

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Blake 02 HM (slot E)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1326+18 @ 1344.00ft (Precision 528)
<b>Site:</b>	Blake Pad	<b>MD Reference:</b>	RKB=1326+18 @ 1344.00ft (Precision 528)
<b>Well:</b>	Blake 02 HM (slot E)	<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 W to 78 W)		

<b>Site</b>	Blake Pad				
<b>Site Position:</b>		<b>Northing:</b>	14,440,917.72 usft	<b>Latitude:</b>	39.76416471
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,695,217.29 usft	<b>Longitude:</b>	-80.80498839
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.12 "

<b>Well</b>	Blake 02 HM (slot E)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	14,440,940.05 usft	<b>Latitude:</b>	39.76422598
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	1,695,226.07 usft	<b>Longitude:</b>	-80.80495697
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,326.00 ft

<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</b> (nT)
	IGRF2015	4/29/2018	-8.64	66.88	52,072.68646326

<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)</b> (ft)	<b>+N/-S</b> (ft)	<b>+E/-W</b> (ft)	<b>Direction</b> (°)	
	0.00	0.00	0.00	313.86	

<b>Survey Program</b>	<b>Date</b>	12/15/2018			
<b>From</b> (ft)	<b>To</b> (ft)	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	<p style="text-align: center;"><b>RECEIVED</b> Office of Oil and Gas</p> <p style="font-size: 2em; text-align: center;">JUL 10 2020</p> <p style="text-align: center;">WV Department of Environmental Protection</p>
189.00	1,001.00	MWD surf (Original Hole)	MWD	MWD - Standard	
1,095.00	2,825.00	MWD 12 3/8 (Original Hole)	MWD	MWD - Standard	
2,905.00	17,886.00	MWD (Original Hole)	MWD	MWD - Standard	
17,942.00	17,942.00	Projection (Original Hole)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured</b>	<b>Depth</b> (ft)	<b>Inclination</b> (°)	<b>Azimuth</b> (°)	<b>Vertical</b> <b>Depth</b> (ft)	<b>+N/-S</b> (ft)	<b>+E/-W</b> (ft)	<b>Map</b> <b>Northing</b> (usft)	<b>Map</b> <b>Easting</b> (usft)	<b>Latitude</b>	<b>Longitude</b>
	0.00	0.00	0.00	0.00	0.00	0.00	14,440,940.05	1,695,226.07	39.76422598	-80.80495697
	189.00	0.49	254.29	189.00	-0.22	-0.78	14,440,939.83	1,695,225.29	39.76422539	-80.80495974
<b>MWD surveys</b>										
	253.00	0.56	267.05	253.00	-0.31	-1.35	14,440,939.74	1,695,224.71	39.76422514	-80.80496179
	338.00	0.51	247.06	337.99	-0.48	-2.12	14,440,939.57	1,695,223.95	39.76422468	-80.80496451
	431.00	0.39	259.78	430.99	-0.70	-2.81	14,440,939.36	1,695,223.26	39.76422409	-80.80496697
	526.00	0.36	241.89	525.99	-0.89	-3.39	14,440,939.16	1,695,222.68	39.76422355	-80.80496905
	621.00	0.28	219.60	620.99	-1.21	-3.80	14,440,938.84	1,695,222.26	39.76422267	-80.80497051
	716.00	0.20	266.73	715.98	-1.40	-4.12	14,440,938.65	1,695,221.95	39.76422216	-80.80497163





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<b>Site:</b>	Blake Pad	<b>MD Reference:</b>	RKB=1326+18 @ 1344.00ft (Precision 528)
<b>Well:</b>	Blake 02 HM (slot E)	<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

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Survey									WV Department of Environmental Protection	
