

<b>Company:</b>	Tug Hill Operating, LLC	<b>Local Co-ordinate Reference:</b>	Well Ten High 1S-09HM (I)
<b>Project:</b>	Marshall County West Virginia.	<b>TVD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Site:</b>	Ten High	<b>MD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Well:</b>	Ten High 1S-09HM (I)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	DB_Jul2216dt_v14

<b>Project</b>	Marshall County West Virginia.		
<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° 00' 00" W to 84° 00' 00" W)		

<b>Site</b>	Ten High			
<b>Site Position:</b>	<b>Northing:</b>	14,456,545.60 usft	<b>Latitude:</b>	39.80680885
<b>From:</b>	<b>Easting:</b>	1,730,001.41 usft	<b>Longitude:</b>	-80.68101011
<b>Position Uncertainty:</b>	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.20 °

<b>Well</b>	Ten High 1S-09HM (I)			
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,456,523.42 usft
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,730,098.89 usft
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	0.00 usft
			<b>Ground Level:</b>	1,310.00 usft

<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>
		2/20/2019	-8.76	66.83	51,986.43156656

<b>Design</b>	Surveys Original Hole				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	140.11	

<b>Survey Program</b>	Date 3/5/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
153.00	1,150.00	TVD surf (Original Hole)	MWD	MWD - Standard
1,248.00	17,238.00	TVD (Original Hole)	MWD	MWD - Standard
17,288.00	17,288.00	Projection (Original Hole)	MWD	MWD - Standard

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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	14,456,523.42	1,730,098.89	39.80674699	-80.68066331
153.00	0.48	270.06	153.00	-0.13	-0.63	14,456,523.29	1,730,098.26	39.80674664	-80.68066555
<b>MWD surveys</b>									
183.00	0.07	270.00	183.00	-0.15	-0.73	14,456,523.28	1,730,098.16	39.80674660	-80.68066593
213.00	0.25	270.03	213.00	-0.20	-0.74	14,456,523.23	1,730,098.15	39.80674645	-80.68066596
242.00	0.48	270.03	242.00	-0.32	-0.66	14,456,523.10	1,730,098.23	39.80674612	-80.68066567
272.00	0.11	270.07	272.00	-0.41	-0.53	14,456,523.02	1,730,098.36	39.80674588	-80.68066522
302.00	0.24	270.02	302.00	-0.42	-0.58	14,456,523.00	1,730,098.31	39.80674584	-80.68066537
333.00	0.62	270.04	333.00	-0.52	-0.78	14,456,522.91	1,730,098.11	39.80674558	-80.68066608
364.00	0.27	270.04	364.00	-0.68	-0.88	14,456,522.74	1,730,098.01	39.80674512	-80.68066647

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<b>Site:</b>	Ten High	<b>MD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Well:</b>	Ten High 1S-09HM (I)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original	<b>Database:</b>	DB_Jul2216dt_v14

