



Well: Michter N-09HU (F)
Site: Michter
Project: Marshall County, West Virginia
Design: rev5
Rig: H&P 611

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
1	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.000	0.00	
2	1100.00	0.00	0.000	1100.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2°/100' build
3	1350.00	5.00	30.000	1349.68	9.44	5.45	2.00	30.000	7.06	Begin 5.00° tangent
4	2050.00	5.00	30.000	2047.02	62.28	35.96	0.00	0.000	46.54	Begin 2°/100' turn
5	2223.52	5.00	70.660	2219.93	71.33	46.87	2.00	110.259	51.39	Begin 5.00° tangent
6	3106.95	5.00	70.660	3100.00	96.83	119.53	0.00	0.000	50.95	
7	6519.94	5.00	70.660	6500.00	195.34	400.20	0.00	0.000	49.23	Begin 4°/100' build
8	7019.94	25.00	70.660	6980.51	237.98	521.69	4.00	0.000	48.49	Begin 25.00° tangent
9	10297.51	25.00	70.660	9951.00	696.71	1828.68	0.00	0.000	40.52	Begin 6°/100' build
10	11004.02	67.39	70.655	10428.97	861.77	2298.90	6.00	-0.007	37.67	Begin 67.39° tangent
11	11523.16	67.39	70.655	10628.55	1020.52	2751.08	0.00	0.000	34.95	Begin 8°/100' build/turn
12	12835.39	91.00	324.826	10971.00	2068.36	3026.37	8.00	-95.273	928.98	Begin 91.00° lateral
13	26107.91	91.00	324.826	10740.00	12915.80	-4618.20	0.00	0.000	3716.62	PBHL/TD 26107.91 MD/10740.00 TVD

ANNOTATIONS SURVEYS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Annotation
184.00	0.09	81.150	184.00	0.02	0.14	-0.03	MWD surveys
26069.00	91.38	324.340	10738.73	12880.48	-4599.32	13677.00	Survey @ 26069.00 MD 10738.73 TVD
26111.00	91.38	324.340	10737.72	12914.59	-4623.80	13717.37	Survey projected to 26111.00 MD 10737.72 TVD

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level
 Depth Reference: RKB=1128+25 @ 1153.00ft (H&P 611)

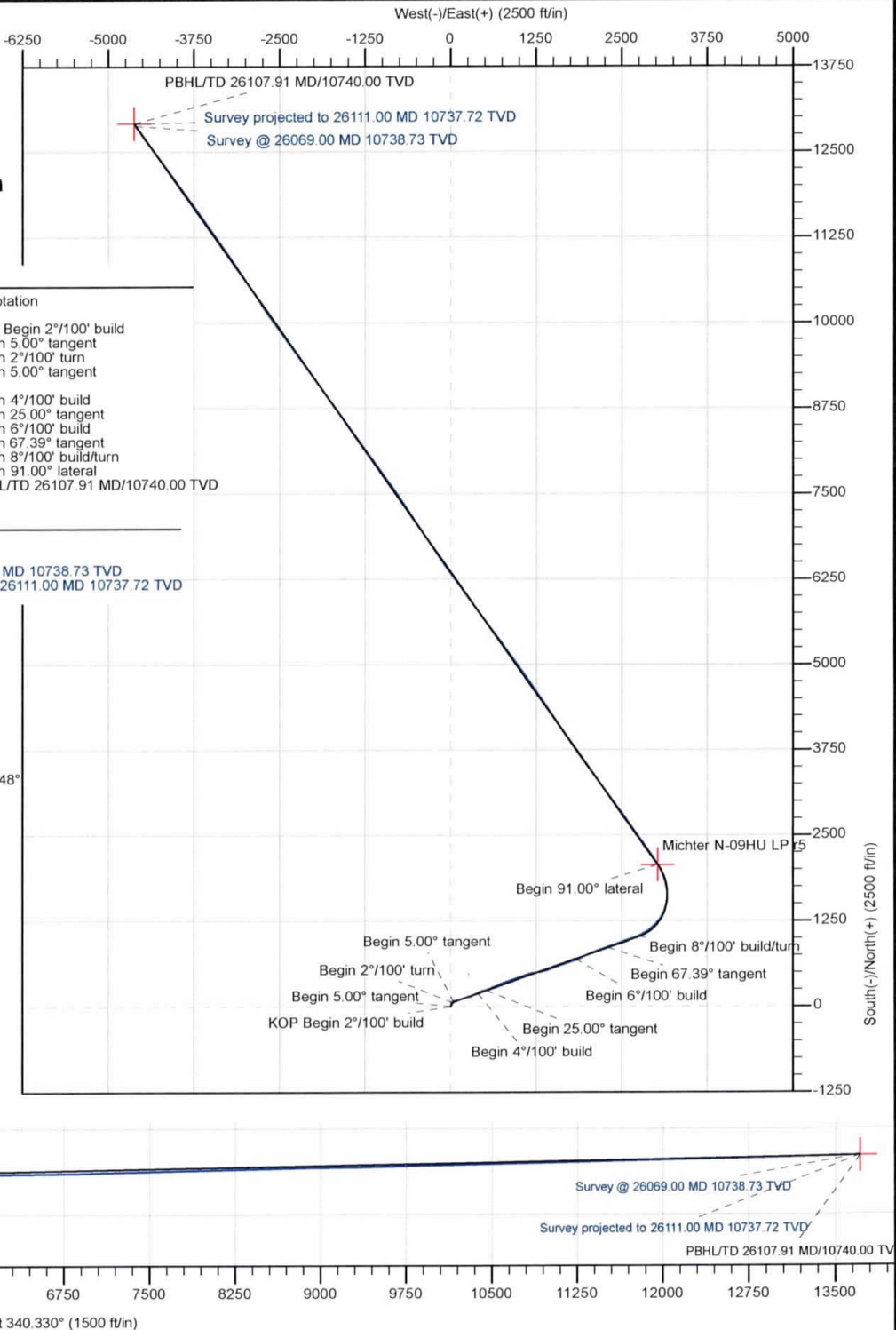
Northing	Easting	Latitude	Longitude
14455050.52	1697280.59	39.80296476	-80.79753230

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.848°



Azimuths to Grid North
 True North: -0.13°
 Magnetic North: -8.85°

Magnetic Field
 Strength: 51869.9snT
 Dip Angle: 66.75°
 Date: 4/4/2020
 Model: IGRF2015



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_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	Michter				
Site Position:		Northing:	14,454,962.42 usft	Latitude:	39.80272253
From:	Lat/Long	Easting:	1,697,325.45 usft	Longitude:	-80.79737330
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.130 °

Well	Michter N-09HU (F)					
Well Position	+N/-S	0.00 ft	Northing:	14,455,050.52 usft	Latitude:	39.80296476
	+E/-W	0.00 ft	Easting:	1,697,280.59 usft	Longitude:	-80.79753230
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	1,128.00 ft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	4/4/2020	-8.718	66.747	51,869.88093682

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	340.330	

Survey Program	Date 5/19/2020				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
184.00	780.00	MWD surf (Original Hole)	MWD	MWD - Standard	
874.00	2,611.00	MWD int (Original Hole)	MWD	MWD - Standard	
2,684.00	10,141.00	MWD (Original Hole)	MWD	MWD - Standard	
10,207.00	26,069.00	MWD lat (Original Hole)	MWD	MWD - Standard	
26,111.00	26,111.00	Projection (Original Hole)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
184.00	0.09	81.150	184.00	0.02	0.14	-0.03	0.05	0.05	0.00	0.00
MWD surveys										
235.00	0.09	350.270	235.00	0.07	0.18	0.00	0.25	0.00	-178.20	
282.00	0.09	45.110	282.00	0.13	0.20	0.06	0.18	0.00	116.68	
326.00	0.13	33.160	326.00	0.20	0.25	0.10	0.10	0.09	-27.16	
373.00	0.09	4.250	373.00	0.28	0.28	0.17	0.14	-0.09	-61.51	

