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west virginia department of environmental protection

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

Harold D. Ward, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Tuesday, August 31, 2021  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

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

Re: Permit Modification Approval for OLD CROW N-7HM  
47-051-02239-00-00

**Casing Plan Update**

TUG HILL OPERATING, LLC

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

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

James A. Martin  
Chief

Operator's Well Number: OLD CROW N-7HM  
Farm Name: DONNA VIVIAN YOHO (TOD) GARY LANCE YOHO  
U.S. WELL NUMBER: 47-051-02239-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 08/31/2021

Promoting a healthy environment.

09/03/2021

WW-6B  
(04/15)

Check # 051796 MODIFICATION  
\$5,000.00  
8/20/2021

API NO. 47-051 - 02239  
OPERATOR WELL NO. Old Crow N-7HM  
Well Pad Name: Old Crow

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

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

2) Operator's Well Number: Old Crow N-7HM Well Pad Name: Old Crow

3) Farm Name/Surface Owner: Donna Yoho Public Road Access: Rines Ridge Road (County Route 76)

4) Elevation, current ground: 1286' Elevation, proposed post-construction: 1264.99'

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

(b) If Gas Shallow  Deep   
Horizontal

6) Existing Pad: Yes or No Yes *Bary Stiller 8-23-21*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus is the target formation at a depth of 6598' - 6651', thickness of 47' and an anticipated approximate pressure of 3800 psi.

8) Proposed Total Vertical Depth: 6,751'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 18,070'

11) Proposed Horizontal Leg Length: 9,377.60'

12) Approximate Fresh Water Strata Depths: 70'; 919'

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

14) Approximate Saltwater Depths: 1,353'

15) Approximate Coal Seam Depths: Sewickley Coal - 821' and Pittsburgh Coal - 913'

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	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	120'	120'	259ft <sup>3</sup> (CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	1,010'	1,010' ✓	1052ft <sup>3</sup> (CTS)
Coal	13 3/8"	NEW	J55	54.5#	1,010'	1,010'	1052ft <sup>3</sup> (CTS)
Intermediate	9 5/8"	NEW	J55	36#	3,028'	3,028' ✓	998ft <sup>3</sup> (CTS)
Production	5 1/2"	NEW	P110	20#	18,070'	18,070' ✓	4623ft <sup>3</sup> (CTS)
Tubing	2 3/8"	NEW	N80	4.7#	8,208'		
Liners							

*B.S. 8-23-21*

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17.5"	.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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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 Onondaga 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 completed with approximately 23,440,000 lb. proppant and 362,400 barrels of water. Max rate = 80bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 19.18 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.64 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.

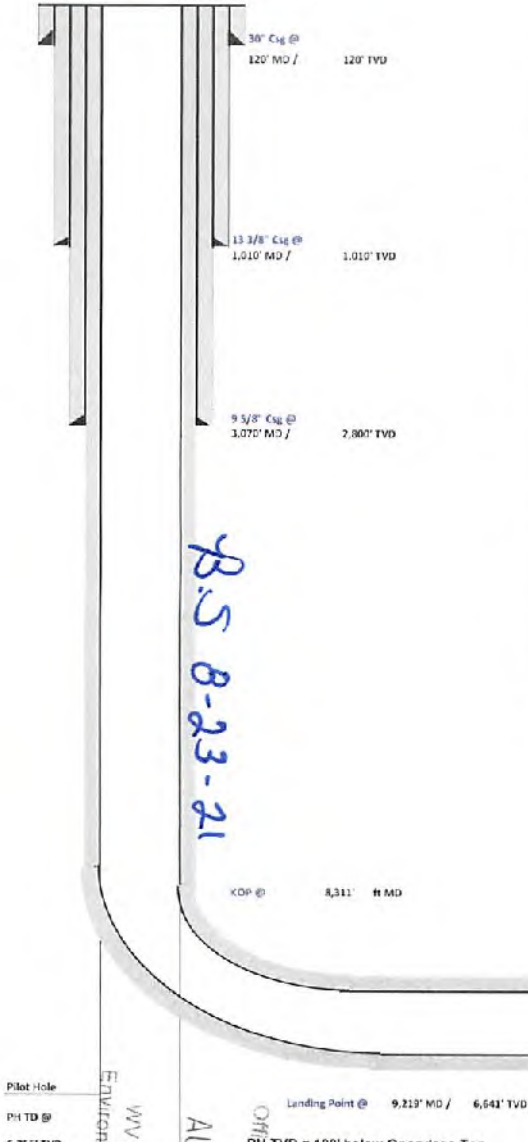


**WELL NAME:** Old Crow N-SHM  
**STATE:** WV      **COUNTY:** Marshall  
**DISTRICT:** Franklin  
**DF Elev:** 1,298'      **GL Elev:** 1,265'  
**TD:** 18,294'  
**TH Latitude:** 39.77847351  
**TH Longitude:** -80.76301843  
**BH Latitude:** 39.80933  
**BH Longitude:** 80.764886

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	919
Sewickley Coal	823
Pittsburgh Coal	513
Big Lime	2129
Weir	2483
Berea	2678
Gordon	3023
Rhinestreet	5996
Genesee/Burkett	6495
Tully	6521
Hamilton	6554
Marcellus	6602
Landing Depth	6641
Onondaga	6655
Pilot Hole Depth	6755

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'	8W	9W	Surface
Surface	17.5	13 3/8	1,010'	1,010'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	1,070'	2,800'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	18,294'	6,482'	20	CYHP110	Surface

	CEMENT SUMMARY			DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,060	A	15.5	Air	3 Centralizers at equal distance
Intermediate 1	1,027	A	15	Air	1 Centralizer every other jt
Production	4,303	A	14.5	Air / SOBIM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to s/c



B.S. 8-23-21

Pilot Hole  
 PH TD @ 6,755' TVD  
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 TVD = 100' below Onondaga Top  
 Landing Point @ 9,219' MD / 6,641' TVD  
 KOP @ 8,311' H MD  
 Lateral TD @ 18,294' H MD  
 6,482' H TVD

4705102239



## Tug Hill Operating, LLC Casing and Cement Program

### Old Crow N-8HM

#### Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	1,010'	CTS
Intermediate	9 5/8"	J55	12 1/4"	3,070'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	18,294'	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: Old Crow N-07 HM (slot C)  
 Site: Old Crow Pad  
 Project: Marshall County, West Virginia.  
 Design: rev3

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSecl	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1232.50	0.00	0.00	1232.50	0.00	0.00	0.00	0.00	0.00	KOP Begin 3°/100' build
3	2232.50	30.00	45.00	2167.43	180.93	180.93	3.00	45.00	157.87	Begin 3°/100' build/turn
4	2754.17	44.08	55.55	2603.29	374.36	426.06	3.00	31.07	320.45	Begin 44.08° tangent
5	7737.41	44.08	55.55	6163.20	2285.41	3318.27	0.00	0.00	1859.97	Begin 8°/100' build/turn
6	8090.84	50.00	18.37	6428.74	2485.73	3466.52	8.00	-91.76	2051.02	Begin 10°/100' build/turn
7	8694.14	91.00	329.74	6637.00	3015.40	3379.11	10.00	-59.73	2587.36	Begin 91.00° lateral
8	18070.03	91.00	329.74	6474.00	11112.25	-1345.48	0.00	0.00	1193.41	PBHL/TD 18070.03 MD 6474.00 TVD

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude	Shape
BHL Old Crow N-07 HM r3 - plan hits target center	6474.00	11112.25	-1345.48	14457276.46	1705643.02	39.809022	-80.767737	Point
LP Old Crow N-07 HM 50 E r3 - plan hits target center	6637.00	3015.40	3379.11	14449179.61	1710367.61	39.786751	-80.750994	Point

Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: NAD83 West Virginia - HARN  
 Ellipsoid: GRS 1980  
 Zone: Zone 17N (64 W to 78 W)

System Datum: Mean Sea Level  
 Depth Reference: RKB=1265+32.5 @ 1297.50usft

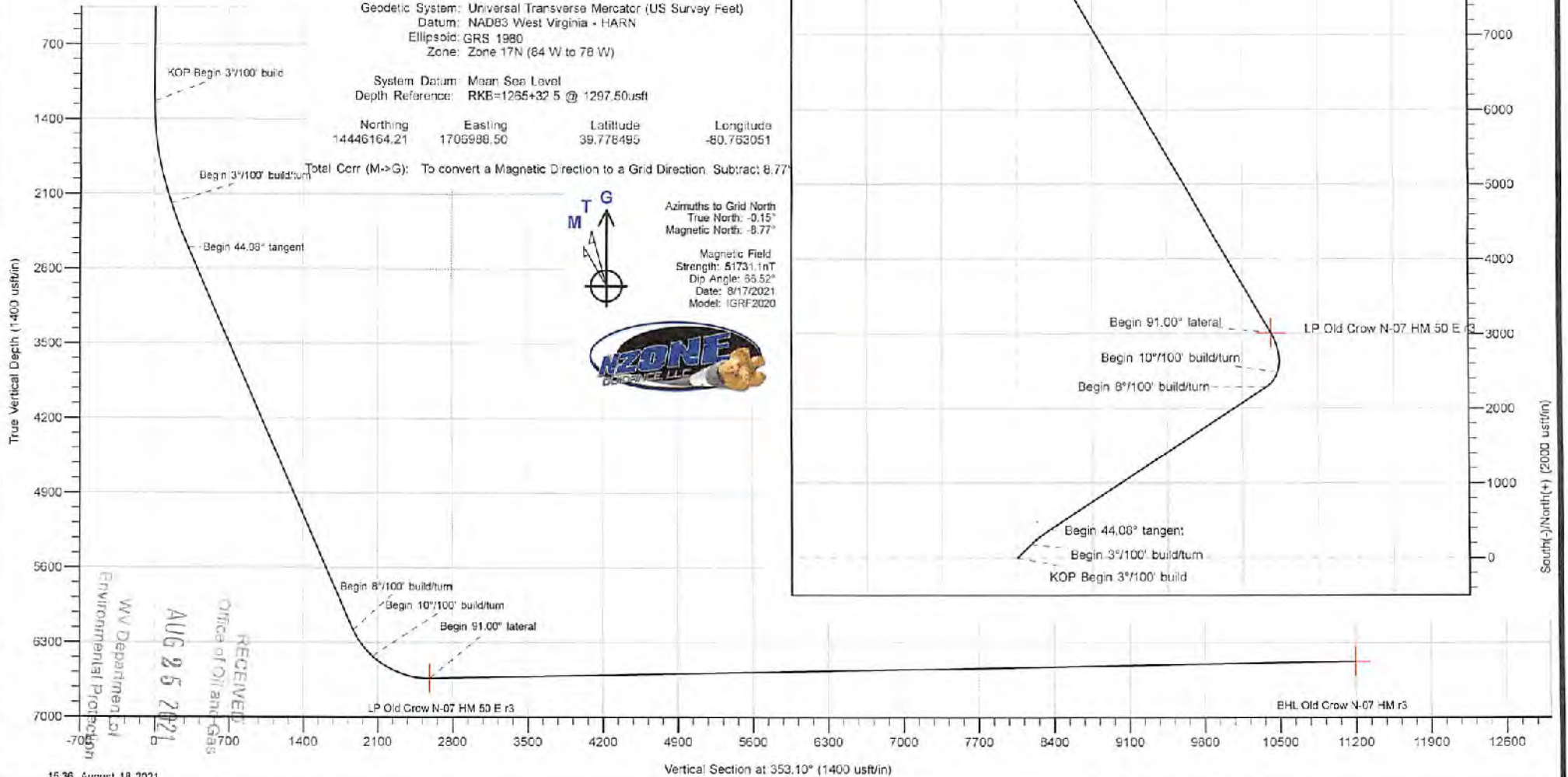
Northing: 14446164.21    Easting: 1706986.50    Latitude: 39.778495    Longitude: -80.763051

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction. Subtract: 8.77°



Azimuths to Grid North  
 True North: -0.15°  
 Magnetic North: -8.77°

Magnetic Field  
 Strength: 51731.1nT  
 Dip Angle: 65.52°  
 Date: 8/17/2021  
 Model: IGRF2020



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Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Old Crow N-07 HM (slot C)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1265+32.5 @ 1297.50usft
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1265+32.5 @ 1297.50usft
Site:	Old Crow Pad	North Reference:	Grid
Well:	Old Crow N-07 HM (slot C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

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	Old Crow Pad				
Site Position:		Northing:	14,446,179.89 usft	Latitude:	39.778538
From:	Lat/Long	Easting:	1,706,970.33 usft	Longitude:	-80.783115
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "		

Well	Old Crow N-07 HM (slot C)					
Well Position	+N/-S	0.00 usft	Northing:	14,446,164.21 usft	Latitude:	39.778495
	+E/-W	0.00 usft	Easting:	1,706,988.50 usft	Longitude:	-80.763051
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	1,265.00 usft
Grid Convergence:						

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	8/17/2021	-8.62	66.52	51,731.10824408

Design	rev3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	353.10

Plan Survey Tool Program	Date				
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	18,069.81	rev3 (Original Hole)		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RECEIVED
1,232.50	0.00	0.00	1,232.50	0.00	0.00	0.00	0.00	0.00	0.00	Department of Oil and Gas
2,232.50	30.00	45.00	2,187.43	180.93	180.93	3.00	3.00	0.00	45.00	AUG 25 2021
2,754.17	44.08	56.55	2,603.29	374.36	426.06	3.00	2.70	2.21	31.476	
7,737.41	44.08	58.55	6,183.20	2,285.41	3,318.27	0.00	0.00	0.00	0.00	
8,090.84	50.00	18.37	6,428.74	2,485.73	3,466.52	8.00	1.68	-10.80	-91.76	Department of Environmental Protection
8,694.14	91.00	329.74	6,637.00	3,015.40	3,379.11	10.00	6.80	-8.06	59.73	
18,070.03	91.00	329.74	6,474.00	11,112.25	-1,345.48	0.00	0.00	0.00	0.00	BHL Old Crow N-07 H





Planning Report - Geographic

Database: DB\_Dec2220\_v16  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia.  
 Site: Old Crow Pad  
 Well: Old Crow N-07 HM (slot C)  
 Wellbore: Original Hole  
 Design: rev3

