

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Heaven Hill 2-01 HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1331+33 @ 1364.00usft (Nabors X08)
Site:	Heaven Hill 2	MD Reference:	RKB=1331+33 @ 1364.00usft (Nabors X08)
Well:	Heaven Hill 2-01 HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug0116_LT_v14

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	Heaven Hill 2				
Site Position:		Northing:	14,457,660.30 usft	Latitude:	39.80995400
From:	Lat/Long	Easting:	1,720,974.97 usft	Longitude:	-80.71313800
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.18 °

Well	Heaven Hill 2-01 HM (slot B)					
Well Position	+N/-S	0.00 usft	Northing:	14,457,721.56 usft	Latitude:	39.81012150
	+E/-W	0.00 usft	Easting:	1,721,058.07 usft	Longitude:	-80.71284140
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,331.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/17/2017	-8.69	66.97	52,175.88033331
	IGRF2015	7/19/2018	-8.72	66.88	52,059.79149364

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

150 RECEIVED
Office of Oil and Gas

Survey Program	Date	7/30/2018				JUN 10 2020
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	WV Department of Environmental Protection	
100.00	885.00	Gyro (Original Hole)	NS-GYRO-MS	North sensing gyrocompassing m/s		
887.00	2,786.00	MWD TIP=885 MD (Original Hole)	MWD	MWD - Standard		
2,894.00	6,017.00	MWD2 (Original Hole)	MWD	MWD - Standard		
6,125.00	16,460.00	MWD Lat (Original Hole)	MWD	MWD - Standard		
16,510.00	16,510.00	Projection (Original Hole)	UNKNOWN	Unknown survey		

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	14,457,721.56	1,721,058.07	39.81012150	-80.71284140	
100.00	0.80	110.62	100.00	-0.25	0.65	14,457,721.32	1,721,058.72	39.81012082	-80.71283908	
Gyro										
200.00	0.60	98.92	199.99	-0.57	1.82	14,457,720.99	1,721,059.89	39.81011991	-80.71283491	
300.00	0.47	125.33	299.99	-0.89	2.68	14,457,720.67	1,721,060.74	39.81011903	-80.71283188	
400.00	0.33	120.47	399.98	-1.27	3.26	14,457,720.29	1,721,061.33	39.81011797	-80.71282981	
500.00	0.29	135.65	499.98	-1.60	3.68	14,457,719.96	1,721,061.75	39.81011707	-80.71282830	

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Well:	Heaven Hill 2-01 HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug0116_LT_v14

