



Well: Jeffersons N-07 HU (slot B)  
 Site: Jeffersons  
 Project: Wetzel County, West Virginia (UTM17 NAD83)  
 Design: rev0  
 Rig:

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Jeffersons N-07HU BHL	11252.00	7965.01	-6616.11	14420726.65	1698458.17	39.70869400	-80.79362100
- plan hits target center							
Jeffersons N-07HU LP	11457.00	-2171.55	-764.00	14410590.11	1704310.27	39.68081700	-80.77290400
- plan misses target center by 43.09ft at 12775.54ft MD (11456.56 TVD, -2149.87 N, -726.76 E)							
Jeffersons N-07HU LP 50E	11457.00	-2171.55	-714.00	14410590.11	1704360.27	39.68081665	-80.77272628
- plan misses target center by 0.12ft at 12750.38ft MD (11457.00 TVD, -2171.61 N, -714.10 E)							

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 @ 1217.00ft

Northing	Easting	Latitude	Longitude
14412761.65	1705074.27	39.68677541	-80.77016878

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.75°

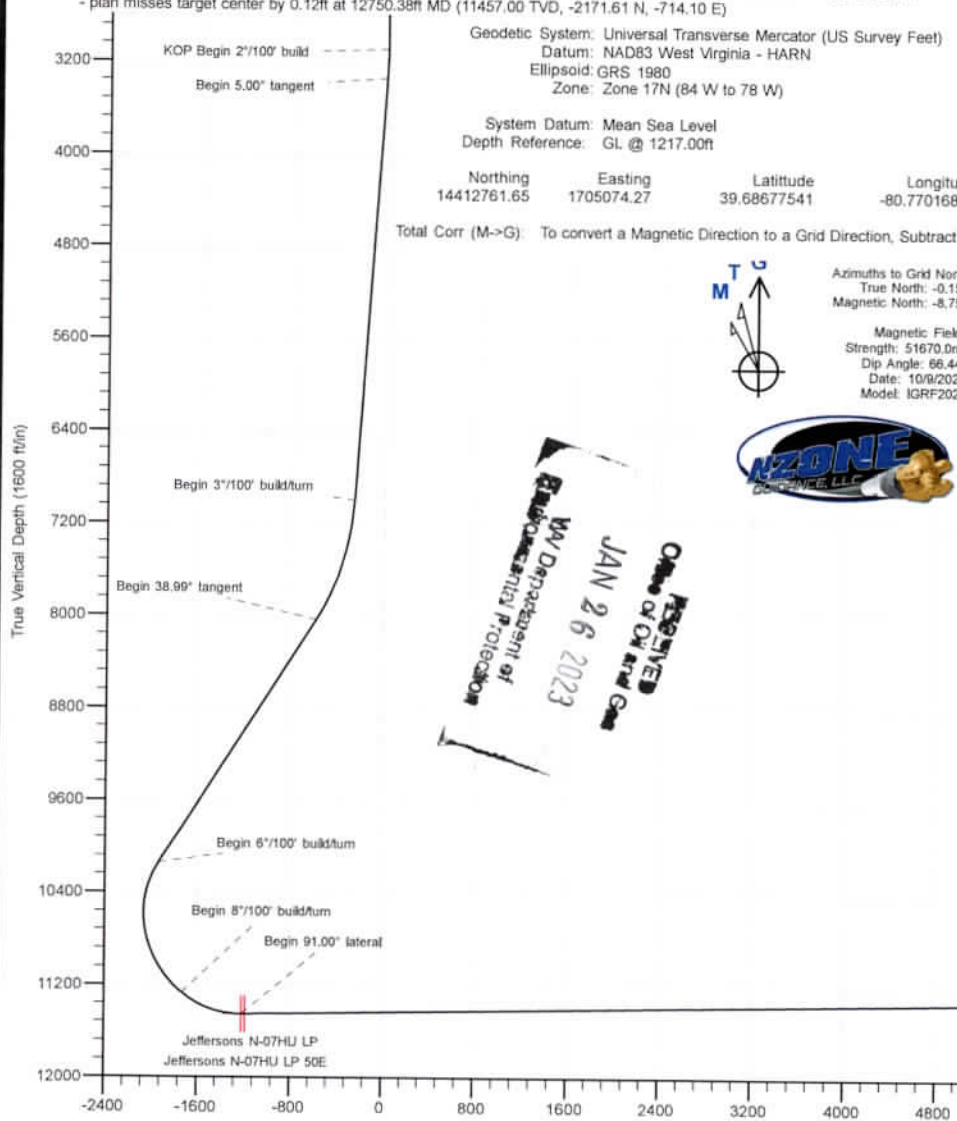


Azimuths to Grid North  
 True North: -0.15°  
 Magnetic North: -8.75°

Magnetic Field  
 Strength: 51670.0nT  
 Dip Angle: 66.44°  
 Date: 10/9/2021  
 Model: IGRF2020