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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
396.00	0.58	34	395.99	-0.74	-0.69	14,456,522.68	1,730,098.20	39.80674496	-80.68066579	
427.00	0.56	31	426.99	-0.86	-0.46	14,456,522.57	1,730,098.43	39.80674464	-80.68066496	
459.00	0.34	21	458.99	-0.95	-0.29	14,456,522.47	1,730,098.60	39.80674438	-80.68066437	
490.00	0.83	32	489.99	-1.13	-0.28	14,456,522.30	1,730,098.61	39.80674389	-80.68066431	
522.00	0.55	22	521.99	-1.37	-0.50	14,456,522.06	1,730,098.39	39.80674324	-80.68066511	
553.00	0.41	37	552.99	-1.46	-0.73	14,456,521.96	1,730,098.16	39.80674299	-80.68066593	
585.00	0.28	46	584.99	-1.53	-0.74	14,456,521.89	1,730,098.15	39.80674279	-80.68066596	
616.00	0.15	46	615.99	-1.57	-0.67	14,456,521.86	1,730,098.22	39.80674270	-80.68066571	
648.00	0.14	47	647.99	-1.58	-0.70	14,456,521.85	1,730,098.19	39.80674266	-80.68066583	
679.00	0.16	47	678.99	-1.59	-0.72	14,456,521.83	1,730,098.17	39.80674262	-80.68066590	
711.00	0.25	45	710.99	-1.67	-0.78	14,456,521.76	1,730,098.11	39.80674242	-80.68066610	
743.00	0.75	43	742.99	-1.74	-1.05	14,456,521.68	1,730,097.85	39.80674222	-80.68066705	
774.00	0.35	30	773.99	-1.87	-1.21	14,456,521.55	1,730,097.68	39.80674186	-80.68066764	
805.00	0.30	43	804.99	-2.03	-1.21	14,456,521.39	1,730,097.68	39.80674142	-80.68066765	
837.00	0.36	42	836.98	-2.18	-1.32	14,456,521.25	1,730,097.57	39.80674103	-80.68066804	
868.00	0.16	46	867.98	-2.27	-1.43	14,456,521.16	1,730,097.46	39.80674078	-80.68066843	
900.00	0.34	41	899.98	-2.38	-1.45	14,456,521.04	1,730,097.44	39.80674046	-80.68066852	
931.00	0.28	42	930.98	-2.55	-1.44	14,456,520.88	1,730,097.45	39.80674001	-80.68066849	
970.00	0.59	45	969.98	-2.75	-1.28	14,456,520.68	1,730,097.61	39.80673946	-80.68066790	
994.00	0.12	47	993.98	-2.82	-1.20	14,456,520.61	1,730,097.69	39.80673927	-80.68066760	
1,026.00	0.22	48	1,025.98	-2.83	-1.29	14,456,520.59	1,730,097.60	39.80673923	-80.68066794	
1,057.00	0.31	45	1,056.98	-2.84	-1.43	14,456,520.59	1,730,097.46	39.80673922	-80.68066845	
1,089.00	0.51	45	1,088.98	-2.98	-1.52	14,456,520.44	1,730,097.37	39.80673881	-80.68066876	
1,120.00	0.40	48	1,119.98	-3.16	-1.62	14,456,520.26	1,730,097.27	39.80673833	-80.68066913	
1,150.00	0.47	48	1,149.98	-3.29	-1.80	14,456,520.14	1,730,097.09	39.80673798	-80.68066977	
1,248.00	0.32	44	1,247.98	-3.51	-2.33	14,456,519.92	1,730,096.56	39.80673739	-80.68067165	
1,279.00	0.30	43	1,278.98	-3.46	-2.49	14,456,519.97	1,730,096.40	39.80673752	-80.68067222	