Local Co-ordinate Reference: Well Old Crow N-07 HM (slot C)  
 TVD Reference: RKB=1265+32.5 @ 1297.50usft  
 MD Reference: RKB=1265+32.5 @ 1297.50usft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
100.00	0.00	0.00	100.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
200.00	0.00	0.00	200.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
300.00	0.00	0.00	300.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
400.00	0.00	0.00	400.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
500.00	0.00	0.00	500.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
600.00	0.00	0.00	600.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
700.00	0.00	0.00	700.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
800.00	0.00	0.00	800.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
900.00	0.00	0.00	900.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
1,232.50	0.00	0.00	1,232.50	0.00	0.00	14,446,164.21	1,706,988.50	39.778495	-80.763051	
<b>KOP Begin 3°/100' build</b>										
1,300.00	2.03	45.00	1,299.99	0.84	0.84	14,446,165.06	1,706,989.34	39.778498	-80.763048	
1,400.00	5.03	45.00	1,399.79	5.19	5.19	14,446,169.40	1,706,993.69	39.778509	-80.763032	
1,500.00	8.03	45.00	1,499.13	13.22	13.22	14,446,177.44	1,707,001.72	39.778531	-80.763004	
1,600.00	11.03	45.00	1,597.74	24.92	24.92	14,446,189.14	1,707,013.42	39.778563	-80.762982	
1,700.00	14.03	45.00	1,695.35	40.26	40.26	14,446,204.47	1,707,028.75	39.778605	-80.762907	
1,800.00	17.03	45.00	1,791.69	59.18	59.18	14,446,223.39	1,707,047.68	39.778657	-80.762840	
1,900.00	20.03	45.00	1,886.49	81.65	81.65	14,446,245.86	1,707,070.14	39.778719	-80.762750	
2,000.00	23.03	45.00	1,979.51	107.59	107.59	14,446,271.80	1,707,096.08	39.778790	-80.762667	
2,100.00	26.03	45.00	2,070.48	136.93	136.93	14,446,301.15	1,707,125.43	39.778870	-80.762562	
2,200.00	29.03	45.00	2,159.15	169.61	169.61	14,446,333.82	1,707,158.10	39.778960	-80.762446	
2,232.50	30.00	45.00	2,187.43	180.93	180.93	14,446,345.14	1,707,169.43	39.778991	-80.762405	
<b>Begin 3°/100' build/turn</b>										
2,300.00	31.75	46.99	2,245.36	204.98	205.85	14,446,369.19	1,707,194.35	39.779057	-80.762316	
2,400.00	34.39	49.59	2,329.16	241.24	246.60	14,446,405.46	1,707,235.10	39.779156	-80.762171	
2,500.00	37.08	51.86	2,410.33	278.18	291.83	14,446,442.39	1,707,280.33	39.779257	-80.762010	
2,600.00	39.81	53.87	2,488.64	315.68	341.41	14,446,479.90	1,707,329.91	39.779360	-80.761833	
2,700.00	42.57	55.65	2,563.88	353.65	395.21	14,446,517.87	1,707,383.71	39.779464	-80.761641	
2,754.17	44.08	56.55	2,603.29	374.38	426.06	14,446,538.59	1,707,414.56	39.779520	-80.761531	
<b>Begin 44.08° tangent</b>										
2,800.00	44.08	56.55	2,636.21	391.96	452.66	14,446,558.17	1,707,441.18	39.779568	-80.761436	
2,900.00	44.08	56.55	2,708.05	430.30	510.70	14,446,594.52	1,707,499.19	39.779673	-80.761229	
3,000.00	44.08	56.55	2,779.89	468.65	568.74	14,446,632.87	1,707,557.23	39.779778	-80.761022	
3,100.00	44.08	56.55	2,851.73	507.00	626.78	14,446,671.22	1,707,615.27	39.779883	-80.760815	
3,200.00	44.08	56.55	2,923.57	545.35	684.81	14,446,709.57	1,707,673.31	39.779988	-80.760608	
3,300.00	44.08	56.55	2,995.41	583.70	742.85	14,446,747.91	1,707,731.35	39.780093	-80.760401	
3,400.00	44.08	56.55	3,067.25	622.05	800.89	14,446,786.26	1,707,789.39	39.780198	-80.760194	
3,500.00	44.08	56.55	3,139.09	660.40	858.93	14,446,824.61	1,707,847.43	39.780303	-80.759987	
3,600.00	44.08	56.55	3,210.93	698.75	916.97	14,446,862.96	1,707,905.47	39.780407	-80.759780	
3,700.00	44.08	56.55	3,282.76	737.10	975.01	14,446,901.31	1,707,963.51	39.780512	-80.759574	
3,800.00	44.08	56.55	3,354.60	775.45	1,033.05	14,446,939.66	1,708,021.54	39.780617	-80.759367	
3,900.00	44.08	56.55	3,426.44	813.80	1,091.09	14,446,978.01	1,708,079.58	39.780722	-80.759160	
4,000.00	44.08	56.55	3,498.28	852.15	1,149.13	14,447,016.36	1,708,137.62	39.780827	-80.758953	
4,100.00	44.08	56.55	3,570.12	890.49	1,207.16	14,447,054.71	1,708,195.66	39.780932	-80.758746	
4,200.00	44.08	56.55	3,641.96	928.84	1,265.20	14,447,093.06	1,708,253.70	39.781037	-80.758539	
4,300.00	44.08	56.55	3,713.80	967.19	1,323.24	14,447,131.41	1,708,311.74	39.781142	-80.758332	
4,400.00	44.08	56.55	3,785.64	1,005.54	1,381.28	14,447,169.75	1,708,369.78	39.781247	-80.758125	
4,500.00	44.08	56.55	3,857.48	1,043.89	1,439.32	14,447,208.10	1,708,427.82	39.781351	-80.757918	
4,600.00	44.08	56.55	3,929.32	1,082.24	1,497.36	14,447,246.45	1,708,485.85	39.781456	-80.757711	
4,700.00	44.08	56.55	4,001.15	1,120.59	1,555.40	14,447,284.80	1,708,543.89	39.781561	-80.757504	

**Database:** DB\_Dec2220\_v16  
**Company:** Tug Hill Operating LLC  
**Project:** Marshall County, West Virginia.  
**Site:** Old Crow Pad  
**Well:** Old Crow N-07 HM (slot C)  
**Wellbore:** Original Hole  
**Design:** rev3

**Local Co-ordinate Reference:** Well Old Crow N-07 HM (slot C)  
**TVD Reference:** RKB=1265+32.5 @ 1297.50usft  
**MD Reference:** RKB=1265+32.5 @ 1297.50usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

