14,445,825.49	1,696,845.42	39.77763297	-80.79915544
6,800.00	44.33	307.01	6,364.13	882.99	-1,799.29	14,445,863.19	1,696,792.67	39.77773683	-80.79934288
6,872.71	50.00	308.81	6,413.54	915.77	-1,841.31	14,445,895.97	1,696,750.65	39.77782710	-80.79949218
Begin 10°/100' build/turn									
6,900.00	52.67	309.56	6,430.59	929.23	-1,857.83	14,445,909.43	1,696,734.14	39.77786418	-80.79955085
7,000.00	62.47	311.91	6,484.16	984.31	-1,921.64	14,445,964.50	1,696,670.33	39.77801581	-80.79977753
7,100.00	72.30	313.87	6,522.57	1,047.10	-1,989.14	14,446,027.29	1,696,602.82	39.77818866	-80.80001731
7,200.00	82.16	315.63	6,544.65	1,115.69	-2,058.30	14,446,095.88	1,696,533.67	39.77837746	-80.80026290
7,289.69	91.00	317.13	6,550.00	1,180.44	-2,119.99	14,446,160.64	1,696,471.97	39.77855566	-80.80048199
Begin 91.00° lateral									
7,300.00	91.00	317.13	6,549.82	1,187.99	-2,127.01	14,446,168.19	1,696,464.96	39.77857645	-80.80050688
7,400.00	91.00	317.13	6,548.07	1,261.28	-2,195.03	14,446,241.47	1,696,396.93	39.77877812	-80.80074841
7,500.00	91.00	317.13	6,546.33	1,334.56	-2,263.05	14,446,314.75	1,696,328.91	39.77897978	-80.80098994
7,600.00	91.00	317.13	6,544.59	1,407.84	-2,331.07	14,446,388.03	1,696,260.89	39.77918145	-80.80123147
7,700.00	91.00	317.13	6,542.84	1,481.12	-2,399.09	14,446,461.31	1,696,192.87	39.77938311	-80.80147300
7,800.00	91.00	317.13	6,541.10	1,554.40	-2,467.11	14,446,534.59	1,696,124.85	39.77958477	-80.80171453
7,900.00	91.00	317.13	6,539.36	1,627.68	-2,535.13	14,446,607.87	1,696,056.83	39.77978643	-80.80195607
8,000.00	91.00	317.13	6,537.61	1,700.96	-2,603.16	14,446,681.15	1,695,988.81	39.77998810	-80.80219760
8,100.00	91.00	317.13	6,535.87	1,774.24	-2,671.18	14,446,754.43	1,695,920.79	39.78018976	-80.80243914
8,200.00	91.00	317.13	6,534.12	1,847.52	-2,739.20	14,446,827.72	1,695,852.76	39.78039142	-80.80268068
8,300.00	91.00	317.13	6,532.38	1,920.80	-2,807.22	14,446,901.00	1,695,784.74	39.78059308	-80.80292222
8,400.00	91.00	317.13	6,530.64	1,994.08	-2,875.24	14,446,974.28	1,695,716.72	39.78079474	-80.80316376
8,500.00	91.00	317.13	6,528.89	2,067.36	-2,943.26	14,447,047.56	1,695,648.70	39.78099640	-80.80340530
8,600.00	91.00	317.13	6,527.15	2,140.64	-3,011.28	14,447,120.84	1,695,580.68	39.78119806	-80.80364684
8,700.00	91.00	317.13	6,525.41	2,213.92	-3,079.31	14,447,194.12	1,695,512.66	39.78139971	-80.80388839
8,800.00	91.00	317.13	6,523.66	2,287.20	-3,147.33	14,447,267.40	1,695,444.64	39.78160137	-80.80412993
8,900.00	91.00	317.13	6,521.92	2,360.48	-3,215.35	14,447,340.68	1,695,376.62	39.78180303	-80.80437148
9,000.00	91.00	317.13	6,520.17	2,433.77	-3,283.37	14,447,413.96	1,695,308.59	39.78200468	-80.80461303
9,100.00	91.00	317.13	6,518.43	2,507.05	-3,351.39	14,447,487.24	1,695,240.57	39.78220634	-80.80485458
9,200.00	91.00	317.13	6,516.69	2,580.33	-3,419.41	14,447,560.52	1,695,172.55	39.78240800	-80.80509614
9,300.00	91.00	317.13	6,514.94	2,653.61	-3,487.43	14,447,633.80	1,695,104.53	39.78260965	-80.80533769
9,400.00	91.00	317.13	6,513.20	2,726.89	-3,555.46	14,447,707.08	1,695,036.51	39.78281131	-80.80557924
9,500.00	91.00	317.13	6,511.46	2,800.17	-3,623.48	14,447,780.36	1,694,968.49	39.78301296	-80.80582080
9,600.00	91.00	317.13	6,509.71	2,873.45	-3,691.50	14,447,853.64	1,694,900.47	39.78321461	-80.80606236
9,700.00	91.00	317.13	6,507.97	2,946.73	-3,759.52	14,447,926.92	1,694,832.45	39.78341627	-80.80630392
9,800.00	91.00	317.13	6,506.22	3,020.01	-3,827.54	14,448,000.20	1,694,764.42	39.78361792	-80.80654548



Planning Report - Geographic

Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Whistlepig
 Well: Whistlepig N-04HM (slot C)
 Wellbore: Original Hole
 Design: rev1

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

Well Whistlepig N-04HM (slot C)
 GL @ 1367.00ft
 GL @ 1367.00ft
 Grid
 Minimum Curvature