1,374.00	1.05	47	1,373.97	-2.89	-2.02	14,456,520.53	1,730,096.87	39.80673907	-80.68067053	
1,469.00	3.29	44	1,468.90	-0.82	0.92	14,456,522.61	1,730,099.81	39.80674474	-80.68066004	
1,564.00	5.27	48	1,563.63	3.25	6.73	14,456,526.67	1,730,105.62	39.80675585	-80.68063931	
1,659.00	5.68	41	1,658.20	8.88	13.81	14,456,532.30	1,730,112.70	39.80677124	-80.68061402	
1,753.00	5.30	42	1,751.76	14.89	20.50	14,456,538.31	1,730,119.39	39.80678768	-80.68059012	
1,848.00	4.90	47	1,846.39	19.90	27.25	14,456,543.33	1,730,126.14	39.80680138	-80.68056604	
1,942.00	5.55	46	1,940.00	23.36	35.02	14,456,546.79	1,730,133.91	39.80681080	-80.68053832	
2,037.00	6.57	49	2,034.47	26.05	44.67	14,456,549.48	1,730,143.56	39.80681811	-80.68050392	
2,132.00	5.32	48	2,128.96	28.86	54.09	14,456,552.28	1,730,152.98	39.80682571	-80.68047035	
2,226.00	4.37	44	2,222.62	32.09	61.32	14,456,555.51	1,730,160.21	39.80683451	-80.68044457	
2,321.00	4.87	45	2,317.31	35.87	67.97	14,456,559.29	1,730,166.86	39.80684483	-80.68042085	
2,416.00	5.74	43	2,411.91	40.43	75.47	14,456,563.85	1,730,174.36	39.80685728	-80.68039406	
2,510.00	5.01	41	2,505.49	45.07	82.96	14,456,568.49	1,730,181.85	39.80686995	-80.68036735	
2,605.00	4.44	47	2,600.17	49.29	89.54	14,456,572.71	1,730,188.43	39.80688147	-80.68034384	
2,699.00	4.75	49	2,693.87	53.61	95.71	14,456,577.03	1,730,194.60	39.80689327	-80.68032183	
2,794.00	4.95	46	2,788.53	58.27	102.25	14,456,581.69	1,730,201.14	39.80690601	-80.68029848	
2,830.00	5.05	43	2,824.39	60.02	104.86	14,456,583.44	1,730,203.75	39.80691079	-80.68028918	
2,917.00	5.27	42	2,911.04	64.41	111.33	14,456,587.84	1,730,210.22	39.80692280	-80.68026609	
2,980.00	5.02	44	2,973.78	67.87	115.79	14,456,591.30	1,730,214.68	39.80693225	-80.68025015	
3,074.00	5.19	44	3,067.42	72.11	122.87	14,456,595.54	1,730,221.76	39.80694382	-80.68022487	
3,169.00	4.84	41	3,162.05	75.19	130.59	14,456,598.62	1,730,229.48	39.80695221	-80.68019738	
3,264.00	4.44	43	3,256.74	78.06	137.72	14,456,601.48	1,730,236.61	39.80696000	-80.68017194	
3,358.00	4.18	45	3,350.48	80.85	144.21	14,456,604.27	1,730,243.10	39.80696760	-80.68014881	
3,453.00	5.74	49	3,445.12	84.37	151.63	14,456,607.79	1,730,250.52	39.80697720	-80.68012234	
3,548.00	5.08	49	3,539.70	88.72	159.43	14,456,612.15	1,730,258.32	39.80698909	-80.68009448	
3,643.00	8.05	47	3,634.06	94.86	168.39	14,456,618.28	1,730,267.29	39.80700584	-80.68006250	
3,741.00	11.56	43	3,730.62	105.34	181.35	14,456,628.76	1,730,280.24	39.80703450	-80.68001624	
3,836.00	14.09	45	3,823.24	119.96	196.52	14,456,643.38	1,730,295.41	39.80707449	-80.67996202	

