

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Ten High 1N-04HM (A)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1310+33 @ 1343.00usft (Nabors X08)
Site:	Ten High	MD Reference:	RKB=1310+33 @ 1343.00usft (Nabors X08)
Well:	Ten High 1N-04HM (A)	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	Ten High				
Site Position:		Northing:	14,456,545.60 usft	Latitude:	39.80680885
From:	Lat/Long	Easting:	1,730,001.41 usft	Longitude:	-80.68101011
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.20 °

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Well	Ten High 1N-04HM (A)					
Well Position	+N/-S	0.00 usft	Northing:	14,456,545.60 usft	Latitude:	39.80680885
	+E/-W	0.00 usft	Easting:	1,730,001.41 usft	Longitude:	-80.68101011
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,310.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/8/2018	-8.75	66.85	52,019.35255404

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	335.38	

Survey Program	Date 11/16/2018				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
183.00	1,119.00	MWD surf (Original Hole)	MWD	MWD - Standard	
1,167.00	6,096.00	MWD 8 3/4 (Original Hole)	MWD	MWD - Standard	
6,167.00	18,237.00	MWD lat (Original Hole)	MWD	MWD - Standard	
18,297.00	18,297.00	Projection (Original Hole)	MWD	MWD - Standard	

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	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
183.00	1.07	143.54	182.99	-1.37	1.02	14,456,544.23	1,730,002.43	39.80680507	-80.68100651	
MWD surveys										
215.00	0.75	158.60	214.99	-1.81	1.27	14,456,543.79	1,730,002.68	39.80680387	-80.68100561	
246.00	0.93	165.68	245.98	-2.24	1.41	14,456,543.36	1,730,002.82	39.80680268	-80.68100513	
278.00	0.88	173.64	277.98	-2.74	1.50	14,456,542.86	1,730,002.91	39.80680132	-80.68100481	
310.00	1.04	164.16	309.97	-3.26	1.60	14,456,542.34	1,730,003.02	39.80679988	-80.68100444	
341.00	0.84	159.87	340.97	-3.75	1.76	14,456,541.86	1,730,003.17	39.80679855	-80.68100390	
375.00	0.51	160.97	374.97	-4.12	1.89	14,456,541.48	1,730,003.31	39.80679751	-80.68100342	

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Site: Ten High
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Wellbore: Original Hole
Design: Surveys Original Hole