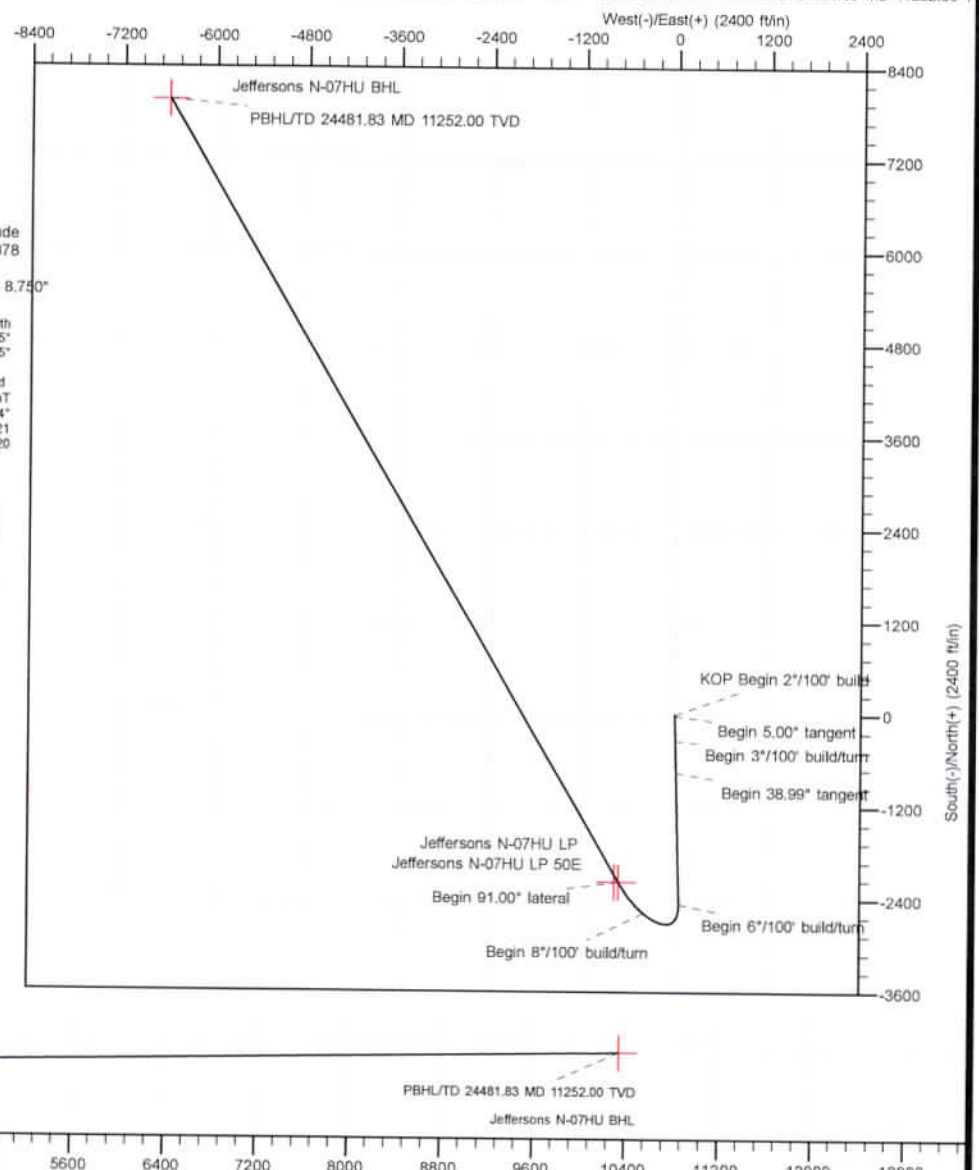


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SECTION DETAILS

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	0.000	0.00	
2	3100.00	0.00	0.00	3100.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2°/100' build
3	3350.00	5.00	178.38	3349.68	-10.90	0.31	2.00	178.380	-8.58	Begin 5.00° tangent
4	7014.26	5.00	178.38	7000.00	-330.13	9.34	0.00	0.000	-259.91	Begin 3°/100' build/turn
5	8147.42	38.99	178.38	8035.32	-748.21	21.19	3.00	-0.005	-589.09	Begin 38.99° tangent
6	10863.93	38.99	178.38	10146.60	-2456.88	69.65	0.00	0.000	-1934.43	Begin 6°/100' build/turn
7	12185.91	50.00	309.06	11270.75	-2572.69	-387.12	6.00	143.762	-1731.65	Begin 8°/100' build/turn
8	12750.43	91.00	329.79	11457.00	-2171.56	-714.13	8.00	29.940	-1214.15	Begin 91.00° lateral
9	24481.83	91.00	329.79	11252.00	7965.01	-6616.11	0.00	0.000	10354.44	PBHL/TD 24481.83 MD 11252.00 TVD



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Planning Report - Geographic

<b>Database:</b>	DB_Dec2220_v16	<b>Local Co-ordinate Reference:</b>	Well Jeffersons N-07 HU (slot B)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1217.00ft
<b>Project:</b>	Wetzel County, West Virginia (UTM17 NAD83)	<b>MD Reference:</b>	GL @ 1217.00ft
<b>Site:</b>	Jeffersons	<b>North Reference:</b>	Grid
<b>Well:</b>	Jeffersons N-07 HU (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev0		

<b>Project</b>	Wetzel County, West Virginia (UTM17 NAD83)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	Jeffersons				
<b>Site Position:</b>		<b>Northing:</b>	14,412,666.05 usft	<b>Latitude:</b>	39.68651309
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,705,043.41 usft	<b>Longitude:</b>	-80.77027935
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "		

<b>Well</b>	Jeffersons N-07 HU (slot B)					
<b>Well Position</b>	<b>+N-S</b>	0.00 ft	<b>Northing:</b>	14,412,761.65 usft	<b>Latitude:</b>	39.68677541
	<b>+E-W</b>	0.00 ft	<b>Easting:</b>	1,705,074.27 usft	<b>Longitude:</b>	-80.77016878
<b>Position Uncertainty</b>	0.00 ft		<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,217.00 ft
<b>Grid Convergence:</b>						

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2020	10/9/2021	-8.603	66.437	51,670.01412192

<b>Design</b>	rev0			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N-S (ft)</b>	<b>+E-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	320.29

Plan Survey Tool Program		Date		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	24,481.83 rev0 (Original Hole)		

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<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1217.00ft
<b>Project:</b>	Wetzel County, West Virginia (UTM17 NAD83)	<b>MD Reference:</b>	GL @ 1217.00ft
<b>Site:</b>	Jeffersons	<b>North Reference:</b>	Grid
<b>Well:</b>	Jeffersons N-07 HU (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev0		

Plan Sections										
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	0.000	
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.000	
3,350.00	5.00	178.38	3,349.68	-10.90	0.31	2.00	2.00	0.00	178.380	
7,014.26	5.00	178.38	7,000.00	-330.13	9.34	0.00	0.00	0.00	0.000	
8,147.42	38.99	178.38	8,035.32	-748.21	21.19	3.00	3.00	0.00	-0.005	
10,863.93	38.99	178.38	10,146.60	-2,456.88	69.65	0.00	0.00	0.00	0.000	
12,185.91	50.00	309.06	11,270.75	-2,572.69	-387.12	6.00	0.83	9.89	143.762	
12,750.43	91.00	329.79	11,457.00	-2,171.56	-714.13	8.00	7.26	3.67	29.940	
24,481.83	91.00	329.79	11,252.00	7,965.01	-6,616.11	0.00	0.00	0.00	0.000	Jeffersons N-07HU BI

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<b>Site:</b>	Jeffersons	<b>North Reference:</b>	Grid
<b>Well:</b>	Jeffersons N-07 HU (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev0		