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Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
416.00	0.09	16.640	416.00	0.34	0.29	0.23	0.05	0.00	28.81	
463.00	0.22	348.690	463.00	0.47	0.28	0.34	0.31	0.28	-59.47	
506.00	0.09	302.900	506.00	0.57	0.24	0.45	0.40	-0.30	-106.49	
553.00	0.22	316.610	553.00	0.65	0.15	0.57	0.29	0.28	29.17	
597.00	0.22	352.380	597.00	0.80	0.08	0.73	0.31	0.00	81.30	
637.00	0.18	19.450	637.00	0.93	0.09	0.85	0.25	-0.10	67.68	
688.00	0.09	6.440	688.00	1.05	0.12	0.95	0.19	-0.18	-25.51	
780.00	0.09	347.810	780.00	1.19	0.11	1.08	0.03	0.00	-20.25	
874.00	0.09	43.800	874.00	1.32	0.15	1.19	0.09	0.00	59.56	
969.00	0.18	58.830	969.00	1.45	0.33	1.25	0.10	0.09	15.82	
1,064.00	0.62	67.790	1,064.00	1.72	0.93	1.31	0.47	0.46	9.43	
1,159.00	0.92	36.500	1,158.99	2.53	1.86	1.75	0.53	0.32	-32.94	
1,253.00	1.80	25.690	1,252.96	4.46	2.95	3.21	0.97	0.94	-11.50	
1,348.00	3.47	19.540	1,347.86	8.52	4.56	6.49	1.78	1.76	-6.47	
1,443.00	5.45	18.570	1,442.56	15.50	6.96	12.26	2.09	2.08	-1.02	
1,537.00	6.06	21.910	1,536.09	24.34	10.23	19.48	0.74	0.65	3.55	
1,632.00	5.05	25.430	1,630.64	32.77	13.90	26.18	1.12	-1.06	3.71	
1,727.00	5.19	30.170	1,725.26	40.26	17.85	31.90	0.47	0.15	4.99	
1,822.00	5.32	23.760	1,819.87	48.00	21.78	37.87	0.63	0.14	-6.75	
1,917.00	4.75	23.320	1,914.50	55.65	25.12	43.95	0.60	-0.60	-0.46	
2,011.00	5.98	28.590	2,008.09	63.52	29.00	50.05	1.41	1.31	5.61	
2,106.00	6.72	41.770	2,102.51	72.01	35.07	56.01	1.72	0.78	13.87	
2,201.00	7.12	64.010	2,196.83	78.74	44.07	59.31	2.83	0.42	23.41	
2,295.00	7.65	69.640	2,290.05	83.47	55.17	60.03	0.95	0.56	5.99	
2,390.00	6.55	74.560	2,384.32	87.11	66.32	59.70	1.32	-1.16	5.18	
2,485.00	5.76	75.000	2,478.78	89.79	76.15	58.92	0.83	-0.83	0.46	
2,580.00	5.01	79.300	2,573.36	91.79	84.83	57.88	0.90	-0.79	4.53	
2,611.00	4.79	79.300	2,604.24	92.28	87.43	57.47	0.71	-0.71	0.00	
2,684.00	4.79	75.440	2,676.99	93.62	93.38	56.72	0.44	0.00	-5.29	
2,779.00	5.05	78.510	2,771.64	95.45	101.31	55.77	0.39	0.27	3.23	
2,874.00	5.41	78.070	2,866.24	97.20	109.79	54.58	0.38	0.38	-0.46	
2,968.00	5.67	78.070	2,959.80	99.08	118.67	53.35	0.28	0.28	0.00	
3,063.00	4.83	72.010	3,054.40	101.29	127.07	52.60	1.06	-0.88	-6.38	
3,158.00	4.79	64.980	3,149.07	104.20	134.47	52.86	0.62	-0.04	-7.40	
3,253.00	5.01	64.540	3,243.72	107.66	141.81	53.65	0.23	0.23	-0.46	
3,348.00	5.36	65.770	3,338.33	111.26	149.60	54.42	0.39	0.37	1.29	
3,442.00	5.89	68.050	3,431.88	114.87	158.07	54.96	0.61	0.56	2.43	
3,537.00	4.70	72.710	3,526.48	117.85	166.31	54.99	1.33	-1.25	4.91	
3,632.00	4.22	74.650	3,621.19	119.93	173.40	54.56	0.53	-0.51	2.04	
3,726.00	4.53	75.530	3,714.91	121.77	180.33	53.97	0.34	0.33	0.94	
3,821.00	4.88	77.810	3,809.59	123.56	187.91	53.10	0.42	0.37	2.40	
3,916.00	5.23	80.270	3,904.22	125.15	196.13	51.83	0.43	0.37	2.59	
4,010.00	5.32	73.420	3,997.83	127.12	204.53	50.85	0.68	0.10	-7.29	
4,105.00	5.23	70.080	4,092.42	129.85	212.82	50.64	0.34	-0.09	-3.52	