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
811.00	0.14	266.81	810.98	-1.42	-4.40	14,440,938.63	1,695,221.67	39.76422212	-80.80497263	
906.00	0.09	175.08	905.98	-1.50	-4.51	14,440,938.55	1,695,221.56	39.76422190	-80.80497302	
1,001.00	0.12	117.06	1,000.98	-1.62	-4.41	14,440,938.43	1,695,221.66	39.76422157	-80.80497268	
1,095.00	0.05	149.05	1,094.98	-1.70	-4.30	14,440,938.35	1,695,221.76	39.76422135	-80.80497230	
1,151.00	0.27	58.81	1,150.98	-1.65	-4.18	14,440,938.40	1,695,221.89	39.76422148	-80.80497185	
1,258.00	0.35	103.70	1,257.98	-1.60	-3.64	14,440,938.45	1,695,222.42	39.76422162	-80.80496995	
1,352.00	0.41	95.66	1,351.98	-1.70	-3.03	14,440,938.35	1,695,223.04	39.76422134	-80.80496777	
1,448.00	0.98	63.08	1,447.97	-1.36	-1.96	14,440,938.69	1,695,224.11	39.76422226	-80.80496395	
1,542.00	1.81	60.64	1,541.94	-0.27	0.05	14,440,939.78	1,695,226.12	39.76422524	-80.80495678	
1,637.00	2.72	60.92	1,636.87	1.56	3.33	14,440,941.61	1,695,229.40	39.76423025	-80.80494510	
1,732.00	2.64	54.33	1,731.77	3.93	7.08	14,440,943.99	1,695,233.15	39.76423674	-80.80493175	
1,827.00	1.12	26.81	1,826.71	6.04	9.28	14,440,946.09	1,695,235.34	39.76424251	-80.80492392	
1,922.00	0.98	312.22	1,921.70	7.41	9.09	14,440,947.46	1,695,235.16	39.76424629	-80.80492456	
2,017.00	1.81	268.38	2,016.67	7.92	6.99	14,440,947.97	1,695,233.06	39.76424768	-80.80493203	
2,112.00	2.26	243.62	2,111.62	7.04	3.81	14,440,947.09	1,695,229.88	39.76424530	-80.80494335	
2,207.00	1.80	216.52	2,206.56	5.01	1.25	14,440,945.06	1,695,227.31	39.76423974	-80.80495250	
2,302.00	0.69	183.33	2,301.54	3.24	0.33	14,440,943.29	1,695,226.39	39.76423488	-80.80495579	
2,397.00	0.78	142.58	2,396.53	2.16	0.69	14,440,942.21	1,695,226.75	39.76423190	-80.80495452	
2,492.00	0.35	148.75	2,491.52	1.39	1.23	14,440,941.45	1,695,227.30	39.76422980	-80.80495259	
2,586.00	0.51	310.54	2,585.52	1.42	1.06	14,440,941.47	1,695,227.13	39.76422988	-80.80495319	
2,680.00	1.10	327.62	2,679.51	2.45	0.26	14,440,942.51	1,695,226.33	39.76423272	-80.80495603	
2,775.00	0.74	350.32	2,774.50	3.83	-0.33	14,440,943.88	1,695,225.73	39.76423650	-80.80495813	
2,825.00	0.76	357.83	2,824.50	4.48	-0.40	14,440,944.53	1,695,225.67	39.76423829	-80.80495836	
2,905.00	0.48	103.15	2,904.49	4.93	-0.09	14,440,944.98	1,695,225.97	39.76423953	-80.80495727	
2,968.00	0.58	107.17	2,967.49	4.78	0.47	14,440,944.83	1,695,226.54	39.76423910	-80.80495527	
3,062.00	0.61	114.04	3,061.49	4.43	1.38	14,440,944.49	1,695,227.45	39.76423815	-80.80495203	
3,157.00	0.54	114.24	3,156.48	4.05	2.25	14,440,944.10	1,695,228.32	39.76423708	-80.80494893	
3,252.00	0.32	154.16	3,251.48	3.62	2.77	14,440,943.67	1,695,228.84	39.76423591	-80.80494707	
3,346.00	0.29	93.16	3,345.48	3.37	3.13	14,440,943.42	1,695,229.19	39.76423523	-80.80494582	
3,440.00	0.08	347.05	3,439.48	3.42	3.35	14,440,943.48	1,695,229.42	39.76423536	-80.80494503	
3,533.00	1.61	37.21	3,532.46	4.53	4.12	14,440,944.58	1,695,230.19	39.76423839	-80.80494226	
3,628.00	1.96	40.78	3,627.42	6.82	5.99	14,440,946.87	1,695,232.06	39.76424468	-80.80493559	
3,723.00	3.59	43.05	3,722.30	10.22	9.08	14,440,950.28	1,695,235.15	39.76425401	-80.80492457	