JUN 10 2020

WV Department of Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
600.00	0.10	151.41	599.98	-1.86	3.90	14,457,719.70	1,721,061.97	39.81011636	-80.71282753
700.00	0.33	102.47	699.98	-2.00	4.23	14,457,719.56	1,721,062.29	39.81011598	-80.71282638
800.00	0.40	75.92	799.98	-1.98	4.85	14,457,719.59	1,721,062.91	39.81011604	-80.71282417
885.00	0.52	76.90	884.98	-1.82	5.51	14,457,719.75	1,721,063.58	39.81011647	-80.71282181
887.00	0.53	62.08	886.98	-1.81	5.53	14,457,719.75	1,721,063.59	39.81011648	-80.71282174
918.00	0.50	82.05	917.97	-1.72	5.79	14,457,719.84	1,721,063.85	39.81011672	-80.71282082
950.00	0.54	70.28	949.97	-1.65	6.07	14,457,719.91	1,721,064.13	39.81011691	-80.71281982
981.00	0.38	83.04	980.97	-1.59	6.31	14,457,719.97	1,721,064.37	39.81011708	-80.71281896
1,013.00	0.48	80.26	1,012.97	-1.56	6.54	14,457,720.01	1,721,064.61	39.81011717	-80.71281812
1,044.00	0.51	153.67	1,043.97	-1.66	6.73	14,457,719.90	1,721,064.80	39.81011689	-80.71281744
1,076.00	0.08	43.15	1,075.97	-1.77	6.81	14,457,719.79	1,721,064.88	39.81011658	-80.71281717
1,107.00	0.40	84.43	1,106.97	-1.74	6.93	14,457,719.82	1,721,065.00	39.81011666	-80.71281673
1,123.00	0.14	17.82	1,122.97	-1.72	7.00	14,457,719.84	1,721,065.06	39.81011672	-80.71281651
1,196.00	0.31	78.22	1,195.97	-1.59	7.22	14,457,719.97	1,721,065.28	39.81011706	-80.71281572
1,290.00	1.41	104.39	1,289.96	-1.83	8.59	14,457,719.73	1,721,066.65	39.81011640	-80.71281085
1,385.00	3.37	106.28	1,384.87	-2.90	12.40	14,457,718.66	1,721,070.47	39.81011342	-80.71279729
1,479.00	4.28	88.79	1,478.66	-3.60	18.56	14,457,717.96	1,721,076.62	39.81011144	-80.71277536
1,574.00	5.22	67.15	1,573.34	-1.85	26.08	14,457,719.71	1,721,084.15	39.81011619	-80.71274854
1,669.00	5.44	39.05	1,667.95	3.33	32.91	14,457,724.89	1,721,090.97	39.81013035	-80.71272419
1,764.00	5.62	14.79	1,762.52	11.32	36.93	14,457,732.88	1,721,095.00	39.81015227	-80.71270977
1,858.00	5.52	1.62	1,856.08	20.29	38.23	14,457,741.85	1,721,096.30	39.81017689	-80.71270503
1,953.00	4.69	358.30	1,950.70	28.74	38.25	14,457,750.30	1,721,096.31	39.81020010	-80.71270488
2,047.00	4.39	4.61	2,044.41	36.17	38.42	14,457,757.73	1,721,096.49	39.81022049	-80.71270417
2,142.00	4.79	19.18	2,139.10	43.54	40.02	14,457,765.10	1,721,098.08	39.81024072	-80.71269841
2,237.00	5.33	29.02	2,233.74	51.14	43.46	14,457,772.71	1,721,101.53	39.81026158	-80.71268606
2,331.00	6.04	26.19	2,327.27	59.40	47.76	14,457,780.96	1,721,105.83	39.81028421	-80.71267065
2,426.00	5.88	21.97	2,421.76	68.40	51.79	14,457,789.96	1,721,109.86	39.81030888	-80.71265621
2,520.00	4.86	10.73	2,515.35	76.78	54.33	14,457,798.34	1,721,112.40	39.81033187	-80.71264706