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Measured Depth (usft)	Inclination (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,930.00	17.48	3,913.69	138.54	214.08	14,456,661.97	1,730,312.97	39.80712536	-80.67989928
4,025.00	18.52	4,004.06	158.11	235.81	14,456,681.54	1,730,334.71	39.80717890	-80.67982163
4,120.00	20.51	4,093.60	176.71	261.52	14,456,700.14	1,730,360.41	39.80722972	-80.67972986
4,214.00	22.59	4,181.03	197.58	288.99	14,456,721.01	1,730,387.88	39.80728676	-80.67963178
4,309.00	25.02	4,267.94	222.90	317.76	14,456,746.32	1,730,416.65	39.80735600	-80.67952900
4,404.00	27.29	4,353.22	252.92	346.89	14,456,776.35	1,730,445.78	39.80743817	-80.67942490
4,499.00	30.67	4,436.32	288.29	376.31	14,456,811.72	1,730,475.20	39.80753501	-80.67931969
4,593.00	34.35	4,515.58	327.62	408.01	14,456,851.04	1,730,506.90	39.80764270	-80.67920633
4,687.00	33.40	4,593.63	368.75	440.44	14,456,892.18	1,730,539.33	39.80775536	-80.67909034
4,783.00	33.83	4,673.58	410.45	473.37	14,456,933.87	1,730,572.26	39.80786953	-80.67897252
4,877.00	35.46	4,750.91	451.26	507.87	14,456,974.68	1,730,606.76	39.80798126	-80.67884917
4,972.00	35.43	4,828.30	493.16	543.64	14,457,016.58	1,730,642.53	39.80809598	-80.67872127
5,066.00	35.43	4,904.90	535.28	578.20	14,457,058.71	1,730,677.09	39.80821132	-80.67859767
5,161.00	34.99	4,982.52	578.17	612.27	14,457,101.60	1,730,711.16	39.80832878	-80.67847581
5,256.00	34.14	5,060.75	620.08	646.15	14,457,143.51	1,730,745.04	39.80844353	-80.67835461
5,351.00	33.23	5,139.80	660.80	679.59	14,457,184.23	1,730,778.48	39.80855504	-80.67823504
5,445.00	32.72	5,218.65	700.45	711.92	14,457,223.88	1,730,810.81	39.80866360	-80.67811939
5,540.00	33.22	5,298.35	740.64	744.44	14,457,264.07	1,730,843.33	39.80877364	-80.67800308
5,635.00	33.93	5,377.50	781.53	777.43	14,457,304.96	1,730,876.32	39.80888562	-80.67788510
5,729.00	34.87	5,455.06	823.05	810.54	14,457,346.47	1,730,909.43	39.80899931	-80.67776666
5,823.00	34.22	5,532.49	865.15	843.24	14,457,388.57	1,730,942.13	39.80911459	-80.67764969
5,918.00	33.74	5,611.27	907.29	875.54	14,457,430.71	1,730,974.43	39.80923000	-80.67753413
6,012.00	32.98	5,689.78	948.34	906.95	14,457,471.76	1,731,005.84	39.80934242	-80.67742176
6,107.00	32.39	5,769.73	989.16	938.02	14,457,512.59	1,731,036.91	39.80945423	-80.67731061
6,205.00	33.08	5,852.17	1,031.96	969.26	14,457,555.39	1,731,068.15	39.80957146	-80.67719882
6,300.00	34.22	5,931.25	1,074.89	999.72	14,457,598.31	1,731,098.61	39.80968904	-80.67708979
6,409.00	31.69	6,022.71	1,123.37	1,033.85	14,457,646.79	1,731,132.74	39.80982185	-80.67696765