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	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
100.00	0.00	0.00	100.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
200.00	0.00	0.00	200.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
300.00	0.00	0.00	300.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
400.00	0.00	0.00	400.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
500.00	0.00	0.00	500.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
600.00	0.00	0.00	600.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
700.00	0.00	0.00	700.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
800.00	0.00	0.00	800.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
900.00	0.00	0.00	900.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
1,800.00	0.00	0.00	1,800.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
1,900.00	0.00	0.00	1,900.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
2,000.00	0.00	0.00	2,000.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
2,100.00	0.00	0.00	2,100.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
2,200.00	0.00	0.00	2,200.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
2,300.00	0.00	0.00	2,300.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
2,400.00	0.00	0.00	2,400.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
2,500.00	0.00	0.00	2,500.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
2,600.00	0.00	0.00	2,600.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
2,700.00	0.00	0.00	2,700.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
2,800.00	0.00	0.00	2,800.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
2,900.00	0.00	0.00	2,900.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
3,000.00	0.00	0.00	3,000.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
3,100.00	0.00	0.00	3,100.00	0.00	0.00	14,412,761.65	1,705,074.27	39.68677541	-80.77016878
<b>KOP Begin 2°/100' build</b>									
3,200.00	2.00	178.38	3,199.98	-1.74	0.05	14,412,759.90	1,705,074.32	39.68677062	-80.77016862
3,300.00	4.00	178.38	3,299.84	-6.98	0.20	14,412,754.67	1,705,074.47	39.68675625	-80.77016814
3,350.00	5.00	178.38	3,349.68	-10.90	0.31	14,412,750.75	1,705,074.58	39.68674548	-80.77016778
<b>Begin 5.00° tangent</b>									
3,400.00	5.00	178.38	3,399.49	-15.25	0.43	14,412,746.40	1,705,074.70	39.68673352	-80.77016739
3,500.00	5.00	178.38	3,499.11	-23.97	0.68	14,412,737.68	1,705,074.95	39.68670959	-80.77016659
3,600.00	5.00	178.38	3,598.73	-32.68	0.92	14,412,728.97	1,705,075.19	39.68668566	-80.77016579
3,700.00	5.00	178.38	3,698.35	-41.39	1.17	14,412,720.26	1,705,075.44	39.68666173	-80.77016500
3,800.00	5.00	178.38	3,797.97	-50.10	1.42	14,412,711.55	1,705,075.69	39.68663781	-80.77016420
3,900.00	5.00	178.38	3,897.59	-58.81	1.66	14,412,702.84	1,705,075.93	39.68661388	-80.77016340
4,000.00	5.00	178.38	3,997.21	-67.53	1.91	14,412,694.12	1,705,076.18	39.68658995	-80.77016261
4,100.00	5.00	178.38	4,096.83	-76.24	2.16	14,412,685.41	1,705,076.43	39.68656602	-80.77016181
4,200.00	5.00	178.38	4,196.45	-84.95	2.40	14,412,676.70	1,705,076.67	39.68654210	-80.77016101
4,300.00	5.00	178.38	4,296.07	-93.66	2.65	14,412,667.99	1,705,076.92	39.68651817	-80.77016022
4,400.00	5.00	178.38	4,395.69	-102.37	2.90	14,412,659.28	1,705,077.16	39.68649424	-80.77015942
4,500.00	5.00	178.38	4,495.31	-111.09	3.14	14,412,650.56	1,705,077.41	39.68647031	-80.77015862
4,600.00	5.00	178.38	4,594.93	-119.80	3.39	14,412,641.85	1,705,077.66	39.68644638	-80.77015783
4,700.00	5.00	178.38	4,694.55	-128.51	3.63	14,412,633.14	1,705,077.90	39.68642246	-80.77015703
4,800.00	5.00	178.38	4,794.17	-137.22	3.88	14,412,624.43	1,705,078.15	39.68639853	-80.77015624
4,900.00	5.00	178.38	4,893.78	-145.93	4.13	14,412,615.72	1,705,078.40	39.68637460	-80.77015544
5,000.00	5.00	178.38	4,993.40	-154.65	4.37	14,412,607.00	1,705,078.64	39.68635067	-80.77015464

JAN 26 2023



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<b>Site:</b>	Jeffersons	<b>North Reference:</b>	Grid
<b>Well:</b>	Jeffersons N-07 HU (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev0		