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Planned Survey									WV Department of Environmental Protection	
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,900.00	91.00	317.13	6,504.46	3,093.29	-3,895.56	14,448,073.46	1,694,696.40	39.78381957	-80.80678704	
10,000.00	91.00	317.13	6,502.74	3,166.57	-3,963.58	14,448,146.76	1,694,628.38	39.78402122	-80.80702860	
10,100.00	91.00	317.13	6,500.99	3,239.85	-4,031.61	14,448,220.04	1,694,560.36	39.78422287	-80.80727017	
10,200.00	91.00	317.13	6,499.25	3,313.13	-4,099.63	14,448,293.32	1,694,492.34	39.78442452	-80.80751174	
10,300.00	91.00	317.13	6,497.51	3,386.41	-4,167.65	14,448,366.61	1,694,424.32	39.78462617	-80.80775330	
10,400.00	91.00	317.13	6,495.76	3,459.69	-4,235.67	14,448,439.89	1,694,356.30	39.78482782	-80.80799487	
10,500.00	91.00	317.13	6,494.02	3,532.97	-4,303.69	14,448,513.17	1,694,288.28	39.78502947	-80.80823644	
10,600.00	91.00	317.13	6,492.27	3,606.26	-4,371.71	14,448,586.45	1,694,220.25	39.78523112	-80.80847801	
10,700.00	91.00	317.13	6,490.53	3,679.54	-4,439.73	14,448,659.73	1,694,152.23	39.78543277	-80.80871959	
10,800.00	91.00	317.13	6,488.79	3,752.82	-4,507.76	14,448,733.01	1,694,084.21	39.78563442	-80.80896116	
10,900.00	91.00	317.13	6,487.04	3,826.10	-4,575.78	14,448,806.29	1,694,016.19	39.78583606	-80.80920274	
11,000.00	91.00	317.13	6,485.30	3,899.38	-4,643.80	14,448,879.57	1,693,948.17	39.78603771	-80.80944432	
11,100.00	91.00	317.13	6,483.56	3,972.66	-4,711.82	14,448,952.85	1,693,880.15	39.78623936	-80.80968590	
11,200.00	91.00	317.13	6,481.81	4,045.94	-4,779.84	14,449,026.13	1,693,812.13	39.78644100	-80.80992748	
11,300.00	91.00	317.13	6,480.07	4,119.22	-4,847.86	14,449,099.41	1,693,744.11	39.78664265	-80.81016906	
11,400.00	91.00	317.13	6,478.32	4,192.50	-4,915.88	14,449,172.69	1,693,676.08	39.78684429	-80.81041064	
11,500.00	91.00	317.13	6,476.58	4,265.78	-4,983.91	14,449,245.97	1,693,608.06	39.78704594	-80.81065223	
11,600.00	91.00	317.13	6,474.84	4,339.06	-5,051.93	14,449,319.25	1,693,540.04	39.78724758	-80.81089381	
11,700.00	91.00	317.13	6,473.09	4,412.34	-5,119.95	14,449,392.53	1,693,472.02	39.78744922	-80.81113540	
11,800.00	91.00	317.13	6,471.35	4,485.62	-5,187.97	14,449,465.81	1,693,404.00	39.78765086	-80.81137699	
11,900.00	91.00	317.13	6,469.61	4,558.90	-5,255.99	14,449,539.09	1,693,335.98	39.78785251	-80.81161858	
12,000.00	91.00	317.13	6,467.86	4,632.18	-5,324.01	14,449,612.37	1,693,267.96	39.78805415	-80.81186017	
12,100.00	91.00	317.13	6,466.12	4,705.46	-5,392.03	14,449,685.65	1,693,199.94	39.78825579	-80.81210176	
12,200.00	91.00	317.13	6,464.37	4,778.75	-5,460.05	14,449,758.93	1,693,131.91	39.78845743	-80.81234336	
12,300.00	91.00	317.13	6,462.63	4,852.03	-5,528.08	14,449,832.21	1,693,063.89	39.78865907	-80.81258495	
12,400.00	91.00	317.13	6,460.89	4,925.31	-5,596.10	14,449,905.49	1,692,995.87	39.78886071	-80.81282655	
12,500.00	91.00	317.13	6,459.14	4,998.59	-5,664.12	14,449,978.78	1,692,927.85	39.78906235	-80.81306815	
12,600.00	91.00	317.13	6,457.40	5,071.87	-5,732.14	14,450,052.06	1,692,859.83	39.78926399	-80.81330975	
12,700.00	91.00	317.13	6,455.66	5,145.15	-5,800.16	14,450,125.34	1,692,791.81	39.78946562	-80.81355135	
12,800.00	91.00	317.13	6,453.91	5,218.43	-5,868.18	14,450,198.62	1,692,723.79	39.78966726	-80.81379296	
12,900.00	91.00	317.13	6,452.17	5,291.71	-5,936.20	14,450,271.90	1,692,655.77	39.78986890	-80.81403456	
13,000.00	91.00	317.13	6,450.42	5,364.99	-6,004.23	14,450,345.18	1,692,587.74	39.79007053	-80.81427617	
13,100.00	91.00	317.13	6,448.68	5,438.27	-6,072.25	14,450,418.46	1,692,519.72	39.79027217	-80.81451777	
13,200.00	91.00	317.13	6,446.94	5,511.55	-6,140.27	14,450,491.74	1,692,451.70	39.79047381	-80.81475938	
13,300.00	91.00	317.13	6,445.19	5,584.83	-6,208.29	14,450,565.02	1,692,383.68	39.79067544	-80.81500099	
13,400.00	91.00	317.13	6,443.45	5,658.11	-6,276.31	14,450,638.30	1,692,315.66	39.79087708	-80.81524260	
13,500.00	91.00	317.13	6,441.71	5,731.39	-6,344.33	14,450,711.58	1,692,247.64	39.79107871	-80.81548422	
13,600.00	91.00	317.13	6,439.96	5,804.67	-6,412.35	14,450,784.86	1,692,179.62	39.79128034	-80.81572583	
13,700.00	91.00	317.13	6,438.22	5,877.95	-6,480.38	14,450,858.14	1,692,111.60	39.79148198	-80.81596745	
13,800.00	91.00	317.13	6,436.47	5,951.23	-6,548.40	14,450,931.42	1,692,043.57	39.79168361	-80.81620906	
13,900.00	91.00	317.13	6,434.73	6,024.52	-6,616.42	14,451,004.70	1,691,975.55	39.79188524	-80.81645068	
14,000.00	91.00	317.13	6,432.99	6,097.80	-6,684.44	14,451,077.98	1,691,907.53	39.79208687	-80.81669230	
14,100.00	91.00	317.13	6,431.24	6,171.08	-6,752.46	14,451,151.26	1,691,839.51	39.79228850	-80.81693392	
14,200.00	91.00	317.13	6,429.50	6,244.36	-6,820.48	14,451,224.54	1,691,771.49	39.79249013	-80.81717555	
14,300.00	91.00	317.13	6,427.76	6,317.64	-6,888.50	14,451,297.82	1,691,703.47	39.79269176	-80.81741717	
14,400.00	91.00	317.13	6,426.01	6,390.92	-6,956.53	14,451,371.10	1,691,635.45	39.79289339	-80.81765880	
14,500.00	91.00	317.13	6,424.27	6,464.20	-7,024.55	14,451,444.38	1,691,567.42	39.79309502	-80.81790042	
14,600.00	91.00	317.13	6,422.52	6,537.48	-7,092.57	14,451,517.67	1,691,499.40	39.79329665	-80.81814205	
14,700.00	91.00	317.13	6,420.78	6,610.76	-7,160.59	14,451,590.95	1,691,431.38	39.79349828	-80.81838368	
14,800.00	91.00	317.13	6,419.04	6,684.04	-7,228.61	14,451,664.23	1,691,363.36	39.79369990	-80.81862531	
14,900.00	91.00	317.13	6,417.29	6,757.32	-7,296.63	14,451,737.51	1,691,295.34	39.79390153	-80.81886694	
15,000.00	91.00	317.13	6,415.55	6,830.60	-7,364.65	14,451,810.79	1,691,227.32	39.79410316	-80.81910858	
15,100.00	91.00	317.13	6,413.81	6,903.88	-7,432.68	14,451,884.07	1,691,159.30	39.79430478	-80.81935021	
15,200.00	91.00	317.13	6,412.06	6,977.16	-7,500.70	14,451,957.35	1,691,091.28	39.79450641	-80.81959185	
15,300.00	91.00	317.13	6,410.32	7,050.44	-7,568.72	14,452,030.63	1,691,023.25	39.79470803	-80.81983349	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Whistlepig N-04HM (slot C)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1367.00ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1367.00ft
Site:	Whistlepig	North Reference:	Grid
Well:	Whistlepig N-04HM (slot C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,400.00	91.00	317.13	6,408.57	7,123.72	-7,636.74	14,452,103.91	1,690,955.23	39.79490966	-80.82007513
15,500.00	91.00	317.13	6,406.83	7,197.01	-7,704.76	14,452,177.19	1,690,887.21	39.79511128	-80.82031677
15,600.00	91.00	317.13	6,405.09	7,270.29	-7,772.78	14,452,250.47	1,690,819.19	39.79531290	-80.82055841
15,700.00	91.00	317.13	6,403.34	7,343.57	-7,840.80	14,452,323.75	1,690,751.17	39.79551453	-80.82080006
15,800.00	91.00	317.13	6,401.60	7,416.85	-7,908.83	14,452,397.03	1,690,683.15	39.79571615	-80.82104170
15,900.00	91.00	317.13	6,399.86	7,490.13	-7,976.85	14,452,470.31	1,690,615.13	39.79591777	-80.82128335
16,000.00	91.00	317.13	6,398.11	7,563.41	-8,044.87	14,452,543.59	1,690,547.11	39.79611939	-80.82152500
16,100.00	91.00	317.13	6,396.37	7,636.69	-8,112.89	14,452,616.87	1,690,479.08	39.79632101	-80.82176665
16,121.09	91.00	317.13	6,396.00	7,652.15	-8,127.24	14,452,632.33	1,690,464.74	39.79636354	-80.82181762
PBHL/TD 16121.09 MD/6396.00 TVD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Whistlepig N-4HM PBHL - hit/miss target - Shape - Point	0.00	0.00	6,396.00	7,652.15	-8,127.24	14,452,632.33	1,690,464.74	39.79636354	-80.82181762
Whistlepig N-4HM LP r1 - plan misses target center by 0.07ft at 7289.67ft MD (6550.00 TVD, 1180.43 N, -2119.98 E) - Point	0.00	0.00	6,550.00	1,180.48	-2,119.93	14,446,160.67	1,696,472.03	39.77855576	-80.80048175

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment	
1,500.00	1,500.00	0.00	0.00	KOP Begin 2°/100' build	
2,741.20	2,702.73	114.50	-238.66	Begin 24.82° tangent	
6,544.03	6,154.19	805.08	-1,678.13	Begin 8°/100' build/turn	
6,872.71	6,413.54	915.77	-1,841.31	Begin 10°/100' build/turn	
7,289.69	6,550.00	1,180.44	-2,119.99	Begin 91.00° lateral	
16,121.09	6,396.00	7,652.15	-8,127.24	PBHL/TD 16121.09 MD/6396.00 TVD	

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Environmental Protection

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Whistlepig N-4HM

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) Haynes Run - Ohio River Quadrangle Powhatan Point 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP ECH1386426)

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 A Pancake
Company Official (Typed Name) James Pancake
Company Official Title Vice President - Geoscience

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DEC 20 2018

Subscribed and sworn before me this 20 day of NOVEMBER, 20 20
Maureen A Stead Notary Public

My commission expires: 1/20/19

WV Department of Environmental Protection
COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
MAUREEN A STEAD
Notary Public
CECIL TWP, WASHINGTON COUNTY
My Commission Expires Jan 20, 2019

Form WW-9

Operator's Well No. Whistlepig N-4HM

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 21.74 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: *[Signature]*

Comments: _____

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DEC 20 2018

WV Department of Environmental Protection

Title: Oil & Gas Inspector

Date: 11/29/18

Field Reviewed? Yes No

WW-9

SHEET 1

PROPOSED WHISTLEPIG N-4HM

SUPPLEMENT PG 1

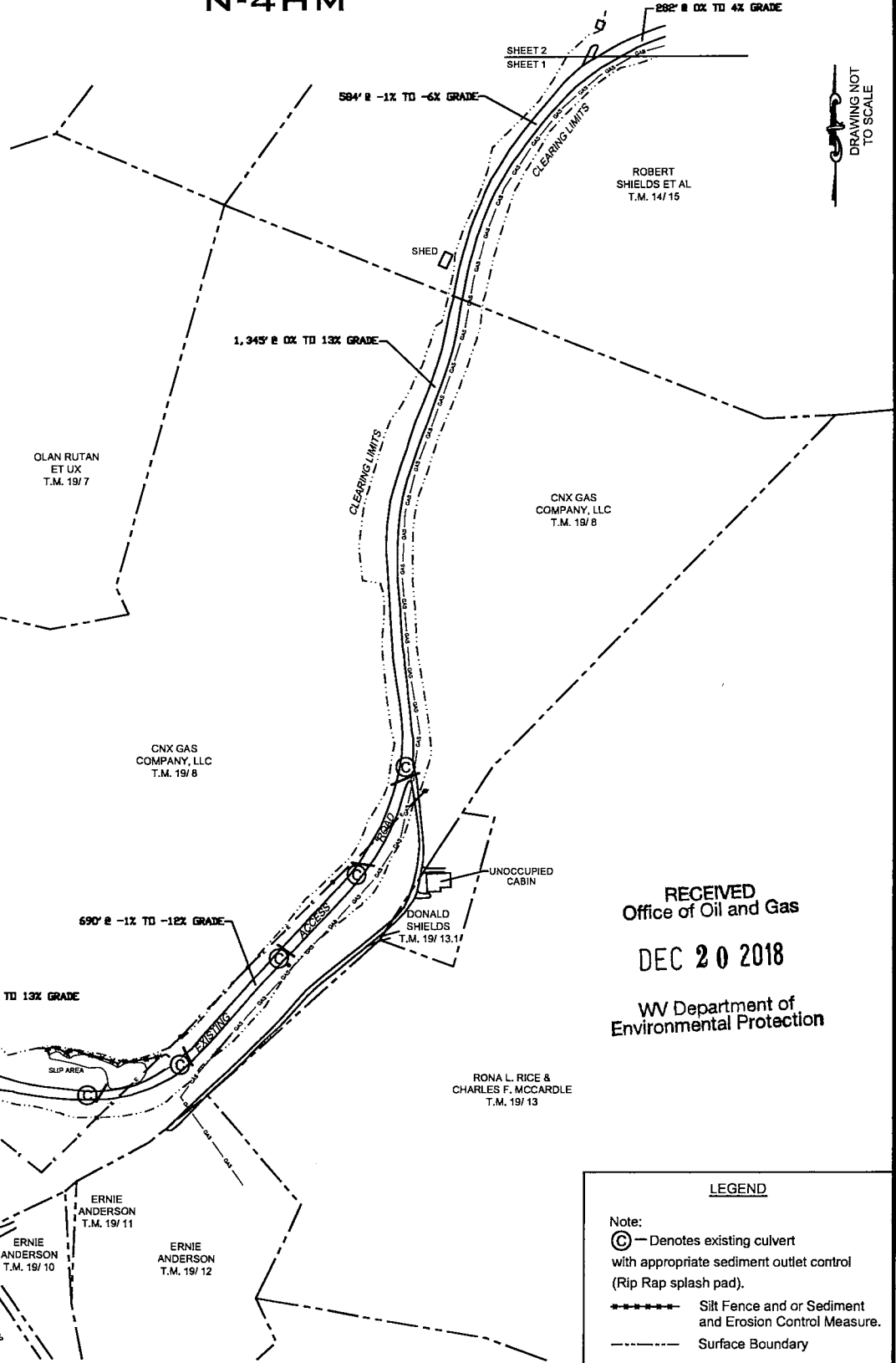
REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES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