6,503.00	31.25	6,102.96	1,160.53	1,065.57	14,457,683.96	1,731,164.46	39.80992359	-80.67685421
6,598.00	31.87	6,184.04	1,189.36	1,105.62	14,457,712.78	1,731,204.51	39.81000235	-80.67671122
6,693.00	30.46	6,265.47	1,206.23	1,151.38	14,457,729.65	1,731,250.27	39.81004823	-80.67654805
6,786.00	28.26	6,346.67	1,209.06	1,196.44	14,457,732.48	1,731,295.33	39.81005556	-80.67638759
6,881.00	28.35	6,430.46	1,197.98	1,239.63	14,457,721.40	1,731,338.52	39.81002470	-80.67623393
6,975.00	27.25	6,513.73	1,175.44	1,276.79	14,457,698.87	1,731,375.68	39.80996244	-80.67610191
7,070.00	29.80	6,597.29	1,142.46	1,307.48	14,457,665.88	1,731,406.37	39.80987155	-80.67599303
7,165.00	35.30	6,677.35	1,100.34	1,336.39	14,457,623.77	1,731,435.28	39.80975561	-80.67589063
7,259.00	42.77	6,750.32	1,049.90	1,367.26	14,457,573.32	1,731,466.15	39.80961677	-80.67578135
7,354.00	51.65	6,814.79	988.89	1,400.84	14,457,512.32	1,731,499.73	39.80944889	-80.67566257
7,448.00	63.52	6,865.09	918.33	1,436.82	14,457,441.75	1,731,535.71	39.80925475	-80.67553535
7,543.00	70.81	6,901.94	839.45	1,474.69	14,457,362.88	1,731,573.58	39.80903776	-80.67540155
7,636.00	82.15	6,923.64	758.00	1,513.61	14,457,281.43	1,731,612.50	39.80881369	-80.67526400
7,730.00	89.01	6,930.88	674.40	1,555.85	14,457,197.83	1,731,654.74	39.80858368	-80.67511469
7,825.00	87.69	6,933.62	590.86	1,600.98	14,457,114.28	1,731,699.87	39.80835380	-80.67495506
7,920.00	89.23	6,936.17	508.37	1,648.03	14,457,031.80	1,731,746.92	39.80812681	-80.67478859
8,014.00	90.42	6,936.46	427.26	1,695.54	14,456,950.69	1,731,794.43	39.80790359	-80.67462047
8,109.00	90.59	6,935.62	346.01	1,744.74	14,456,869.43	1,731,843.63	39.80767994	-80.67444632
8,202.00	87.87	6,936.87	267.41	1,794.42	14,456,790.83	1,731,893.31	39.80746360	-80.67427045
8,296.00	88.31	6,940.01	187.57	1,843.94	14,456,711.00	1,731,942.83	39.80724386	-80.67409517
8,391.00	88.88	6,942.33	105.05	1,890.92	14,456,628.47	1,731,989.81	39.80701676	-80.67392893
8,485.00	90.42	6,942.91	22.32	1,935.54	14,456,545.74	1,732,034.43	39.80678911	-80.67377113
8,580.00	90.86	6,941.85	-61.67	1,979.93	14,456,461.76	1,732,078.82	39.80655802	-80.67361418
8,674.00	90.29	6,940.90	-144.15	2,024.98	14,456,379.27	1,732,123.87	39.80633105	-80.67345482
8,769.00	89.76	6,940.86	-226.09	2,073.06	14,456,297.34	1,732,171.95	39.80610556	-80.67328469
8,863.00	89.54	6,941.44	-306.49	2,121.75	14,456,216.93	1,732,220.64	39.80588425	-80.67311238
8,958.00	89.89	6,941.91	-387.49	2,171.39	14,456,135.94	1,732,270.28	39.80566132	-80.67293667
9,052.00	90.46	6,941.62	-467.44	2,220.82	14,456,055.98	1,732,319.71	39.80544125	-80.67276171