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	5.00	178.38	5,093.02	-163.36	4.62	14,412,598.29	1,705,078.89	39.68632674	-80.77015385
5,200.00	5.00	178.38	5,192.64	-172.07	4.87	14,412,589.58	1,705,079.14	39.68630282	-80.77015305
5,300.00	5.00	178.38	5,292.26	-180.78	5.11	14,412,580.87	1,705,079.38	39.68627889	-80.77015225
5,400.00	5.00	178.38	5,391.88	-189.49	5.36	14,412,572.15	1,705,079.63	39.68625496	-80.77015146
5,500.00	5.00	178.38	5,491.50	-198.21	5.61	14,412,563.44	1,705,079.88	39.68623103	-80.77015066
5,600.00	5.00	178.38	5,591.12	-206.92	5.85	14,412,554.73	1,705,080.12	39.68620711	-80.77014986
5,700.00	5.00	178.38	5,690.74	-215.63	6.10	14,412,546.02	1,705,080.37	39.68618318	-80.77014907
5,800.00	5.00	178.38	5,790.36	-224.34	6.34	14,412,537.31	1,705,080.61	39.68615925	-80.77014827
5,900.00	5.00	178.38	5,889.98	-233.06	6.59	14,412,528.59	1,705,080.86	39.68613532	-80.77014747
6,000.00	5.00	178.38	5,989.60	-241.77	6.84	14,412,519.88	1,705,081.11	39.68611139	-80.77014668
6,100.00	5.00	178.38	6,089.22	-250.48	7.08	14,412,511.17	1,705,081.35	39.68608747	-80.77014588
6,200.00	5.00	178.38	6,188.84	-259.19	7.33	14,412,502.46	1,705,081.60	39.68606354	-80.77014508
6,300.00	5.00	178.38	6,288.46	-267.90	7.58	14,412,493.75	1,705,081.85	39.68603961	-80.77014429
6,400.00	5.00	178.38	6,388.08	-276.62	7.82	14,412,485.03	1,705,082.09	39.68601568	-80.77014349
6,500.00	5.00	178.38	6,487.70	-285.33	8.07	14,412,476.32	1,705,082.34	39.68599175	-80.77014270
6,600.00	5.00	178.38	6,587.32	-294.04	8.32	14,412,467.61	1,705,082.59	39.68596783	-80.77014190
6,700.00	5.00	178.38	6,686.94	-302.75	8.56	14,412,458.90	1,705,082.83	39.68594390	-80.77014110
6,800.00	5.00	178.38	6,786.55	-311.46	8.81	14,412,450.19	1,705,083.08	39.68591997	-80.77014031
6,900.00	5.00	178.38	6,886.17	-320.18	9.06	14,412,441.47	1,705,083.32	39.68589604	-80.77013951
7,000.00	5.00	178.38	6,985.79	-328.89	9.30	14,412,432.76	1,705,083.57	39.68587211	-80.77013871
7,014.26	5.00	178.38	7,000.00	-330.13	9.34	14,412,431.52	1,705,083.61	39.68586870	-80.77013860
<b>Begin 3°/100' build/turn</b>									
7,100.00	7.57	178.38	7,085.22	-339.51	9.60	14,412,422.14	1,705,083.87	39.68584293	-80.77013774
7,200.00	10.57	178.38	7,183.95	-355.27	10.05	14,412,406.38	1,705,084.32	39.68579965	-80.77013630
7,300.00	13.57	178.38	7,281.73	-376.18	10.64	14,412,385.47	1,705,084.91	39.68574223	-80.77013438
7,400.00	16.57	178.38	7,378.28	-402.17	11.38	14,412,359.48	1,705,085.65	39.68567085	-80.77013200
7,500.00	19.57	178.38	7,473.34	-433.17	12.26	14,412,328.48	1,705,086.53	39.68558570	-80.77012916
7,600.00	22.57	178.38	7,566.64	-469.11	13.28	14,412,292.54	1,705,087.54	39.68548700	-80.77012586
7,700.00	25.57	178.38	7,657.93	-509.88	14.43	14,412,251.77	1,705,088.70	39.68537503	-80.77012213
7,800.00	28.57	178.38	7,746.96	-555.36	15.72	14,412,206.29	1,705,089.99	39.68525010	-80.77011796
7,900.00	31.57	178.38	7,833.49	-605.45	17.14	14,412,156.20	1,705,091.41	39.68511254	-80.77011336
8,000.00	34.57	178.38	7,917.28	-659.99	18.69	14,412,101.66	1,705,092.96	39.68496274	-80.77010836
8,100.00	37.57	178.38	7,998.10	-718.84	20.36	14,412,042.81	1,705,094.63	39.68480111	-80.77010297
8,147.42	38.99	178.38	8,035.32	-748.21	21.19	14,412,013.45	1,705,095.46	39.68472045	-80.77010027
<b>Begin 38.99° tangent</b>									
8,200.00	38.99	178.38	8,076.19	-781.28	22.13	14,411,980.37	1,705,096.40	39.68462962	-80.77009724
8,300.00	38.99	178.38	8,153.91	-844.18	23.91	14,411,917.47	1,705,098.18	39.68445686	-80.77009147
8,400.00	38.99	178.38	8,231.63	-907.08	25.70	14,411,854.57	1,705,099.97	39.68428411	-80.77008570
8,500.00	38.99	178.38	8,309.35	-969.98	27.48	14,411,791.67	1,705,101.75	39.68411136	-80.77007994
8,600.00	38.99	178.38	8,387.07	-1,032.88	29.26	14,411,728.77	1,705,103.53	39.68393860	-80.77007417
8,700.00	38.99	178.38	8,464.79	-1,095.78	31.05	14,411,665.87	1,705,105.32	39.68376585	-80.77006840
8,800.00	38.99	178.38	8,542.51	-1,158.68	32.83	14,411,602.98	1,705,107.10	39.68359309	-80.77006263
8,900.00	38.99	178.38	8,620.23	-1,221.58	34.62	14,411,540.08	1,705,108.89	39.68342034	-80.77005686
9,000.00	38.99	178.38	8,697.95	-1,284.48	36.40	14,411,477.18	1,705,110.67	39.68324758	-80.77005109
9,100.00	38.99	178.38	8,775.67	-1,347.38	38.18	14,411,414.28	1,705,112.45	39.68307483	-80.77004533
9,200.00	38.99	178.38	8,853.39	-1,410.27	39.97	14,411,351.38	1,705,114.24	39.68290207	-80.77003956
9,300.00	38.99	178.38	8,931.11	-1,473.17	41.75	14,411,288.48	1,705,116.02	39.68272932	-80.77003379
9,400.00	38.99	178.38	9,008.83	-1,536.07	43.54	14,411,225.58	1,705,117.81	39.68255656	-80.77002802
9,500.00	38.99	178.38	9,086.55	-1,598.97	45.32	14,411,162.68	1,705,119.59	39.68238381	-80.77002225
9,600.00	38.99	178.38	9,164.27	-1,661.87	47.10	14,411,099.78	1,705,121.37	39.68221105	-80.77001649
9,700.00	38.99	178.38	9,241.99	-1,724.77	48.89	14,411,036.88	1,705,123.16	39.68203830	-80.77001072
9,800.00	38.99	178.38	9,319.71	-1,787.67	50.67	14,410,973.98	1,705,124.94	39.68186554	-80.77000495
9,900.00	38.99	178.38	9,397.43	-1,850.57	52.46	14,410,911.08	1,705,126.73	39.68169279	-80.76999918
10,000.00	38.99	178.38	9,475.15	-1,913.47	54.24	14,410,848.18	1,705,128.51	39.68152003	-80.76999342