2,615.00	4.22	359.15	2,610.05	84.23	55.03	14,457,805.79	1,721,113.10	39.81035232	-80.71264449
2,710.00	4.08	349.18	2,704.80	91.04	54.34	14,457,812.60	1,721,112.41	39.81037104	-80.71264685
2,786.00	4.14	349.85	2,780.61	96.40	53.35	14,457,817.96	1,721,111.42	39.81038576	-80.71265032
2,894.00	4.33	0.63	2,888.32	104.31	52.71	14,457,825.87	1,721,110.78	39.81040750	-80.71265252
2,989.00	5.48	10.05	2,982.97	112.36	53.54	14,457,833.92	1,721,111.61	39.81042961	-80.71264947
3,083.00	7.31	19.64	3,076.38	122.42	56.33	14,457,843.98	1,721,114.40	39.81045719	-80.71263940
3,178.00	8.40	21.78	3,170.49	134.55	60.94	14,457,856.11	1,721,119.01	39.81049048	-80.71262286
3,273.00	10.36	18.39	3,264.21	149.10	66.21	14,457,870.66	1,721,124.28	39.81053039	-80.71260393
3,367.00	14.21	11.91	3,356.05	168.42	71.26	14,457,889.98	1,721,129.33	39.81058340	-80.71258573
3,462.00	18.57	8.65	3,447.17	194.80	75.94	14,457,916.36	1,721,134.01	39.81065580	-80.71256875
3,557.00	23.08	10.53	3,535.94	228.08	81.62	14,457,949.64	1,721,139.69	39.81074714	-80.71254814
3,651.00	27.66	19.31	3,620.88	266.82	92.22	14,457,988.38	1,721,150.28	39.81085344	-80.71250998
3,746.00	29.30	23.70	3,704.39	308.92	108.85	14,458,030.48	1,721,166.92	39.81096892	-80.71245025
3,840.00	29.65	25.30	3,786.23	351.00	128.04	14,458,072.57	1,721,186.10	39.81108432	-80.71238146
3,935.00	28.46	24.57	3,869.27	392.84	147.49	14,458,114.40	1,721,205.56	39.81119903	-80.71231170
4,029.00	27.36	20.25	3,952.34	433.48	164.28	14,458,155.04	1,721,222.35	39.81131049	-80.71225144
4,124.00	27.36	16.60	4,036.72	474.88	178.08	14,458,196.44	1,721,236.14	39.81142407	-80.71220185
4,219.00	27.39	14.89	4,121.09	516.92	189.93	14,458,238.48	1,721,248.00	39.81153942	-80.71215917
4,313.00	27.58	16.43	4,204.48	558.69	201.64	14,458,280.25	1,721,259.71	39.81165402	-80.71211699
4,408.00	27.86	17.33	4,288.58	600.97	214.47	14,458,322.53	1,721,272.54	39.81177003	-80.71207081
4,502.00	27.59	17.11	4,371.78	642.74	227.42	14,458,364.30	1,721,285.49	39.81188463	-80.71202422
4,597.00	27.39	16.17	4,456.06	684.76	239.98	14,458,406.32	1,721,298.04	39.81199989	-80.71197902
4,691.00	27.45	16.99	4,539.50	726.24	252.33	14,458,447.80	1,721,310.40	39.81211372	-80.71193456
4,786.00	27.29	15.17	4,623.86	768.20	264.43	14,458,489.77	1,721,322.49	39.81222885	-80.71189100
4,881.00	27.40	14.89	4,708.25	810.35	275.74	14,458,531.91	1,721,333.81	39.81234449	-80.71185022
4,976.00	27.75	16.68	4,792.46	852.66	287.71	14,458,574.22	1,721,345.78	39.81246058	-80.71180713
5,071.00	28.26	17.22	4,876.33	895.33	300.71	14,458,616.89	1,721,358.78	39.81257765	-80.71176032