3,818.00	5.45	39.01	3,817.00	15.90	13.95	14,440,955.96	1,695,240.02	39.76426958	-80.80490719	
3,913.00	7.24	36.39	3,911.42	24.23	20.35	14,440,964.28	1,695,246.41	39.76429240	-80.80488438	
4,009.00	8.88	38.80	4,006.47	34.87	28.58	14,440,974.93	1,695,254.65	39.76432159	-80.80485500	
4,103.00	10.21	40.22	4,099.16	46.89	38.50	14,440,986.94	1,695,264.57	39.76435453	-80.80481959	
4,198.00	8.24	40.80	4,192.93	58.47	48.39	14,440,998.52	1,695,274.46	39.76438628	-80.80478432	
4,292.00	11.28	39.41	4,285.56	70.68	58.63	14,441,010.73	1,695,284.70	39.76441974	-80.80474778	
4,387.00	12.83	41.02	4,378.46	85.82	71.45	14,441,025.87	1,695,297.52	39.76446123	-80.80470204	
4,481.00	12.70	47.17	4,470.14	100.72	85.88	14,441,040.77	1,695,311.95	39.76450206	-80.80465058	
4,576.00	10.48	47.59	4,563.20	113.64	99.92	14,441,053.69	1,695,325.99	39.76453748	-80.80460052	
4,671.00	10.20	46.15	4,656.66	125.30	112.37	14,441,065.35	1,695,338.43	39.76456941	-80.80455614	
4,765.00	10.04	42.69	4,749.20	137.09	123.92	14,441,077.14	1,695,349.99	39.76460172	-80.80451492	
4,860.00	10.07	40.73	4,842.74	149.47	134.96	14,441,089.52	1,695,361.02	39.76463565	-80.80447556	
4,955.00	9.82	36.21	4,936.31	162.30	145.16	14,441,102.35	1,695,371.23	39.76467083	-80.80443914	
5,049.00	11.26	39.37	5,028.72	175.86	155.72	14,441,115.91	1,695,381.79	39.76470801	-80.80440147	
5,143.00	11.45	37.25	5,120.88	190.38	167.19	14,441,130.43	1,695,393.26	39.76474783	-80.80436054	
5,238.00	11.43	42.90	5,214.00	204.78	179.31	14,441,144.84	1,695,405.37	39.76478730	-80.80431731	
5,333.00	11.58	42.49	5,307.09	218.71	192.15	14,441,158.76	1,695,418.22	39.76482547	-80.80427148	
5,427.00	11.15	45.47	5,399.25	232.04	205.01	14,441,172.09	1,695,431.07	39.76486201	-80.80422564	
5,522.00	10.82	43.65	5,492.51	244.94	217.71	14,441,184.99	1,695,443.78	39.76489734	-80.80418034	
5,616.00	9.43	48.01	5,585.04	256.47	229.52	14,441,196.52	1,695,455.59	39.76492895	-80.80413821	
5,711.00	8.87	42.21	5,678.83	267.10	240.23	14,441,207.15	1,695,466.30	39.76495809	-80.80410003	
5,806.00	9.61	40.61	5,772.60	278.55	250.31	14,441,218.60	1,695,476.38	39.76498946	-80.80406406	



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5.895.00	10.73	42.10	5,860.20	290.34	260.70	14,441,230.39	1,695,486.77	39.76502177	-80.80402699	
5.961.00	10.73	36.23	5,925.05	299.85	268.45	14,441,239.90	1,695,494.52	39.76504785	-80.80399934	
6.004.00	10.73	22.08	5,967.31	306.79	272.32	14,441,246.84	1,695,498.39	39.76506688	-80.80398551	
6.051.00	8.48	12.06	6,013.65	314.24	274.69	14,441,254.29	1,695,500.76	39.76508732	-80.80397702	
6.099.00	9.05	0.11	6,061.09	321.47	275.44	14,441,261.52	1,695,501.51	39.76510719	-80.80397431	
6.161.00	13.23	347.89	6,121.92	333.29	273.96	14,441,273.34	1,695,500.03	39.76513966	-80.80397948	
6.195.00	16.09	337.96	6,154.81	341.47	271.37	14,441,281.52	1,695,497.44	39.76516212	-80.80398862	
6.227.00	20.04	334.97	6,185.23	350.55	267.39	14,441,290.60	1,695,493.46	39.76518709	-80.80400273	
6.258.00	23.82	335.15	6,213.98	361.05	262.51	14,441,301.10	1,695,488.58	39.76521594	-80.80402001	