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Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,200.00	5.41	70.950	4,187.02	132.78	221.12	50.61	0.21	0.19	0.92
4,294.00	5.67	73.240	4,280.58	135.57	229.76	50.32	0.36	0.28	2.44
4,389.00	4.92	75.610	4,375.17	137.94	238.20	49.71	0.82	-0.79	2.49
4,484.00	5.01	79.130	4,469.81	139.73	246.22	48.70	0.33	0.09	3.71
4,579.00	5.63	83.170	4,564.40	141.07	254.92	47.03	0.76	0.65	4.25
4,674.00	5.14	79.040	4,658.99	142.43	263.72	45.35	0.66	-0.52	-4.35
4,768.00	5.05	67.000	4,752.62	144.85	271.66	44.95	1.14	-0.10	-12.81
4,863.00	5.71	64.100	4,847.20	148.55	279.76	45.71	0.75	0.69	-3.05
4,958.00	5.01	69.020	4,941.78	152.10	287.89	46.32	0.88	-0.74	5.18
5,056.00	5.19	73.420	5,039.39	154.89	296.13	46.17	0.44	0.18	4.49
5,151.00	4.88	67.440	5,134.03	157.67	303.98	46.15	0.64	-0.33	-6.29
5,246.00	5.32	63.220	5,228.65	161.20	311.65	46.90	0.61	0.46	-4.44
5,340.00	4.48	69.810	5,322.31	164.43	318.98	47.47	1.07	-0.89	7.01
5,435.00	4.17	75.440	5,417.04	166.58	325.81	47.19	0.55	-0.33	5.93
5,530.00	5.01	68.320	5,511.73	168.98	333.01	47.03	1.07	0.88	-7.49
5,625.00	6.24	64.800	5,606.28	172.71	341.53	47.68	1.34	1.29	-3.71
5,719.00	5.93	71.480	5,699.75	176.43	350.76	48.07	0.82	-0.33	7.11
5,814.00	4.79	76.400	5,794.33	178.92	359.27	47.55	1.29	-1.20	5.18
5,909.00	3.87	65.070	5,889.06	181.21	366.03	47.43	1.32	-0.97	-11.93
6,003.00	5.32	57.950	5,982.76	184.86	372.60	48.65	1.65	1.54	-7.57
6,098.00	6.28	60.670	6,077.27	189.74	380.86	50.47	1.05	1.01	2.86
6,322.00	5.63	58.560	6,300.06	201.47	400.92	54.76	0.31	-0.29	-0.94
6,382.00	5.84	57.680	6,359.76	204.64	406.01	56.03	0.38	0.35	-1.47
6,477.00	6.20	60.760	6,454.23	209.73	414.57	57.95	0.51	0.38	3.24
6,571.00	7.34	67.090	6,547.58	214.55	424.53	59.13	1.45	1.21	6.73
6,666.00	10.68	71.220	6,641.39	219.74	438.46	59.33	3.58	3.52	4.35
6,761.00	14.81	74.730	6,734.04	225.78	458.52	58.27	4.42	4.35	3.69
6,856.00	17.62	75.530	6,825.25	232.57	484.16	56.03	2.97	2.96	0.84
6,951.00	20.92	71.480	6,914.92	241.55	514.17	54.39	3.75	3.47	-4.26
7,045.00	23.55	69.900	7,001.92	253.34	547.73	54.19	2.87	2.80	-1.68
7,140.00	23.07	68.850	7,089.17	266.58	582.91	54.81	0.67	-0.51	-1.11
7,235.00	21.84	66.560	7,176.96	280.32	616.48	56.46	1.59	-1.29	-2.41
7,330.00	22.06	65.510	7,265.08	294.75	648.93	59.12	0.47	0.23	-1.11
7,425.00	23.12	65.150	7,352.79	309.98	682.09	62.30	1.13	1.12	-0.38
7,519.00	24.61	65.590	7,438.75	325.83	716.66	65.58	1.60	1.59	0.47
7,614.00	25.22	68.410	7,524.91	341.45	753.49	67.90	1.41	0.64	2.97
7,709.00	26.28	70.430	7,610.48	355.94	792.13	68.54	1.45	1.12	2.13
7,803.00	25.80	70.520	7,694.93	369.73	831.02	68.43	0.51	-0.51	0.10
7,898.00	25.14	72.620	7,780.70	382.66	869.77	67.56	1.18	-0.69	2.21
7,993.00	24.74	72.360	7,866.84	394.71	907.98	66.05	0.44	-0.42	-0.27
8,088.00	25.14	71.660	7,952.98	407.08	946.08	64.88	0.52	0.42	-0.74
8,183.00	23.51	70.780	8,039.55	419.67	983.12	64.26	1.76	-1.72	-0.93
8,277.00	23.29	71.310	8,125.82	431.80	1,018.43	63.79	0.32	-0.23	0.56