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TVD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
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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		
407.00	0.45	188.31	406.97	-4.38	1.92	14,456,541.22	1,730,003.34	39.80679680	-80.68100332		
438.00	0.54	161.34	437.96	-4.64	1.95	14,456,540.96	1,730,003.37	39.80679609	-80.68100322		
470.00	0.04	143.89	469.96	-4.79	2.01	14,456,540.81	1,730,003.42	39.80679567	-80.68100303		
502.00	0.18	216.99	501.96	-4.84	1.98	14,456,540.76	1,730,003.40	39.80679554	-80.68100311		
533.00	0.40	168.35	532.96	-4.99	1.97	14,456,540.62	1,730,003.39	39.80679514	-80.68100314		
565.00	0.15	150.93	564.96	-5.13	2.02	14,456,540.47	1,730,003.43	39.80679474	-80.68100299		
596.00	0.17	251.73	595.96	-5.18	1.99	14,456,540.42	1,730,003.41	39.80679460	-80.68100308		
628.00	0.34	205.17	627.96	-5.28	1.91	14,456,540.32	1,730,003.32	39.80679432	-80.68100338		
660.00	0.22	317.93	659.96	-5.32	1.83	14,456,540.28	1,730,003.24	39.80679421	-80.68100367		
691.00	0.29	201.96	690.96	-5.35	1.76	14,456,540.25	1,730,003.17	39.80679414	-80.68100392		
722.00	0.38	177.33	721.96	-5.53	1.73	14,456,540.07	1,730,003.15	39.80679365	-80.68100401		
754.00	0.27	115.05	753.96	-5.67	1.81	14,456,539.94	1,730,003.22	39.80679328	-80.68100375		
785.00	0.19	161.23	784.96	-5.75	1.89	14,456,539.86	1,730,003.30	39.80679306	-80.68100346		
817.00	0.28	232.64	816.96	-5.84	1.84	14,456,539.76	1,730,003.26	39.80679279	-80.68100362		
848.00	0.00	65.46	847.96	-5.89	1.78	14,456,539.71	1,730,003.20	39.80679266	-80.68100383		
880.00	0.35	179.25	879.96	-5.99	1.78	14,456,539.62	1,730,003.20	39.80679239	-80.68100383		
912.00	0.30	197.34	911.96	-6.16	1.76	14,456,539.44	1,730,003.18	39.80679191	-80.68100392		
943.00	0.14	135.11	942.96	-6.27	1.76	14,456,539.33	1,730,003.18	39.80679162	-80.68100391		
964.00	0.26	172.29	963.96	-6.33	1.79	14,456,539.27	1,730,003.20	39.80679144	-80.68100382		
1,006.00	0.23	128.60	1,005.96	-6.48	1.87	14,456,539.12	1,730,003.28	39.80679104	-80.68100354		
1,038.00	0.21	179.95	1,037.96	-6.58	1.92	14,456,539.02	1,730,003.33	39.80679076	-80.68100337		
1,069.00	0.27	149.80	1,068.96	-6.70	1.95	14,456,538.90	1,730,003.37	39.80679043	-80.68100324		
1,101.00	0.29	180.69	1,100.96	-6.85	1.99	14,456,538.76	1,730,003.41	39.80679003	-80.68100311		
1,119.00	0.42	157.85	1,118.96	-6.95	2.02	14,456,538.65	1,730,003.43	39.80678974	-80.68100302		
1,167.00	0.48	238.01	1,166.96	-7.22	1.91	14,456,538.38	1,730,003.33	39.80678900	-80.68100340		
1,262.00	0.77	255.42	1,261.95	-7.59	0.96	14,456,538.01	1,730,002.37	39.80678799	-80.68100680		
1,356.00	0.78	314.77	1,355.94	-7.30	-0.11	14,456,538.30	1,730,001.31	39.80678880	-80.68101059		