**Planned Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,800.00	44.08	56.55	4,072.99	1,158.94	1,613.44	14,447,323.15	1,708,601.93	39.781666	-80.757297
4,900.00	44.08	56.55	4,144.83	1,197.29	1,671.47	14,447,361.50	1,708,659.97	39.781771	-80.757090
5,000.00	44.08	56.55	4,216.67	1,235.64	1,729.51	14,447,399.85	1,708,718.01	39.781876	-80.756883
5,100.00	44.08	56.55	4,288.51	1,273.99	1,787.55	14,447,438.20	1,708,776.05	39.781981	-80.756676
5,200.00	44.08	56.55	4,360.35	1,312.33	1,845.59	14,447,476.55	1,708,834.09	39.782086	-80.756469
5,300.00	44.08	56.55	4,432.19	1,350.68	1,903.63	14,447,514.90	1,708,892.13	39.782191	-80.756262
5,400.00	44.08	56.55	4,504.03	1,389.03	1,961.67	14,447,553.25	1,708,950.17	39.782295	-80.756055
5,500.00	44.08	56.55	4,575.87	1,427.38	2,019.71	14,447,591.59	1,709,008.20	39.782400	-80.755848
5,600.00	44.08	56.55	4,647.70	1,465.73	2,077.75	14,447,629.94	1,709,066.24	39.782505	-80.755641
5,700.00	44.08	56.55	4,719.54	1,504.08	2,135.79	14,447,668.29	1,709,124.28	39.782610	-80.755434
5,800.00	44.08	56.55	4,791.38	1,542.43	2,193.82	14,447,706.64	1,709,182.32	39.782715	-80.755227
5,900.00	44.08	56.55	4,863.22	1,580.78	2,251.86	14,447,744.99	1,709,240.36	39.782820	-80.755020
6,000.00	44.08	56.55	4,935.06	1,619.13	2,309.90	14,447,783.34	1,709,298.40	39.782925	-80.754814
6,100.00	44.08	56.55	5,006.90	1,657.48	2,367.94	14,447,821.69	1,709,356.44	39.783030	-80.754607
6,200.00	44.08	56.55	5,078.74	1,695.83	2,425.98	14,447,860.04	1,709,414.48	39.783134	-80.754400
6,300.00	44.08	56.55	5,150.58	1,734.17	2,484.02	14,447,898.39	1,709,472.51	39.783239	-80.754193
6,400.00	44.08	56.55	5,222.42	1,772.52	2,542.06	14,447,936.74	1,709,530.55	39.783344	-80.753986
6,500.00	44.08	56.55	5,294.26	1,810.87	2,600.10	14,447,975.09	1,709,588.59	39.783449	-80.753779
6,600.00	44.08	56.55	5,366.09	1,849.22	2,658.14	14,448,013.43	1,709,646.63	39.783554	-80.753572
6,700.00	44.08	56.55	5,437.93	1,887.57	2,716.17	14,448,051.78	1,709,704.67	39.783659	-80.753365
6,800.00	44.08	56.55	5,509.77	1,925.92	2,774.21	14,448,090.13	1,709,762.71	39.783764	-80.753158
6,900.00	44.08	56.55	5,581.61	1,964.27	2,832.25	14,448,128.48	1,709,820.75	39.783869	-80.752951
7,000.00	44.08	56.55	5,653.45	2,002.62	2,890.29	14,448,166.83	1,709,878.79	39.783973	-80.752744
7,100.00	44.08	56.55	5,725.29	2,040.97	2,948.33	14,448,205.18	1,709,936.83	39.784078	-80.752537
7,200.00	44.08	56.55	5,797.13	2,079.32	3,006.37	14,448,243.53	1,709,994.86	39.784183	-80.752330
7,300.00	44.08	56.55	5,868.97	2,117.67	3,064.41	14,448,281.88	1,710,052.90	39.784288	-80.752123
7,400.00	44.08	56.55	5,940.81	2,156.01	3,122.45	14,448,320.23	1,710,110.94	39.784393	-80.751916
7,500.00	44.08	56.55	6,012.65	2,194.36	3,180.49	14,448,358.58	1,710,168.98	39.784498	-80.751709
7,600.00	44.08	56.55	6,084.48	2,232.71	3,238.52	14,448,396.93	1,710,227.02	39.784603	-80.751502
7,700.00	44.08	56.55	6,156.32	2,271.06	3,296.56	14,448,435.27	1,710,285.06	39.784708	-80.751295
7,737.41	44.08	56.55	6,183.20	2,285.41	3,318.27	14,448,449.62	1,710,306.77	39.784747	-80.751218
<b>Begin 8°/100' build/turn</b>									
7,750.00	44.08	55.10	6,192.24	2,280.33	3,325.52	14,448,454.54	1,710,314.01	39.784760	-80.751192
7,800.00	44.15	49.35	6,228.16	2,311.63	3,353.00	14,448,475.84	1,710,341.49	39.784819	-80.751094
7,850.00	44.53	43.65	6,263.94	2,335.67	3,378.32	14,448,499.88	1,710,366.82	39.784884	-80.751003
7,900.00	45.19	38.06	6,299.39	2,362.33	3,401.37	14,448,526.54	1,710,389.86	39.784957	-80.750921
7,950.00	46.11	32.61	6,334.36	2,391.48	3,422.02	14,448,555.69	1,710,410.52	39.785037	-80.750847
8,000.00	47.29	27.36	6,368.66	2,422.99	3,440.18	14,448,587.20	1,710,428.68	39.785124	-80.750782
8,050.00	48.70	22.32	6,402.13	2,456.89	3,455.76	14,448,620.90	1,710,444.26	39.785216	-80.750727
8,090.84	50.00	18.37	6,428.74	2,485.73	3,466.52	14,448,649.94	1,710,455.02	39.785296	-80.750688
<b>Begin 10°/100' build/turn</b>									
8,100.00	50.47	17.34	6,434.60	2,492.43	3,468.68	14,448,656.65	1,710,457.18	39.785314	-80.750680
8,150.00	53.16	11.98	6,465.52	2,530.43	3,478.59	14,448,694.65	1,710,467.08	39.785419	-80.750645
8,200.00	56.08	7.00	6,494.48	2,570.62	3,485.28	14,448,734.64	1,710,473.77	39.785529	-80.750620
8,250.00	59.19	2.36	6,521.25	2,612.69	3,488.69	14,448,776.91	1,710,477.19	39.785644	-80.750608
8,300.00	62.45	358.02	6,545.64	2,656.33	3,488.81	14,448,820.54	1,710,477.31	39.785764	-80.750607
8,350.00	65.84	353.93	6,567.45	2,701.19	3,485.63	14,448,865.40	1,710,474.13	39.785887	-80.750618
8,400.00	69.33	350.06	6,586.52	2,746.94	3,479.18	14,448,911.15	1,710,467.68	39.786013	-80.750640
8,450.00	72.90	346.36	6,602.71	2,793.23	3,469.50	14,448,957.44	1,710,458.00	39.786140	-80.750674
8,500.00	76.54	342.81	6,615.89	2,839.70	3,456.67	14,449,003.92	1,710,445.17	39.786268	-80.750720
8,550.00	80.23	339.36	6,625.96	2,886.02	3,440.79	14,449,050.23	1,710,429.29	39.786395	-80.750776
8,600.00	83.95	335.98	6,632.84	2,931.81	3,421.98	14,449,096.02	1,710,410.47	39.786521	-80.750842
8,650.00	87.69	332.66	6,636.49	2,976.73	3,400.37	14,449,140.95	1,710,388.87	39.786645	-80.750919

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Planning Report - Geographic

Database: DB\_Dec2220\_v16  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia.  
 Site: Old Crow Pad  
 Well: Old Crow N-07 HM (slot C)  
 Wellbore: Original Hole  
 Design: rev3