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Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
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Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
8,372.00	25.40	71.480	8,212.36	444.29	1,055.55	63.06	2.22	2.22	0.18	
8,467.00	25.84	70.690	8,298.02	457.61	1,094.40	62.53	0.59	0.46	-0.83	
8,561.00	26.02	69.640	8,382.56	471.55	1,133.07	62.64	0.52	0.19	-1.12	
8,656.00	26.02	75.880	8,467.95	483.89	1,172.82	60.88	2.88	0.00	6.57	
8,751.00	25.71	80.710	8,553.44	492.30	1,213.37	55.15	2.24	-0.33	5.08	
8,846.00	24.83	83.000	8,639.35	498.06	1,253.50	47.06	1.38	-0.93	2.41	
8,940.00	23.95	81.770	8,724.96	503.19	1,291.98	38.95	1.08	-0.94	-1.31	
9,038.00	24.65	75.260	8,814.30	511.24	1,331.43	33.25	2.82	0.71	-6.64	
9,133.00	24.70	71.660	8,900.63	522.53	1,369.44	31.08	1.58	0.05	-3.79	
9,227.00	24.08	71.660	8,986.24	534.74	1,406.28	30.18	0.66	-0.66	0.00	
9,322.00	24.52	72.450	9,072.82	546.79	1,443.47	29.00	0.58	0.46	0.83	
9,416.00	25.36	71.480	9,158.05	559.06	1,481.16	27.88	0.99	0.89	-1.03	
9,511.00	25.44	69.640	9,243.87	572.62	1,519.58	27.72	0.84	0.08	-1.94	
9,606.00	24.74	69.640	9,329.91	586.64	1,557.35	28.20	0.74	-0.74	0.00	
9,701.00	25.18	69.550	9,416.03	600.62	1,594.92	28.72	0.46	0.46	-0.09	
9,796.00	24.74	69.460	9,502.16	614.65	1,632.47	29.29	0.46	-0.46	-0.09	
9,891.00	23.77	69.550	9,588.77	628.32	1,669.03	29.85	1.02	-1.02	0.09	
9,985.00	22.81	70.600	9,675.11	640.99	1,703.96	30.03	1.11	-1.02	1.12	
10,080.00	22.02	71.750	9,762.94	652.68	1,738.25	29.50	0.95	-0.83	1.21	
10,141.00	22.06	73.240	9,819.48	659.57	1,760.07	28.63	0.92	0.07	2.44	
10,207.00	21.89	75.790	9,880.69	666.16	1,783.87	26.83	1.47	-0.26	3.86	
10,254.00	21.36	76.400	9,924.38	670.32	1,800.68	25.09	1.22	-1.13	1.30	
10,301.00	22.15	72.190	9,968.03	675.05	1,817.44	23.90	3.72	1.68	-8.96	
10,348.00	24.22	66.300	10,011.24	681.63	1,834.71	24.29	6.61	4.40	-12.53	
10,396.00	28.79	63.400	10,054.19	690.77	1,854.07	26.38	9.89	9.52	-6.04	
10,443.00	33.01	63.480	10,094.51	701.56	1,875.65	29.27	8.98	8.98	0.17	
10,491.00	36.88	63.400	10,133.84	713.85	1,900.24	32.57	8.06	8.06	-0.17	
10,538.00	41.63	64.890	10,170.23	726.80	1,927.00	35.76	10.30	10.11	3.17	
10,585.00	45.14	67.180	10,204.38	739.89	1,956.50	38.15	8.18	7.47	4.87	
10,632.00	47.96	67.530	10,236.70	753.02	1,987.99	39.92	6.02	6.00	0.74	
10,680.00	51.34	68.490	10,267.78	766.71	2,021.91	41.39	7.20	7.04	2.00	
10,727.00	54.51	69.810	10,296.11	780.05	2,056.95	42.16	7.11	6.74	2.81	
10,775.00	56.97	69.550	10,323.13	793.82	2,094.15	42.61	5.14	5.13	-0.54	
10,822.00	58.90	70.250	10,348.08	807.51	2,131.55	42.90	4.30	4.11	1.49	
10,870.00	62.37	69.900	10,371.61	821.77	2,170.87	43.09	7.26	7.23	-0.73	
10,917.00	65.36	68.930	10,392.31	836.60	2,210.37	43.77	6.63	6.36	-2.06	
10,964.00	67.52	69.550	10,411.10	851.87	2,250.65	44.59	4.75	4.60	1.32	
11,011.00	69.27	69.990	10,428.40	866.98	2,291.65	45.01	3.82	3.72	0.94	
11,059.00	69.23	70.160	10,445.41	882.28	2,333.85	45.21	0.34	-0.08	0.35	
11,106.00	69.36	70.160	10,462.03	897.20	2,375.21	45.34	0.28	0.28	0.00	
11,154.00	69.32	69.810	10,478.96	912.57	2,417.41	45.61	0.69	-0.08	-0.73	
11,201.00	69.32	69.550	10,495.56	927.84	2,458.64	46.11	0.52	0.00	-0.55	
11,249.00	68.84	69.640	10,512.70	943.47	2,500.66	46.69	1.02	-1.00	0.19	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,296.00	68.57	70.520	10,529.77	958.39	2,541.83	46.88	1.84	-0.57	1.87
11,343.00	68.70	70.430	10,546.89	973.02	2,583.09	46.77	0.33	0.28	-0.19
11,390.00	67.47	70.600	10,564.43	987.57	2,624.19	46.63	2.64	-2.62	0.36
11,438.00	66.33	70.690	10,583.26	1,002.20	2,665.85	46.39	2.38	-2.38	0.19
11,485.00	66.11	70.250	10,602.22	1,016.58	2,706.38	46.28	0.98	-0.47	-0.94
11,533.00	65.05	67.000	10,622.06	1,032.50	2,747.08	47.58	6.55	-2.21	-6.77
11,580.00	65.45	63.840	10,641.75	1,050.25	2,785.88	51.23	6.16	0.85	-6.72
11,628.00	66.37	60.940	10,661.34	1,070.56	2,824.71	57.29	5.84	1.92	-6.04
11,675.00	67.43	59.790	10,679.78	1,091.94	2,862.28	64.77	3.19	2.26	-2.45
11,723.00	67.25	55.310	10,698.28	1,115.70	2,899.65	74.56	8.62	-0.38	-9.33
11,770.00	67.30	49.510	10,716.45	1,142.13	2,933.98	87.90	11.38	0.11	-12.34
11,817.00	67.74	45.550	10,734.43	1,171.44	2,966.00	104.72	7.84	0.94	-8.43
11,865.00	68.31	43.710	10,752.39	1,203.12	2,997.27	124.03	3.75	1.19	-3.83
11,913.00	69.71	42.130	10,769.59	1,235.94	3,027.79	144.66	4.24	2.92	-3.29
11,960.00	69.41	35.710	10,786.01	1,270.18	3,055.44	167.59	12.81	-0.64	-13.66
12,007.00	68.84	29.820	10,802.77	1,307.08	3,079.19	194.35	11.77	-1.21	-12.53
12,054.00	69.49	26.570	10,819.50	1,345.79	3,099.94	223.81	6.61	1.38	-6.91
12,102.00	70.68	21.740	10,835.85	1,386.96	3,118.40	256.37	9.78	2.48	-10.06
12,149.00	71.96	17.960	10,850.91	1,428.83	3,133.51	290.71	8.09	2.72	-8.04
12,197.00	71.87	13.910	10,865.82	1,472.69	3,146.03	327.80	8.02	-0.19	-8.44
12,244.00	72.00	8.460	10,880.40	1,516.51	3,154.69	366.14	11.03	0.28	-11.60
12,292.00	73.63	5.480	10,894.59	1,562.02	3,160.25	407.12	6.83	3.40	-6.21
12,339.00	75.12	1.780	10,907.25	1,607.18	3,163.11	448.69	8.22	3.17	-7.87
12,386.00	77.05	357.570	10,918.56	1,652.79	3,162.85	491.72	9.61	4.11	-8.96
12,433.00	78.29	353.870	10,928.60	1,698.57	3,159.42	535.98	8.13	2.64	-7.87
12,481.00	78.86	351.240	10,938.11	1,745.21	3,153.32	581.96	5.50	1.19	-5.48
12,528.00	80.44	348.340	10,946.55	1,790.71	3,145.12	627.56	6.94	3.36	-6.17
12,576.00	81.98	344.470	10,953.89	1,836.80	3,133.97	674.72	8.59	3.21	-8.06
12,623.00	84.09	340.250	10,959.59	1,881.25	3,119.83	721.33	9.98	4.49	-8.98
12,671.00	83.74	337.610	10,964.68	1,925.78	3,102.68	769.04	5.52	-0.73	-5.50
12,718.00	83.87	335.420	10,969.75	1,968.64	3,084.06	815.66	4.64	0.28	-4.66
12,766.00	84.70	331.990	10,974.53	2,011.45	3,062.90	863.10	7.32	1.73	-7.15
12,813.00	85.80	330.410	10,978.42	2,052.49	3,040.34	909.34	4.09	2.34	-3.36
12,861.00	86.68	328.030	10,981.57	2,093.64	3,015.83	956.33	5.28	1.83	-4.96
12,908.00	87.74	326.890	10,983.86	2,133.21	2,990.58	1,002.10	3.31	2.26	-2.43
12,955.00	88.92	326.010	10,985.23	2,172.36	2,964.61	1,047.70	3.13	2.51	-1.87
13,002.00	89.49	324.960	10,985.88	2,211.09	2,937.99	1,093.13	2.54	1.21	-2.23
13,050.00	89.67	324.870	10,986.23	2,250.36	2,910.40	1,139.40	0.42	0.38	-0.19
13,145.00	89.41	324.520	10,987.00	2,327.89	2,855.50	1,230.88	0.46	-0.27	-0.37
13,240.00	91.38	324.430	10,986.34	2,405.20	2,800.30	1,322.26	2.08	2.07	-0.09
13,337.00	91.74	325.050	10,983.70	2,484.38	2,744.32	1,415.66	0.74	0.37	0.64
13,432.00	91.78	325.660	10,980.78	2,562.49	2,690.34	1,507.39	0.64	0.04	0.64
13,526.00	90.90	325.130	10,978.59	2,639.84	2,636.97	1,598.19	1.09	-0.94	-0.56
13,621.00	90.73	323.460	10,977.23	2,716.97	2,581.54	1,689.48	1.77	-0.18	-1.76