1,451.00	1.71	342.01	1,450.92	-5.50	-1.01	14,456,540.10	1,730,000.41	39.80679376	-80.68101376		
1,546.00	1.72	9.80	1,545.88	-2.75	-1.20	14,456,542.86	1,730,000.21	39.80680133	-80.68101442		
1,640.00	1.67	19.91	1,639.84	-0.07	-0.50	14,456,545.54	1,730,000.92	39.80680867	-80.68101187		
1,735.00	1.98	28.70	1,734.79	2.67	0.76	14,456,548.28	1,730,002.18	39.80681619	-80.68100735		
1,830.00	2.90	23.48	1,829.70	6.32	2.51	14,456,551.92	1,730,003.93	39.80682618	-80.68100109		
1,925.00	3.28	23.06	1,924.57	11.02	4.53	14,456,556.62	1,730,005.95	39.80683908	-80.68099383		
2,020.00	3.36	23.22	2,019.41	16.08	6.69	14,456,561.68	1,730,008.11	39.80685295	-80.68098607		
2,115.00	3.50	16.55	2,114.24	21.42	8.62	14,456,567.02	1,730,010.03	39.80686759	-80.68097915		
2,209.00	3.38	23.21	2,208.07	26.72	10.53	14,456,572.32	1,730,011.94	39.80688212	-80.68097229		
2,304.00	2.79	37.50	2,302.93	31.13	13.04	14,456,576.73	1,730,014.45	39.80689420	-80.68096329		
2,399.00	2.37	40.42	2,397.84	34.45	15.72	14,456,580.06	1,730,017.13	39.80690332	-80.68095370		
2,493.00	2.45	40.62	2,491.75	37.46	18.29	14,456,583.06	1,730,019.70	39.80691155	-80.68094452		
2,588.00	2.01	32.25	2,586.68	40.41	20.50	14,456,586.01	1,730,021.91	39.80691963	-80.68093661		
2,682.00	2.83	25.28	2,680.60	43.90	22.37	14,456,589.50	1,730,023.78	39.80692920	-80.68092990		
2,777.00	3.13	19.56	2,775.47	48.47	24.24	14,456,594.07	1,730,025.65	39.80694172	-80.68092319		
2,871.00	2.72	24.19	2,869.34	52.92	26.01	14,456,598.52	1,730,027.43	39.80695393	-80.68091682		
2,903.00	2.41	25.44	2,901.31	54.22	26.61	14,456,599.82	1,730,028.03	39.80695749	-80.68091466		
2,993.00	2.57	18.48	2,991.23	57.84	28.06	14,456,603.44	1,730,029.48	39.80696743	-80.68090944		
3,069.00	1.14	54.89	3,067.19	59.89	29.22	14,456,605.50	1,730,030.64	39.80697305	-80.68090529		
3,163.00	1.32	73.42	3,161.17	60.74	31.03	14,456,606.34	1,730,032.44	39.80697536	-80.68089886		
3,257.00	0.38	357.57	3,255.16	61.36	32.05	14,456,606.96	1,730,033.47	39.80697705	-80.68089521		
3,352.00	0.70	117.94	3,350.16	61.40	32.55	14,456,607.01	1,730,033.97	39.80697716	-80.68089343		
3,446.00	1.92	121.20	3,444.13	60.32	34.40	14,456,605.92	1,730,035.82	39.80697416	-80.68088684		
3,541.00	1.88	125.29	3,539.08	58.59	37.04	14,456,604.20	1,730,038.45	39.80696940	-80.68087749		
3,636.00	1.79	121.95	3,634.03	56.91	39.57	14,456,602.51	1,730,040.98	39.80696475	-80.68086850		
3,730.00	1.66	121.55	3,727.99	55.42	41.97	14,456,601.02	1,730,043.39	39.80696064	-80.68085995		
3,825.00	1.72	114.87	3,822.94	54.10	44.44	14,456,599.70	1,730,045.86	39.80695699	-80.68085118		
3,919.00	1.52	113.39	3,916.91	53.01	46.86	14,456,598.61	1,730,048.28	39.80695398	-80.68084257		