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WV Department of
Environmental Protection

LEGEND

Note:
 (C) — Denotes existing culvert with appropriate sediment outlet control (Rip Rap splash pad).
 ***** Silt Fence and or Sediment and Erosion Control Measure.
 - - - - - Surface Boundary

WW-9

SHEET 2

PROPOSED WHISTLEPIG N-4HM

SUPPLEMENT PG 1

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.

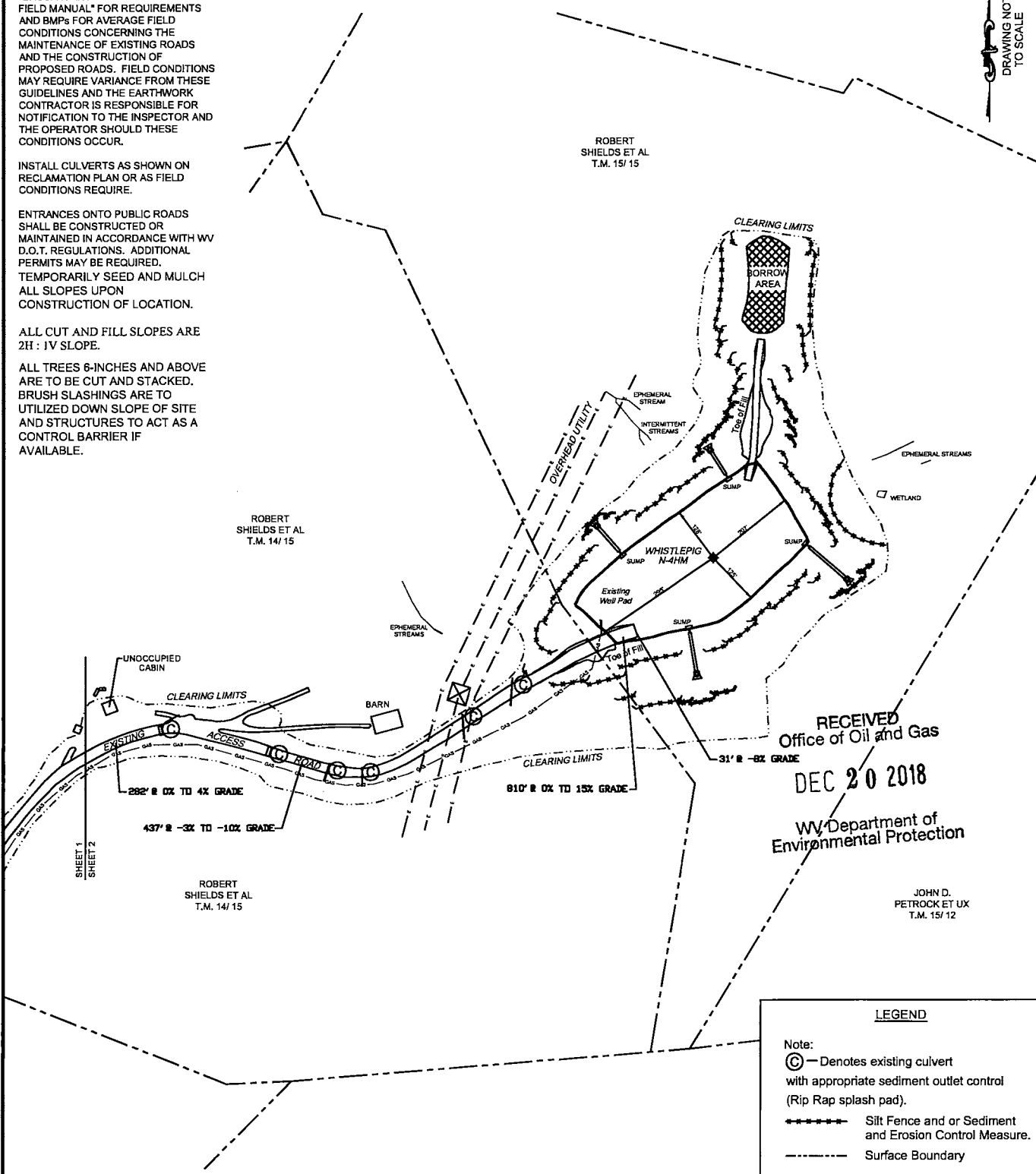
INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

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DRAWING NOT TO SCALE



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WV Department of
Environmental Protection

LEGEND

- Note:
- ⊙ — Denotes existing culvert with appropriate sediment outlet control (Rip Rap splash pad).
 - Silt Fence and or Sediment and Erosion Control Measure.
 - Surface Boundary

DATE: 11-28-2018

PROJECT NO: 494510851

DRAWN BY: J.A.H.



Well Site Safety Plan

Tug Hill Operating, LLC

Ju
11/29/18

Well Name: Whistlepig N-4HM

Pad Location: Hoyt Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,402,838.77

Easting: 517,731.87

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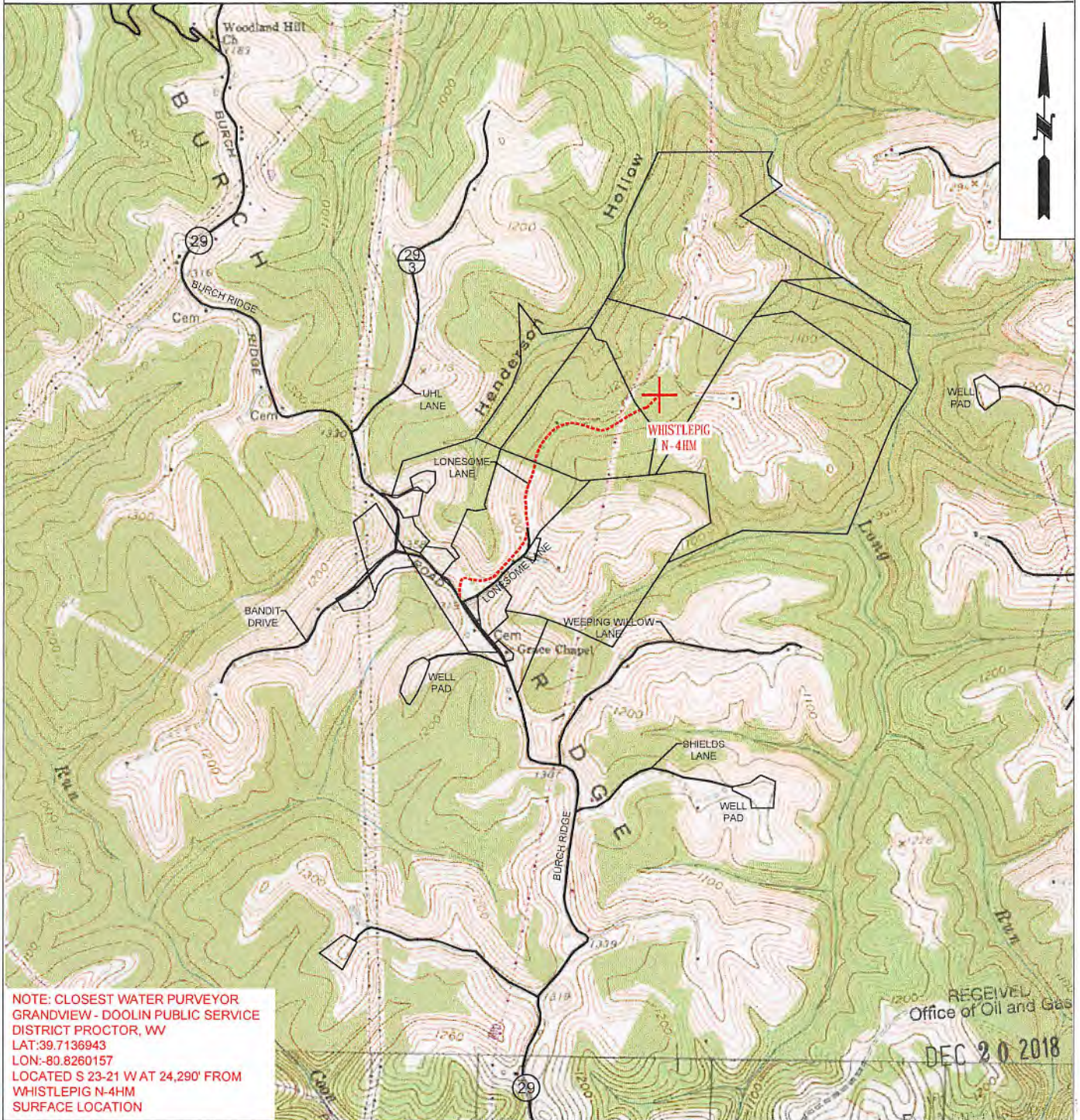
WV Department of
Environmental Protection