6.290.00	26.99	332.07	6,242.88	373.33	256.39	14,441,313.38	1,695,482.46	39.76524971	-80.80404169	
6.322.00	30.73	328.64	6,270.91	386.73	248.73	14,441,326.78	1,695,474.80	39.76528656	-80.80406884	
6.354.00	34.46	327.59	6,297.86	401.36	239.62	14,441,341.41	1,695,465.69	39.76532680	-80.80410115	
6.385.00	38.29	328.29	6,322.82	416.94	229.87	14,441,356.99	1,695,455.93	39.76536964	-80.80413573	
6.417.00	42.20	328.03	6,347.24	434.50	218.96	14,441,374.55	1,695,445.03	39.76541793	-80.80417440	
6.448.00	46.33	326.44	6,369.43	452.68	207.25	14,441,392.73	1,695,433.31	39.76546794	-80.80421596	
6.480.00	50.59	325.48	6,390.65	472.52	193.84	14,441,412.57	1,695,419.90	39.76552250	-80.80426352	
6.511.00	53.36	324.25	6,409.74	492.49	179.78	14,441,432.54	1,695,405.85	39.76557742	-80.80431339	
6.543.00	55.30	323.81	6,428.40	513.53	164.51	14,441,453.58	1,695,390.58	39.76563528	-80.80436756	
6.575.00	56.79	323.02	6,446.28	534.84	148.69	14,441,474.89	1,695,374.76	39.76569391	-80.80442370	
6.607.00	59.78	321.35	6,463.10	556.33	132.00	14,441,496.38	1,695,358.06	39.76575304	-80.80448293	
6.639.00	63.96	318.27	6,478.18	577.87	113.78	14,441,517.92	1,695,339.85	39.76581231	-80.80454758	
6.670.00	66.15	317.13	6,491.26	598.66	94.87	14,441,538.71	1,695,320.93	39.76586951	-80.80461474	
6.702.00	68.13	316.25	6,503.69	620.11	74.64	14,441,560.16	1,695,300.71	39.76592854	-80.80468655	
6.734.00	71.12	315.37	6,514.83	641.62	53.73	14,441,581.67	1,695,279.80	39.76598773	-80.80476079	
6.765.00	74.29	314.32	6,524.04	662.49	32.75	14,441,602.54	1,695,258.81	39.76604516	-80.80483531	
6.797.00	77.01	313.00	6,531.97	683.89	10.32	14,441,623.94	1,695,236.39	39.76610406	-80.80491495	
6.828.00	78.95	313.26	6,538.43	704.61	-11.81	14,441,644.66	1,695,214.26	39.76616112	-80.80499353	
6.860.00	82.55	312.82	6,543.57	726.17	-34.89	14,441,666.22	1,695,191.18	39.76622045	-80.80507550	
6.892.00	87.43	312.56	6,546.37	747.77	-58.31	14,441,687.82	1,695,167.75	39.76627993	-80.80515869	
6.923.00	89.98	312.38	6,547.07	768.70	-81.17	14,441,708.75	1,695,144.90	39.76633753	-80.80523987	
6.954.00	90.64	312.21	6,546.90	789.56	-104.10	14,441,729.61	1,695,121.97	39.76639495	-80.80532131	
7.048.00	91.47	311.50	6,545.17	852.27	-174.10	14,441,792.32	1,695,051.96	39.76656759	-80.80556994	
7.143.00	90.99	310.27	6,543.13	914.43	-245.91	14,441,854.48	1,694,980.16	39.76673874	-80.80582499	
7.238.00	90.20	310.19	6,542.14	975.79	-318.43	14,441,915.84	1,694,907.64	39.76690767	-80.80608260	
7.333.00	90.42	308.95	6,541.63	1,036.30	-391.66	14,441,976.35	1,694,834.41	39.76707429	-80.80634273	
7.427.00	89.14	309.75	6,541.99	1,095.90	-464.35	14,442,035.95	1,694,761.72	39.76723840	-80.80660094	
7.523.00	89.76	309.48	6,542.91	1,157.11	-538.29	14,442,097.16	1,694,687.77	39.76740694	-80.80686364	
7.615.00	89.93	310.62	6,543.16	1,216.31	-608.72	14,442,156.35	1,694,617.35	39.76756992	-80.80711380	
7.709.00	90.07	310.10	6,543.16	1,277.18	-680.34	14,442,217.23	1,694,545.72	39.76773752	-80.80736823	
7.804.00	90.90	312.03	6,542.36	1,339.58	-751.96	14,442,279.63	1,694,474.10	39.76790931	-80.80762263	
7.897.00	91.21	311.94	6,540.64	1,401.78	-821.08	14,442,341.83	1,694,404.99	39.76808054	-80.80786812	