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Survey										WV Department of Environmental Protection
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,165.00	28.18	15.94	4,959.16	937.93	313.40	14,458,659.49	1,721,371.46	39.81269452	-80.71171467	
5,260.00	27.55	17.18	5,043.15	980.49	326.05	14,458,702.05	1,721,384.11	39.81281129	-80.71166913	
5,355.00	26.95	19.01	5,127.60	1,021.83	339.55	14,458,743.39	1,721,397.62	39.81292471	-80.71162058	
5,449.00	27.46	17.60	5,211.21	1,062.63	353.04	14,458,784.19	1,721,411.11	39.81303663	-80.71157206	
5,544.00	28.54	15.78	5,295.09	1,105.35	365.84	14,458,826.91	1,721,423.90	39.81315384	-80.71152601	
5,639.00	28.62	16.06	5,378.51	1,149.05	378.30	14,458,870.61	1,721,436.37	39.81327375	-80.71148112	
5,734.00	27.36	19.51	5,462.40	1,191.50	391.89	14,458,913.06	1,721,449.96	39.81339019	-80.71143225	
5,828.00	27.41	19.23	5,545.87	1,232.29	406.23	14,458,953.85	1,721,464.30	39.81350208	-80.71138071	
5,923.00	27.19	17.75	5,630.29	1,273.61	420.05	14,458,995.17	1,721,478.12	39.81361543	-80.71133103	
6,017.00	26.64	16.41	5,714.11	1,314.28	432.55	14,459,035.84	1,721,490.62	39.81372701	-80.71128604	
6,126.00	26.11	15.26	5,811.76	1,360.86	445.77	14,459,082.42	1,721,503.83	39.81385482	-80.71123844	
6,221.00	25.41	14.29	5,897.32	1,400.78	456.30	14,459,122.34	1,721,514.37	39.81396435	-80.71120047	
6,315.00	23.69	15.88	5,982.82	1,438.49	466.44	14,459,160.05	1,721,524.51	39.81406782	-80.71116391	
6,362.00	22.73	26.16	6,026.03	1,455.73	473.03	14,459,177.29	1,721,531.10	39.81411511	-80.71114024	
6,410.00	22.11	37.76	6,070.43	1,471.20	482.66	14,459,192.76	1,721,540.73	39.81415752	-80.71110579	
6,457.00	22.81	49.80	6,113.89	1,484.08	495.04	14,459,205.64	1,721,553.11	39.81419278	-80.71106155	
6,505.00	23.56	60.35	6,158.03	1,494.84	510.49	14,459,216.40	1,721,568.56	39.81422218	-80.71100641	
6,551.00	24.97	70.54	6,199.98	1,502.62	527.64	14,459,224.18	1,721,585.71	39.81424341	-80.71094523	
6,600.00	26.68	78.37	6,244.10	1,508.29	548.18	14,459,229.85	1,721,606.25	39.81425879	-80.71087204	
6,647.00	26.77	87.51	6,286.10	1,510.88	569.10	14,459,232.44	1,721,627.16	39.81426571	-80.71079752	
6,695.00	26.29	97.00	6,329.06	1,510.05	590.46	14,459,231.61	1,721,648.52	39.81426325	-80.71072147	
6,742.00	26.42	106.75	6,371.20	1,505.77	610.81	14,459,227.33	1,721,668.88	39.81425131	-80.71064903	
6,789.00	27.65	115.81	6,413.08	1,498.00	630.65	14,459,219.56	1,721,688.72	39.81422980	-80.71057847	
6,836.00	30.68	119.94	6,454.12	1,487.26	650.86	14,459,208.83	1,721,708.93	39.81420014	-80.71050661	
6,884.00	31.91	126.62	6,495.15	1,473.58	671.67	14,459,195.14	1,721,729.73	39.81416238	-80.71043269	
6,931.00	34.86	131.01	6,534.39	1,457.35	691.78	14,459,178.91	1,721,749.85	39.81411763	-80.71036126	
6,979.00	38.55	133.38	6,572.87	1,438.07	713.01	14,459,159.63	1,721,771.08	39.81406449	-80.71028587	
7,026.00	41.89	133.47	6,608.75	1,417.21	735.05	14,459,138.77	1,721,793.11	39.81400700	-80.71020764	