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,716.00	90.81	323.550	10,975.96	2,793.34	2,525.04	1,780.40	0.13	0.08	0.09
13,811.00	90.77	323.820	10,974.65	2,869.88	2,468.79	1,871.41	0.29	-0.04	0.28
13,905.00	90.73	323.820	10,973.42	2,945.75	2,413.30	1,961.53	0.04	-0.04	0.00
14,000.00	90.81	324.080	10,972.14	3,022.55	2,357.40	2,052.67	0.29	0.08	0.27
14,095.00	90.77	323.820	10,970.83	3,099.35	2,301.50	2,143.80	0.28	-0.04	-0.27
14,190.00	90.73	323.990	10,969.59	3,176.11	2,245.54	2,234.92	0.18	-0.04	0.18
14,284.00	90.73	323.990	10,968.39	3,252.14	2,190.27	2,325.11	0.00	0.00	0.00
14,379.00	90.73	323.900	10,967.18	3,328.93	2,134.37	2,416.25	0.09	0.00	-0.09
14,474.00	90.73	323.990	10,965.97	3,405.73	2,078.46	2,507.38	0.09	0.00	0.09
14,569.00	90.99	324.170	10,964.54	3,482.66	2,022.73	2,598.58	0.33	0.27	0.19
14,664.00	91.30	324.080	10,962.64	3,559.62	1,967.07	2,689.78	0.34	0.33	-0.09
14,758.00	91.21	324.170	10,960.59	3,635.77	1,912.00	2,780.03	0.14	-0.10	0.10
14,853.00	91.30	324.080	10,958.51	3,712.73	1,856.34	2,871.23	0.13	0.09	-0.09
14,948.00	91.21	324.340	10,956.42	3,789.77	1,800.80	2,962.47	0.29	-0.09	0.27
15,043.00	91.25	326.010	10,954.39	3,867.74	1,746.56	3,054.15	1.76	0.04	1.76
15,137.00	91.25	326.100	10,952.33	3,945.70	1,694.08	3,145.22	0.10	0.00	0.10
15,232.00	91.34	325.930	10,950.19	4,024.45	1,640.99	3,237.25	0.20	0.09	-0.18
15,327.00	91.38	325.750	10,947.93	4,103.04	1,587.66	3,329.20	0.19	0.04	-0.19
15,422.00	91.25	326.010	10,945.75	4,181.66	1,534.39	3,421.17	0.31	-0.14	0.27
15,517.00	91.25	326.100	10,943.68	4,260.45	1,481.36	3,513.22	0.09	0.00	0.09
15,612.00	91.25	325.660	10,941.61	4,339.08	1,428.08	3,605.19	0.46	0.00	-0.46
15,706.00	91.34	326.010	10,939.48	4,416.84	1,375.31	3,696.17	0.38	0.10	0.37
15,801.00	91.34	326.190	10,937.26	4,495.67	1,322.33	3,788.23	0.19	0.00	0.19
15,896.00	91.25	326.190	10,935.11	4,574.58	1,269.49	3,880.33	0.09	-0.09	0.00
15,991.00	91.30	326.100	10,933.00	4,653.46	1,216.57	3,972.41	0.11	0.05	-0.09
16,086.00	91.25	326.100	10,930.89	4,732.29	1,163.60	4,064.47	0.05	-0.05	0.00
16,180.00	90.68	323.820	10,929.30	4,809.23	1,109.64	4,155.09	2.50	-0.61	-2.43
16,275.00	90.90	324.430	10,927.99	4,886.21	1,053.98	4,246.31	0.68	0.23	0.64
16,370.00	90.81	324.170	10,926.58	4,963.34	998.55	4,337.61	0.29	-0.09	-0.27
16,465.00	90.86	324.340	10,925.19	5,040.44	943.06	4,428.88	0.19	0.05	0.18
16,559.00	90.81	323.990	10,923.82	5,116.64	888.03	4,519.15	0.38	-0.05	-0.37
16,654.00	90.64	323.820	10,922.62	5,193.40	832.07	4,610.27	0.25	-0.18	-0.18
16,749.00	90.86	323.900	10,921.38	5,270.11	776.04	4,701.36	0.25	0.23	0.08
16,843.00	90.77	323.640	10,920.04	5,345.93	720.49	4,791.46	0.29	-0.10	-0.28
16,938.00	90.81	323.820	10,918.73	5,422.51	664.30	4,882.49	0.19	0.04	0.19
17,033.00	90.77	324.430	10,917.42	5,499.48	608.63	4,973.70	0.64	-0.04	0.64
17,128.00	90.81	324.690	10,916.11	5,576.87	553.55	5,065.12	0.28	0.04	0.27
17,223.00	90.86	324.340	10,914.73	5,654.22	498.41	5,156.51	0.37	0.05	-0.37
17,317.00	90.81	324.170	10,913.36	5,730.51	443.50	5,246.83	0.19	-0.05	-0.18
17,412.00	90.81	324.340	10,912.01	5,807.60	388.01	5,338.11	0.18	0.00	0.18
17,507.00	90.81	323.990	10,910.67	5,884.61	332.40	5,429.34	0.37	0.00	-0.37
17,601.00	90.77	324.080	10,909.37	5,960.69	277.20	5,519.56	0.10	-0.04	0.10
17,696.00	90.77	324.080	10,908.10	6,037.61	221.47	5,610.75	0.00	0.00	0.00

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
17,791.00	90.77	324.430	10,906.82	6,114.71	165.98	5,702.03	0.37	0.00	0.37
17,885.00	90.90	324.260	10,905.45	6,191.08	111.19	5,792.39	0.23	0.14	-0.18
17,980.00	90.77	324.340	10,904.07	6,268.22	55.76	5,883.68	0.16	-0.14	0.08
18,075.00	90.29	324.170	10,903.19	6,345.32	0.27	5,974.96	0.54	-0.51	-0.18
18,170.00	90.24	324.260	10,902.75	6,422.39	-55.28	6,066.23	0.11	-0.05	0.09
18,264.00	90.73	325.400	10,901.95	6,499.22	-109.42	6,156.81	1.32	0.52	1.21
18,359.00	90.86	326.360	10,900.63	6,577.86	-162.71	6,248.79	1.02	0.14	1.01
18,454.00	90.73	325.840	10,899.32	6,656.70	-215.69	6,340.87	0.56	-0.14	-0.55
18,548.00	90.73	325.750	10,898.12	6,734.44	-268.52	6,431.85	0.10	0.00	-0.10
18,643.00	90.77	325.930	10,896.87	6,813.04	-321.86	6,523.82	0.19	0.04	0.19
18,738.00	90.68	325.750	10,895.67	6,891.65	-375.20	6,615.79	0.21	-0.09	-0.19
18,833.00	90.73	325.930	10,894.50	6,970.25	-428.54	6,707.76	0.20	0.05	0.19
18,927.00	91.12	326.100	10,892.99	7,048.18	-481.08	6,798.83	0.45	0.41	0.18
19,022.00	91.30	326.190	10,890.98	7,127.06	-533.99	6,890.91	0.21	0.19	0.09
19,117.00	91.38	326.280	10,888.76	7,206.01	-586.77	6,983.03	0.13	0.08	0.09
19,211.00	91.30	325.930	10,886.56	7,284.02	-639.18	7,074.12	0.38	-0.09	-0.37
19,306.00	91.34	326.360	10,884.37	7,362.89	-692.09	7,166.20	0.45	0.04	0.45
19,401.00	91.43	325.750	10,882.08	7,441.67	-745.12	7,258.24	0.65	0.09	-0.64
19,495.00	91.21	324.430	10,879.91	7,518.74	-798.90	7,348.91	1.42	-0.23	-1.40
19,590.00	91.30	324.260	10,877.83	7,595.91	-854.27	7,440.21	0.20	0.09	-0.18
19,685.00	91.30	324.170	10,875.67	7,672.96	-909.80	7,531.46	0.09	0.00	-0.09
19,779.00	91.21	324.340	10,873.62	7,749.23	-964.70	7,621.76	0.20	-0.10	0.18
19,874.00	91.30	325.050	10,871.53	7,826.74	-1,019.59	7,713.22	0.75	0.09	0.75
19,969.00	91.30	324.430	10,869.38	7,904.29	-1,074.42	7,804.70	0.65	0.00	-0.65
20,064.00	91.43	325.130	10,867.12	7,981.88	-1,129.19	7,896.20	0.75	0.14	0.74
20,158.00	91.30	324.690	10,864.88	8,058.77	-1,183.21	7,986.79	0.49	-0.14	-0.47
20,253.00	91.38	324.520	10,862.66	8,136.19	-1,238.22	8,078.21	0.20	0.08	-0.18
20,348.00	91.38	324.430	10,860.37	8,213.49	-1,293.41	8,169.57	0.09	0.00	-0.09
20,443.00	91.30	324.340	10,858.15	8,290.70	-1,348.71	8,260.89	0.13	-0.08	-0.09
20,537.00	91.25	324.610	10,856.05	8,367.18	-1,403.32	8,351.29	0.29	-0.05	0.29
20,631.00	91.21	324.610	10,854.04	8,443.79	-1,457.75	8,441.75	0.04	-0.04	0.00
20,726.00	91.30	324.520	10,851.96	8,521.18	-1,512.81	8,533.16	0.13	0.09	-0.09
20,821.00	91.25	324.170	10,849.84	8,598.35	-1,568.17	8,624.46	0.37	-0.05	-0.37
20,916.00	91.30	324.170	10,847.73	8,675.35	-1,623.77	8,715.68	0.05	0.05	0.00
21,010.00	91.21	324.340	10,845.67	8,751.63	-1,678.67	8,805.99	0.20	-0.10	0.18
21,105.00	91.12	323.990	10,843.74	8,828.63	-1,734.28	8,897.21	0.38	-0.09	-0.37
21,200.00	90.73	324.340	10,842.20	8,905.64	-1,789.89	8,988.44	0.55	-0.41	0.37
21,294.00	90.77	324.080	10,840.97	8,981.88	-1,844.86	9,078.74	0.28	0.04	-0.28
21,389.00	90.81	324.340	10,839.66	9,058.93	-1,900.41	9,170.00	0.28	0.04	0.27
21,484.00	90.07	324.690	10,838.93	9,136.28	-1,955.55	9,261.40	0.86	-0.78	0.37
21,578.00	90.77	324.430	10,838.25	9,212.87	-2,010.06	9,351.86	0.79	0.74	-0.28
21,673.00	90.95	324.430	10,836.82	9,290.13	-2,065.31	9,443.21	0.19	0.19	0.00
21,767.00	91.38	324.960	10,834.91	9,366.83	-2,119.63	9,533.71	0.73	0.46	0.56