7.992.00	91.78	311.86	6,538.16	1,465.20	-891.77	14,442,405.25	1,694,334.30	39.76825513	-80.80811919	
8.087.00	90.20	312.03	6,536.52	1,528.69	-962.41	14,442,468.74	1,694,263.66	39.76842991	-80.80837012	
8.182.00	89.93	312.38	6,536.42	1,592.51	-1,032.78	14,442,532.56	1,694,193.28	39.76860558	-80.80862007	
8.277.00	90.37	311.94	6,536.17	1,656.27	-1,103.20	14,442,596.32	1,694,122.86	39.76878111	-80.80887020	
8.372.00	88.53	313.44	6,537.08	1,720.68	-1,173.02	14,442,660.73	1,694,053.04	39.76895840	-80.80911818	
8.466.00	88.62	313.52	6,539.42	1,785.34	-1,241.21	14,442,725.39	1,693,984.86	39.76913637	-80.80936035	
8.561.00	89.32	313.61	6,541.12	1,850.80	-1,310.04	14,442,790.85	1,693,916.03	39.76931655	-80.80960479	
8.656.00	91.34	313.35	6,540.58	1,916.17	-1,378.96	14,442,856.21	1,693,847.10	39.76949646	-80.80984960	
8.750.00	90.29	311.68	6,539.24	1,979.68	-1,448.24	14,442,919.73	1,693,777.83	39.76967129	-80.81009567	
8.845.00	90.95	310.89	6,538.21	2,042.36	-1,519.62	14,442,982.41	1,693,706.45	39.76984384	-80.81034923	
8.939.00	91.47	310.71	6,536.23	2,103.77	-1,590.76	14,443,043.81	1,693,635.31	39.77001289	-80.81060195	
9.035.00	92.00	310.45	6,533.32	2,166.19	-1,663.64	14,443,106.23	1,693,562.43	39.77018474	-80.81086084	
9.129.00	90.64	309.92	6,531.16	2,226.82	-1,735.43	14,443,166.87	1,693,490.64	39.77035168	-80.81111588	
9.224.00	90.55	310.71	6,530.17	2,288.28	-1,807.87	14,443,228.33	1,693,418.20	39.77052089	-80.81137320	



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Blake 02 HM (slot E)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1326+18 @ 1344.00ft (Precision 528)
<b>Site:</b>	Blake Pad	<b>MD Reference:</b>	RKB=1326+18 @ 1344.00ft (Precision 528)
<b>Well:</b>	Blake 02 HM (slot E)	<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

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Survey									WV Department of Environmental Protection	
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,318.00	90.99	310.80	6,528.91	2,349.64	-1,879.07	14,443,289.69	1,693,347.00	39.77068981	-80.81162613	
9,412.00	89.71	310.36	6,528.33	2,410.79	-1,950.46	14,443,350.83	1,693,275.61	39.77085814	-80.81187974	
9,506.00	89.85	310.54	6,528.69	2,471.77	-2,021.99	14,443,411.82	1,693,204.08	39.77102604	-80.81213385	
9,601.00	90.42	310.62	6,528.47	2,533.57	-2,094.14	14,443,473.62	1,693,131.93	39.77119617	-80.81239017	
9,696.00	90.77	310.19	6,527.48	2,595.14	-2,166.48	14,443,535.19	1,693,059.60	39.77136568	-80.81264715	
9,791.00	91.21	309.31	6,525.84	2,655.88	-2,239.50	14,443,595.93	1,692,986.57	39.77153290	-80.81290660	
9,885.00	89.93	310.36	6,524.91	2,716.09	-2,311.68	14,443,656.14	1,692,914.39	39.77169867	-80.81316302	
9,979.00	90.15	310.36	6,524.84	2,776.96	-2,383.31	14,443,717.01	1,692,842.76	39.77186625	-80.81341749	
10,075.00	90.11	310.45	6,524.62	2,839.19	-2,456.41	14,443,779.24	1,692,769.66	39.77203756	-80.81367719	
10,169.00	90.07	310.71	6,524.47	2,900.34	-2,527.80	14,443,840.38	1,692,698.27	39.77220590	-80.81393082	
10,263.00	91.47	310.80	6,523.21	2,961.70	-2,599.00	14,443,901.74	1,692,627.07	39.77237481	-80.81418376	