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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
4,013.00	1.46	121.86	4,010.87	51.88	49.03	14,456,597.49	1,730,050.44	39.80695086	-80.68083488
4,108.00	3.18	110.51	4,105.79	50.32	52.52	14,456,595.92	1,730,053.94	39.80694653	-80.68082245
4,202.00	5.15	102.74	4,199.54	48.48	59.08	14,456,594.08	1,730,060.49	39.80694141	-80.68079913
4,297.00	6.77	95.24	4,294.03	47.03	68.82	14,456,592.63	1,730,070.23	39.80693732	-80.68076448
4,393.00	8.55	88.46	4,389.17	46.70	81.59	14,456,592.30	1,730,083.00	39.80693631	-80.68071902
4,488.00	9.77	85.26	4,482.96	47.56	96.68	14,456,593.16	1,730,098.09	39.80693851	-80.68066526
4,583.00	11.11	81.00	4,576.38	49.66	113.75	14,456,595.26	1,730,115.17	39.80694410	-80.68060444
4,677.00	12.71	78.33	4,668.36	53.16	132.83	14,456,598.77	1,730,134.24	39.80695355	-80.68053648
4,772.00	14.47	82.39	4,760.69	56.85	154.83	14,456,602.45	1,730,156.24	39.80696346	-80.68045809
4,867.00	16.43	85.67	4,852.26	59.44	179.99	14,456,605.04	1,730,181.41	39.80697032	-80.68036846
4,961.00	15.92	93.38	4,942.55	59.68	206.12	14,456,605.28	1,730,207.53	39.80697073	-80.68027542
5,055.00	17.39	99.13	5,032.61	56.69	232.86	14,456,602.29	1,730,234.28	39.80696226	-80.68018024
5,150.00	19.83	97.88	5,122.63	52.23	262.84	14,456,597.83	1,730,264.26	39.80694971	-80.68007353
5,245.00	22.41	96.51	5,211.25	47.97	296.80	14,456,593.57	1,730,298.22	39.80693767	-80.67995267
5,340.00	25.99	95.84	5,297.88	43.79	335.51	14,456,589.40	1,730,336.93	39.80692583	-80.67981488
5,434.00	29.74	89.00	5,380.99	42.10	379.34	14,456,587.71	1,730,380.76	39.80692076	-80.67965885
5,528.00	27.84	85.24	5,463.38	44.33	424.54	14,456,589.93	1,730,425.95	39.80692643	-80.67949790
5,623.00	26.53	85.15	5,547.88	47.97	467.78	14,456,593.57	1,730,469.20	39.80693599	-80.67934386
5,718.00	26.37	88.98	5,632.94	50.14	510.02	14,456,595.74	1,730,511.44	39.80694153	-80.67919343
5,812.00	28.84	89.41	5,716.23	50.74	553.57	14,456,596.34	1,730,554.99	39.80694276	-80.67903835
5,907.00	28.61	83.68	5,799.56	53.48	599.10	14,456,599.08	1,730,600.51	39.80694984	-80.67887621
6,001.00	27.12	85.99	5,882.66	57.46	642.84	14,456,603.06	1,730,644.26	39.80696033	-80.67872040
6,096.00	27.79	88.93	5,966.96	59.39	686.59	14,456,604.99	1,730,688.00	39.80696519	-80.67856461
6,212.00	25.23	85.97	6,070.76	61.63	738.30	14,456,607.23	1,730,739.71	39.80697084	-80.67838046
6,307.00	26.64	61.71	6,156.44	73.18	777.36	14,456,618.78	1,730,778.78	39.80700218	-80.67824122
6,402.00	29.32	36.75	6,240.61	102.01	810.15	14,456,647.62	1,730,811.57	39.80708104	-80.67812409
6,496.00	33.98	18.74	6,320.79	145.45	832.42	14,456,691.05	1,730,833.84	39.80720011	-80.67804423