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
21,862.00	91.38	324.430	10,832.62	9,444.33	-2,174.51	9,625.17	0.56	0.00	-0.56
21,956.00	91.38	324.430	10,830.36	9,520.77	-2,229.18	9,715.55	0.00	0.00	0.00
22,051.00	91.38	323.730	10,828.07	9,597.68	-2,284.89	9,806.73	0.74	0.00	-0.74
22,146.00	91.25	324.260	10,825.89	9,674.51	-2,340.72	9,897.87	0.57	-0.14	0.56
22,241.00	91.34	324.610	10,823.74	9,751.77	-2,395.96	9,989.21	0.38	0.09	0.37
22,336.00	91.47	324.520	10,821.41	9,829.15	-2,451.03	10,080.61	0.17	0.14	-0.09
22,430.00	91.30	324.170	10,819.14	9,905.51	-2,505.80	10,170.95	0.41	-0.18	-0.37
22,525.00	91.34	324.340	10,816.95	9,982.59	-2,561.29	10,262.21	0.18	0.04	0.18
22,620.00	91.30	324.260	10,814.76	10,059.72	-2,616.71	10,353.49	0.09	-0.04	-0.08
22,714.00	91.12	325.050	10,812.78	10,136.38	-2,671.07	10,443.98	0.86	-0.19	0.84
22,809.00	91.25	325.930	10,810.81	10,214.64	-2,724.88	10,535.79	0.94	0.14	0.93
22,903.00	91.25	326.010	10,808.76	10,292.52	-2,777.48	10,626.83	0.09	0.00	0.09
22,998.00	91.21	326.010	10,806.72	10,371.27	-2,830.57	10,718.86	0.04	-0.04	0.00
23,093.00	91.25	326.010	10,804.68	10,450.02	-2,883.67	10,810.88	0.04	0.04	0.00
23,187.00	91.30	326.280	10,802.59	10,528.07	-2,936.02	10,901.99	0.29	0.05	0.29
23,282.00	91.25	326.190	10,800.48	10,607.02	-2,988.81	10,994.11	0.11	-0.05	-0.09
23,376.00	91.25	325.930	10,798.43	10,684.99	-3,041.28	11,085.19	0.28	0.00	-0.28
23,471.00	91.25	326.010	10,796.36	10,763.70	-3,094.43	11,177.20	0.08	0.00	0.08
23,565.00	91.25	326.010	10,794.30	10,841.62	-3,146.97	11,268.26	0.00	0.00	0.00
23,660.00	91.25	326.010	10,792.23	10,920.37	-3,200.07	11,360.28	0.00	0.00	0.00
23,755.00	91.21	326.360	10,790.19	10,999.28	-3,252.92	11,452.38	0.37	-0.04	0.37
23,849.00	91.43	325.400	10,788.03	11,077.08	-3,305.64	11,543.38	1.05	0.23	-1.02
23,944.00	91.30	324.690	10,785.76	11,154.92	-3,360.05	11,635.00	0.76	-0.14	-0.75
24,038.00	91.30	324.960	10,783.63	11,231.73	-3,414.19	11,725.55	0.29	0.00	0.29
24,133.00	91.34	324.340	10,781.44	11,309.20	-3,469.14	11,816.99	0.65	0.04	-0.65
24,228.00	91.25	324.340	10,779.30	11,386.36	-3,524.51	11,908.29	0.09	-0.09	0.00
24,322.00	91.30	324.260	10,777.21	11,462.68	-3,579.34	11,998.61	0.10	0.05	-0.09
24,417.00	91.30	324.690	10,775.05	11,539.98	-3,634.53	12,089.98	0.45	0.00	0.45
24,511.00	91.25	324.430	10,772.96	11,616.54	-3,689.02	12,180.42	0.28	-0.05	-0.28
24,606.00	91.30	324.260	10,770.84	11,693.72	-3,744.39	12,271.72	0.19	0.05	-0.18
24,701.00	91.30	324.340	10,768.69	11,770.84	-3,799.81	12,363.00	0.08	0.00	0.08
24,795.00	91.25	324.610	10,766.60	11,847.33	-3,854.41	12,453.40	0.29	-0.05	0.29
24,890.00	91.21	324.170	10,764.56	11,924.55	-3,909.72	12,544.73	0.46	-0.04	-0.46
24,984.00	91.21	323.990	10,762.57	12,000.65	-3,964.85	12,634.95	0.19	0.00	-0.19
25,079.00	91.25	324.260	10,760.53	12,077.61	-4,020.51	12,726.16	0.29	0.04	0.28
25,174.00	91.21	324.260	10,758.49	12,154.70	-4,075.98	12,817.43	0.04	-0.04	0.00
25,268.00	91.25	324.170	10,756.48	12,230.94	-4,130.94	12,907.71	0.10	0.04	-0.10
25,363.00	91.25	324.260	10,754.40	12,307.99	-4,186.48	12,998.96	0.09	0.00	0.09
25,457.00	91.25	324.430	10,752.35	12,384.35	-4,241.26	13,089.30	0.18	0.00	0.18
25,552.00	91.25	324.340	10,750.28	12,461.56	-4,296.56	13,180.62	0.09	0.00	-0.09
25,647.00	91.30	324.340	10,748.17	12,538.73	-4,351.93	13,271.93	0.05	0.05	0.00
25,741.00	91.25	323.820	10,746.08	12,614.83	-4,407.07	13,362.15	0.56	-0.05	-0.55
25,836.00	91.30	324.170	10,743.96	12,691.67	-4,462.90	13,453.29	0.37	0.05	0.37
25,930.00	91.25	324.080	10,741.87	12,767.82	-4,517.97	13,543.53	0.11	-0.05	-0.10

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
26,025.00	91.30	324.170	10,739.76	12,844.78	-4,573.63	13,634.74	0.11	0.05	0.09
26,069.00	91.38	324.340	10,738.73	12,880.48	-4,599.32	13,677.00	0.43	0.18	0.39
Survey @ 26069.00 MD 10738.73 TVD									
26,111.00	91.38	324.340	10,737.72	12,914.59	-4,623.80	13,717.37	0.00	0.00	0.00
Survey projected to 26111.00 MD 10737.72 TVD									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
184.00	184.00	0.02	0.14	MWD surveys
26,069.00	10,738.73	12,880.48	-4,599.32	Survey @ 26069.00 MD 10738.73 TVD
26,111.00	10,737.72	12,914.59	-4,623.80	Survey projected to 26111.00 MD 10737.72 TVD