WV Department of Environmental Protection



<b>Company:</b> Tug Hill Operating, LLC	<b>Local Co-ordinate Reference:</b> Well Ten High 1S-09HM (I)
<b>Project:</b> Marshall County West Virginia.	<b>TVD Reference:</b> RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Site:</b> Ten High	<b>MD Reference:</b> RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Well:</b> Ten High 1S-09HM (I)	<b>North Reference:</b> Grid
<b>Wellbore:</b> Original Hole	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Surveys Originated	<b>Database:</b> DB_Jul2216dt_v14

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Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,147.00	90.15	296	6,941.12	-547.63	2,271.76	14,455,975.80	1,732,370.65	39.80522053	-80.67258139
9,242.00	90.37	296	6,940.69	-627.77	2,322.76	14,455,895.65	1,732,421.65	39.80499992	-80.67240084
9,336.00	90.11	296	6,940.29	-707.62	2,372.37	14,455,815.81	1,732,471.26	39.80478015	-80.67222524
9,430.00	90.73	296	6,939.60	-788.39	2,420.43	14,455,735.04	1,732,519.32	39.80455785	-80.67205515
9,525.00	89.71	296	6,939.24	-870.87	2,467.56	14,455,652.55	1,732,566.46	39.80433086	-80.67188841
9,620.00	89.54	296	6,939.86	-952.99	2,515.33	14,455,570.44	1,732,614.22	39.80410487	-80.67171942
9,715.00	89.76	296	6,940.44	-1,034.06	2,564.84	14,455,489.37	1,732,663.73	39.80388173	-80.67154418
9,809.00	88.92	296	6,941.52	-1,114.60	2,613.28	14,455,408.82	1,732,712.17	39.80366005	-80.67137278
9,904.00	88.92	296	6,943.31	-1,197.64	2,659.39	14,455,325.79	1,732,758.28	39.80343155	-80.67120968
9,998.00	90.64	296	6,943.67	-1,280.02	2,704.64	14,455,243.40	1,732,803.53	39.80320485	-80.67104963
10,093.00	90.81	296	6,942.47	-1,363.00	2,750.89	14,455,160.43	1,732,849.78	39.80297650	-80.67088607
10,188.00	91.21	296	6,940.80	-1,446.29	2,796.55	14,455,077.14	1,732,895.44	39.80274731	-80.67072457
10,283.00	90.59	296	6,939.31	-1,529.36	2,842.60	14,454,994.06	1,732,941.49	39.80251870	-80.67056170
10,378.00	89.45	296	6,939.27	-1,611.66	2,890.06	14,454,911.77	1,732,988.95	39.80229222	-80.67039381
10,472.00	90.02	296	6,939.71	-1,692.72	2,937.64	14,454,830.70	1,733,036.53	39.80206911	-80.67023547
10,566.00	90.15	296	6,939.57	-1,773.61	2,985.52	14,454,749.81	1,733,084.41	39.80184648	-80.67005603
10,661.00	90.64	296	6,938.91	-1,854.99	3,034.53	14,454,668.43	1,733,133.42	39.80162250	-80.66988260
10,756.00	89.41	296	6,938.87	-1,936.55	3,083.24	14,454,586.87	1,733,182.13	39.80139803	-80.66971025
10,850.00	89.36	296	6,939.88	-2,017.76	3,130.56	14,454,505.66	1,733,229.46	39.80117452	-80.66954283
10,945.00	89.23	296	6,941.05	-2,099.73	3,178.58	14,454,423.70	1,733,277.47	39.80094893	-80.66937296
11,039.00	88.88	296	6,942.60	-2,180.46	3,226.70	14,454,342.96	1,733,325.59	39.80072674	-80.66920268
11,134.00	90.11	296	6,943.44	-2,262.46	3,274.65	14,454,260.96	1,733,373.54	39.80050105	-80.66903304
11,229.00	90.20	296	6,943.18	-2,344.98	3,321.72	14,454,178.44	1,733,420.61	39.80027395	-80.66886655
11,324.00	90.73	296	6,942.41	-2,427.17	3,369.35	14,454,096.25	1,733,468.24	39.80004775	-80.66869804