7,074.00	45.67	133.47	6,643.40	1,394.37	759.15	14,459,115.93	1,721,817.21	39.81394405	-80.71012208	
7,121.00	50.11	133.82	6,674.91	1,370.30	784.37	14,459,091.87	1,721,842.43	39.81387775	-80.71003254	
7,168.00	52.79	133.56	6,704.20	1,344.92	810.94	14,459,066.48	1,721,869.01	39.81380780	-80.70993819	
7,215.00	56.88	133.38	6,731.26	1,318.49	838.82	14,459,040.05	1,721,896.89	39.81373497	-80.70983922	
7,263.00	61.05	134.09	6,756.00	1,290.06	868.53	14,459,011.62	1,721,926.60	39.81365663	-80.70973376	
7,310.00	66.29	135.41	6,776.84	1,260.41	898.43	14,458,981.97	1,721,956.49	39.81357493	-80.70962764	
7,357.00	69.45	137.25	6,794.55	1,228.92	928.48	14,458,950.48	1,721,986.55	39.81348818	-80.70952098	
7,404.00	72.62	139.36	6,809.82	1,195.73	958.03	14,458,917.29	1,722,016.10	39.81339677	-80.70941612	
7,451.00	76.53	140.42	6,822.32	1,161.08	987.21	14,458,882.64	1,722,045.28	39.81330136	-80.70931261	
7,498.00	80.53	142.35	6,831.67	1,125.10	1,015.95	14,458,846.66	1,722,074.02	39.81320228	-80.70921070	
7,546.00	84.79	143.05	6,837.80	1,087.23	1,044.79	14,458,808.80	1,722,102.86	39.81309805	-80.70910844	
7,593.00	88.88	144.90	6,840.39	1,049.29	1,072.38	14,458,770.85	1,722,130.45	39.81299360	-80.70901062	
7,640.00	88.84	148.68	6,841.33	1,009.98	1,098.11	14,458,731.54	1,722,156.18	39.81288542	-80.70891944	
7,734.00	89.45	150.08	6,842.73	929.10	1,145.99	14,458,650.66	1,722,204.05	39.81266287	-80.70874991	
7,829.00	88.22	150.44	6,844.66	846.63	1,193.10	14,458,568.19	1,722,251.17	39.81243597	-80.70858308	
7,924.00	88.26	148.50	6,847.58	764.84	1,241.33	14,458,486.41	1,722,299.40	39.81221093	-80.70841227	
8,019.00	88.18	151.75	6,850.53	682.52	1,288.63	14,458,404.08	1,722,346.69	39.81198442	-80.70824482	
8,113.00	87.65	151.75	6,853.95	599.77	1,333.09	14,458,321.33	1,722,391.16	39.81175677	-80.70808745	
8,208.00	87.38	151.14	6,858.07	516.41	1,378.46	14,458,237.97	1,722,436.52	39.81152743	-80.70792687	
8,302.00	88.66	151.31	6,861.32	434.06	1,423.68	14,458,155.62	1,722,481.74	39.81130089	-80.70776680	
8,398.00	88.35	151.93	6,863.82	349.63	1,469.29	14,458,071.19	1,722,527.36	39.81106861	-80.70760535	
8,493.00	89.63	152.55	6,865.50	265.58	1,513.53	14,457,987.14	1,722,571.60	39.81083739	-80.70744879	
8,587.00	90.68	153.69	6,865.24	181.74	1,556.03	14,457,903.30	1,722,614.10	39.81060676	-80.70729844	
8,682.00	89.58	152.19	6,865.03	97.14	1,599.24	14,457,818.70	1,722,657.31	39.81037405	-80.70714553	
8,776.00	90.02	152.37	6,865.36	13.93	1,642.97	14,457,735.49	1,722,701.04	39.81014513	-80.70699081	
8,871.00	88.84	150.35	6,866.30	-69.44	1,688.50	14,457,652.13	1,722,746.56	39.80991578	-80.70682966	
8,966.00	90.24	151.58	6,867.06	-152.49	1,734.60	14,457,569.07	1,722,792.67	39.80968728	-80.70666646	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Heaven Hill 2-01 HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1331+33 @ 1364.00usft (Nabors X08)
Site:	Heaven Hill 2	MD Reference:	RKB=1331+33 @ 1364.00usft (Nabors X08)
Well:	Heaven Hill 2-01 HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug0116_LT_v14