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_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	Michter				
Site Position:		Northing:	14,454,962.42 usft	Latitude:	39.80272253
From:	Lat/Long	Easting:	1,697,325.45 usft	Longitude:	-80.79737330
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.130 °

Well	Michter N-09HU (F)					
Well Position	+N/-S	0.00 ft	Northing:	14,455,050.52 usft	Latitude:	39.80296476
	+E/-W	0.00 ft	Easting:	1,697,280.59 usft	Longitude:	-80.79753230
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	1,128.00 ft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	4/4/2020	-8.718	66.747	51,869.88093682

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	340.330	

Survey Program	Date	5/19/2020			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
184.00	780.00	MWD surf (Original Hole)	MWD	MWD - Standard	
874.00	2,611.00	MWD int (Original Hole)	MWD	MWD - Standard	
2,684.00	10,141.00	MWD (Original Hole)	MWD	MWD - Standard	
10,207.00	26,069.00	MWD lat (Original Hole)	MWD	MWD - Standard	
26,111.00	26,111.00	Projection (Original Hole)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.000	0.00	0.00	0.00	14,455,050.52	1,697,280.59	39.80296476	-80.79753230	
184.00	0.09	81.150	184.00	0.02	0.14	14,455,050.55	1,697,280.74	39.80296482	-80.79753179	
MWD surveys										
235.00	0.09	350.270	235.00	0.07	0.18	14,455,050.59	1,697,280.77	39.80296495	-80.79753168	
282.00	0.09	45.110	282.00	0.13	0.20	14,455,050.65	1,697,280.79	39.80296512	-80.79753160	
326.00	0.13	33.160	326.00	0.20	0.25	14,455,050.72	1,697,280.84	39.80296530	-80.79753142	
373.00	0.09	4.250	373.00	0.28	0.28	14,455,050.80	1,697,280.87	39.80296552	-80.79753130	
416.00	0.09	16.640	416.00	0.34	0.29	14,455,050.87	1,697,280.88	39.80296570	-80.79753126	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
463.00	0.22	348.690	463.00	0.47	0.28	14,455,050.99	1,697,280.88	39.80296604	-80.79753129	
506.00	0.09	302.900	506.00	0.57	0.24	14,455,051.09	1,697,280.83	39.80296632	-80.79753144	
553.00	0.22	316.610	553.00	0.65	0.15	14,455,051.18	1,697,280.74	39.80296655	-80.79753177	
597.00	0.22	352.380	597.00	0.80	0.08	14,455,051.32	1,697,280.67	39.80296695	-80.79753202	
637.00	0.18	19.450	637.00	0.93	0.09	14,455,051.46	1,697,280.68	39.80296732	-80.79753198	
688.00	0.09	6.440	688.00	1.05	0.12	14,455,051.57	1,697,280.71	39.80296764	-80.79753187	
780.00	0.09	347.810	780.00	1.19	0.11	14,455,051.72	1,697,280.70	39.80296803	-80.79753189	
874.00	0.09	43.800	874.00	1.32	0.15	14,455,051.84	1,697,280.74	39.80296838	-80.79753176	
969.00	0.18	58.830	969.00	1.45	0.33	14,455,051.97	1,697,280.92	39.80296874	-80.79753112	
1,064.00	0.62	67.790	1,064.00	1.72	0.93	14,455,052.24	1,697,281.52	39.80296948	-80.79752897	
1,159.00	0.92	36.500	1,159.00	2.53	1.86	14,455,053.05	1,697,282.45	39.80297169	-80.79752566	
1,253.00	1.80	25.690	1,253.00	4.46	2.95	14,455,054.99	1,697,283.54	39.80297700	-80.79752176	
1,348.00	3.47	19.540	1,348.00	8.52	4.56	14,455,059.04	1,697,285.15	39.80298813	-80.79751601	
1,443.00	5.45	18.570	1,443.00	15.50	6.96	14,455,066.03	1,697,287.55	39.80300730	-80.79750741	
1,537.00	6.06	21.910	1,537.00	24.34	10.23	14,455,074.86	1,697,290.82	39.80303154	-80.79749568	
1,632.00	5.05	25.430	1,632.00	32.77	13.90	14,455,083.29	1,697,294.49	39.80305467	-80.79748256	
1,727.00	5.19	30.170	1,727.00	40.26	17.85	14,455,090.78	1,697,298.44	39.80307521	-80.79746842	
1,822.00	5.32	23.760	1,822.00	48.00	21.78	14,455,098.53	1,697,302.38	39.80309646	-80.79745435	
1,917.00	4.75	23.320	1,917.00	55.65	25.12	14,455,106.17	1,697,305.71	39.80311743	-80.79744243	
2,011.00	5.98	28.590	2,011.00	63.52	29.00	14,455,114.05	1,697,309.59	39.80313903	-80.79742853	
2,106.00	6.72	41.770	2,106.00	72.01	35.07	14,455,122.54	1,697,315.66	39.80316231	-80.79740685	
2,201.00	7.12	64.010	2,201.00	78.74	44.07	14,455,129.26	1,697,324.66	39.80318073	-80.79737476	
2,295.00	7.65	69.640	2,295.00	83.47	55.17	14,455,133.99	1,697,335.76	39.80319365	-80.79733519	
2,390.00	6.55	74.560	2,390.00	87.11	66.32	14,455,137.64	1,697,346.91	39.80320358	-80.79729546	
2,485.00	5.76	75.000	2,485.00	89.79	76.15	14,455,140.31	1,697,356.74	39.80321087	-80.79726044	
2,580.00	5.01	79.300	2,580.00	91.79	84.83	14,455,142.32	1,697,365.42	39.80321632	-80.79722952	
2,611.00	4.79	79.300	2,611.00	92.28	87.43	14,455,142.81	1,697,368.02	39.80321765	-80.79722025	
2,684.00	4.79	75.440	2,684.00	93.62	93.38	14,455,144.14	1,697,373.97	39.80322128	-80.79719907	
2,779.00	5.05	78.510	2,779.00	95.45	101.31	14,455,145.97	1,697,381.91	39.80322625	-80.79717080	
2,874.00	5.41	78.070	2,874.00	97.20	109.79	14,455,147.73	1,697,390.38	39.80323103	-80.79714060	
2,968.00	5.67	78.070	2,968.00	99.08	118.67	14,455,149.60	1,697,399.26	39.80323613	-80.79710897	
3,063.00	4.83	72.010	3,063.00	101.29	127.07	14,455,151.81	1,697,407.66	39.80324213	-80.79707906	
3,158.00	4.79	64.980	3,158.00	104.20	134.47	14,455,154.72	1,697,415.06	39.80325008	-80.79705269	
3,253.00	5.01	64.540	3,253.00	107.66	141.81	14,455,158.18	1,697,422.40	39.80325954	-80.79702653	
3,348.00	5.36	65.770	3,348.00	111.26	149.60	14,455,161.79	1,697,430.19	39.80326939	-80.79699876	
3,442.00	5.89	68.050	3,442.00	114.87	158.07	14,455,165.39	1,697,438.67	39.80327924	-80.79696855	
3,537.00	4.70	72.710	3,537.00	117.85	166.31	14,455,168.37	1,697,446.90	39.80328737	-80.79693919	