6,590.00	33.93	9.77	6,398.81	196.21	845.32	14,456,741.82	1,730,846.74	39.80733939	-80.67799765
6,685.00	35.60	3.71	6,476.87	249.96	851.61	14,456,795.56	1,730,853.03	39.80748692	-80.67797456
6,780.00	35.96	356.24	6,553.98	305.41	851.57	14,456,851.01	1,730,852.99	39.80763920	-80.67797399
6,874.00	38.68	349.91	6,628.76	361.90	844.61	14,456,907.50	1,730,846.03	39.80779441	-80.67799805
6,969.00	43.56	345.95	6,700.31	422.93	831.46	14,456,968.53	1,730,832.87	39.80796214	-80.67804412
7,063.00	51.78	342.79	6,763.57	489.74	812.63	14,457,035.35	1,730,814.05	39.80814582	-80.67811029
7,158.00	61.98	341.65	6,815.41	565.39	788.33	14,457,110.99	1,730,789.74	39.80835381	-80.67819587
7,253.00	69.93	341.29	6,854.09	647.58	760.77	14,457,193.18	1,730,762.18	39.80857979	-80.67829294
7,348.00	76.00	341.12	6,881.90	733.53	731.52	14,457,279.13	1,730,732.93	39.80881611	-80.67839601
7,442.00	81.93	338.83	6,899.89	820.16	699.92	14,457,365.76	1,730,701.34	39.80905434	-80.67850740
7,537.00	87.16	335.67	6,908.92	907.33	663.36	14,457,452.93	1,730,664.77	39.80929408	-80.67863649
7,631.00	91.12	334.53	6,910.33	992.56	623.79	14,457,538.17	1,730,625.21	39.80952854	-80.67877628
7,726.00	90.86	333.56	6,908.69	1,077.97	582.22	14,457,623.57	1,730,583.64	39.80976349	-80.67892322
7,821.00	91.03	332.24	6,907.12	1,162.52	538.95	14,457,708.13	1,730,540.37	39.80999613	-80.67907622
7,915.00	88.09	331.45	6,907.84	1,245.39	494.60	14,457,790.99	1,730,496.02	39.81022414	-80.67923308
8,010.00	88.22	330.66	6,910.90	1,328.48	448.65	14,457,874.08	1,730,450.07	39.81045277	-80.67939565
8,105.00	89.54	330.75	6,912.76	1,411.31	402.18	14,457,956.91	1,730,403.59	39.81068071	-80.67956008
8,199.00	90.64	330.84	6,912.61	1,493.36	356.31	14,458,038.96	1,730,357.73	39.81090649	-80.67972236
8,294.00	91.47	328.64	6,910.86	1,575.40	308.45	14,458,121.00	1,730,309.86	39.81113225	-80.67989175
8,389.00	92.31	327.58	6,907.73	1,656.01	258.29	14,458,201.61	1,730,259.71	39.81135413	-80.68006933
8,483.00	93.01	327.67	6,903.37	1,735.32	208.01	14,458,280.92	1,730,209.43	39.81157241	-80.68024736
8,578.00	91.96	328.29	6,899.25	1,815.79	157.69	14,458,361.39	1,730,159.11	39.81179389	-80.68042553
8,672.00	91.30	329.43	6,896.57	1,896.21	109.10	14,458,441.81	1,730,110.52	39.81201522	-80.68059754
8,767.00	91.65	329.60	6,894.13	1,978.05	60.92	14,458,523.65	1,730,062.34	39.81224045	-80.68076806
8,861.00	91.96	328.29	6,891.17	2,058.53	12.46	14,458,604.13	1,730,013.87	39.81246196	-80.68093962
8,955.00	90.29	329.87	6,889.32	2,139.15	-35.83	14,458,684.75	1,729,965.58	39.81268383	-80.68111055
9,049.00	90.64	329.43	6,888.56	2,220.27	-83.33	14,458,765.87	1,729,918.09	39.81290706	-80.68127865
9,144.00	91.78	329.60	6,886.55	2,302.11	-131.51	14,458,847.72	1,729,869.91	39.81313230	-80.68144920