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05/26/2023

WV Dept of Energy & Natural Resources  
Office of Oil and Gas



Planning Report - Geographic

<b>Database:</b>	DB_Dec2220_v16	<b>Local Co-ordinate Reference:</b>	Well Jeffersons N-07 HU (slot B)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1217.00ft
<b>Project:</b>	Wetzel County, West Virginia (UTM17 NAD83)	<b>MD Reference:</b>	GL @ 1217.00ft
<b>Site:</b>	Jeffersons	<b>North Reference:</b>	Grid
<b>Well:</b>	Jeffersons N-07 HU (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev0		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
13,100.00	91.00	329.79	11,450.89	-1,869.52	-889.99	14,410,892.13	1,704,184.28	39.68164733	-80.77334909	
13,200.00	91.00	329.79	11,449.14	-1,783.11	-940.30	14,410,978.54	1,704,133.97	39.68188498	-80.77352713	
13,300.00	91.00	329.79	11,447.39	-1,696.71	-990.61	14,411,064.94	1,704,083.66	39.68212263	-80.77370517	
13,400.00	91.00	329.79	11,445.65	-1,610.30	-1,040.92	14,411,151.35	1,704,033.35	39.68238627	-80.77388321	
13,500.00	91.00	329.79	11,443.90	-1,523.90	-1,091.23	14,411,237.75	1,703,983.04	39.68259792	-80.77406125	
13,600.00	91.00	329.79	11,442.15	-1,437.49	-1,141.54	14,411,324.16	1,703,932.73	39.68283556	-80.77423930	
13,700.00	91.00	329.79	11,440.40	-1,351.09	-1,191.85	14,411,410.56	1,703,882.42	39.68307321	-80.77441734	
13,800.00	91.00	329.79	11,438.66	-1,264.68	-1,242.16	14,411,496.97	1,703,832.12	39.68331085	-80.77459539	
13,900.00	91.00	329.79	11,436.91	-1,178.28	-1,292.47	14,411,583.38	1,703,781.81	39.68354849	-80.77477344	
14,000.00	91.00	329.79	11,435.16	-1,091.87	-1,342.78	14,411,669.78	1,703,731.50	39.68378614	-80.77495148	
14,100.00	91.00	329.79	11,433.41	-1,005.46	-1,393.08	14,411,756.19	1,703,681.19	39.68402378	-80.77512953	
14,200.00	91.00	329.79	11,431.67	-919.06	-1,443.39	14,411,842.59	1,703,630.88	39.68426142	-80.77530759	
14,300.00	91.00	329.79	11,429.92	-832.65	-1,493.70	14,411,929.00	1,703,580.57	39.68449907	-80.77548564	
14,400.00	91.00	329.79	11,428.17	-746.25	-1,544.01	14,412,015.40	1,703,530.26	39.68473671	-80.77566369	
14,500.00	91.00	329.79	11,426.42	-659.84	-1,594.32	14,412,101.81	1,703,479.95	39.68497435	-80.77584175	
14,600.00	91.00	329.79	11,424.68	-573.44	-1,644.63	14,412,188.21	1,703,429.64	39.68521199	-80.77601980	
14,700.00	91.00	329.79	11,422.93	-487.03	-1,694.94	14,412,274.62	1,703,379.33	39.68544964	-80.77619786	
14,800.00	91.00	329.79	11,421.18	-400.63	-1,745.25	14,412,361.02	1,703,329.02	39.68568728	-80.77637592	
14,900.00	91.00	329.79	11,419.43	-314.22	-1,795.56	14,412,447.43	1,703,278.71	39.68592492	-80.77655398	
15,000.00	91.00	329.79	11,417.69	-227.81	-1,845.87	14,412,533.83	1,703,228.41	39.68616256	-80.77673204	
15,100.00	91.00	329.79	11,415.94	-141.41	-1,896.18	14,412,620.24	1,703,178.10	39.68640020	-80.77691010	
15,200.00	91.00	329.79	11,414.19	-55.00	-1,946.49	14,412,706.65	1,703,127.79	39.68663784	-80.77708816	
15,300.00	91.00	329.79	11,412.44	31.40	-1,996.80	14,412,793.05	1,703,077.48	39.68687548	-80.77726623	
15,400.00	91.00	329.79	11,410.70	117.81	-2,047.11	14,412,879.46	1,703,027.17	39.68711312	-80.77744429	
15,500.00	91.00	329.79	11,408.95	204.21	-2,097.41	14,412,965.86	1,702,976.86	39.68735076	-80.77762236	
15,600.00	91.00	329.79	11,407.20	290.62	-2,147.72	14,413,052.27	1,702,926.55	39.68758840	-80.77780043	
15,700.00	91.00	329.79	11,405.45	377.02	-2,198.03	14,413,138.67	1,702,876.24	39.68782604	-80.77797850	
15,800.00	91.00	329.79	11,403.71	463.43	-2,248.34	14,413,225.08	1,702,825.93	39.68806368	-80.77815657	
15,900.00	91.00	329.79	11,401.96	549.84	-2,298.65	14,413,311.48	1,702,775.62	39.68830132	-80.77833464	
16,000.00	91.00	329.79	11,400.21	636.24	-2,348.96	14,413,397.89	1,702,725.31	39.68853895	-80.77851271	
16,100.00	91.00	329.79	11,398.47	722.65	-2,399.27	14,413,484.29	1,702,675.00	39.68877659	-80.77869079	
16,200.00	91.00	329.79	11,396.72	809.05	-2,449.58	14,413,570.70	1,702,624.69	39.68901423	-80.77886886	
16,300.00	91.00	329.79	11,394.97	895.46	-2,499.89	14,413,657.10	1,702,574.39	39.68925187	-80.77904694	
16,400.00	91.00	329.79	11,393.22	981.86	-2,550.20	14,413,743.51	1,702,524.08	39.68948950	-80.77922502	
16,500.00	91.00	329.79	11,391.48	1,068.27	-2,600.51	14,413,829.92	1,702,473.77	39.68972714	-80.77940310	
16,600.00	91.00	329.79	11,389.73	1,154.67	-2,650.82	14,413,916.32	1,702,423.46	39.68996478	-80.77958118	
16,700.00	91.00	329.79	11,387.98	1,241.08	-2,701.13	14,414,002.73	1,702,373.15	39.69020241	-80.77975926	
16,800.00	91.00	329.79	11,386.23	1,327.49	-2,751.44	14,414,089.13	1,702,322.84	39.69044005	-80.77993734	
16,900.00	91.00	329.79	11,384.49	1,413.89	-2,801.74	14,414,175.54	1,702,272.53	39.69067768	-80.78011542	
17,000.00	91.00	329.79	11,382.74	1,500.30	-2,852.05	14,414,261.94	1,702,222.22	39.69091532	-80.78029351	
17,100.00	91.00	329.79	11,380.99	1,586.70	-2,902.36	14,414,348.35	1,702,171.91	39.69115296	-80.78047160	
17,200.00	91.00	329.79	11,379.24	1,673.11	-2,952.67	14,414,434.75	1,702,121.60	39.69139059	-80.78064968	
17,300.00	91.00	329.79	11,377.50	1,759.51	-3,002.98	14,414,521.16	1,702,071.29	39.69162822	-80.78082777	
17,400.00	91.00	329.79	11,375.75	1,845.92	-3,053.29	14,414,607.56	1,702,020.98	39.69186586	-80.78100586	
17,500.00	91.00	329.79	11,374.00	1,932.32	-3,103.60	14,414,693.97	1,701,970.67	39.69210349	-80.78118395	
17,600.00	91.00	329.79	11,372.25	2,018.73	-3,153.91	14,414,780.37	1,701,920.37	39.69234113	-80.78136205	
17,700.00	91.00	329.79	11,370.51	2,105.14	-3,204.22	14,414,866.78	1,701,870.06	39.69257876	-80.78154014	
17,800.00	91.00	329.79	11,368.76	2,191.54	-3,254.53	14,414,953.19	1,701,819.75	39.69281639	-80.78171824	
17,900.00	91.00	329.79	11,367.01	2,277.95	-3,304.84	14,415,039.59	1,701,769.44	39.69305403	-80.78189633	
18,000.00	91.00	329.79	11,365.26	2,364.35	-3,355.15	14,415,126.00	1,701,719.13	39.69329166	-80.78207443	
18,100.00	91.00	329.79	11,363.52	2,450.76	-3,405.46	14,415,212.40	1,701,668.82	39.69352929	-80.78225253	
18,200.00	91.00	329.79	11,361.77	2,537.16	-3,455.77	14,415,298.81	1,701,618.51	39.69376692	-80.78243063	
18,300.00	91.00	329.79	11,360.02	2,623.57	-3,506.08	14,415,385.21	1,701,568.20	39.69400455	-80.78260873	
18,400.00	91.00	329.79	11,358.27	2,709.97	-3,556.38	14,415,471.62	1,701,517.89	39.69424219	-80.78278683	
18,500.00	91.00	329.79	11,356.53	2,796.38	-3,606.69	14,415,558.02	1,701,467.58	39.69447982	-80.78296493	