Local Co-ordinate Reference: Well Old Crow N-07 HM (slot C)  
 TVD Reference: RKB=1265+32.5 @ 1297.50usft  
 MD Reference: RKB=1265+32.5 @ 1297.50usft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,694.14	91.00	329.74	6,637.00	3,015.40	3,379.11	14,449,179.61	1,710,367.61	39.786751	-80.750994
<b>Begin 91.00° lateral</b>									
8,700.00	91.00	329.74	6,636.90	3,020.46	3,376.16	14,449,184.67	1,710,384.65	39.786765	-80.751004
8,800.00	91.00	329.74	6,635.16	3,106.82	3,325.77	14,449,271.03	1,710,314.26	39.787003	-80.751183
8,900.00	91.00	329.74	6,633.42	3,193.18	3,275.38	14,449,357.39	1,710,263.87	39.787240	-80.751361
9,000.00	91.00	329.74	6,631.68	3,279.54	3,224.98	14,449,443.75	1,710,213.48	39.787478	-80.751540
9,100.00	91.00	329.74	6,629.94	3,365.89	3,174.59	14,449,530.11	1,710,163.09	39.787715	-80.751718
9,200.00	91.00	329.74	6,628.21	3,452.25	3,124.20	14,449,616.47	1,710,112.70	39.787953	-80.751897
9,300.00	91.00	329.74	6,626.47	3,538.61	3,073.81	14,449,702.82	1,710,062.31	39.788190	-80.752075
9,400.00	91.00	329.74	6,624.73	3,624.97	3,023.42	14,449,789.18	1,710,011.92	39.788428	-80.752254
9,500.00	91.00	329.74	6,622.99	3,711.33	2,973.03	14,449,875.54	1,709,961.53	39.788665	-80.752433
9,600.00	91.00	329.74	6,621.25	3,797.69	2,922.64	14,449,961.90	1,709,911.14	39.788903	-80.752611
9,700.00	91.00	329.74	6,619.51	3,884.04	2,872.25	14,450,048.26	1,709,860.74	39.789141	-80.752790
9,800.00	91.00	329.74	6,617.77	3,970.40	2,821.86	14,450,134.61	1,709,810.35	39.789378	-80.752968
9,900.00	91.00	329.74	6,616.04	4,056.76	2,771.47	14,450,220.97	1,709,759.96	39.789616	-80.753147
10,000.00	91.00	329.74	6,614.30	4,143.12	2,721.08	14,450,307.33	1,709,709.57	39.789853	-80.753325
10,100.00	91.00	329.74	6,612.56	4,229.48	2,670.69	14,450,393.69	1,709,659.18	39.790091	-80.753504
10,200.00	91.00	329.74	6,610.82	4,315.83	2,620.29	14,450,480.05	1,709,608.79	39.790328	-80.753682
10,300.00	91.00	329.74	6,609.08	4,402.19	2,569.90	14,450,566.41	1,709,558.40	39.790566	-80.753861
10,400.00	91.00	329.74	6,607.34	4,488.55	2,519.51	14,450,652.76	1,709,508.01	39.790803	-80.754039
10,500.00	91.00	329.74	6,605.61	4,574.91	2,469.12	14,450,739.12	1,709,457.62	39.791041	-80.754218
10,600.00	91.00	329.74	6,603.87	4,661.27	2,418.73	14,450,825.48	1,709,407.23	39.791278	-80.754396
10,700.00	91.00	329.74	6,602.13	4,747.63	2,368.34	14,450,911.84	1,709,356.84	39.791516	-80.754575
10,800.00	91.00	329.74	6,600.39	4,833.98	2,317.95	14,450,998.20	1,709,306.45	39.791753	-80.754754
10,900.00	91.00	329.74	6,598.65	4,920.34	2,267.56	14,451,084.56	1,709,256.05	39.791991	-80.754932
11,000.00	91.00	329.74	6,596.91	5,006.70	2,217.17	14,451,170.91	1,709,205.66	39.792229	-80.755111
11,100.00	91.00	329.74	6,595.17	5,093.06	2,166.78	14,451,257.27	1,709,155.27	39.792466	-80.755289
11,200.00	91.00	329.74	6,593.44	5,179.42	2,116.39	14,451,343.63	1,709,104.88	39.792704	-80.755468
11,300.00	91.00	329.74	6,591.70	5,265.77	2,065.99	14,451,429.99	1,709,054.49	39.792941	-80.755646
11,400.00	91.00	329.74	6,589.96	5,352.13	2,015.60	14,451,516.35	1,709,004.10	39.793179	-80.755825
11,500.00	91.00	329.74	6,588.22	5,438.49	1,965.21	14,451,602.70	1,708,953.71	39.793416	-80.756003
11,600.00	91.00	329.74	6,586.48	5,524.85	1,914.82	14,451,689.06	1,708,903.32	39.793654	-80.756182
11,700.00	91.00	329.74	6,584.74	5,611.21	1,864.43	14,451,775.42	1,708,852.93	39.793891	-80.756361
11,800.00	91.00	329.74	6,583.00	5,697.57	1,814.04	14,451,861.78	1,708,802.54	39.794129	-80.756539
11,900.00	91.00	329.74	6,581.27	5,783.92	1,763.65	14,451,948.14	1,708,752.15	39.794366	-80.756718
12,000.00	91.00	329.74	6,579.53	5,870.28	1,713.26	14,452,034.50	1,708,701.75	39.794604	-80.756896
12,100.00	91.00	329.74	6,577.79	5,956.64	1,662.87	14,452,120.85	1,708,651.36	39.794842	-80.757075
12,200.00	91.00	329.74	6,576.05	6,043.00	1,612.48	14,452,207.21	1,708,600.97	39.795079	-80.757253
12,300.00	91.00	329.74	6,574.31	6,129.36	1,562.09	14,452,293.57	1,708,550.58	39.795317	-80.757432
12,400.00	91.00	329.74	6,572.57	6,215.71	1,511.70	14,452,379.93	1,708,500.19	39.795554	-80.757610
12,500.00	91.00	329.74	6,570.84	6,302.07	1,461.30	14,452,466.29	1,708,449.80	39.795792	-80.757789
12,600.00	91.00	329.74	6,569.10	6,388.43	1,410.91	14,452,552.64	1,708,399.41	39.796029	-80.757968
12,700.00	91.00	329.74	6,567.36	6,474.79	1,360.52	14,452,639.00	1,708,349.02	39.796267	-80.758146
12,800.00	91.00	329.74	6,565.62	6,561.15	1,310.13	14,452,725.36	1,708,298.63	39.796504	-80.758325
12,900.00	91.00	329.74	6,563.88	6,647.51	1,259.74	14,452,811.72	1,708,248.24	39.796742	-80.758503
13,000.00	91.00	329.74	6,562.14	6,733.86	1,209.35	14,452,898.08	1,708,197.85	39.796979	-80.758682
13,100.00	91.00	329.74	6,560.40	6,820.22	1,158.96	14,452,984.44	1,708,147.46	39.797217	-80.758860
13,200.00	91.00	329.74	6,558.67	6,906.58	1,108.57	14,453,070.79	1,708,097.07	39.797454	-80.759039
13,300.00	91.00	329.74	6,556.93	6,992.94	1,058.18	14,453,157.15	1,708,046.67	39.797692	-80.759218
13,400.00	91.00	329.74	6,555.19	7,079.30	1,007.79	14,453,243.51	1,707,996.26	39.797929	-80.759396
13,500.00	91.00	329.74	6,553.45	7,165.66	957.40	14,453,329.87	1,707,945.89	39.798167	-80.759575
13,600.00	91.00	329.74	6,551.71	7,252.01	907.00	14,453,416.23	1,707,895.50	39.798405	-80.759753
13,700.00	91.00	329.74	6,549.97	7,338.37	856.61	14,453,502.58	1,707,845.11	39.798642	-80.759932
13,800.00	91.00	329.74	6,548.23	7,424.73	806.22	14,453,588.94	1,707,794.72	39.798880	-80.760111

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Planning Report - Geographic