Company: Tug Hill Operating LLC	Local Co-ordinate Reference: Well Ten High 1N-04HM (A)
Project: Marshall County, West Virginia.	TVD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
Site: Ten High	MD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
Well: Ten High 1N-04HM (A)	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
9,239.00	90.55	332.68	6,884.62	2,385.29	-177.35	14,458,930.89	1,729,824.07	39.81336116	-80.68161137
9,333.00	91.43	332.33	6,883.00	2,468.66	-220.74	14,459,014.26	1,729,780.68	39.81359054	-80.68176483
9,428.00	92.35	332.07	6,879.86	2,552.65	-265.02	14,459,098.25	1,729,736.40	39.81382162	-80.68192146
9,523.00	91.08	331.80	6,877.02	2,636.44	-309.69	14,459,182.04	1,729,691.72	39.81405217	-80.68207949
9,617.00	92.09	331.54	6,874.42	2,719.14	-354.28	14,459,264.75	1,729,647.13	39.81427974	-80.68223723
9,712.00	90.42	330.48	6,872.34	2,802.22	-400.31	14,459,347.82	1,729,601.10	39.81450832	-80.68240009
9,806.00	90.99	330.22	6,871.18	2,883.90	-446.81	14,459,429.50	1,729,554.60	39.81473311	-80.68256465
9,901.00	92.04	330.31	6,868.67	2,966.36	-493.91	14,459,511.97	1,729,507.50	39.81496002	-80.68273134
9,996.00	90.51	330.04	6,866.56	3,048.76	-541.15	14,459,594.36	1,729,460.27	39.81518676	-80.68289851
10,091.00	91.60	330.84	6,864.81	3,131.38	-588.01	14,459,676.98	1,729,413.41	39.81541410	-80.68306434
10,185.00	92.62	331.63	6,861.35	3,213.72	-633.21	14,459,759.32	1,729,368.21	39.81564068	-80.68322427
10,280.00	90.99	331.10	6,858.36	3,297.06	-678.71	14,459,842.66	1,729,322.70	39.81586998	-80.68338527
10,375.00	91.82	330.75	6,856.03	3,380.06	-724.86	14,459,925.66	1,729,276.55	39.81609837	-80.68354857
10,469.00	93.01	330.75	6,852.07	3,462.00	-770.75	14,460,007.60	1,729,230.66	39.81632385	-80.68371096
10,564.00	91.69	330.84	6,848.17	3,544.85	-817.06	14,460,090.45	1,729,184.35	39.81655183	-80.68387485
10,659.00	91.78	329.25	6,845.29	3,627.12	-864.48	14,460,172.72	1,729,136.94	39.81677822	-80.68404266
10,753.00	91.96	328.20	6,842.23	3,707.42	-913.25	14,460,253.02	1,729,088.17	39.81699920	-80.68421534
10,848.00	89.58	328.46	6,840.95	3,788.26	-963.12	14,460,333.86	1,729,038.30	39.81722169	-80.68439192
10,942.00	90.02	327.76	6,841.28	3,868.07	-1,012.78	14,460,413.67	1,728,988.64	39.81744135	-80.68456777
11,037.00	90.73	328.29	6,840.66	3,948.65	-1,063.08	14,460,494.25	1,728,938.33	39.81766314	-80.68474591
11,132.00	91.38	328.55	6,838.91	4,029.57	-1,112.83	14,460,575.17	1,728,888.59	39.81788584	-80.68492204
11,226.00	92.79	328.81	6,835.49	4,109.81	-1,161.65	14,460,655.42	1,728,839.76	39.81810669	-80.68509493
11,320.00	93.76	328.99	6,830.12	4,190.17	-1,210.13	14,460,735.77	1,728,791.29	39.81832784	-80.68526655
11,414.00	92.26	327.76	6,825.18	4,270.10	-1,259.35	14,460,815.70	1,728,742.07	39.81854781	-80.68544084
11,509.00	92.35	327.67	6,821.36	4,350.35	-1,310.05	14,460,895.95	1,728,691.37	39.81876868	-80.68562040
11,603.00	91.16	328.81	6,818.48	4,430.23	-1,359.50	14,460,975.83	1,728,641.91	39.81898854	-80.68579552