Planning Report - Geographic

<b>Database:</b>	DB_Dec2220_v16	<b>Local Co-ordinate Reference:</b>	Well Jeffersons N-07 HU (slot B)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1217.00ft
<b>Project:</b>	Wetzel County, West Virginia (UTM17 NAD83)	<b>MD Reference:</b>	GL @ 1217.00ft
<b>Site:</b>	Jeffersons	<b>North Reference:</b>	Grid
<b>Well:</b>	Jeffersons N-07 HU (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev0		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,100.00	38.99	178.38	9,552.87	-1,976.37	56.02	14,410,785.28	1,705,130.29	39.68134728	-80.76998765	
10,200.00	38.99	178.38	9,630.59	-2,039.27	57.81	14,410,722.38	1,705,132.08	39.68117452	-80.76998188	
10,300.00	38.99	178.38	9,708.32	-2,102.17	59.59	14,410,659.48	1,705,133.86	39.68100177	-80.76997611	
10,400.00	38.99	178.38	9,786.04	-2,165.07	61.38	14,410,596.58	1,705,135.65	39.68082901	-80.76997034	
10,500.00	38.99	178.38	9,863.76	-2,227.97	63.16	14,410,533.68	1,705,137.43	39.68065626	-80.76996458	
10,600.00	38.99	178.38	9,941.48	-2,290.87	64.94	14,410,470.78	1,705,139.21	39.68048350	-80.76995881	
10,700.00	38.99	178.38	10,019.20	-2,353.77	66.73	14,410,407.88	1,705,141.00	39.68031075	-80.76995304	
10,800.00	38.99	178.38	10,096.92	-2,416.67	68.51	14,410,344.98	1,705,142.78	39.68013799	-80.76994727	
10,863.93	38.99	178.38	10,146.60	-2,456.88	69.65	14,410,304.77	1,705,143.92	39.68002755	-80.76994359	
<b>Begin 6°/100' build/tum</b>										
10,900.00	37.27	180.49	10,174.98	-2,479.15	69.88	14,410,282.51	1,705,144.15	39.67996639	-80.76994298	
10,950.00	34.94	183.71	10,215.37	-2,508.58	68.83	14,410,253.07	1,705,143.10	39.67988557	-80.76994699	
11,000.00	32.71	187.31	10,256.91	-2,536.28	66.18	14,410,225.38	1,705,140.45	39.67980953	-80.76995665	
11,050.00	30.60	191.37	10,299.48	-2,562.16	61.95	14,410,199.50	1,705,136.22	39.67973848	-80.76997192	
11,100.00	28.63	195.95	10,342.95	-2,586.16	56.15	14,410,175.50	1,705,130.42	39.67967261	-80.76999275	
11,150.00	26.83	201.12	10,387.21	-2,608.20	48.79	14,410,153.45	1,705,123.06	39.67961212	-80.77001910	
11,200.00	25.24	206.92	10,432.14	-2,628.24	39.90	14,410,133.42	1,705,114.17	39.67955716	-80.77005089	
11,250.00	23.91	213.39	10,477.62	-2,646.21	29.50	14,410,115.45	1,705,103.76	39.67950788	-80.77008804	
11,300.00	22.87	220.49	10,523.52	-2,662.06	17.61	14,410,099.59	1,705,091.88	39.67946443	-80.77013043	
11,350.00	22.18	228.11	10,569.72	-2,675.76	4.27	14,410,085.90	1,705,078.54	39.67942691	-80.77017797	
11,400.00	21.86	236.07	10,616.08	-2,687.26	-10.48	14,410,074.40	1,705,063.79	39.67939543	-80.77023050	
11,450.00	21.93	244.12	10,662.49	-2,696.53	-26.61	14,410,065.13	1,705,047.66	39.67937008	-80.77028790	
11,500.00	22.38	251.99	10,708.80	-2,703.55	-44.06	14,410,058.11	1,705,030.21	39.67935093	-80.77035001	
11,550.00	23.20	259.45	10,754.91	-2,708.29	-62.80	14,410,053.36	1,705,011.47	39.67933802	-80.77041664	
11,600.00	24.34	266.34	10,800.68	-2,710.75	-82.77	14,410,050.90	1,704,991.50	39.67933141	-80.77048763	
11,650.00	25.76	272.58	10,845.98	-2,710.92	-103.91	14,410,050.73	1,704,970.36	39.67933109	-80.77056277	
11,700.00	27.43	278.16	10,890.70	-2,708.80	-126.17	14,410,052.86	1,704,948.10	39.67933708	-80.77064187	
11,750.00	29.29	283.11	10,934.70	-2,704.39	-149.49	14,410,057.27	1,704,924.78	39.67934935	-80.77072470	
11,800.00	31.31	287.51	10,977.87	-2,697.70	-173.79	14,410,063.95	1,704,900.48	39.67936788	-80.77081103	
11,850.00	33.47	291.40	11,020.10	-2,688.76	-199.03	14,410,072.89	1,704,875.24	39.67939262	-80.77090064	
11,900.00	35.74	294.87	11,061.25	-2,677.59	-225.12	14,410,084.07	1,704,849.15	39.67942348	-80.77099327	
11,950.00	38.09	297.96	11,101.23	-2,664.22	-252.00	14,410,097.44	1,704,822.27	39.67946040	-80.77108867	
12,000.00	40.52	300.75	11,139.92	-2,648.68	-279.58	14,410,112.98	1,704,794.69	39.67950327	-80.77118658	
12,050.00	43.01	303.26	11,177.22	-2,631.02	-307.81	14,410,130.64	1,704,766.46	39.67955197	-80.77128674	
12,100.00	45.54	305.56	11,213.01	-2,611.28	-336.59	14,410,150.37	1,704,737.68	39.67960637	-80.77138885	
12,150.00	48.12	307.65	11,247.22	-2,589.53	-365.85	14,410,172.13	1,704,708.42	39.67966631	-80.77149266	
12,185.91	50.00	309.06	11,270.75	-2,572.69	-387.12	14,410,188.96	1,704,687.15	39.67971271	-80.77156810	
<b>Begin 8°/100' build/tum</b>										
12,200.00	50.98	309.78	11,279.71	-2,565.79	-395.52	14,410,195.87	1,704,678.76	39.67973172	-80.77159788	
12,250.00	54.49	312.20	11,309.99	-2,539.68	-425.53	14,410,221.97	1,704,648.74	39.67980363	-80.77170431	
12,300.00	58.04	314.41	11,337.76	-2,511.15	-455.77	14,410,250.50	1,704,618.51	39.67988218	-80.77181152	
12,350.00	61.63	316.46	11,362.88	-2,480.35	-486.08	14,410,281.30	1,704,588.19	39.67996698	-80.77191899	
12,400.00	65.24	318.37	11,385.24	-2,447.42	-516.32	14,410,314.23	1,704,557.95	39.68005763	-80.77202619	
12,450.00	68.88	320.18	11,404.73	-2,412.53	-546.35	14,410,349.13	1,704,527.92	39.68015367	-80.77213259	
12,500.00	72.54	321.90	11,421.24	-2,375.84	-576.01	14,410,385.82	1,704,498.26	39.68025465	-80.77223769	
12,550.00	76.21	323.55	11,434.71	-2,337.53	-605.17	14,410,424.13	1,704,469.10	39.68036006	-80.77234096	
12,600.00	79.89	325.14	11,445.06	-2,297.79	-633.67	14,410,463.87	1,704,440.60	39.68046940	-80.77244191	
12,650.00	83.58	326.71	11,452.25	-2,256.81	-661.38	14,410,504.85	1,704,412.89	39.68058214	-80.77254004	
12,700.00	87.27	328.25	11,456.24	-2,214.79	-688.17	14,410,546.86	1,704,386.10	39.68069771	-80.77263488	
12,750.43	91.00	329.79	11,457.00	-2,171.56	-714.13	14,410,590.09	1,704,360.14	39.68081660	-80.77272674	
<b>Begin 91.00° lateral</b>										
12,800.00	91.00	329.79	11,456.13	-2,128.74	-739.06	14,410,632.92	1,704,335.21	39.68093440	-80.77281498	
12,900.00	91.00	329.79	11,454.38	-2,042.33	-789.37	14,410,716.22	1,704,284.90	39.68117204	-80.77299302	
13,000.00	91.00	329.79	11,452.63	-1,955.93	-839.68	14,410,805.73	1,704,234.59	39.68140969	-80.77317105	