JUN 10 2020

Survey								WV Department of Environmental Protection	
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,060.00	89.54	152.63	6,867.24	-235.57	1,778.58	14,457,486.00	1,722,836.65	39.80945873	-80.70651083
9,155.00	87.30	151.05	6,869.86	-319.28	1,823.39	14,457,402.28	1,722,881.46	39.80922843	-80.70635224
9,249.00	88.40	151.05	6,873.39	-401.48	1,868.86	14,457,320.08	1,722,926.93	39.80900229	-80.70619130
9,344.00	88.84	150.44	6,875.68	-484.34	1,915.27	14,457,237.23	1,722,973.34	39.80877432	-80.70602700
9,439.00	89.19	149.47	6,877.31	-566.56	1,962.83	14,457,155.00	1,723,020.89	39.80854809	-80.70585862
9,533.00	88.31	149.38	6,879.36	-647.47	2,010.63	14,457,074.09	1,723,068.70	39.80832546	-80.70568935
9,628.00	90.07	148.50	6,880.70	-728.83	2,059.64	14,456,992.73	1,723,117.70	39.80810156	-80.70551580
9,723.00	90.42	148.15	6,880.30	-809.68	2,109.52	14,456,911.88	1,723,167.59	39.80787908	-80.70533913
9,817.00	89.58	149.56	6,880.30	-890.13	2,158.14	14,456,831.43	1,723,216.20	39.80765771	-80.70516696
9,912.00	89.49	149.21	6,881.07	-971.89	2,206.52	14,456,749.68	1,723,264.58	39.80743275	-80.70499565
10,006.00	90.42	149.64	6,881.14	-1,052.82	2,254.33	14,456,668.75	1,723,312.40	39.80721007	-80.70482635
10,100.00	89.32	149.64	6,881.36	-1,133.92	2,301.84	14,456,587.64	1,723,359.91	39.80698689	-80.70465813
10,195.00	89.80	149.64	6,882.09	-1,215.89	2,349.85	14,456,505.67	1,723,407.92	39.80676135	-80.70448813
10,289.00	87.96	148.15	6,883.92	-1,296.36	2,398.40	14,456,425.20	1,723,456.47	39.80653993	-80.70431621
10,384.00	88.75	148.06	6,886.65	-1,376.98	2,448.57	14,456,344.58	1,723,506.64	39.80631807	-80.70413851
10,478.00	89.23	149.03	6,888.31	-1,457.15	2,497.62	14,456,264.41	1,723,555.69	39.80609745	-80.70396482
10,572.00	88.04	149.29	6,890.55	-1,537.84	2,545.79	14,456,183.72	1,723,603.86	39.80587543	-80.70379424
10,667.00	89.32	149.73	6,892.73	-1,619.68	2,593.98	14,456,101.88	1,723,652.05	39.80565024	-80.70362363
10,761.00	88.62	150.26	6,894.42	-1,701.06	2,640.98	14,456,020.50	1,723,699.05	39.80542630	-80.70345724
10,855.00	89.98	150.26	6,895.57	-1,782.68	2,687.60	14,455,938.89	1,723,745.67	39.80520175	-80.70329219
10,950.00	91.96	151.31	6,893.96	-1,865.57	2,733.96	14,455,855.99	1,723,792.03	39.80497367	-80.70312810
11,045.00	92.00	150.70	6,890.68	-1,948.62	2,779.99	14,455,772.94	1,723,838.05	39.80474520	-80.70296521
11,139.00	89.71	150.17	6,889.28	-2,030.36	2,826.36	14,455,691.20	1,723,884.43	39.80452028	-80.70280107
11,234.00	89.05	150.26	6,890.31	-2,112.81	2,873.55	14,455,608.75	1,723,931.61	39.80429343	-80.70263402
11,329.00	88.31	149.29	6,892.50	-2,194.87	2,921.35	14,455,526.69	1,723,979.42	39.80406764	-80.70246477
11,423.00	89.19	149.82	6,894.55	-2,275.89	2,968.97	14,455,445.67	1,724,027.04	39.80384470	-80.70229618
11,518.00	90.02	149.91	6,895.20	-2,358.05	3,016.67	14,455,363.52	1,724,074.73	39.80361864	-80.70212734