<b>Database:</b>	DB_Dec2220_v16	<b>Local Co-ordinate Reference:</b>	Well Old Crow N-07 HM (slot C)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1265+32.5 @ 1297.50usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1265+32.5 @ 1297.50usft
<b>Site:</b>	Old Crow Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Old Crow N-07 HM (slot C)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
13,900.00	91.00	329.74	6,546.50	7,511.09	755.83	14,453,675.30	1,707,744.33	39.799117	-80.760289	
14,000.00	91.00	329.74	6,544.76	7,597.45	705.44	14,453,761.66	1,707,693.94	39.799355	-80.760468	
14,100.00	91.00	329.74	6,543.02	7,683.80	655.05	14,453,848.02	1,707,643.55	39.799592	-80.760646	
14,200.00	91.00	329.74	6,541.28	7,770.16	604.66	14,453,934.38	1,707,593.16	39.799830	-80.760825	
14,300.00	91.00	329.74	6,539.54	7,856.52	554.27	14,454,020.73	1,707,542.76	39.800067	-80.761003	
14,400.00	91.00	329.74	6,537.80	7,942.88	503.88	14,454,107.09	1,707,492.37	39.800305	-80.761182	
14,500.00	91.00	329.74	6,536.07	8,029.24	453.49	14,454,193.45	1,707,441.98	39.800542	-80.761361	
14,600.00	91.00	329.74	6,534.33	8,115.60	403.10	14,454,279.81	1,707,391.59	39.800780	-80.761539	
14,700.00	91.00	329.74	6,532.59	8,201.95	352.71	14,454,366.17	1,707,341.20	39.801017	-80.761718	
14,800.00	91.00	329.74	6,530.85	8,288.31	302.31	14,454,452.52	1,707,290.81	39.801255	-80.761896	
14,900.00	91.00	329.74	6,529.11	8,374.67	251.92	14,454,538.88	1,707,240.42	39.801492	-80.762075	
15,000.00	91.00	329.74	6,527.37	8,461.03	201.53	14,454,625.24	1,707,190.03	39.801730	-80.762254	
15,100.00	91.00	329.74	6,525.63	8,547.39	151.14	14,454,711.60	1,707,139.64	39.801968	-80.762432	
15,200.00	91.00	329.74	6,523.90	8,633.74	100.75	14,454,797.95	1,707,089.25	39.802205	-80.762611	
15,300.00	91.00	329.74	6,522.16	8,720.10	50.36	14,454,884.32	1,707,038.86	39.802443	-80.762789	
15,400.00	91.00	329.74	6,520.42	8,806.46	-0.03	14,454,970.67	1,706,988.47	39.802680	-80.762968	
15,500.00	91.00	329.74	6,518.68	8,892.82	-50.42	14,455,057.03	1,706,938.07	39.802918	-80.763147	
15,600.00	91.00	329.74	6,516.94	8,979.18	-100.81	14,455,143.39	1,706,887.68	39.803155	-80.763325	
15,700.00	91.00	329.74	6,515.20	9,065.54	-151.20	14,455,229.75	1,706,837.29	39.803393	-80.763504	
15,800.00	91.00	329.74	6,513.46	9,151.89	-201.59	14,455,316.11	1,706,786.90	39.803630	-80.763682	
15,900.00	91.00	329.74	6,511.73	9,238.25	-251.99	14,455,402.47	1,706,736.51	39.803868	-80.763861	
16,000.00	91.00	329.74	6,509.99	9,324.61	-302.38	14,455,488.82	1,706,686.12	39.804105	-80.764040	
16,100.00	91.00	329.74	6,508.25	9,410.97	-352.77	14,455,575.18	1,706,635.73	39.804343	-80.764218	
16,200.00	91.00	329.74	6,506.51	9,497.33	-403.16	14,455,661.54	1,706,585.34	39.804580	-80.764397	
16,300.00	91.00	329.74	6,504.77	9,583.68	-453.55	14,455,747.90	1,706,534.95	39.804818	-80.764575	
16,400.00	91.00	329.74	6,503.03	9,670.04	-503.94	14,455,834.26	1,706,484.56	39.805055	-80.764754	
16,500.00	91.00	329.74	6,501.30	9,756.40	-554.33	14,455,920.61	1,706,434.17	39.805293	-80.764933	
16,600.00	91.00	329.74	6,499.56	9,842.76	-604.72	14,456,006.97	1,706,383.77	39.805530	-80.765111	
16,700.00	91.00	329.74	6,497.82	9,929.12	-655.11	14,456,093.33	1,706,333.38	39.805768	-80.765290	
16,800.00	91.00	329.74	6,496.08	10,015.48	-705.50	14,456,179.69	1,706,282.99	39.806005	-80.765469	
16,900.00	91.00	329.74	6,494.34	10,101.83	-755.89	14,456,266.05	1,706,232.60	39.806243	-80.765647	
17,000.00	91.00	329.74	6,492.60	10,188.19	-806.28	14,456,352.41	1,706,182.21	39.806481	-80.765826	
17,100.00	91.00	329.74	6,490.86	10,274.55	-856.68	14,456,438.76	1,706,131.82	39.806718	-80.766004	
17,200.00	91.00	329.74	6,489.13	10,360.91	-907.07	14,456,525.12	1,706,081.43	39.806956	-80.766183	
17,300.00	91.00	329.74	6,487.39	10,447.27	-957.46	14,456,611.48	1,706,031.04	39.807193	-80.766362	
17,400.00	91.00	329.74	6,485.65	10,533.62	-1,007.85	14,456,697.84	1,705,980.65	39.807431	-80.766540	
17,500.00	91.00	329.74	6,483.91	10,619.98	-1,058.24	14,456,784.20	1,705,930.26	39.807668	-80.766719	
17,600.00	91.00	329.74	6,482.17	10,706.34	-1,108.63	14,456,870.55	1,705,879.87	39.807906	-80.766898	
17,700.00	91.00	329.74	6,480.43	10,792.70	-1,159.02	14,456,956.91	1,705,829.48	39.808143	-80.767076	
17,800.00	91.00	329.74	6,478.69	10,879.06	-1,209.41	14,457,043.27	1,705,779.08	39.808381	-80.767255	
17,900.00	91.00	329.74	6,476.95	10,965.42	-1,259.80	14,457,129.63	1,705,728.69	39.808618	-80.767433	
18,000.00	91.00	329.74	6,475.22	11,051.77	-1,310.19	14,457,215.99	1,705,678.30	39.808856	-80.767612	
18,070.03	91.00	329.74	6,474.00	11,112.25	-1,345.48	14,457,276.46	1,705,643.02	39.809022	-80.767737	

PBHL/TD 18070.03 MD 6474.00 TVD

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Planning Report - Geographic

<b>Database:</b>	DB_Dec2220_v16	<b>Local Co-ordinate Reference:</b>	Well Old Crow N-07 HM (slot C)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1265+32.5 @ 1297.50usft
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	RKB=1265+32.5 @ 1297.50usft
<b>Site:</b>	Old Crow Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Old Crow N-07 HM (slot C)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
BHL Old Crow N-07 HM - plan hits target center - Point	0.00	0.00	6,474.00	11,112.25	-1,345.48	14,457,276.46	1,705,643.02	39.809022	-80.767737
LP Old Crow N-07 HM 5 - plan hits target center - Point	0.00	0.00	6,637.00	3,015.40	3,379.11	14,449,179.61	1,710,367.61	39.766751	-80.750994

Casing Points				
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter
(usft)	(usft)		(")	(")
18,070.03	6,474.00	20" Casing	20	24

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
1,232.50	1,232.50	0.00	0.00	KOP Begin 3°/100' build
2,232.50	2,187.43	180.93	180.93	Begin 3°/100' build/turn
2,754.17	2,603.29	374.38	426.06	Begin 44.08° tangent
7,737.41	6,183.20	2,285.41	3,318.27	Begin 8°/100' build/turn
8,090.84	6,428.74	2,485.73	3,466.52	Begin 10°/100' build/turn
8,694.14	6,637.00	3,015.40	3,379.11	Begin 91.00° lateral
18,070.03	6,474.00	11,112.25	-1,345.48	PBHL/TD 18070.03 MD 6474.00 TVD

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

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

**Date of Notice:** 8/23/2021 **Date Permit Application Filed:** 8/23/2021

**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: Donna Yoho

Address: 3692 Rines Ridge Road

Proctor, WV 26055

Name: \_\_\_\_\_

Address: \_\_\_\_\_

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

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

SURFACE OWNER(s) (Impoundments or Pits)

Name: \_\_\_\_\_

Address: \_\_\_\_\_

COAL OWNER OR LESSEE

Name: Consol Energy, Inc. Leatherwood, Inc. Attn: Casey Saunders

Address: 1000 CONSOL Energy Drive

Canonsburg, PA 15317

COAL OPERATOR

Name: \_\_\_\_\_

Address: \_\_\_\_\_

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

Name: \_\_\_\_\_

Address: \_\_\_\_\_

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\*Please attach additional forms if necessary

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WV Department of  
Environmental Protection  
**09/03/2021**

**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.

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

APR 25 2012

WV Department of  
Environmental Protection

**Well Location Restrictions**

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

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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 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 57<sup>th</sup> St. SE  
Charleston, WV 25304  
(304) 926-0450

PERMITS  
Office of Oil and Gas

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WV Department of  
Environmental Protection