11,419.00	89.93	296	6,941.86	-2,509.40	3,416.92	14,454,014.02	1,733,515.81	39.79982145	-80.66852976
11,513.00	90.64	296	6,941.39	-2,591.55	3,462.62	14,453,931.88	1,733,561.51	39.79959540	-80.66836816
11,608.00	91.38	296	6,939.72	-2,674.97	3,508.03	14,453,848.45	1,733,606.92	39.79936583	-80.66820758
11,702.00	89.76	296	6,938.78	-2,756.54	3,554.72	14,453,766.89	1,733,653.61	39.79914136	-80.66804241
11,797.00	89.85	296	6,939.11	-2,837.72	3,604.05	14,453,685.70	1,733,702.94	39.79891790	-80.66786785
11,891.00	89.89	296	6,939.32	-2,918.05	3,652.87	14,453,605.37	1,733,751.76	39.79869679	-80.66769512
11,986.00	89.54	296	6,939.79	-2,999.58	3,701.64	14,453,523.85	1,733,800.53	39.79847241	-80.66752256
12,081.00	93.14	296	6,937.57	-3,081.69	3,749.32	14,453,441.73	1,733,848.21	39.79824642	-80.66735387
12,176.00	93.19	296	6,932.33	-3,164.04	3,796.39	14,453,359.38	1,733,895.28	39.79801978	-80.66718738
12,270.00	93.01	296	6,927.24	-3,245.57	3,842.90	14,453,277.85	1,733,941.79	39.79779541	-80.66702286
12,364.00	92.13	296	6,923.03	-3,327.49	3,888.81	14,453,195.93	1,733,987.70	39.79756997	-80.66686052
12,459.00	89.93	296	6,921.32	-3,410.46	3,935.04	14,453,112.97	1,734,033.93	39.79734165	-80.66669701
12,552.00	88.66	296	6,922.47	-3,492.00	3,979.75	14,453,031.43	1,734,078.64	39.79711727	-80.66653893
12,646.00	88.57	296	6,924.74	-3,574.60	4,024.55	14,452,948.83	1,734,123.44	39.79688996	-80.66638051
12,740.00	89.10	296	6,926.65	-3,656.97	4,069.80	14,452,866.45	1,734,168.69	39.79666329	-80.66622052
12,835.00	89.19	296	6,928.07	-3,740.02	4,115.91	14,452,783.41	1,734,214.80	39.79643474	-80.66605747
12,930.00	88.79	296	6,929.74	-3,822.09	4,163.72	14,452,701.34	1,734,262.61	39.79620888	-80.66588834
13,024.00	87.65	296	6,932.66	-3,902.64	4,212.08	14,452,620.78	1,734,310.97	39.79598716	-80.66571726
13,119.00	88.62	296	6,935.75	-3,984.96	4,259.38	14,452,538.46	1,734,358.27	39.79576059	-80.66554996
13,213.00	88.92	296	6,937.77	-4,067.16	4,304.94	14,452,456.26	1,734,403.83	39.79553440	-80.66538885
13,308.00	89.01	296	6,939.49	-4,150.38	4,350.73	14,452,373.05	1,734,449.62	39.79530539	-80.66522692
13,402.00	89.58	296	6,940.64	-4,232.82	4,395.86	14,452,290.60	1,734,494.75	39.79507851	-80.66506735
13,497.00	90.55	296	6,940.54	-4,316.54	4,440.77	14,452,206.89	1,734,539.66	39.79484814	-80.66490859
13,591.00	89.85	296	6,940.21	-4,399.34	4,485.27	14,452,124.09	1,734,584.16	39.79462030	-80.66475128
13,686.00	90.20	296	6,940.17	-4,481.96	4,532.16	14,452,041.47	1,734,631.05	39.79439293	-80.66458546
13,780.00	90.24	296	6,939.81	-4,563.02	4,579.74	14,451,960.40	1,734,678.63	39.79416981	-80.66441715
13,875.00	90.11	296	6,939.52	-4,644.92	4,627.88	14,451,878.51	1,734,726.77	39.79394441	-80.66424685
13,970.00	90.33	296	6,939.15	-4,726.97	4,675.77	14,451,796.46	1,734,774.66	39.79371859	-80.66407747
14,064.00	90.33	296	6,938.61	-4,808.44	4,722.65	14,451,714.99	1,734,821.54	39.79349437	-80.66391164
14,159.00	90.33	296	6,938.06	-4,890.41	4,770.67	14,451,633.02	1,734,869.56	39.79326877	-80.66374181
14,254.00	89.41	296	6,938.28	-4,970.98	4,820.98	14,451,552.45	1,734,919.88	39.79304698	-80.66356375