10,359.00	91.38	311.06	6,520.82	3,024.57	-2,671.51	14,443,964.62	1,692,554.57	39.77254789	-80.81444134	
10,454.00	91.65	311.77	6,518.31	3,087.39	-2,742.72	14,444,027.44	1,692,483.35	39.77272082	-80.81469434	
10,548.00	91.47	312.29	6,515.75	3,150.30	-2,812.52	14,444,090.35	1,692,413.55	39.77289399	-80.81494229	
10,643.00	90.02	311.50	6,514.52	3,213.73	-2,883.23	14,444,153.78	1,692,342.85	39.77306859	-80.81519347	
10,738.00	90.24	310.98	6,514.30	3,276.36	-2,954.66	14,444,216.40	1,692,271.41	39.77324098	-80.81544724	
10,833.00	89.45	311.77	6,514.56	3,339.15	-3,025.95	14,444,279.19	1,692,200.12	39.77341383	-80.81570049	
10,928.00	89.71	311.68	6,515.26	3,402.38	-3,096.85	14,444,342.42	1,692,129.22	39.77358786	-80.81595237	
11,023.00	89.93	311.33	6,515.55	3,465.33	-3,168.00	14,444,405.37	1,692,058.08	39.77376116	-80.81620512	
11,118.00	90.81	311.24	6,514.94	3,528.01	-3,239.38	14,444,468.05	1,691,986.69	39.77393370	-80.81645872	
11,211.00	89.49	311.59	6,514.70	3,589.53	-3,309.12	14,444,529.57	1,691,916.95	39.77410303	-80.81670649	
11,306.00	90.11	311.59	6,515.03	3,652.59	-3,380.17	14,444,592.63	1,691,845.90	39.77427661	-80.81695890	
11,401.00	89.80	312.91	6,515.10	3,716.46	-3,450.49	14,444,656.51	1,691,775.58	39.77445242	-80.81720871	
11,496.00	89.93	312.12	6,515.33	3,780.66	-3,520.52	14,444,720.70	1,691,705.56	39.77462912	-80.81745746	
11,591.00	90.20	311.77	6,515.22	3,844.16	-3,591.18	14,444,784.20	1,691,634.90	39.77480391	-80.81770848	
11,686.00	90.59	310.62	6,514.56	3,906.73	-3,662.66	14,444,846.77	1,691,563.42	39.77497613	-80.81796244	
11,781.00	89.71	311.33	6,514.32	3,969.02	-3,734.38	14,444,909.06	1,691,491.69	39.77514760	-80.81821726	
11,873.00	90.29	311.24	6,514.32	4,029.72	-3,803.51	14,444,969.76	1,691,422.56	39.77531469	-80.81846287	
11,968.00	90.55	311.06	6,513.62	4,092.23	-3,875.04	14,445,032.28	1,691,351.03	39.77548677	-80.81871701	
12,063.00	90.55	310.71	6,512.71	4,154.41	-3,946.86	14,445,094.45	1,691,279.21	39.77565792	-80.81897218	
12,155.00	91.08	310.54	6,511.40	4,214.31	-4,016.68	14,445,154.35	1,691,209.39	39.77582280	-80.81922024	
12,250.00	90.68	311.94	6,509.94	4,276.92	-4,088.11	14,445,216.97	1,691,137.97	39.77599516	-80.81947401	
12,345.00	90.42	311.42	6,509.03	4,340.09	-4,159.06	14,445,280.13	1,691,067.02	39.77616903	-80.81972607	
12,440.00	89.41	311.42	6,509.17	4,402.94	-4,230.29	14,445,342.98	1,690,995.78	39.77634202	-80.81997917	
12,536.00	89.80	311.24	6,509.83	4,466.34	-4,302.38	14,445,406.38	1,690,923.69	39.77651653	-80.82023528	
12,631.00	90.24	310.45	6,509.80	4,528.47	-4,374.25	14,445,468.51	1,690,851.83	39.77668755	-80.82049062	
12,726.00	90.46	309.57	6,509.22	4,589.54	-4,447.01	14,445,529.59	1,690,779.07	39.77685568	-80.82074916	
12,821.00	90.42	309.75	6,508.49	4,650.17	-4,520.14	14,445,590.22	1,690,705.94	39.77702259	-80.82100902	
12,916.00	90.20	309.83	6,507.97	4,710.97	-4,593.14	14,445,651.01	1,690,632.94	39.77718996	-80.82126840	
13,011.00	90.29	310.71	6,507.57	4,772.38	-4,665.62	14,445,712.42	1,690,560.46	39.77735899	-80.82152595	
13,106.00	89.98	310.98	6,507.34	4,834.51	-4,737.49	14,445,774.55	1,690,488.59	39.77753001	-80.82178130	