November 2018

WW-9


PROPOSED WHISTLEPIG N-4HM

SUPPLEMENT PG 2



NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN PUBLIC SERVICE
DISTRICT PROCTOR, WV
LAT: 39.7136943
LON: -80.8260157
LOCATED S 23-21' W AT 24,290' FROM
WHISTLEPIG N-4HM
SURFACE LOCATION

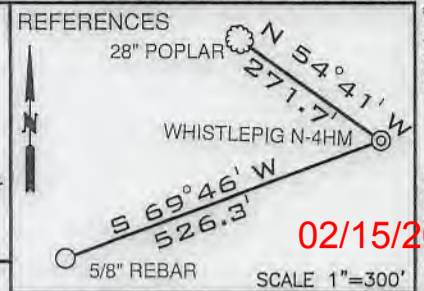
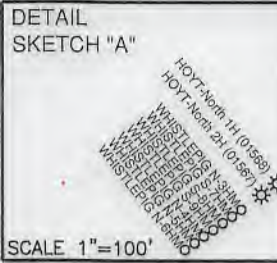
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 TUG HILL OPERATING	OPERATOR 494510851 TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	TOPO SECTION POWHATAN POINT 7.5'	LEASE NAME WHISTLEPIG
	SCALE: 1" = 2000'	DATE: DATE: 11-28-2018	

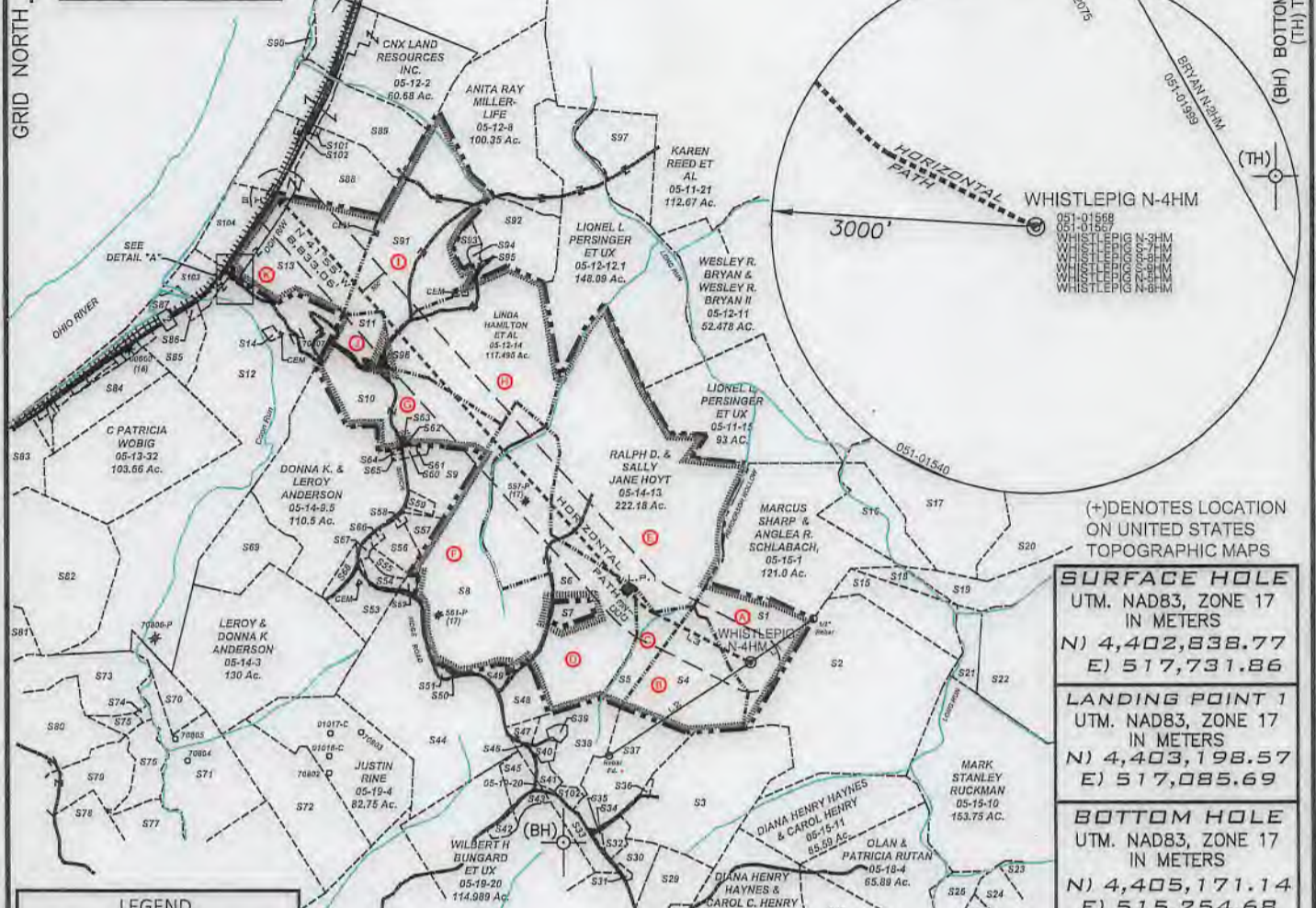
WHISTLEPIG LEASE WELL N-4HM 975.896± ACRES

NOTES

1. BORE PATH BASED ON GRID NORTH.
2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 525' OF PAD CENTER WERE FOUND.
3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN NOVEMBER, 2018. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
4. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.



02/15/2019



(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

SURFACE HOLE	UTM. NAD83, ZONE 17 IN METERS
N) 4,402,838.77	
E) 517,731.86	
LANDING POINT 1	UTM. NAD83, ZONE 17 IN METERS
N) 4,403,198.57	
E) 517,085.69	
BOTTOM HOLE	UTM. NAD83, ZONE 17 IN METERS
N) 4,405,171.14	
E) 515,254.68	

LEGEND

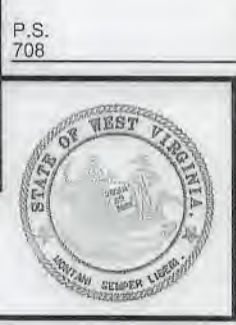
- LEASED TRACTS
- SURFACE TRACTS
- UNIT BOUNDARY
- (A) LEASE # (SEE 6A1 FORM)

LINE	BEARING	DISTANCE
L1	N 55°30' E	1296.82'
L2	S 56°37' W	2891.70'
L3	N 63°25' W	1861.89'

NUMBER	CHORD	DIRECTION	CHORD LENGTH	RADIUS	ARC LENGTH
C1	N 57°23' W		110.47	668.29	110.59
C2	N 50°40' W		149.31	1676.58	149.36
C3	N 44°49' W		322.29	2967.83	322.45

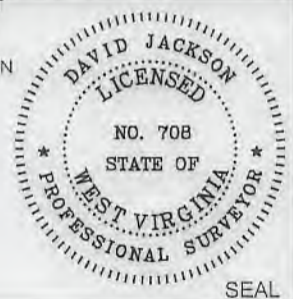
FILE NUMBER _____
 DRAWING NUMBER: WHISTLEPIG N-4HM REV 1
 SCALE: 1" = 3000'
 MINIMUM DEGREE OF ACCURACY: 1/200
 PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING
GRADE GPS

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



David L Jackson

JACKSON SURVEYING INC.
 P.O. Box 1480
 Clarksburg, WV 26302
 304-623-6851



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

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

DATE: DECEMBER 14, 2018
 OPERATORS WELL NO. WHISTLEPIG N-4HM
 API WELL NO. 47-051-02160 HGA
 STATE WV COUNTY MARSHALL PERMIT 02160

LOCATION ELEVATION 1367.4' WATERSHED (HUC 10) FISH CREEK
 DISTRICT FRANKLIN COUNTY MARSHALL
 QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER SEE WW-6A1 Form

SURFACE OWNER ROBERT L. & REBECCA SHIELDS AND DONALD SHIELDS ACREAGE 49.0
 OIL & GAS ROYALTY OWNER ROBERT L. & REBECCA SHIELDS AND DONALD SHIELDS LEASE ACREAGE 49.0
 PROPOSED WORK: DRILL X 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: 6,665' TMD: 16,121'
 WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
CT CORPORATION SYSTEM
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD
FORT WORTH, TX 76107 CHARLESTON, WV 25313