REC'D  
Office of Oil and Gas

JAN 26 2023



Planning Report - Geographic

Database: DB\_Dec2220\_v16  
 Company: Tug Hill Operating LLC  
 Project: Wetzel County, West Virginia (UTM17 NAD83)  
 Site: Jeffersons  
 Well: Jeffersons N-07 HU (slot B)  
 Wellbore: Original Hole  
 Design: rev0

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

Well Jeffersons N-07 HU (slot B)  
 GL @ 1217.00ft  
 GL @ 1217.00ft  
 Grid  
 Minimum Curvature

**RECEIVED**  
 Office of Oil and Gas  
**JAN 26 2023**

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
18,600.00	91.00	329.79	11,354.78	2,882.79	-3,657.00	14,415,644.43	1,701,417.27	39.69471745	-80.78314304
18,700.00	91.00	329.79	11,353.03	2,969.19	-3,707.31	14,415,730.83	1,701,366.96	39.69495508	-80.78332114
18,800.00	91.00	329.79	11,351.29	3,055.60	-3,757.62	14,415,817.24	1,701,316.66	39.69519271	-80.78349925
18,900.00	91.00	329.79	11,349.54	3,142.00	-3,807.93	14,415,903.65	1,701,266.35	39.69543034	-80.78367736
19,000.00	91.00	329.79	11,347.79	3,228.41	-3,858.24	14,415,990.05	1,701,216.04	39.69566797	-80.78385547
19,100.00	91.00	329.79	11,346.04	3,314.81	-3,908.55	14,416,076.46	1,701,165.73	39.69590560	-80.78403358
19,200.00	91.00	329.79	11,344.30	3,401.22	-3,958.86	14,416,162.86	1,701,115.42	39.69614323	-80.78421169
19,300.00	91.00	329.79	11,342.55	3,487.62	-4,009.17	14,416,249.27	1,701,065.11	39.69638086	-80.78438981
19,400.00	91.00	329.79	11,340.80	3,574.03	-4,059.48	14,416,335.67	1,701,014.80	39.69661848	-80.78456792
19,500.00	91.00	329.79	11,339.05	3,660.44	-4,109.79	14,416,422.08	1,700,964.49	39.69685611	-80.78474604
19,600.00	91.00	329.79	11,337.31	3,746.84	-4,160.10	14,416,508.48	1,700,914.18	39.69709374	-80.78492415
19,700.00	91.00	329.79	11,335.56	3,833.25	-4,210.41	14,416,594.89	1,700,863.87	39.69733137	-80.78510227
19,800.00	91.00	329.79	11,333.81	3,919.65	-4,260.71	14,416,681.29	1,700,813.56	39.69756900	-80.78528039
19,900.00	91.00	329.79	11,332.06	4,006.06	-4,311.02	14,416,767.70	1,700,763.25	39.69780662	-80.78545851
20,000.00	91.00	329.79	11,330.32	4,092.46	-4,361.33	14,416,854.10	1,700,712.94	39.69804425	-80.78563663
20,100.00	91.00	329.79	11,328.57	4,178.87	-4,411.64	14,416,940.51	1,700,662.64	39.69828188	-80.78581476
20,200.00	91.00	329.79	11,326.82	4,265.27	-4,461.95	14,417,026.92	1,700,612.33	39.69851950	-80.78599288
20,300.00	91.00	329.79	11,325.07	4,351.68	-4,512.26	14,417,113.32	1,700,562.02	39.69875713	-80.78617101
20,400.00	91.00	329.79	11,323.33	4,438.09	-4,562.57	14,417,199.73	1,700,511.71	39.69899476	-80.78634913
20,500.00	91.00	329.79	11,321.58	4,524.49	-4,612.88	14,417,286.13	1,700,461.40	39.69923238	-80.78652726
20,600.00	91.00	329.79	11,319.83	4,610.90	-4,663.19	14,417,372.54	1,700,411.09	39.69947001	-80.78670539
20,700.00	91.00	329.79	11,318.08	4,697.30	-4,713.50	14,417,458.94	1,700,360.78	39.69970763	-80.78688352
20,800.00	91.00	329.79	11,316.34	4,783.71	-4,763.81	14,417,545.35	1,700,310.47	39.69994526	-80.78706165
20,900.00	91.00	329.79	11,314.59	4,870.11	-4,814.12	14,417,631.75	1,700,260.16	39.70018288	-80.78723978
21,000.00	91.00	329.79	11,312.84	4,956.52	-4,864.43	14,417,718.16	1,700,209.85	39.70042050	-80.78741792
21,100.00	91.00	329.79	11,311.09	5,042.92	-4,914.74	14,417,804.56	1,700,159.54	39.70065813	-80.78759605
21,200.00	91.00	329.79	11,309.35	5,129.33	-4,965.04	14,417,890.97	1,700,109.23	39.70089575	-80.78777419
21,300.00	91.00	329.79	11,307.60	5,215.74	-5,015.35	14,417,977.37	1,700,058.93	39.70113337	-80.78795233
21,400.00	91.00	329.79	11,305.85	5,302.14	-5,065.66	14,418,063.78	1,700,008.62	39.70137100	-80.78813047
21,500.00	91.00	329.79	11,304.11	5,388.55	-5,115.97	14,418,150.19	1,699,958.31	39.70160862	-80.78830861
21,600.00	91.00	329.79	11,302.36	5,474.95	-5,166.28	14,418,236.59	1,699,908.00	39.70184624	-80.78848675
21,700.00	91.00	329.79	11,300.61	5,561.36	-5,216.59	14,418,323.00	1,699,857.69	39.70208387	-80.78866489
21,800.00	91.00	329.79	11,298.86	5,647.76	-5,266.90	14,418,409.40	1,699,807.38	39.70232149	-80.78884303
21,900.00	91.00	329.79	11,297.12	5,734.17	-5,317.21	14,418,495.81	1,699,757.07	39.70255911	-80.78902118
22,000.00	91.00	329.79	11,295.37	5,820.57	-5,367.52	14,418,582.21	1,699,706.76	39.70279673	-80.78919932
22,100.00	91.00	329.79	11,293.62	5,906.98	-5,417.83	14,418,668.62	1,699,656.45	39.70303435	-80.78937747
22,200.00	91.00	329.79	11,291.87	5,993.39	-5,468.14	14,418,755.02	1,699,606.14	39.70327197	-80.78955562
22,300.00	91.00	329.79	11,290.13	6,079.79	-5,518.45	14,418,841.43	1,699,555.83	39.70350959	-80.78973377
22,400.00	91.00	329.79	11,288.38	6,166.20	-5,568.76	14,418,927.83	1,699,505.52	39.70374721	-80.78991192
22,500.00	91.00	329.79	11,286.63	6,252.60	-5,619.07	14,419,014.24	1,699,455.21	39.70398483	-80.79009007
22,600.00	91.00	329.79	11,284.88	6,339.01	-5,669.38	14,419,100.64	1,699,404.91	39.70422245	-80.79026823
22,700.00	91.00	329.79	11,283.14	6,425.41	-5,719.68	14,419,187.05	1,699,354.60	39.70446007	-80.79044638
22,800.00	91.00	329.79	11,281.39	6,511.82	-5,769.99	14,419,273.46	1,699,304.29	39.70469769	-80.79062454
22,900.00	91.00	329.79	11,279.64	6,598.22	-5,820.30	14,419,359.86	1,699,253.98	39.70493531	-80.79080269
23,000.00	91.00	329.79	11,277.89	6,684.63	-5,870.61	14,419,446.27	1,699,203.67	39.70517293	-80.79098085
23,100.00	91.00	329.79	11,276.15	6,771.04	-5,920.92	14,419,532.67	1,699,153.36	39.70541055	-80.79115901
23,200.00	91.00	329.79	11,274.40	6,857.44	-5,971.23	14,419,619.08	1,699,103.05	39.70564816	-80.79133717
23,300.00	91.00	329.79	11,272.65	6,943.85	-6,021.54	14,419,705.48	1,699,052.74	39.70588578	-80.79151533
23,400.00	91.00	329.79	11,270.90	7,030.25	-6,071.85	14,419,791.89	1,699,002.43	39.70612340	-80.79169350
23,500.00	91.00	329.79	11,269.16	7,116.66	-6,122.16	14,419,878.29	1,698,952.12	39.70636102	-80.79187166
23,600.00	91.00	329.79	11,267.41	7,203.06	-6,172.47	14,419,964.70	1,698,901.81	39.70659863	-80.79204983
23,700.00	91.00	329.79	11,265.66	7,289.47	-6,222.78	14,420,051.10	1,698,851.50	39.70683625	-80.79222799
23,800.00	91.00	329.79	11,263.91	7,375.87	-6,273.09	14,420,137.51	1,698,801.20	39.70707387	-80.79240616
23,900.00	91.00	329.79	11,262.17	7,462.28	-6,323.40	14,420,223.91	1,698,750.89	39.70731148	-80.79258433
24,000.00	91.00	329.79	11,260.42	7,548.69	-6,373.71	14,420,310.32	1,698,700.58	39.70754910	-80.79276250