11,612.00	90.07	148.94	6,895.13	-2,438.98	3,064.48	14,455,282.59	1,724,122.55	39.80339595	-80.70195805
11,707.00	89.01	148.24	6,895.89	-2,520.05	3,113.99	14,455,201.51	1,724,172.05	39.80317285	-80.70178274
11,801.00	89.54	148.77	6,897.08	-2,600.20	3,163.09	14,455,121.37	1,724,221.16	39.80295230	-80.70160886
11,896.00	89.36	149.47	6,897.99	-2,681.72	3,211.85	14,455,039.84	1,724,269.91	39.80272795	-80.70143623
11,991.00	90.59	151.93	6,898.03	-2,764.56	3,258.33	14,454,957.00	1,724,316.40	39.80250003	-80.70127170
12,086.00	90.11	151.14	6,897.45	-2,848.08	3,303.61	14,454,873.49	1,724,361.68	39.80227027	-80.70111148
12,180.00	90.68	150.35	6,896.80	-2,930.08	3,349.55	14,454,791.48	1,724,407.61	39.80204464	-80.70094890
12,275.00	91.47	149.56	6,895.02	-3,012.30	3,397.10	14,454,709.26	1,724,455.17	39.80181840	-80.70078056
12,370.00	90.99	151.40	6,892.98	-3,094.95	3,443.90	14,454,626.61	1,724,501.97	39.80159101	-80.70061493
12,464.00	89.45	150.96	6,892.62	-3,177.30	3,489.21	14,454,544.26	1,724,547.28	39.80136443	-80.70045458
12,559.00	88.70	150.79	6,894.16	-3,260.28	3,535.44	14,454,461.28	1,724,593.51	39.80113613	-80.70029097
12,654.00	89.58	150.96	6,895.58	-3,343.26	3,581.67	14,454,378.31	1,724,639.74	39.80090783	-80.70012735
12,748.00	90.29	152.11	6,895.69	-3,425.89	3,626.48	14,454,295.67	1,724,684.54	39.80068048	-80.69996883
12,843.00	90.95	153.51	6,894.66	-3,510.38	3,669.88	14,454,211.18	1,724,727.95	39.80044804	-80.69981529
12,937.00	91.38	151.58	6,892.75	-3,593.78	3,713.21	14,454,127.78	1,724,771.28	39.80021862	-80.69966203
13,032.00	90.64	148.85	6,891.07	-3,676.21	3,760.39	14,454,045.36	1,724,818.46	39.79999182	-80.69949504
13,126.00	89.54	147.01	6,890.93	-3,755.86	3,810.29	14,453,965.71	1,724,868.36	39.79977262	-80.69931830
13,221.00	87.74	144.99	6,893.18	-3,834.59	3,863.40	14,453,886.98	1,724,921.46	39.79955592	-80.69913018
13,316.00	90.86	146.74	6,894.34	-3,913.20	3,916.69	14,453,808.36	1,724,974.76	39.79933953	-80.69894137
13,411.00	89.89	148.59	6,893.72	-3,993.46	3,967.50	14,453,728.10	1,725,025.57	39.79911864	-80.69876144
13,505.00	88.57	149.47	6,894.98	-4,074.05	4,015.87	14,453,647.51	1,725,073.93	39.79889687	-80.69859021
13,600.00	88.35	149.21	6,897.54	-4,155.74	4,064.29	14,453,565.82	1,725,122.36	39.79867208	-80.69841877
13,695.00	89.54	150.00	6,899.29	-4,237.67	4,112.35	14,453,483.89	1,725,170.42	39.79844665	-80.69824866
13,789.00	90.51	147.80	6,899.24	-4,318.15	4,160.90	14,453,403.41	1,725,218.97	39.79822517	-80.69807677
13,883.00	91.56	147.89	6,897.55	-4,397.72	4,210.92	14,453,323.84	1,725,268.99	39.79800619	-80.69789965
13,978.00	93.32	150.61	6,893.50	-4,479.28	4,259.44	14,453,242.28	1,725,317.51	39.79778177	-80.69772787
14,073.00	91.96	152.37	6,889.13	-4,562.66	4,304.74	14,453,158.90	1,725,362.80	39.79755235	-80.69756762
14,168.00	89.63	153.60	6,887.81	-4,647.28	4,347.88	14,453,074.28	1,725,405.95	39.79731956	-80.69741504