11,697.00	90.86	328.46	6,816.82	4,510.48	-1,408.42	14,461,056.08	1,728,592.99	39.81920940	-80.68596873
11,792.00	91.16	331.10	6,815.15	4,592.55	-1,456.22	14,461,138.15	1,728,545.19	39.81943524	-80.68613795
11,887.00	91.25	330.66	6,813.15	4,675.52	-1,502.45	14,461,221.13	1,728,498.97	39.81966355	-80.68630152
11,981.00	92.22	330.57	6,810.31	4,757.39	-1,548.55	14,461,302.99	1,728,452.87	39.81988882	-80.68646468
12,076.00	92.66	330.13	6,806.26	4,839.88	-1,595.50	14,461,385.48	1,728,405.91	39.82011580	-80.68663088
12,171.00	91.69	330.40	6,802.66	4,922.31	-1,642.59	14,461,467.91	1,728,358.83	39.82034263	-80.68679753
12,266.00	92.62	330.48	6,799.08	5,004.88	-1,689.42	14,461,550.49	1,728,312.00	39.82056985	-80.68696330
12,360.00	90.68	331.71	6,796.38	5,087.13	-1,734.83	14,461,632.74	1,728,266.58	39.82079616	-80.68712401
12,455.00	91.21	331.80	6,794.81	5,170.81	-1,779.78	14,461,716.41	1,728,221.63	39.82102639	-80.68728306
12,550.00	91.56	331.45	6,792.51	5,254.37	-1,824.92	14,461,799.97	1,728,176.50	39.82125631	-80.68744276
12,644.00	89.89	332.68	6,791.33	5,337.41	-1,868.95	14,461,883.01	1,728,132.47	39.82148476	-80.68759854
12,739.00	90.59	333.03	6,790.93	5,421.94	-1,912.29	14,461,967.55	1,728,089.12	39.82171733	-80.68775185
12,833.00	91.47	333.56	6,789.24	5,505.90	-1,954.53	14,462,051.50	1,728,046.89	39.82194831	-80.68790123
12,928.00	92.48	333.82	6,785.96	5,591.01	-1,996.61	14,462,136.61	1,728,004.81	39.82218243	-80.68805005
13,023.00	89.14	332.24	6,784.62	5,675.65	-2,039.68	14,462,221.26	1,727,961.73	39.82241530	-80.68820240
13,118.00	89.45	330.13	6,785.79	5,758.88	-2,085.46	14,462,304.48	1,727,915.95	39.82264430	-80.68836443
13,212.00	90.81	328.73	6,785.58	5,839.81	-2,133.27	14,462,385.41	1,727,868.15	39.82286701	-80.68853368
13,307.00	92.26	328.02	6,783.03	5,920.67	-2,183.06	14,462,466.27	1,727,818.35	39.82308955	-80.68871002
13,401.00	93.41	328.46	6,778.38	6,000.50	-2,232.48	14,462,546.10	1,727,768.94	39.82330924	-80.68888504
13,496.00	91.96	328.90	6,773.93	6,081.56	-2,281.81	14,462,627.16	1,727,719.61	39.82353233	-80.68905971
13,590.00	93.14	328.99	6,769.75	6,162.01	-2,330.25	14,462,707.61	1,727,671.17	39.82375372	-80.68923125
13,685.00	90.11	326.79	6,767.06	6,242.43	-2,380.72	14,462,788.03	1,727,620.70	39.82397505	-80.68941000
13,776.00	90.99	326.88	6,766.18	6,318.60	-2,430.50	14,462,864.20	1,727,570.92	39.82418471	-80.68958635
13,870.00	92.09	329.52	6,763.66	6,398.45	-2,480.01	14,462,944.05	1,727,521.41	39.82440448	-80.68976171
13,965.00	90.42	328.99	6,761.58	6,480.08	-2,528.56	14,463,025.68	1,727,472.86	39.82462910	-80.68993362
14,059.00	91.52	329.78	6,759.98	6,560.96	-2,576.42	14,463,106.56	1,727,424.99	39.82485169	-80.69010310
14,153.00	92.04	329.08	6,757.06	6,641.86	-2,624.21	14,463,187.46	1,727,377.21	39.82507430	-80.69027229
14,248.00	91.38	330.66	6,754.23	6,723.98	-2,671.87	14,463,269.58	1,727,329.54	39.82530028	-80.69044104
14,342.00	90.90	330.48	6,752.36	6,805.83	-2,718.05	14,463,351.44	1,727,283.37	39.82552551	-80.69060450