COUNTY NAME
 PERMIT

**WHISTLEPIG LEASE
WELL N-4HM
975.896± ACRES**

02/15/2019

Number	TAX MAP-PARCEL	SURFACE OWNER	ACRES
S1 (A)	05-15-15	Robert L. Shields & Rebecca Shields and Donald Shields	49.0
S2	05-15-12	John David Petrock, et ux	150.23
S3	05-19-13	Rona Lee Rice & Charles Franklin McCardle	94.925
S4 (B)	05-14-15	Robert L. Shields, et al	53.00
S5 (C)	05-14-14	Robert L. Shields, et al	29.05
S6 (D)	05-14-12	Dale R. Gallaher, et al	135.100
S7	05-14-12.1	Henry Wilson Plunkert, Jr.	5.00
S8 (F)	05-14-10	Wanda P. Rine (Life)	107.372
S9	05-14-9.2	Maria T. Flores	25.00
S10 (G)	05-12-21	Edward L. Gibson (Life)	73.436
S11 (J)	05-12-21.1	Robert W., Jr. & Wendy L. Riegenbach	14.222
S12	05-12-23	CNX Land Resources, Inc.	236.10
S13 (K)	05-12-06	CNX Land Resources, Inc.	70.81
S14	05-12-22	CNX Land Resources, Inc.	0.944
S15	05-15-14	John David Petrock, et ux	25.00
S16	05-15-03	Joseph J. Kramer, et ux	36.10
S17	05-15-05	Joseph J. Kramer, et ux	35.00
S18	05-15-02	John David Petrock, et ux	5.00
S19	05-15-6.1	Joseph J. Kramer, et ux	39.40
S20	05-15-06	Joseph J. Kramer, et ux	42.50
S21	05-15-13	CNX Land Resources, Inc.	11.00
S22	05-15-09	CNX Land Resources, Inc.	81.98
S23	05-18-15.4	Edward Lee Burge, Jr.	22.34
S24	05-18-15.3	Charles Yeater	26.44
S25	05-18-06	Charles Yeater	26.00
S26	05-18-05	Terry Melott	8.14
S27	05-18-03	Olan V. & Patricia E. Rutan	43.677
S28	05-19-14	James & Sherry Beegle and Ida Rutan	18.356
S29	05-19-30	Ernie & Tammy Anderson	19.037
S30	05-19-29	Ernie L. & Tammy L. Anderson	10.961
S31	05-19-15	B.J. Herran Revocable Trust	0.72
S32	05-19-12	Ernie L. Anderson, et ux	5.33
S33	05-19-09	Penny Elaine Menendez	10.00
S34	05-19-10	Ernie L. Anderson, et ux	0.8125
S35	05-19-11	Ernie L. Anderson, et ux	0.08
S36	05-19-13.1	Donald Shields	0.80
S37	05-19-08	CNX Gas Company, LLC	40.00
S38	05-19-07	Olan V. Rutan, et ux	32.4801
S39	05-19-7.4	Olan V. Rutan, et ux	1.787
S40	05-19-7.2	Olan Rutan	2.783
S41	05-19-7.1	Robert L. Shields, et ux	3.399
S42	05-19-20.3	Sidney Harmon	3.715
S43	05-19-20.1	John J. Ebert (Life)	3.848
S44	05-19-05	Margirene Keefe	126.03
S45	05-19-20.2	Casandra L. Harmon	7.448
S46	05-19-7.3	Olan V. Rutan, et ux	0.341
S47	05-19-06	Martha M. Rutan	5.1099
S48	05-14-11	Dale R. Gallaher, et al	12.00
S49	05-14-10.4	Adam & Jesse Robinson	3.343
S50	05-14-10.2	Ida Belle Rutan (Life) & Ralph R. Hoyt	0.495
S51	05-14-10.1	Ida Belle Rutan (Life) & Ralph R. Hoyt	0.50
S52	05-14-10.3	Vernie A. & Jody K. Rine	1.54

Number	TAX MAP-PARCEL	SURFACE OWNER	ACRES
S53	05-14-08	Lawrence Eugene Anderson	18.29
S54	05-14-9.3	Vernie A. Rine, et al	4.118
S55	05-14-9.4	Vernie A. Rine, et al	3.404
S56	05-14-09	Walter W. Straight, Jr., et ux	9.311
S57	05-14-9.5	Maria T. Flores	6.024
S58	05-14-19	Brian A. & Charlotte Mull	0.92
S59	05-14-9.1	Maria T. Flores	2.882
S60	05-12-18	Joni Lyn Leon	1.018
S61	05-12-17	Joni Lyn Leon	0.762
S62	05-12-16.1	Gary E. Gibson, et al	0.146
S63	05-12-16	Gary E. Gibson, et al	0.104
S64	05-12-20	Joni Lyn Leon	0.457
S65	05-12-19	Joni Lyn Leon	0.457
S66	05-14-17	Justin E. & Jody Rine	1.1044
S67	05-14-16	George E. Knuth	1.6386
S68	05-14-07	Donna K. & Leroy Anderson	4.60
S69	05-14-04	Leroy & Donna K. Anderson	29.29
S70	05-14-02	John B. Williams, Et Al	20.17
S71	05-19-02	Milton R. & Linda L. Neal	63.1
S72	05-19-03	Milton R. & Linda L. Neal	72.01
S73	05-13-42	Thomas & Victoria Bowman	45.0
S74	05-13-41C	Hrs. of Benton Darrah, Lillie May Dugan, Alma Bitmer, Alberta Palmer & Audrey Howard	1.0
S75	05-13-41B	Larry & Judy Darrah	2.50
S76	05-13-41A	Rodney & Rhonda Jackson	17.05
S77	05-19-01	Robert Rine	30.80
S78	05-20-25	Robert Rine	43.82
S79	05-13-40	Robert Rine	29.76
S80	05-13-39	Thomas & Victoria Bowman	46.0
S81	05-13-34	David J. Mast	40.0
S82	05-13-33	Nathan D. Yoder	142.03
S83	05-13-28	Aaron Paul Holdren, Et Ux	17.0
S84	05-13-31	CNX Land Resources, Inc.	31.723
S85	05-12-24.3	CNX Land Resources, Inc.	18.523
S86	05-12-24.1	W.V. D.O.H.	0.994
S87	05-12-25	CNX Land Resources, Inc.	12.8
S88	05-12-05	CNX Land Resources, Inc.	61.883
S89	05-12-03	CNX Land Resources, Inc.	62.30
S90	05-12-01	United States of America	1.68
S91 (I)	05-12-07	Robert Wm. Riegenbach, et ux	104.231
S92	05-12-13	Linda Hamilton, et al	41.887
S93	05-12-7.2	Raymond K. Miller	4.66
S94	05-12-7.1	Raymond K. Miller	1.609
S95	05-12-13.1	Raymond K. Miller	0.113
S96	05-12-15	Woodland Hill Church of God Trust	0.375
S97	05-12-12	Lionel L. Persinger, et ux	45.00
S98	05-12-6.1	W.V. D.O.H.	0.31
S99	05-12-23.3	W.V. D.O.H.	0.11
S100	05-12-23.1	James N. Daugherty	0.28
S101	05-12-5.1	CNX Land Resources, Inc.	0.52
S102	05-12-4	CNX Land Resources, Inc.	0.93
S103	05-12-23.2	Consolidation Coal Co./ Murray Energy + CNX Land Resources, Inc.	12.50
S104	05-12-6.2	Consolidation Coal Co./ Murray Energy	25.50



P.S. 708 *David L Jackson*

NOTES:
 05-13-41A MAPPED AS PART OF 05-13-41
 05-13-41B MAPPED AS PART OF 05-13-41, INCORRECTLY ASSESSED AS 05-25-22 4.15 ACRES
 05-13-41C MAPPED AS PART OF 05-13-41, NOT ASSESSED.



TUG HILL
OPERATING

OPERATOR'S
 WELL #: Whistlepig N-4HM
 DISTRICT: Franklin
 COUNTY: Marshall
 STATE: WV

WELL PLAT
 PAGE 2 OF 2
 DATE: 12/14/2018

WW-6A1
(5/13)

Operator's Well No. Whistlepig N-4HM

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

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

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

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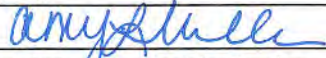
*See attached pages

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

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

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

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

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

Lease ID	Tag	Parcel	Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*14116	A	5-15-15	DONALD SHIELDS	USA, INC.	1/8+	669	367	NA	NA	NA	NA	23/353 Gaster Exploration USA, Inc to Athum Marcellus I LLC	26/419 Gaster Exploration USA, Inc to Athum Marcellus I LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	26/419 Gaster Athum Marcellus I LLC
10*14117	A	5-15-15	REBECCA A SHIELDS	USA, INC.	1/8+	669	360	NA	NA	NA	NA	23/353 Gaster Exploration USA, Inc to Athum Marcellus I LLC	26/419 Gaster Exploration USA, Inc to Athum Marcellus I LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	26/419 Gaster Athum Marcellus I LLC
10*14116	B	5-14-15	DONALD SHIELDS	USA, INC.	1/8+	669	367	NA	NA	NA	NA	23/353 Gaster Exploration USA, Inc to Athum Marcellus I LLC	26/419 Gaster Exploration USA, Inc to Athum Marcellus I LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	26/419 Gaster Athum Marcellus I LLC
10*14117	B	5-14-15	REBECCA A SHIELDS AND ROBERT L SHIELDS	USA, INC.	1/8+	669	360	NA	NA	NA	NA	23/353 Gaster Exploration USA, Inc to Athum Marcellus I LLC	26/419 Gaster Exploration USA, Inc to Athum Marcellus I LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	26/419 Gaster Athum Marcellus I LLC
10*14118	B	5-14-15	RITA A. RUSH	USA INC	1/8+	813	450	NA	NA	NA	NA	31/184 Gaster Exploration USA, Inc to Athum Marcellus I LLC	21/41 Gaster Exploration USA, Inc to Athum Marcellus I LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	31/184 Gaster Athum Marcellus I LLC	
10*14119	B	5-14-15	CHARLES W. SNYDER & JUDITH A. SNYDEDR	USA INC	1/8+	813	452	NA	NA	NA	NA	31/184 Gaster Exploration USA, Inc to Athum Marcellus I LLC	21/41 Gaster Exploration USA, Inc to Athum Marcellus I LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	31/184 Gaster Athum Marcellus I LLC	
10*14120	B	5-14-15	CAROL D. HABERLE & ABRAM HABERLE	USA INC	1/8+	813	448	NA	NA	NA	NA	31/184 Gaster Exploration USA, Inc to Athum Marcellus I LLC	21/41 Gaster Exploration USA, Inc to Athum Marcellus I LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	31/184 Gaster Athum Marcellus I LLC	
10*14121	B	5-14-15	JACK D. SNYDER & GRETA A. SNYDER	USA INC	1/8+	813	446	NA	NA	NA	NA	31/184 Gaster Exploration USA, Inc to Athum Marcellus I LLC	21/41 Gaster Exploration USA, Inc to Athum Marcellus I LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	31/184 Gaster Athum Marcellus I LLC	
10*14122	B	5-14-15	ERIC L STOLTZFUS	INC	1/8+	833	525	NA	NA	NA	NA	32/428 Gaster Exploration Inc to Athum Marcellus I LLC	32/428 Gaster Exploration Inc to Athum Marcellus I LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	32/428 Gaster Athum Marcellus I LLC		
10*14123	B	5-14-15	TEESHA L HOLMES	INC	1/8+	836	96	NA	NA	NA	NA	32/428 Gaster Exploration Inc to Athum Marcellus I LLC	32/428 Gaster Exploration Inc to Athum Marcellus I LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	32/428 Gaster Athum Marcellus I LLC		
10*14124	B	5-14-15	BETSY G STOLTZFUS	INC	1/8+	836	94	NA	NA	NA	NA	32/428 Gaster Exploration Inc to Athum Marcellus I LLC	32/428 Gaster Exploration Inc to Athum Marcellus I LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	32/428 Gaster Athum Marcellus I LLC		
10*14116	C	5-14-14	DONALD SHIELDS	USA, INC.	1/8+	669	367	NA	NA	NA	NA	23/353 Gaster Exploration USA, Inc to Athum Marcellus I LLC	26/419 Gaster Exploration USA, Inc to Athum Marcellus I LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	26/419 Gaster Athum Marcellus I LLC
10*14117	C	5-14-14	REBECCA A SHIELDS	USA, INC.	1/8+	669	367	NA	NA	NA	NA	23/353 Gaster Exploration USA, Inc to Athum Marcellus I LLC	26/419 Gaster Exploration USA, Inc to Athum Marcellus I LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	36/9 Gaster Exploration Inc to TH Exploration II, LLC	21/41 Gaster Exploration USA, Inc and Gaster Exploration Inc merger LLC	26/419 Gaster Athum Marcellus I LLC