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WV Department of Environmental Protection



<b>Company:</b> Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b> Well Ten High 1S-09HM (I)
<b>Project:</b> Marshall County West Virginia.	<b>TVD Reference:</b> RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Site:</b> Ten High	<b>MD Reference:</b> RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Well:</b> Ten High 1S-09HM (I)	<b>North Reference:</b> Grid
<b>Wellbore:</b> Original Hole	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Surveys Original	<b>Database:</b> DB_Jul2216dt_v14

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,349.00	89.01	102	6,939.59	-5,049.72	4,874.11	14,451,473.71	1,734,973.00	39.79283019	-80.66337567
14,443.00	88.57	105	6,941.57	-5,127.29	4,927.16	14,451,396.13	1,735,026.05	39.79261661	-80.66318786
14,538.00	87.87	109	6,944.52	-5,206.44	4,979.61	14,451,316.98	1,735,078.50	39.79239669	-80.66300220
14,632.00	89.45	113	6,946.72	-5,285.83	5,029.88	14,451,237.59	1,735,128.77	39.79218015	-80.66282432
14,727.00	89.76	114	6,947.38	-5,366.60	5,079.89	14,451,156.82	1,735,178.78	39.79195782	-80.66264737
14,822.00	89.10	114	6,948.32	-5,447.02	5,130.45	14,451,076.40	1,735,229.34	39.79173645	-80.66246844
14,917.00	89.71	110	6,949.31	-5,528.50	5,179.27	14,450,994.92	1,735,278.16	39.79151218	-80.66229573
15,013.00	91.12	113	6,948.61	-5,611.48	5,227.54	14,450,911.95	1,735,326.43	39.79128380	-80.66212503
15,108.00	90.81	110	6,947.01	-5,695.29	5,272.17	14,450,828.13	1,735,371.06	39.79105317	-80.66196728
15,203.00	90.59	110	6,945.85	-5,780.85	5,313.44	14,450,742.57	1,735,412.33	39.79081778	-80.66182152
15,298.00	90.07	116	6,945.30	-5,866.00	5,355.56	14,450,657.42	1,735,454.45	39.79058350	-80.66167272
15,392.00	89.80	117	6,945.41	-5,950.06	5,397.62	14,450,573.36	1,735,496.51	39.79035221	-80.66152410
15,487.00	89.58	115	6,945.92	-6,034.79	5,440.59	14,450,488.64	1,735,539.48	39.79011908	-80.66137229
15,581.00	89.36	111	6,946.79	-6,118.52	5,483.29	14,450,404.90	1,735,582.18	39.78988868	-80.66122140
15,676.00	88.92	117	6,948.22	-6,202.22	5,528.19	14,450,321.20	1,735,627.08	39.78965835	-80.66106270
15,770.00	88.48	119	6,950.35	-6,283.96	5,574.57	14,450,239.47	1,735,673.46	39.78943340	-80.66089872
15,865.00	87.74	123	6,953.49	-6,366.36	5,621.74	14,450,157.07	1,735,720.63	39.78920662	-80.66073190
15,960.00	89.76	116	6,955.56	-6,448.56	5,669.30	14,450,074.86	1,735,768.19	39.78898038	-80.66056369
16,055.00	89.93	119	6,955.82	-6,530.60	5,717.20	14,449,992.82	1,735,816.09	39.78875457	-80.66039431
16,150.00	89.32	116	6,956.44	-6,612.35	5,765.59	14,449,911.07	1,735,864.48	39.78852957	-80.66022314
16,244.00	89.19	119	6,957.66	-6,692.64	5,814.46	14,449,830.78	1,735,913.35	39.78830856	-80.66005028
16,339.00	89.01	117	6,959.15	-6,773.09	5,864.96	14,449,750.33	1,735,963.85	39.78808710	-80.65987158
16,433.00	89.85	119	6,960.09	-6,853.00	5,914.45	14,449,670.42	1,736,013.34	39.78786713	-80.65969650
16,528.00	90.77	116	6,959.57	-6,934.45	5,963.34	14,449,588.97	1,736,062.23	39.78764294	-80.65952356
16,623.00	90.55	111	6,958.48	-7,016.74	6,010.78	14,449,506.68	1,736,109.67	39.78741645	-80.65935579
16,717.00	89.23	118	6,958.66	-7,098.99	6,056.29	14,449,424.43	1,736,155.18	39.78719010	-80.65919491
16,811.00	89.63	113	6,959.59	-7,181.20	6,101.85	14,449,342.22	1,736,200.74	39.78696385	-80.65903384
16,906.00	89.01	120	6,960.72	-7,264.22	6,148.03	14,449,259.21	1,736,246.92	39.78673539	-80.65887059
17,000.00	89.32	120	6,962.09	-7,346.42	6,193.60	14,449,177.00	1,736,292.49	39.78650915	-80.65870950
17,095.00	89.27	116	6,963.26	-7,429.33	6,239.97	14,449,094.10	1,736,338.86	39.78628099	-80.65854556
17,190.00	89.19	119	6,964.54	-7,511.98	6,286.78	14,449,011.44	1,736,385.67	39.78605351	-80.65838005
17,238.00	89.10	122	6,965.25	-7,553.66	6,310.59	14,448,969.77	1,736,409.48	39.78593882	-80.65829585
<b>Survey @ 17238.00 MD 6965.25 TVD</b>									
17,288.00	89.10	122	6,966.04	-7,597.00	6,335.50	14,448,926.42	1,736,434.39	39.78581951	-80.65820778
<b>Survey projected to 17288.00 MD 6966.04 TVD</b>									

WV Department of Environmental Protection

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
153.00	153.00	-0.13	-0.63	MWD surveys
17,238.00	6965.25	-7,553.66	6,310.59	Survey @ 17238.00 MD 6965.25 TVD
17,288.00	6966.04	-7,597.00	6,335.50	Survey projected to 17288.00 MD 6966.04 TVD