13,200.00	90.20	312.12	6,507.20	4,896.85	-4,807.83	14,445,836.90	1,690,418.24	39.77770162	-80.82203123	
13,296.00	90.20	311.42	6,506.86	4,960.80	-4,879.43	14,445,900.84	1,690,346.65	39.77787763	-80.82228562	
13,391.00	90.20	312.65	6,506.53	5,024.41	-4,949.99	14,445,964.45	1,690,276.09	39.77805270	-80.82253630	
13,486.00	90.51	313.09	6,505.94	5,089.04	-5,019.61	14,446,029.08	1,690,206.46	39.77823058	-80.82278366	
13,581.00	90.68	313.17	6,504.95	5,153.99	-5,088.94	14,446,094.03	1,690,137.14	39.77840931	-80.82302995	
13,676.00	91.12	312.73	6,503.46	5,218.71	-5,158.47	14,446,158.75	1,690,067.61	39.77858742	-80.82327696	
13,771.00	89.85	312.29	6,502.66	5,282.90	-5,228.49	14,446,222.94	1,689,997.58	39.77876409	-80.82352576	
13,866.00	89.76	313.00	6,502.98	5,347.25	-5,298.37	14,446,287.29	1,689,927.71	39.77894121	-80.82377402	
13,961.00	89.93	313.00	6,503.24	5,412.04	-5,367.85	14,446,352.08	1,689,858.23	39.77911951	-80.82402086	
14,056.00	90.42	312.91	6,502.95	5,476.78	-5,437.38	14,446,416.82	1,689,788.70	39.77929767	-80.82426788	
14,151.00	89.58	311.68	6,502.95	5,540.71	-5,507.65	14,446,480.75	1,689,718.43	39.77947361	-80.82451755	
14,246.00	89.80	311.59	6,503.46	5,603.82	-5,578.65	14,446,543.86	1,689,647.43	39.77964733	-80.82476982	
14,341.00	90.15	311.33	6,503.50	5,666.72	-5,649.84	14,446,606.76	1,689,576.24	39.77982045	-80.82502279	
14,436.00	90.46	311.59	6,503.00	5,729.62	-5,721.04	14,446,669.66	1,689,505.04	39.77999356	-80.82527576	





<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Blake 02 HM (slot E)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1326+18 @ 1344.00ft (Precision 528)
<b>Site:</b>	Blake Pad	<b>MD Reference:</b>	RKB=1326+18 @ 1344.00ft (Precision 528)
<b>Well:</b>	Blake 02 HM (slot E)	<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

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Survey JUL 10 2020

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	WV Department of Environmental Protection	
								Latitude	Longitude
14,531.00	90.33	311.86	6,502.34	5,792.85	-5,791.94	14,446,732.88	1,689,434.14	39.78016758	-80.82552768
14,626.00	90.86	311.33	6,501.36	5,855.91	-5,862.98	14,446,795.95	1,689,363.10	39.78034115	-80.82578011
14,721.00	91.03	310.80	6,499.79	5,918.31	-5,934.60	14,446,858.35	1,689,291.48	39.78051289	-80.82603459
14,815.00	91.12	311.15	6,498.03	5,979.93	-6,005.55	14,446,919.97	1,689,220.53	39.78068252	-80.82628673
14,911.00	91.16	311.15	6,496.12	6,043.09	-6,077.83	14,446,983.13	1,689,148.25	39.78085635	-80.82654354
15,006.00	90.29	310.27	6,494.91	6,105.05	-6,149.83	14,447,045.09	1,689,076.25	39.78102689	-80.82679941
15,101.00	89.23	309.13	6,495.31	6,165.73	-6,222.92	14,447,105.77	1,689,003.16	39.78119392	-80.82705915
15,196.00	89.45	308.95	6,496.41	6,225.56	-6,296.70	14,447,165.60	1,688,929.38	39.78135863	-80.82732136
15,291.00	89.10	308.34	6,497.61	6,284.88	-6,370.89	14,447,224.92	1,688,855.19	39.78152193	-80.82758503
15,386.00	89.45	309.13	6,498.81	6,344.32	-6,444.99	14,447,284.36	1,688,781.09	39.78168556	-80.82784837
15,481.00	91.12	310.54	6,498.34	6,405.17	-6,517.94	14,447,345.21	1,688,708.14	39.78185306	-80.82810760