10*14928	D	5-14-12	NEILIE B PARIOTT	TRINEERGY, INC	1/8+	660	517	660	517	19/623TRIENERGY, Inc to AB Resources, LLC	24/319 AB Resources, LLC to Chief Exploration & Development LLC and Radler 2000 Limited	25/105 Chief Exploration & Development LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA, Inc	756/397 AB Resources Royalty Holdings LLC and Amon G Carter Minerals LLC, BRD LLC, Diversified Rox Rivercrest Royalties II LLC, Marcellus I LLC, 35/470 WPP LLC to KRP	32/355 Chevron USA Inc	36/9 Gastar Exploration Inc to TH Exploration II, LLC	10*14067	E	5-14-13	REVA FRANZE	GASTAR EXPLORATION USA, INC.	1/8+	666	51	666	51	NA	NA	NA	23/353 Gastar Exploration USA, Inc to 21/41 Gastar Exploration USA, Inc to 36/9 Gastar Exploration Inc merger LLC	21/41 Gastar Exploration USA, Inc to 36/9 Gastar Exploration Inc merger LLC	10*14420	F	5-14-10	ELIS V. RINE AND WANDA P. RINE	GASTAR EXPLORATION USA, INC.	1/8+	725	141	725	141	NA	NA	NA	735/263 Gastar Exploration USA, Inc to 21/41 Gastar Exploration USA, Inc to 36/9 Gastar Exploration Inc merger LLC	21/41 Gastar Exploration USA, Inc to 36/9 Gastar Exploration Inc merger LLC	10*24492	G	5-12-21	GARY E GIBSON AND EDWARD L AND VIOLET L GIBSON	AMERICAN PETROLEUM PARTNERS OPERATING, LLC	1/8+	920	112	920	112	NA	NA	NA	NA	NA	NA	42/549 American Petroleum Partners Operating, LLC to TH Exploration, LLC	NA	10*21769	H	5-12-14	BETTY HAMILTON	TH EXPLORATION LLC	1/8+	957	419	957	419	NA	NA	NA	NA	NA	NA	NA	10*21770	H	5-12-14	SUSAN WINLAND AND PAUL MICHAEL WINLAND	TH EXPLORATION LLC	1/8+	957	421	957	421	NA	NA	NA	NA	NA	NA	10*21776	H	5-12-14	LINDA HAMILTON	TH EXPLORATION LLC	1/8+	957	417	957	417	NA	NA	NA	NA	NA	NA	10*19255	I	5-12-7	ROBERT W. RIGGENBACH & SHARON RIGGENBACH	CHEVRON USA INC	1/8+	772	450	772	450	NA	NA	NA	NA	NA	NA	40/127 Chevron USA Inc to TH Exploration, LLC	NA	10*19150	J	5-12-21.1	ROBERT W. RIGGENBACH & WENDY RIGGENBACH	TRIENERGY HOLDINGS, LLC	1/8+	706	301	706	301	NA	NA	NA	NA	NA	NA	40/127 Chevron USA Inc to TH Exploration, LLC	24/180 TriEnergy Holdings, LLC to NPAR, LLC	756/332 NPAR, LLC to 40/127 Chevron USA Inc	10*4112	K	5-12-6	COLUMBIAN CHEMICAL COMPANY	CNX LAND RESOURCES INC	1/8+	691	363	691	363	NA	NA	NA	NA	NA	NA	988/351 TH Exploration, LLC, HG Energy II Exploration II, LLC and TH Exploration II, LLC agreement	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	624146	K	5-12-6	OHIO POWER COMPANY CONSOLIDATION COAL COMPANY	646/493 CNX Land Resources, Consolidation Coal Company, Consol Coal Company, Conroy Coal Company, Conroy Coal Company, Reserve Coal Properties Company and CNX Gas Company LLC	745/117 CNX Land Resources Inc to 745/117 CNX Land Gas Company	752/66 CNX Gas Company LLC to Noble Energy Inc	909/94 CNX Gas Company LLC to Noble Energy Inc	931/43 Noble Energy Inc to HG Energy II Appalachia LLC	988/351 TH Exploration, LLC, HG Energy II Exploration II, LLC and TH Exploration II, LLC agreement
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STATE OF WEST VIRGINIA §
§
COUNTY OF MARSHALL §

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "**Assignment**") is made and entered into this 15th day of November, 2018 (the "**Effective Date**"), by and between **AMERICAN PETROLEUM PARTNERS OPERATING, LLC**, (hereinafter "**Assignor**") and **TH EXPLORATION, LLC** (hereinafter "**Assignee**") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated November 15, 2018 (the "**Acreage Trade Agreement**"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

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

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

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

1. **Assignment**. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon.

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

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

Assignor represents and warrants that Assignor has paid any and all bonuses, rentals, royalties, overriding royalties, and other payments required by the Leases which were due for the period in which Assignor held its interests in the Leases, and that Assignor has fully performed all conditions necessary to maintain the Leases in full force and effect during such period, free and clear of all Encumbrances, except for and subject only to Permitted Encumbrances.

3. **Successors and Assigns**. The terms of this Assignment shall be binding upon and inure to the benefit of the parties hereto and each of their respective successors

RECEIVED
Office of Oil and Gas
DEC 20 2018
WV Department of
Environmental Protection

STATE OF WEST VIRGINIA §
§
COUNTY OF MARSHALL §

Marshall County
Jan Pest, Clerk
Instrument 1428356
08/16/2017 @ 12:08:49 PM
ASSIGNMENTS
Book 40 @ Page 127
Pages Recorded 25
Recording Cost \$ 33.00

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 1 day of August, 2017 (the "Effective Date"), by and between CHEVRON U.S.A. INC. (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated the 1st day of August, 2017 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit "A", attached hereto and made a part hereof (hereinafter the "Leases"), less and except certain overriding royalty interests and exclusions; and

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases as described below, subject to certain overriding royalty interests and less and except certain exclusions.

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

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon, except that Assignor excepts and reserves from this Assignment the following:

A. The Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia, and

B. As to each of the Leases and all oil, gas, and associated hydrocarbons produced, saved and sold thereunder, an overriding royalty interest equal to the difference between 82% and the

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MEMORANDUM OF OPERATING AGREEMENT AND FINANCING STATEMENT

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 TH Exploration, LLC, as Operator, and HG Energy II Appalachia, LLC and TH Exploration II, LLC, as Non-Operators, covering, among other things, the development and production of crude oil, natural gas and associated substances from the leases (hereinafter called the "Contract Area") described on Exhibit "A-1" and Exhibit "A-2" attached hereto and owned by Operator and Non-Operator 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 where 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 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.

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02/15/2019



November 30, 2018

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

RE: Whistlepig N-4HM

Subject: Marshall County Route 2 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 2 in the area reflected on the Whistlepig N-4HM well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Route and is not currently aware of any recorded document that would suggest an ownership other than THO.

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

Sincerely,

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

Amy L. Miller
Permitting Specialist

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WW-6AC
(1/12)

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

Date of Notice Certification: 12/19/2018

API No. 47- 051 -

Operator's Well No. Whistlepig N-4HM

Well Pad Name: Hoyt

Notice has been given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>517,731.86</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,838.77</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Burch Ridge Road (CR 29)</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>Robert L. & Rebecca Shields and Donald Shields</u>	
Watershed:	<u>Fish Creek (HUC 10)</u>			

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

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p>OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p style="text-align: right;">RECEIVED Office of Oil and Gas DEC 20 2018</p>
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Required Attachments:

The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been notified 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.

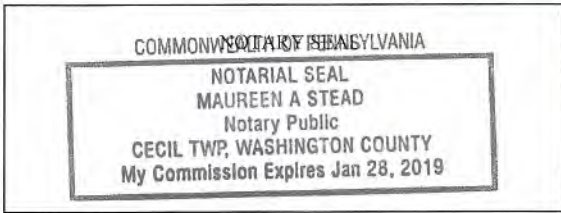
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(1/12)

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 L. Miller</i></u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Permitting Specialist - Appalachia Region</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>724-749-8388</u>	Email:	<u>amiller@tug-hillop.com</u>



Subscribed and sworn before me this 19 day of DECEMBER 2018
Maureen A Stead Notary Public
 My Commission Expires 1/28/19

Oil and Gas Privacy Notice:

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

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API NO. 47- 051 - 02/15/2019
OPERATOR WELL NO. Whistlepig N-4HM
Well Pad Name: Hoyt

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: 11/30/2018 **Date Permit Application Filed:** 11/30/2018

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: Robert L. and Rebecca Shields (Well Pad and Access Road)

Address: RD 2 Box 53 1/2
Proctor, WV 26055-9802

Name: Donald Shields (Well Pad and Access Road) *See attachment

Address: RD 2 Box 54-A
Proctor, WV 26055

COAL OWNER OR LESSEE

Name: CNX Land Resources, Inc. Attn: Casey Saunders

Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

COAL OPERATOR

Name: _____

Address: _____

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

Name: Ernie L. and Tammy L. Anderson

Address: RR 2, Box 58
Proctor, WV 26055

Name: _____

Address: _____

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

Name: *See attachment

Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: _____

Address: _____

SURFACE OWNER(s) (Impoundments or Pits)

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/office-of-oil-and-gas/pages/default.aspx.