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

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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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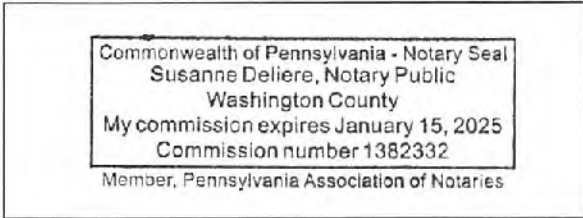
**Notice is hereby given by:**

Well Operator: Tug Hill Operating, LLC  
Telephone: 724-749-8388  
Email: amorris@tug-hill-op.com *amy Morris*

Address: 380 Southpointe Boulevard, Plaza II, Suite 200  
Canonsburg, PA 15317  
Facsimile: 724-336-2030

**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 [deprivacyofficer@wv.gov](mailto:deprivacyofficer@wv.gov).



Subscribed and sworn before me this 23<sup>rd</sup> day of August 2021.  
*Susanne Deliere* Notary Public  
My Commission Expires 1/15/2025

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<input type="checkbox"/> Return Receipt (electronic)	\$ _____
<input type="checkbox"/> Certified Mail Restricted Delivery	\$ _____
<input type="checkbox"/> Adult Signature Required	\$ _____
<input type="checkbox"/> Adult Signature Restricted Delivery	\$ _____

Postage	
\$	

**Total** Donna Yoho  
3682 Rines Ridge Road  
Proctor, WV 26055

\$	
Serial	
Street	
City	
PS	



Instructions
--------------

7018 0040 0000 4434 8429

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WV Department of  
Environmental Protection

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Extra Services & Fees (check box, add fee as appropriate)		
<input type="checkbox"/> Return Receipt (hardcopy)	\$	
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<input type="checkbox"/> Adult Signature Restricted Delivery	\$	



Postage	\$	
Total	\$	
Sent		
Street		
City		

PS Form 3800, September 2015 Edition. For instructions, see the back of this form.

Consol Energy, Inc.  
Leatherwood, Inc.  
Attn: Casey Saunders  
10000 Consol Energy Drive  
Canonsburg, PA 15317

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Office of Oil and Gas  
AUG 25 2021  
WV Department of  
Environmental Protection  
09/03/2021

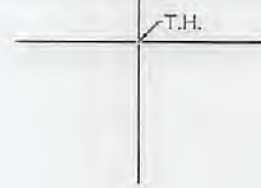
**OLD CROW N LEASE  
WELL 7HM  
TUG HILL OPERATING**

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

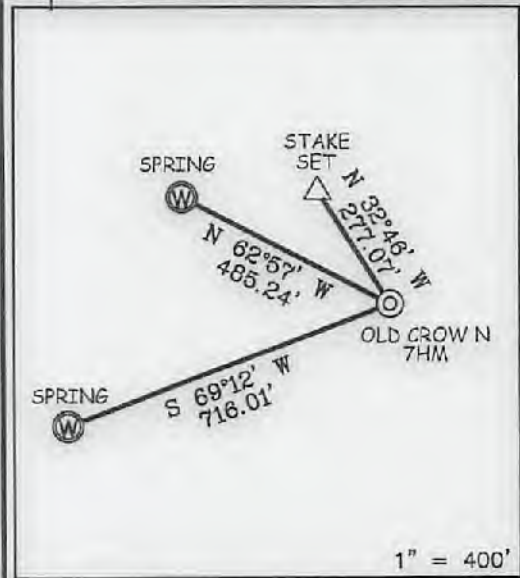
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'83 S.P.C.(FT)	N. 468,182.89	E. 1,613,530.67
NAD'83 GEO.	LAT-(N) 39.778495	LONG-(W) 80.763051
NAD'83 UTM (M)	N. 4,403,199.66	E. 520,291.14
<b>LANDING POINT</b>		
NAD'83 S.P.C.(FT)	N. 471,122.4	E. 1,616,960.8
NAD'83 GEO.	LAT-(N) 39.786751	LONG-(W) 80.750994
NAD'83 UTM (M)	N. 4,404,118.8	E. 521,321.1
<b>BOTTOM HOLE</b>		
NAD'83 S.P.C.(FT)	N. 479,299.9	E. 1,612,370.6
NAD'83 GEO.	LAT-(N) 39.809022	LONG-(W) 80.767737
NAD'83 UTM (M)	N. 4,408,586.7	E. 519,881.0

T.H. LONGITUDE 80°45'00"  
B.H. LONGITUDE 80°45'00"  
4,798' T.H.  
8,856' B.H.



**REFERENCES**



**NOTES ON SURVEY**

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. WELL SPOT CIRCLE & TOPO MARK SCALE ARE 1"=2000'
3. THE ASSESSMENT OF THE 1/10 ACRE LOT, OWNED BY JASON J. STEED AND DESCRIBED AS THE SECOND PARCEL IN DEED BOOK 643 PAGE 319 AND CORRECTIVE DEED 843 PAGE 300, IS NOT CURRENTLY ACCOUNTED FOR WITHIN THE 135.61 ACRE ASSESSMENT OF SURFACE TAX MAP 5-9-13.2
4. TAX MAPS AND TAX ASSESSMENTS FOR PARCELS 5-9-4, 5-9-35 AND 5-9-41 DO NOT APPEAR TO CORRECTLY DEPICT PARCEL BOUNDARIES AND/OR ACREAGES AS DESCRIBED IN THEIR RESPECTIVE DEEDS.



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 25351 | 304.462.5634  
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.546.3952  
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296  
slsw.com

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

P.S. 677 Gregory A. Smith



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
DATE MAY 28, 2019  
REVISED AUGUST 23, 2021  
OPERATORS WELL NO. OLD CROW N-7HM  
API WELL NO. 47 - 051 - 02239  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8796P7HMR.dwg  
OLD CROW NORTH 7HM REV3  
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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



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

LOCATION:  
ELEVATION 1,264.99' WATERSHED TRIBUTARY OF FISH CREEK (HUC-10)  
DISTRICT FRANKLIN COUNTY MARSHALL QUADRANGLE POWHATAN POINT 7.5'

SURFACE OWNER DONNA VIVIAN YOHO (TOD) GARY LANCE YOHO ACREAGE 71.205±  
ROYALTY OWNER DONNA VIVIAN YOHO, ET AL ACREAGE 71.205±

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

PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION MARCELLUS  
ESTIMATED DEPTH TVD: 6,751' / TMD: 18,070'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DARREN BROWN - CT CORPORATION  
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5098 WASHINGTON ST. W, STE 407  
FORT WORTH, TX 76107 CHARLESTON, WV 25313-1561

COUNTY NAME PERMIT

09/03/2021

**OLD CROW N LEASE  
WELL 7HM  
TUG HILL OPERATING**

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

T.H. LONGITUDE 80°45'00"  
B.H. LONGITUDE 80°45'00"

NAD 83 GRID NORTH

TAG	SURFACE OWNER	PARCEL	ACRES
A	DONNA VIVIAN YOHO (TOD) GARY LANCER YOHO	5-16-3	71.205
B	JOHN SWIERKOS	5-10-14	100.00
C	JOHN SWIERKOS	5-16-5	52.07
D	HERBERT M. AULENBACHER, JR	5-10-9	141.43
E	LOUIS DELBERT VAN SCYOC	5-10-10	24.50

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	275.89	1588.10	N 52°08' E	275.32
C2	177.02	378.34	N 41°48' E	175.41
C3	197.37	461.18	N 15°18' E	195.87
C4	182.22	648.19	N 06°07' W	181.82
C5	240.70	871.45	N 21°11' W	239.94



12 Vanden Drive | P.O. Box 150 | Glenview, WV 26031 | 304.452.8684  
1412 Kanawha Boulevard, East | Clarksburg, WV 26301 | 304.346.5952  
254 Exit Beckley Bypass | Beckley, WV 26601 | 304.236.8296  
alsw.com