15,576.00	91.30	310.54	6,496.33	6,466.91	-6,590.12	14,447,406.94	1,688,635.96	39.78202298	-80.82836410
15,671.00	91.65	310.89	6,493.89	6,528.85	-6,662.10	14,447,468.89	1,688,563.98	39.78219348	-80.82861989
15,766.00	90.99	311.59	6,491.70	6,591.46	-6,733.51	14,447,531.50	1,688,492.57	39.78236579	-80.82887367
15,861.00	91.12	311.33	6,489.95	6,654.35	-6,804.70	14,447,594.39	1,688,421.38	39.78253888	-80.82912661
15,956.00	90.90	311.42	6,488.27	6,717.13	-6,875.97	14,447,657.17	1,688,350.11	39.78271167	-80.82937990
16,051.00	90.95	311.06	6,486.74	6,779.75	-6,947.40	14,447,719.79	1,688,278.68	39.78288401	-80.82963372
16,146.00	90.20	311.24	6,485.79	6,842.26	-7,018.93	14,447,782.30	1,688,207.15	39.78305605	-80.82988790
16,240.00	90.90	310.45	6,484.88	6,903.73	-7,090.03	14,447,843.77	1,688,136.05	39.78322525	-80.83014059
16,336.00	90.51	311.06	6,483.70	6,966.40	-7,162.75	14,447,906.44	1,688,063.33	39.78339772	-80.83039900
16,430.00	90.64	311.15	6,482.76	7,028.20	-7,233.58	14,447,968.23	1,687,992.51	39.78356780	-80.83065069
16,525.00	90.95	310.89	6,481.44	7,090.54	-7,305.24	14,448,030.58	1,687,920.84	39.78373939	-80.83090538
16,621.00	90.73	312.29	6,480.03	7,154.26	-7,377.03	14,448,094.29	1,687,849.05	39.78391474	-80.83116049
16,716.00	90.73	312.29	6,478.82	7,218.18	-7,447.30	14,448,158.21	1,687,778.78	39.78409065	-80.83141019
16,810.00	90.77	312.03	6,477.59	7,281.26	-7,516.98	14,448,221.30	1,687,709.10	39.78426426	-80.83165778
16,904.00	90.77	312.21	6,476.33	7,344.30	-7,586.70	14,448,284.34	1,687,639.39	39.78443774	-80.83190552
17,000.00	90.86	312.56	6,474.96	7,409.01	-7,657.60	14,448,349.05	1,687,568.49	39.78461581	-80.83215747
17,095.00	91.16	312.38	6,473.29	7,473.14	-7,727.66	14,448,413.18	1,687,498.42	39.78479231	-80.83240644
17,191.00	90.33	312.38	6,472.04	7,537.85	-7,798.57	14,448,477.88	1,687,427.51	39.78497036	-80.83265842
17,286.00	90.68	311.77	6,471.20	7,601.50	-7,869.08	14,448,541.54	1,687,357.00	39.78514554	-80.83290899
17,381.00	90.37	310.62	6,470.33	7,664.07	-7,940.56	14,448,604.10	1,687,285.52	39.78531773	-80.83316302
17,476.00	90.86	310.10	6,469.31	7,725.59	-8,012.95	14,448,665.62	1,687,213.14	39.78548704	-80.83342027
17,571.00	90.73	309.57	6,468.00	7,786.44	-8,085.89	14,448,726.47	1,687,140.19	39.78565452	-80.83367952
17,666.00	90.77	308.87	6,466.75	7,846.50	-8,159.48	14,448,786.53	1,687,066.60	39.78581985	-80.83394109
17,761.00	91.12	308.16	6,465.19	7,905.65	-8,233.80	14,448,845.68	1,686,992.28	39.78598267	-80.83420526
17,855.00	91.16	307.28	6,463.32	7,963.15	-8,308.14	14,448,903.18	1,686,917.94	39.78614095	-80.83446950
17,886.00	91.00	308.16	6,462.73	7,982.11	-8,332.66	14,448,922.14	1,686,893.43	39.78619315	-80.83455665
<b>Survey @ 17886.00 MD 6462.73 TVD</b>									
17,942.00	91.00	308.16	6,461.75	8,016.70	-8,376.68	14,448,956.74	1,686,849.40	39.78628838	-80.83471314
<b>Survey projected to 17942.00 MD 6461.75 TVD</b>									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
189.00	189.00	-0.22	-0.78	MWD surveys	
17,886.00	6,462.73	7,982.11	-8,332.66	Survey @ 17886.00 MD 6462.73 TVD	
17,942.00	6,461.75	8,016.70	-8,376.68	Survey projected to 17942.00 MD 6461.75 TVD	