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Heaven Hill 2-01 HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1331+33 @ 1364.00usft (Nabors X08)
Site:	Heaven Hill 2	MD Reference:	RKB=1331+33 @ 1364.00usft (Nabors X08)
Well:	Heaven Hill 2-01 HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug0116_LT_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
14,262.00	88.97	152.90	6,888.96	-4,731.22	4,390.19	14,452,990.35	1,725,448.25	39.79708867	-80.69726543
14,357.00	89.14	152.98	6,890.52	-4,815.80	4,433.40	14,452,905.76	1,725,491.46	39.79685596	-80.69711261
14,451.00	88.88	153.16	6,892.15	-4,899.60	4,475.96	14,452,821.96	1,725,534.03	39.79662545	-80.69696207
14,546.00	90.24	152.28	6,892.88	-4,984.03	4,519.50	14,452,737.53	1,725,577.57	39.79639318	-80.69680808
14,640.00	91.65	153.07	6,891.33	-5,067.52	4,562.65	14,452,654.04	1,725,620.71	39.79616348	-80.69665549
14,735.00	91.38	151.40	6,888.81	-5,151.55	4,606.88	14,452,570.01	1,725,664.95	39.79593230	-80.69649901
14,830.00	90.07	150.79	6,887.61	-5,234.71	4,652.80	14,452,486.85	1,725,710.87	39.79570350	-80.69633655
14,925.00	90.55	151.14	6,887.10	-5,317.77	4,698.91	14,452,403.79	1,725,756.97	39.79547497	-80.69617341
15,019.00	91.34	151.31	6,885.55	-5,400.15	4,744.15	14,452,321.41	1,725,802.21	39.79524831	-80.69601334
15,113.00	90.68	151.05	6,883.89	-5,482.49	4,789.45	14,452,239.07	1,725,847.52	39.79502175	-80.69585304
15,206.00	89.45	150.61	6,883.79	-5,563.70	4,834.78	14,452,157.86	1,725,892.85	39.79479832	-80.69569265
15,300.00	89.41	149.82	6,884.72	-5,645.27	4,881.47	14,452,076.29	1,725,939.54	39.79457386	-80.69552741
15,395.00	89.67	150.00	6,885.48	-5,727.47	4,929.10	14,451,994.09	1,725,987.17	39.79434768	-80.69535885
15,489.00	90.37	150.52	6,885.45	-5,809.09	4,975.73	14,451,912.47	1,726,033.80	39.79412310	-80.69519384
15,584.00	90.42	150.26	6,884.80	-5,891.68	5,022.67	14,451,829.88	1,726,080.74	39.79389585	-80.69502774
15,678.00	90.33	149.47	6,884.18	-5,972.97	5,069.86	14,451,748.59	1,726,127.93	39.79367215	-80.69486072
15,773.00	91.21	149.64	6,882.90	-6,054.87	5,117.99	14,451,666.70	1,726,176.06	39.79344680	-80.69469036
15,867.00	89.14	147.01	6,882.62	-6,134.85	5,167.34	14,451,586.71	1,726,225.41	39.79322668	-80.69451564
15,961.00	90.64	150.35	6,882.80	-6,215.14	5,216.20	14,451,506.42	1,726,274.26	39.79300573	-80.69434269
16,056.00	88.79	149.73	6,883.27	-6,297.44	5,263.64	14,451,424.12	1,726,321.70	39.79277927	-80.69417481
16,151.00	88.18	149.03	6,885.78	-6,379.16	5,312.01	14,451,342.40	1,726,370.07	39.79255438	-80.69400361
16,246.00	88.62	148.94	6,888.43	-6,460.55	5,360.94	14,451,261.01	1,726,419.01	39.79233041	-80.69383040
16,340.00	90.64	149.03	6,889.04	-6,541.11	5,409.37	14,451,180.46	1,726,467.44	39.79210873	-80.69365897
16,435.00	90.42	148.85	6,888.16	-6,622.48	5,458.38	14,451,099.08	1,726,516.45	39.79188479	-80.69348549
16,460.00	90.64	148.68	6,887.93	-6,643.86	5,471.34	14,451,077.70	1,726,529.41	39.79182597	-80.69343960
Survey @ 16460.00 MD 6887.93 TVD									
16,510.00	90.64	148.68	6,887.37	-6,686.57	5,497.33	14,451,034.99	1,726,555.40	39.79170843	-80.69334760
Survey Projected to 16510.00 MD 6887.37 TVD									

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
100.00	100.00	-0.25	0.65	Gyro
16,460.00	6,887.93	-6,643.86	5,471.34	Survey @ 16460.00 MD 6887.93 TVD
16,510.00	6,887.37	-6,686.57	5,497.33	Survey Projected to 16510.00 MD 6887.37 TVD