LINE	BEARING	DISTANCE
L1	N 46°57' E	255.98'
L2	N 23°38' E	757.90'
L3	S 52°51' E	1216.06'

TAG	SURFACE OWNER	PARCEL	ACRES
F	HERBERT M. AULENBACHER, JR	5-10-3	225.50
G	STATE OF WEST VIRGINIA (FISH CREEK)	N/A	N/A
H	CARL J. & LAURA A. GILBERT	5-10-4.7	2,110
I	SHEENA ROSE	5-10-4	74,229
J	JACK E. RECTOR	5-10-4.2	2,887
K	KAREN L. ANKROM	5-10-4.3	5,697
L	SHEENA ROSE	5-9-16	1.65
M	JASON J. STEED	5-9-13.2	135.61
N	DENNIS P. CADMUS	5-9-14	136 POLES
O	DENNIS P. CADMUS	5-9-15	3.85
P	DENNIS P. CADMUS	5-9-17	28,063
Q	DENNIS P. CADMUS	5-9-24	21 AC 49 P
R	LLOYD C. & JUDITH C. ARNOLD	5-9-41	93.00

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
 NAD83 S.P.C.(FT) N. 498,162.89 E. 1,619,580.67  
 NAD83 GEO. LAT.(N) 39.778495 LONG.(W) 80.763051  
 NAD83 UTM (M) N. 4,403,199.66 E. 520,291.14  
**LANDING POINT**  
 NAD83 S.P.C.(FT) N. 471,122.4 E. 1,618,980.8  
 NAD83 GEO. LAT.(N) 39.766751 LONG.(W) 80.750894  
 NAD83 UTM (M) N. 4,404,118.8 E. 521,321.1  
**BOTTOM HOLE**  
 NAD83 S.P.C.(FT) N. 479,299.8 E. 1,612,370.8  
 NAD83 GEO. LAT.(N) 39.809222 LONG.(W) 80.767737  
 NAD83 UTM (M) N. 4,403,686.7 E. 519,881.0



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

P.S. 677 *Gregory A. Smith*

SCALE 1" = 2000' FILE NO. 8788P7HMR.dwg  
 OLD CROW NORTH 7HM REV3  
 DATE MAY 28 20 19  
 REVISED AUGUST 23 20 21  
 OPERATORS WELL NO. OLD CROW N-7HM  
 API WELL NO. 47 - 051 - 02239  
 NO. STATE COUNTY PERMIT M08

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

**LEGEND**

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

09/03/2021

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DARREN BROWN - CT CORPORATION  
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5098 WASHINGTON ST. W, STE 407  
 FORT WORTH, TX 76107 CHARLESTON, WV 25313-1561

COUNTY NAME PERMIT

**STATE OF WEST VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS**  
**VOLUNTARY STATEMENT OF NO OBJECTION**

**Instructions to Persons Named on Page WW-6A**

The well operator named on page WW-6A is applying for a permit from the State of West Virginia to conduct oil or gas well work. Well work permits are valid for twenty-four (24) months. Please contact the listed well operator and the Office of Oil and Gas if you do not own any interest in the listed surface tract.

**Comment and Waiver Provisions**

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.

Pursuant to West Virginia Code § 22-6A-8(b) No permit may be issued less than thirty days after the filing date of the application for any well work except plugging or replugging; and no permit for plugging or replugging may be issued less than five days after the filing date of the application except a permit for plugging or replugging a dry hole: *Provided*, That if the applicant certifies that all persons entitled to notice of the application under the provisions of subsection (b), section ten of this article have been served in person or by certified mail, return receipt requested, with a copy of the well work application, including the erosion and sediment control plan, if required, and the well plat, and further files written statements of no objection by all such persons, the secretary may issue the well work permit at any time.

**VOLUNTARY STATEMENT OF NO OBJECTION**

I, Donna Yoho, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through \_\_\_\_\_, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State:	<u>West Virginia</u>	UTM NAD 83 Easting:	<u>620,291.14</u>
County:	<u>Marshall</u>	UTM NAD 83 Northing:	<u>4,403,199.66</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road (County Route 76)</u>
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>Donna Yoho</u>
Watershed:	<u>Tributary of Fish Creek (HUC 10)</u>		

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

<p>*Please check the box that applies</p> <p><input checked="" type="checkbox"/> SURFACE OWNER</p> <p><input type="checkbox"/> SURFACE OWNER (Road and/or Other Disturbance)</p> <p><input type="checkbox"/> SURFACE OWNER (Impoundments/Pits)</p> <p><input type="checkbox"/> COAL OWNER OR LESSEE</p> <p><input type="checkbox"/> COAL OPERATOR</p> <p><input type="checkbox"/> WATER PURVEYOR</p> <p><input type="checkbox"/> OPERATOR OF ANY NATURAL GAS STORAGE FIELD</p>	<p><b>FOR EXECUTION BY A NATURAL PERSON</b></p> <p>Signature: <u>Donna Yoho</u></p> <p>Print Name: <u>Donna Yoho</u></p> <p>Date: <u>8-25-21</u></p> <p><b>FOR EXECUTION BY A CORPORATION, ETC.</b></p> <p>Company: _____</p> <p>By: _____</p> <p>Its: _____</p> <p style="text-align: right;">RECEIVED Office of Oil and Gas</p> <p>Signature: _____</p> <p>Date: <u>AUG 26 2021</u></p>
--	---

**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](mailto:depprivacyofficer@wv.gov).

WV Department of  
Environmental Protection

09/03/2021



# TUG HILL

August 24, 2021

MR. CHARLES T. BREWER  
WV DEP OFFICE OF OIL & GAS  
601 57<sup>TH</sup> STREET SE  
CHARLESTON, WV 25304-2345

**VIA FEDEX**

**RE: Old Crow N-7HM Modification (API # 47-051-02239)  
Franklin District, Marshall County, WV  
Updated Freshwater/Coal String Depth**

Dear Taylor:

Tug Hill Operating, LLC is submitting an expedited modification request to our Old Crow N-7HM permit (47-051-02239).

- Check – Expedited Fee of \$5,000
- Updated WW-6B
- New WW-6A Notice of Application for the Surface Owner and Coal Owner
- Updated Well Plat

If you have any questions or need any additional information, please do not hesitate to call me on (304) 376-0111. Thank you for attention to this matter, it is greatly appreciated.

Sincerely,

AMY MORRIS  
PERMIT SPECIALIST-APPALACHIA REGION  
TUG HILL OPERATING, LLC

Enclosures

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Office of Oil and Gas

AUG 25 2021

WV Department of  
Environmental Protection





Stansberry, Wade A <wade.a.stansberry@wv.gov>

---

## Expedited Modification Horizontal H6A Well Work Permit (API: 47-051-02239)

1 message

---

**Stansberry, Wade A** <wade.a.stansberry@wv.gov>

Tue, Aug 31, 2021 at 9:06 AM

To: Amy Morris <amorris@tug-hilop.com>, Barry Stollings <barry.w.stollings@wv.gov>, Eric Buzzard <ebuzzard@marshallcountywv.org>

have attached a copy of the newly issued well [permit](#) number, "OLD CROW N-7HM", API: (47-051-02239). This will serve as your copy.

If you have any questions, then [please](#) contact us here at the Office of Oil and Gas.

Thank you,

**Wade A. Stansberry**

**Environmental Resource Specialist 3**

**West Virginia Department of Environmental Protection**

**Office of Oil & Gas**

**601 57th St. SE**

**Charleston, WV 25304**

**(304) 926-0499 ext. 41115**

**(304) 926-0452 fax**

**[Wade.A.Stansberry@wv.gov](mailto:Wade.A.Stansberry@wv.gov)**

---

### 2 attachments



**IR-26 Blank.pdf**

152K



**47-051-02239 - mod.pdf**

2525K

09/03/2021