WV Department of Environmental Protection

Company: Tug Hill Operating LLC	Local Co-ordinate Reference: Well Ten High 1N-04HM (A)
Project: Marshall County, West Virginia.	TVD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
Site: Ten High	MD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
Well: Ten High 1N-04HM (A)	North Reference: Grid
Wellbore: Original Hole	Survey Calculation Method: Minimum Curvature
Design: Surveys Original Hole	Database: DB_Aug0116_LT_v14

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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
14,436.00	91.65	330.40	6,750.27	6,887.58	-2,764.41	14,463,433.18	1,727,237.00	39.82575044	-80.69076862
14,531.00	89.98	331.01	6,748.92	6,970.42	-2,810.89	14,463,516.02	1,727,190.53	39.82597838	-80.69093314
14,625.00	90.07	330.66	6,748.87	7,052.50	-2,856.70	14,463,598.10	1,727,144.72	39.82620423	-80.69109529
14,719.00	90.95	331.01	6,748.04	7,134.58	-2,902.50	14,463,680.18	1,727,098.91	39.82643007	-80.69125743
14,813.00	92.22	331.19	6,745.44	7,216.84	-2,947.91	14,463,762.44	1,727,053.50	39.82665641	-80.69141816
14,908.00	90.24	329.25	6,743.40	7,299.27	-2,995.08	14,463,844.87	1,727,006.33	39.82688322	-80.69158515
15,003.00	90.77	329.96	6,742.56	7,381.20	-3,043.15	14,463,926.81	1,726,958.27	39.82710870	-80.69175533
15,097.00	91.82	330.75	6,740.44	7,462.88	-3,089.63	14,464,008.48	1,726,911.79	39.82733343	-80.69191989
15,191.00	89.98	329.87	6,738.96	7,544.52	-3,136.18	14,464,090.12	1,726,865.24	39.82755809	-80.69208469
15,285.00	90.68	329.78	6,738.42	7,625.78	-3,183.43	14,464,171.39	1,726,817.99	39.82778169	-80.69225198
15,380.00	91.65	330.04	6,736.49	7,707.96	-3,231.04	14,464,253.57	1,726,770.37	39.82800783	-80.69242058
15,474.00	90.81	330.13	6,734.47	7,789.42	-3,277.91	14,464,335.02	1,726,723.50	39.82823197	-80.69258652
15,569.00	91.52	329.52	6,732.54	7,871.53	-3,325.65	14,464,417.13	1,726,675.76	39.82845791	-80.69275556
15,663.00	90.77	329.60	6,730.66	7,952.55	-3,373.27	14,464,498.16	1,726,628.15	39.82868088	-80.69292416
15,758.00	91.65	330.22	6,728.65	8,034.73	-3,420.88	14,464,580.34	1,726,580.53	39.82890701	-80.69309276
15,852.00	91.30	329.96	6,726.23	8,116.19	-3,467.74	14,464,661.79	1,726,533.67	39.82913114	-80.69325866
15,946.00	91.21	327.58	6,724.18	8,196.54	-3,516.46	14,464,742.14	1,726,484.95	39.82935227	-80.69343122
16,041.00	89.71	327.58	6,723.41	8,276.73	-3,567.39	14,464,822.33	1,726,434.02	39.82957296	-80.69361164
16,136.00	89.98	329.43	6,723.67	8,357.73	-3,617.02	14,464,903.33	1,726,384.40	39.82979588	-80.69378743
16,230.00	91.12	329.43	6,722.77	8,438.66	-3,664.82	14,464,984.26	1,726,336.59	39.83001858	-80.69395671
16,324.00	92.26	329.43	6,720.00	8,519.56	-3,712.61	14,465,065.16	1,726,288.81	39.83024119	-80.69412594
16,419.00	91.69	330.22	6,716.72	8,601.63	-3,760.33	14,465,147.24	1,726,241.08	39.83046704	-80.69429492
16,513.00	92.09	330.04	6,713.62	8,683.10	-3,807.12	14,465,228.70	1,726,194.29	39.83069121	-80.69446059
16,607.00	90.77	330.22	6,711.28	8,764.59	-3,853.92	14,465,310.19	1,726,147.49	39.83091543	-80.69462630
16,702.00	91.69	329.69	6,709.24	8,846.80	-3,901.47	14,465,392.41	1,726,099.94	39.83114166	-80.69479468
16,796.00	90.11	329.25	6,707.76	8,927.76	-3,949.22	14,465,473.36	1,726,052.20	39.83136443	-80.69496376
16,891.00	90.73	329.78	6,707.06	9,009.62	-3,997.41	14,465,555.23	1,726,004.01	39.83158970	-80.69513443
16,985.00	90.64	327.67	6,705.94	9,089.95	-4,046.20	14,465,635.56	1,725,955.21	39.83181076	-80.69530725
17,080.00	91.30	327.41	6,704.33	9,170.10	-4,097.18	14,465,715.70	1,725,904.23	39.83203134	-80.69548787
17,174.00	91.03	329.34	6,702.42	9,250.12	-4,146.46	14,465,795.72	1,725,854.95	39.83225155	-80.69566243
17,268.00	89.80	329.52	6,701.74	9,331.05	-4,194.27	14,465,876.65	1,725,807.15	39.83247425	-80.69583173
17,362.00	90.64	329.60	6,701.38	9,412.09	-4,241.89	14,465,957.69	1,725,759.53	39.83269726	-80.69600039
17,457.00	91.52	329.60	6,699.59	9,494.02	-4,289.95	14,466,039.62	1,725,711.46	39.83292269	-80.69617060
17,551.00	91.65	331.45	6,696.99	9,575.81	-4,336.19	14,466,121.42	1,725,665.23	39.83314776	-80.69633430
17,645.00	88.53	331.19	6,696.84	9,658.27	-4,381.29	14,466,203.87	1,725,620.12	39.83337462	-80.69649397
17,739.00	89.19	330.75	6,698.71	9,740.45	-4,426.90	14,466,286.05	1,725,574.52	39.83360072	-80.69665543
17,834.00	90.29	331.01	6,699.14	9,823.44	-4,473.13	14,466,369.04	1,725,528.29	39.83382906	-80.69681910
17,929.00	90.90	330.31	6,698.15	9,906.24	-4,519.67	14,466,451.85	1,725,481.74	39.83405690	-80.69698391
18,023.00	91.69	329.78	6,696.03	9,987.67	-4,566.60	14,466,533.27	1,725,434.82	39.83428094	-80.69715007
18,118.00	92.79	329.96	6,692.32	10,069.77	-4,614.25	14,466,615.37	1,725,387.17	39.83450685	-80.69731882
18,212.00	93.54	330.31	6,687.13	10,151.16	-4,660.98	14,466,696.76	1,725,340.43	39.83473081	-80.69748432
18,237.00	93.76	330.40	6,685.54	10,172.84	-4,673.32	14,466,718.44	1,725,328.09	39.83479047	-80.69752801
Survey @ 18237.00 MD 6685.57 TVD									
18,297.00	93.76	330.40	6,681.60	10,224.90	-4,702.90	14,466,770.50	1,725,298.52	39.83493370	-80.69763273
Survey Projected to 18297.00 MD 6681.63 TVD									

Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia.
Site: Ten High
Well: Ten High 1N-04HM (A)
Wellbore: Original Hole
Design: Surveys Original Hole

Local Co-ordinate Reference: Well Ten High 1N-04HM (A)
TVD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
MD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Aug0116_LT_v14

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
183.00	182.99	-1.37	1.02	MWD surveys
18,237.00	6,685.54	10,172.84	-4,673.32	Survey @ 18237.00 MD 6685.57 TVD
18,297.00	6,681.60	10,224.90	-4,702.90	Survey Projected to 18297.00 MD 6681.63 TVD

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