Planning Report - Geographic

<b>Database:</b>	DB_Dec2220_v16	<b>Local Co-ordinate Reference:</b>	Well Jeffersons N-07 HU (slot B)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1217.00ft
<b>Project:</b>	Wetzel County, West Virginia (UTM17 NAD83)	<b>MD Reference:</b>	GL @ 1217.00ft
<b>Site:</b>	Jeffersons	<b>North Reference:</b>	Grid
<b>Well:</b>	Jeffersons N-07 HU (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev0		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
24,100.00	91.00	329.79	11,258.67	7,635.09	-6,424.01	14,420,396.73	1,698,650.27	39.70778671	-80.79294067	
24,200.00	91.00	329.79	11,256.92	7,721.50	-6,474.32	14,420,483.13	1,698,599.96	39.70802433	-80.79311885	
24,300.00	91.00	329.79	11,255.18	7,807.90	-6,524.63	14,420,569.54	1,698,549.65	39.70826194	-80.79329702	
24,400.00	91.00	329.79	11,253.43	7,894.31	-6,574.94	14,420,655.94	1,698,499.34	39.70849956	-80.79347520	
24,481.83	91.00	329.79	11,252.00	7,965.01	-6,616.11	14,420,726.65	1,698,458.17	39.70869400	-80.79362100	
PBHL/TD 24481.83 MD 11252.00 TVD - 20" Casing										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Jeffersons N-07HU BHL - hit/miss target - Shape - Point	0.00	0.00	11,252.00	7,965.01	-6,616.11	14,420,726.65	1,698,458.17	39.70869400	-80.79362100	
Jeffersons N-07HU LP - plan misses target center by 43.09ft at 12775.54ft MD (11456.56 TVD, -2149.87 N, -726.76 E) - Point	0.00	0.00	11,457.00	-2,171.55	-764.00	14,410,590.11	1,704,310.27	39.68081700	-80.77290400	
Jeffersons N-07HU LP 5 - plan misses target center by 0.12ft at 12750.38ft MD (11457.00 TVD, -2171.61 N, -714.10 E) - Point	0.00	0.00	11,457.00	-2,171.55	-714.00	14,410,590.11	1,704,360.27	39.68081665	-80.77272829	

Casing Points										
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")						
24,481.83	11,252.00	20" Casing	20	24						

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
3,100.00	3,100.00	0.00	0.00	KOP Begin 2°/100' build	
3,350.00	3,349.68	-10.90	0.31	Begin 5.00° tangent	
7,014.26	7,000.00	-330.13	9.34	Begin 3°/100' build/turn	
8,147.42	8,035.32	-748.21	21.19	Begin 38.99° tangent	
10,863.93	10,146.60	-2,456.88	69.65	Begin 6°/100' build/turn	
12,185.91	11,270.75	-2,572.69	-387.12	Begin 8°/100' build/turn	
12,750.43	11,457.00	-2,171.56	-714.13	Begin 91.00° lateral	
24,481.83	11,252.00	7,965.01	-6,616.11	PBHL/TD 24481.83 MD 11252.00 TVD	