Well Location Restrictions

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any 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

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

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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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API NO. 47- 051 - **02/15/2019**
OPERATOR WELL NO. Whistlepig N-4HM
Well Pad Name: Hoyt

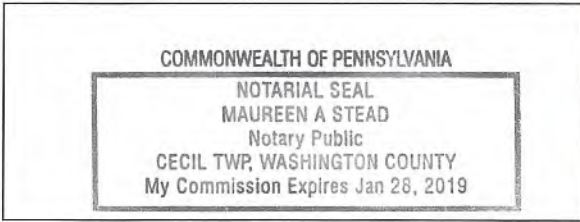
Notice is hereby given by:

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

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-838-2030

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 30 day of NOVEMBER 2018
Maureen A Stead Notary Public
My Commission Expires 1/28/19

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WV Department of
Environmental Protection

WW-6A

Supplement Pg. 1A

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

WATER WELL REPORT

Well: WHISTLEPIG N-4HM
District: Franklin
County: Marshall
State: WV

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

Topo Spot # 1 (Hand Dug Well) TM 15 Par. 12 John D. Petrock et ux 304-242-3233 2394 Overbrook Ave Wheeling, WV 26055	Topo Spot # 2 (Spring with concrete trough) TM 15 Par. 12 John D. Petrock et ux 304-242-3233 2394 Overbrook Ave Wheeling, WV 26055	Topo Spot # 3 (Hand Dug Well) TM 14 Par. 15 Robert L. Shields, et ux 304-455-5387 2756 Burch Ridge Rd. Proctor, WV 26055
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Additional Surface Owner:
CNX Gas Company, Attn: Property Tax
1000 Consol Energy Drive
Canonsburg, PA 15317

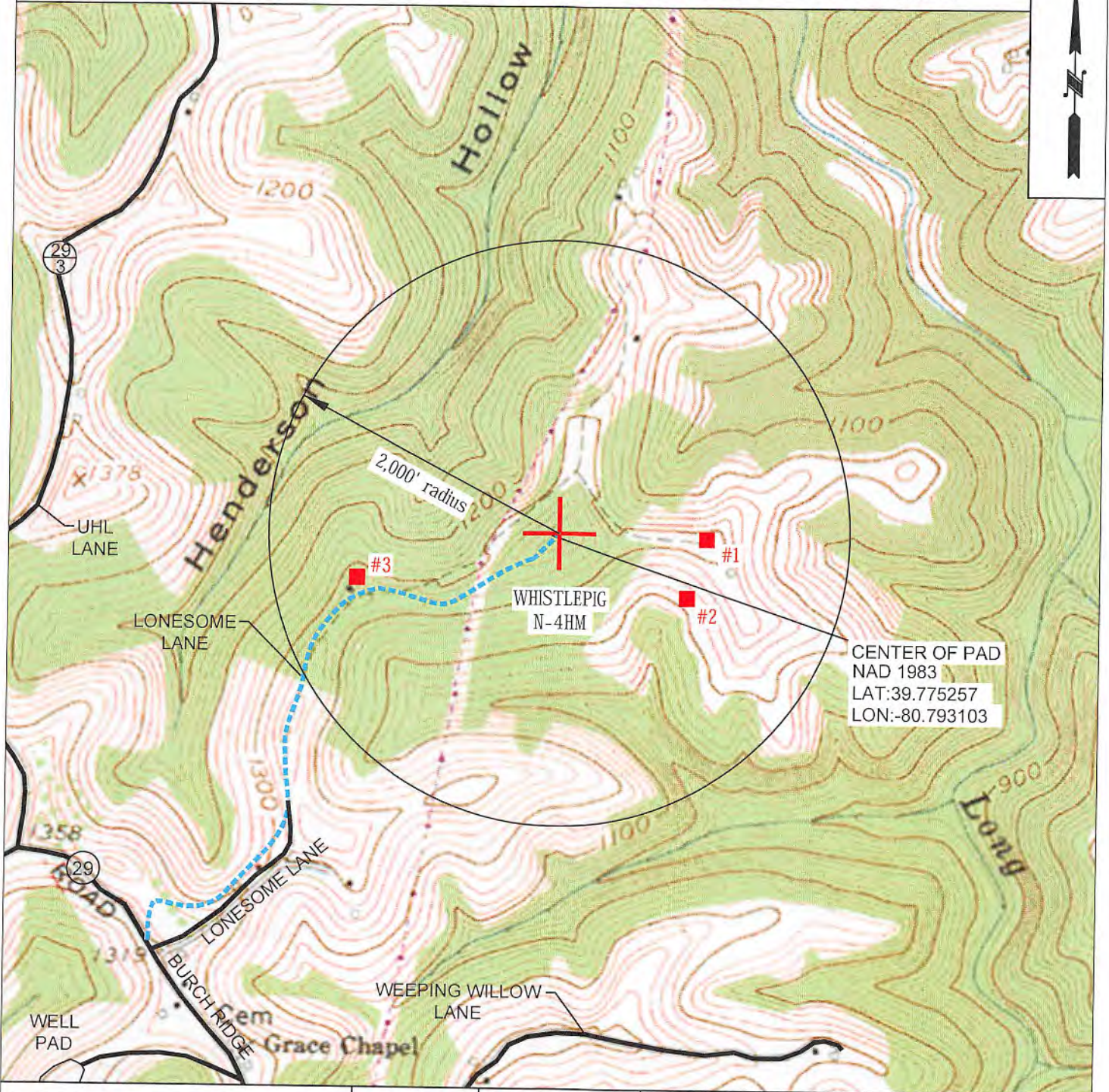
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WW-6A

PROPOSED WHISTLEPIG N-4HM

SUPPLEMENT PG 1

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



OPERATOR 494510851
 TUG HILL OPERATING, LLC
 380 SOUTHPOINTE BLVD
 SUITE 200
 CANONSBURG, PA 15317

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

LEASE NAME
 WHISTLEPIG
DATE:
 DATE: 11-28-2018

02/15/2019

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: 10/25/2018 **Date of Planned Entry:** 11/1/2018

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: Robert L. and Rebecca Shields (Well Pad and Access Road)
Address: RD 2 Box 53 1/2
Proctor, WV 26055-9802

Name: Donald Shields (Well Pad and Access Road)
Address: RD 2 Box 54-A
Proctor, WV 26055

Name: CNX Gas Company, Attn: Property Tax *See attachment
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

COAL OWNER OR LESSEE

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

MINERAL OWNER(s)

Name: Robert L. and Rebecca Shields *See attachment
Address: RD 2 Box 53 1/2
Proctor, WV 26055-9802
*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>39.77539054; -80.79278812</u>
County: <u>Marshall</u>	Public Road Access: <u>Burch Ridge Road (CR 29)</u>
District: <u>Franklin</u>	Watershed: <u>Haynes Run - Ohio River</u>
Quadrangle: <u>Powhatan Point 7.5'</u>	Generally used farm name: <u>Robert and Rebecca Shields & Don Shields</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-hilltop.com

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

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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.

02/15/2019

**WW-6A3 Additional Parties to Notice
Whistlepig N-4HM**

Surface Owner (Access Road)

Ernie L. and Tammy L. Anderson ✓

RR 2, Box 58

Proctor, WV 26055

Mineral Owner ✓

Donald Shields

RD 2, Box 54-A

Proctor, WV 26055

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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: 11/30/2018 **Date Permit Application Filed:** 11/30/2018

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: Robert and Rebecca Shields (Well Pad and Access Road)
Address: RD 2 Box 53 1/2
Proctor, WV 26055-9802

Name: Donald Shields (Well Pad and Access Road)
Address: RD 2 Box 54-A
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>517,731.86</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,838.77</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Burch Ridge Road (CR 29)</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>Robert L. and Rebecca Shields and Donald Shields</u>	
Watershed:	<u>Fish Creek</u>			

This Notice Shall Include:

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

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

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**WW-6A5 – Notice of Planned Operation
Additional Parties to Notice**

Additional Surface Owners

CNX Gas Company, Attn: Property Tax
1000 Consol Energy Drive
Canonsburg, PA 15317

Ernie L. and Tammy L. Anderson
RR 2 Box 56
Proctor, WV 26055

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

November 5, 2018

Jill M. Newman
Deputy CommissionerJames A. Martin, Chief
Office of Oil and Gas
Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304Subject: DOH Permits for the Hoyt North Well Pad, Marshall County
Whistlepig N-4HM Well

Dear Mr. Martin,

This well site will be accessed from Permit #06-2012-0318 transferred to Tug Hill Operating for access to the State Road for a well site located off of Marshall County Route 29 SLS.

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

Very Truly Yours,

Handwritten signature of Gary K. Clayton in blue ink.

Gary K. Clayton, P.E.
Regional Maintenance Engineer
Central Office O&G CoordinatorCc: Amy Miller
Tug Hill Operating
CH, OM, D-6
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Environmental Protection



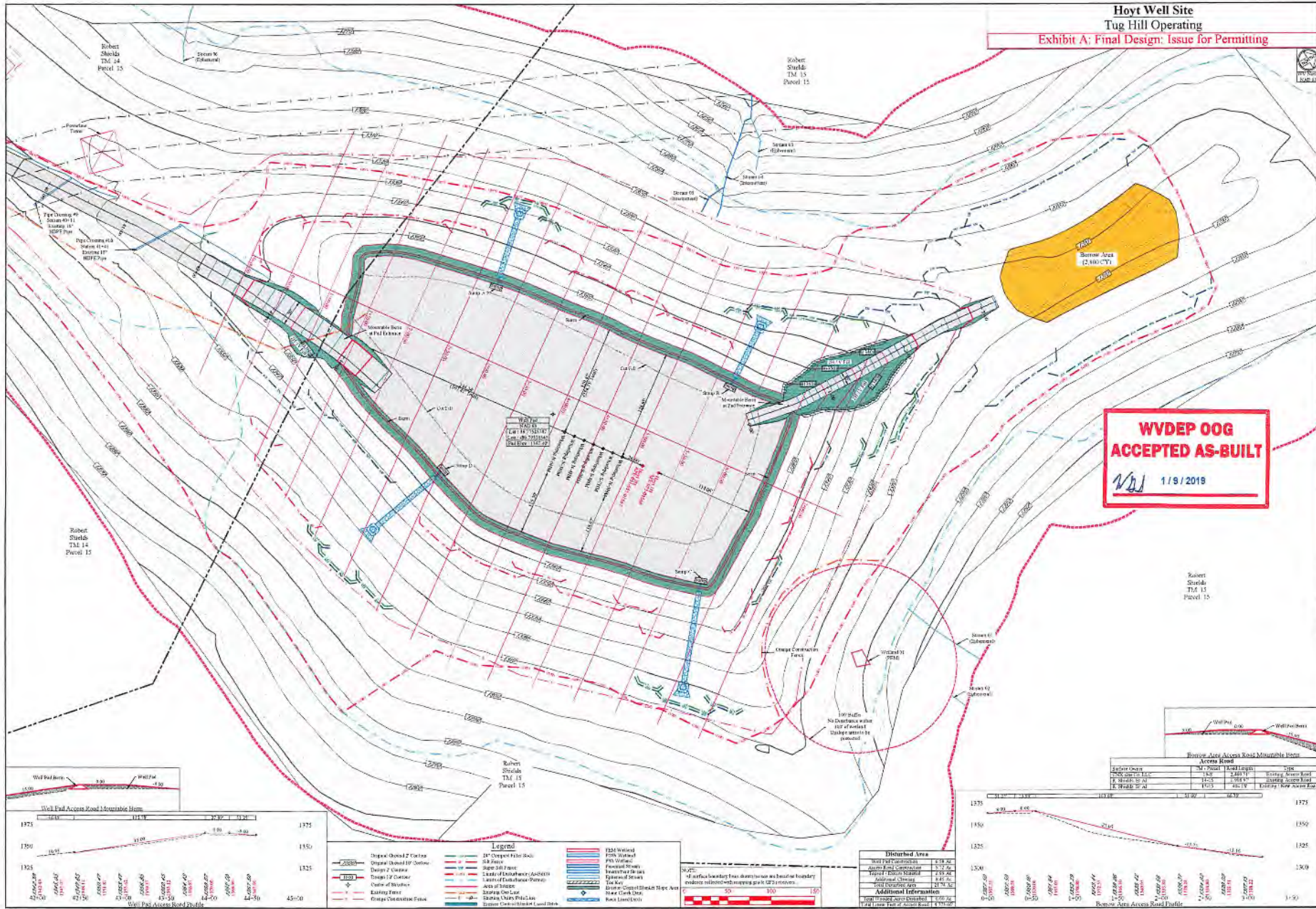
PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

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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Hoyt Well Site
Tug Hill Operating

Exhibit A: Final Design: Issue for Permitting



**WVDEP OOG
ACCEPTED AS-BUILT**
WJL 1/8/2019

TUG HILL OPERATING
 THIS DOCUMENT PREPARED FOR TUG HILL OPERATING
 K&S CONSULTANTS
 Hoyt Well Site
 Franklin District
 Mingo County, WV
 Date: 10/31/2014
 Scale: As Shown
 Drawn by: JG
 Sheet 13 of 13

Legend

Original Contour (2' Contour)	24" Copper Water Pipe	Final Wellhead
Original Contour (4' Contour)	36" Zinc	PAV Wellhead
Design 7 Contour	48" Zinc	Proposed Storage
Design 12 Contour	60" Zinc	Transferable Well
Center of Highway	84" Zinc	Transferable Well
Center of Highway	108" Zinc	Transferable Well
Existing Fence	120" Zinc	Transferable Well
Design Construction Fence	144" Zinc	Transferable Well
	180" Zinc	Transferable Well
	240" Zinc	Transferable Well
	300" Zinc	Transferable Well
	360" Zinc	Transferable Well
	420" Zinc	Transferable Well
	480" Zinc	Transferable Well
	540" Zinc	Transferable Well
	600" Zinc	Transferable Well
	660" Zinc	Transferable Well
	720" Zinc	Transferable Well
	780" Zinc	Transferable Well
	840" Zinc	Transferable Well
	900" Zinc	Transferable Well
	960" Zinc	Transferable Well
	1020" Zinc	Transferable Well
	1080" Zinc	Transferable Well
	1140" Zinc	Transferable Well
	1200" Zinc	Transferable Well
	1260" Zinc	Transferable Well
	1320" Zinc	Transferable Well
	1380" Zinc	Transferable Well
	1440" Zinc	Transferable Well
	1500" Zinc	Transferable Well
	1560" Zinc	Transferable Well
	1620" Zinc	Transferable Well
	1680" Zinc	Transferable Well
	1740" Zinc	Transferable Well
	1800" Zinc	Transferable Well
	1860" Zinc	Transferable Well
	1920" Zinc	Transferable Well
	1980" Zinc	Transferable Well
	2040" Zinc	Transferable Well
	2100" Zinc	Transferable Well
	2160" Zinc	Transferable Well
	2220" Zinc	Transferable Well
	2280" Zinc	Transferable Well
	2340" Zinc	Transferable Well
	2400" Zinc	Transferable Well
	2460" Zinc	Transferable Well
	2520" Zinc	Transferable Well
	2580" Zinc	Transferable Well
	2640" Zinc	Transferable Well
	2700" Zinc	Transferable Well
	2760" Zinc	Transferable Well
	2820" Zinc	Transferable Well
	2880" Zinc	Transferable Well
	2940" Zinc	Transferable Well
	3000" Zinc	Transferable Well
	3060" Zinc	Transferable Well
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	3180" Zinc	Transferable Well
	3240" Zinc	Transferable Well
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	3360" Zinc	Transferable Well
	3420" Zinc	Transferable Well
	3480" Zinc	Transferable Well
	3540" Zinc	Transferable Well
	3600" Zinc	Transferable Well
	3660" Zinc	Transferable Well
	3720" Zinc	Transferable Well
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	4500" Zinc	Transferable Well
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	4620" Zinc	Transferable Well
	4680" Zinc	Transferable Well
	4740" Zinc	Transferable Well
	4800" Zinc	Transferable Well
	4860" Zinc	Transferable Well
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	4980" Zinc	Transferable Well
	5040" Zinc	Transferable Well
	5100" Zinc	Transferable Well
	5160" Zinc	Transferable Well
	5220" Zinc	Transferable Well
	5280" Zinc	Transferable Well
	5340" Zinc	Transferable Well
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	7980" Zinc	Transferable Well
	8040" Zinc	Transferable Well
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	11700" Zinc	Transferable Well
	11760" Zinc	Transferable Well
	11820" Zinc	Transferable Well
	11880" Zinc	Transferable Well
	11940" Zinc	Transferable Well
	12000" Zinc	Transferable Well

NOTE: All surface boundary lines shown are based on boundary evidence collected with magnetic pole GPS receivers.

Scale: 1" = 50'

Disturbed Area

Well Pad Construction	1,318.02
Access Road Construction	1,112.00
Power Line Construction	1,112.00
Additional Storage	441.00
Well Pad Storage	25.00
Total Disturbed Area	4,008.02

Additional Information

Well Pad Construction: 11,000.00
 Access Road: 1,112.00
 Power Line: 1,112.00
 Additional Storage: 441.00
 Well Pad Storage: 25.00

Proposed Well Access Road Measurable Home

Station	Start	End	Length	Width
1+00	1+00	1+50	50.00	12.00
1+50	1+50	2+00	50.00	12.00
2+00	2+00	2+50	50.00	12.00
2+50	2+50	3+00	50.00	12.00
3+00	3+00	3+50	50.00	12.00
3+50	3+50	4+00	50.00	12.00
4+00	4+00	4+50	50.00	12.00
4+50	4+50	5+00	50.00	12.00
5+00	5+00	5+50	50.00	12.00
5+50	5+50	6+00	50.00	12.00
6+00	6+00	6+50	50.00	12.00
6+50	6+50	7+00	50.00	12.00
7+00	7+00	7+50	50.00	12.00
7+50	7+50	8+00	50.00	12.00
8+00	8+00	8+50	50.00	12.00
8+50	8+50	9+00	50.00	12.00
9+00	9+00	9+50	50.00	12.00
9+50	9+50	10+00	50.00	12.00
10+00	10+00	10+50	50.00	12.00
10+50	10+50	11+00	50.00	12.00
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11+50	11+50	12+00	50.00	12.00
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14+50	14+50	15+00	50.00	12.00
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15+50	15+50	16+00	50.00	12.00
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20+00	20+00	20+50	50.00	12.00
20+50	20+50	21+00	50.00	12.00
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22+00	22+00	22+50	50.00	12.00
22+50	22+50	23+00	50.00	12.00
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23+50	23+50	24+00	50.00	12.00
24+00	24+00	24+50	50.00	12.00
24+50	24+50	25+00	50.00	12.00
25+00	25+00	25+50	50.00	12.00
25+50	25+50	26+00	50.00	12.00
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28+50	28+50	29+00	50.00	12.00
29+00	29+00	29+50	50.00	12.00
29+50	29+50	30+00	50.00	12.00
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30+50	30+50	31+00	50.00	12.00
31+00	31+00	31+50	50.00	12.00
31+50	31+50	32+00	50.00	12.00
32+00	32+00	32+50	50.00	12.00
32+50	32+50	33+00	50.00	12.00
33+00	33+00	33+50	50.00	12.00
33+50	33+50	34+00	50.00	12.00
34+00	34+00	34+50	50.00	12.00
34+50	34+50	35+00	50.00	12.00
35+00	35+00	35+50	50.00	12.00
35+50	35+50	36+00	50.00	12.00
36+00	36+00	36+50	50.00	12.00
36+50	36+50	37+00	50.00	12.00
37+00	37+00	37+50	50.00	12.0