3,632.00	4.22	74.650	3,632.00	119.93	173.40	14,455,170.45	1,697,453.99	39.80329304	-80.79691394	
3,726.00	4.53	75.530	3,726.00	121.77	180.33	14,455,172.30	1,697,460.92	39.80329806	-80.79688925	
3,821.00	4.88	77.810	3,821.00	123.56	187.91	14,455,174.09	1,697,468.50	39.80330293	-80.79686224	
3,916.00	5.23	80.270	3,916.00	125.15	196.13	14,455,175.67	1,697,476.72	39.80330723	-80.79683297	
4,010.00	5.32	73.420	4,010.00	127.12	204.53	14,455,177.64	1,697,485.12	39.80331258	-80.79680305	
4,105.00	5.23	70.080	4,105.00	129.85	212.82	14,455,180.37	1,697,493.41	39.80332003	-80.79677350	
4,200.00	5.41	70.950	4,200.00	132.78	221.12	14,455,183.31	1,697,501.71	39.80332805	-80.79674391	
4,294.00	5.67	73.240	4,294.00	135.57	229.76	14,455,186.09	1,697,510.35	39.80333564	-80.79671315	
4,389.00	4.92	75.610	4,389.00	137.94	238.20	14,455,188.46	1,697,518.79	39.80334209	-80.79668308	
4,484.00	5.01	79.130	4,484.00	139.73	246.22	14,455,190.25	1,697,526.81	39.80334697	-80.79665451	
4,579.00	5.63	83.170	4,579.00	141.07	254.92	14,455,191.59	1,697,535.51	39.80335058	-80.79662352	
4,674.00	5.14	79.040	4,674.00	142.43	263.72	14,455,192.95	1,697,544.31	39.80335427	-80.79659216	
4,768.00	5.05	67.000	4,768.00	144.85	271.66	14,455,195.37	1,697,552.26	39.80336086	-80.79656386	
4,863.00	5.71	64.100	4,863.00	148.55	279.76	14,455,199.07	1,697,560.36	39.80337096	-80.79653499	
4,958.00	5.01	69.020	4,958.00	152.10	287.89	14,455,202.62	1,697,568.48	39.80338066	-80.79650603	
5,056.00	5.19	73.420	5,056.00	154.89	296.13	14,455,205.42	1,697,576.73	39.80338829	-80.79647665	
5,151.00	4.88	67.440	5,151.00	157.67	303.98	14,455,208.19	1,697,584.57	39.80339587	-80.79644868	
5,246.00	5.32	63.220	5,246.00	161.20	311.65	14,455,211.73	1,697,592.24	39.80340553	-80.79642137	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,340.00	4.48	69.810	5,322.31	164.43	318.98	14,455,214.96	1,697,599.57	39.80341435	-80.79639522
5,435.00	4.17	75.440	5,417.04	166.58	325.81	14,455,217.11	1,697,606.40	39.80342021	-80.79637090
5,530.00	5.01	68.320	5,511.73	168.98	333.01	14,455,219.51	1,697,613.60	39.80342676	-80.79634525
5,625.00	6.24	64.800	5,606.28	172.71	341.53	14,455,223.24	1,697,622.12	39.80343695	-80.79631486
5,719.00	5.93	71.480	5,699.75	176.43	350.76	14,455,226.96	1,697,631.35	39.80344710	-80.79628198
5,814.00	4.79	76.400	5,794.33	178.92	359.27	14,455,229.45	1,697,639.86	39.80345389	-80.79625166
5,909.00	3.87	65.070	5,889.06	181.21	366.03	14,455,231.73	1,697,646.62	39.80346012	-80.79622757
6,003.00	5.32	57.950	5,982.76	184.86	372.60	14,455,235.38	1,697,653.19	39.80347011	-80.79620414
6,098.00	6.28	60.670	6,077.27	189.74	380.86	14,455,240.26	1,697,661.46	39.80348346	-80.79617468
6,322.00	5.63	58.560	6,300.06	201.47	400.92	14,455,252.00	1,697,681.51	39.80351556	-80.79610318
6,382.00	5.84	57.680	6,359.76	204.64	406.01	14,455,255.16	1,697,686.60	39.80352422	-80.79608503
6,477.00	6.20	60.760	6,454.23	209.73	414.57	14,455,260.25	1,697,695.16	39.80353815	-80.79605450
6,571.00	7.34	67.090	6,547.58	214.55	424.53	14,455,265.07	1,697,705.12	39.80355132	-80.79601900
6,666.00	10.68	71.220	6,641.39	219.74	438.46	14,455,270.27	1,697,719.05	39.80356550	-80.79596936
6,761.00	14.81	74.730	6,734.04	225.78	458.52	14,455,276.30	1,697,739.11	39.80358195	-80.79589790
6,856.00	17.62	75.530	6,825.25	232.57	484.16	14,455,283.09	1,697,764.75	39.80360044	-80.79580655
6,951.00	20.92	71.480	6,914.92	241.55	514.17	14,455,292.08	1,697,794.76	39.80362492	-80.79569961
7,045.00	23.55	69.900	7,001.92	253.34	547.73	14,455,303.86	1,697,828.32	39.80365708	-80.79558005
7,140.00	23.07	68.850	7,089.17	266.58	582.91	14,455,317.10	1,697,863.50	39.80369321	-80.79545467
7,235.00	21.84	66.560	7,176.96	280.32	616.48	14,455,330.85	1,697,897.07	39.80373075	-80.79533501
7,330.00	22.06	65.510	7,265.08	294.75	648.93	14,455,345.27	1,697,929.52	39.80377016	-80.79521936
7,425.00	23.12	65.150	7,352.79	309.98	682.09	14,455,360.51	1,697,962.68	39.80381179	-80.79510117
7,519.00	24.61	65.590	7,438.75	325.83	716.66	14,455,376.35	1,697,997.25	39.80385509	-80.79497795
7,614.00	25.22	68.410	7,524.91	341.45	753.49	14,455,391.97	1,698,034.09	39.80389776	-80.79484667
7,709.00	26.28	70.430	7,610.48	355.94	792.13	14,455,406.47	1,698,072.72	39.80393732	-80.79470898
7,803.00	25.80	70.520	7,694.93	369.73	831.02	14,455,420.26	1,698,111.62	39.80397495	-80.79457039
7,898.00	25.14	72.620	7,780.70	382.66	869.77	14,455,433.18	1,698,150.36	39.80401019	-80.79443231
7,993.00	24.74	72.360	7,866.84	394.71	907.98	14,455,445.23	1,698,188.57	39.80404305	-80.79429619
8,088.00	25.14	71.660	7,952.98	407.08	946.08	14,455,457.61	1,698,226.67	39.80407679	-80.79416043
8,183.00	23.51	70.780	8,039.55	419.67	983.12	14,455,470.19	1,698,263.71	39.80411113	-80.79402841
8,277.00	23.29	71.310	8,125.82	431.80	1,018.43	14,455,482.32	1,698,299.02	39.80414421	-80.79390260
8,372.00	25.40	71.480	8,212.36	444.29	1,055.55	14,455,494.81	1,698,336.14	39.80417828	-80.79377035
8,467.00	25.84	70.690	8,298.02	457.61	1,094.40	14,455,508.13	1,698,374.99	39.80421461	-80.79363188
8,561.00	26.02	69.640	8,382.56	471.55	1,133.07	14,455,522.08	1,698,413.66	39.80425266	-80.79349410
8,656.00	26.02	75.880	8,467.95	483.89	1,172.82	14,455,534.41	1,698,453.41	39.80428629	-80.79335246
8,751.00	25.71	80.710	8,553.44	492.30	1,213.37	14,455,542.82	1,698,493.96	39.80430913	-80.79320802
8,846.00	24.83	83.000	8,639.35	498.06	1,253.50	14,455,548.58	1,698,534.09	39.80432469	-80.79306506
8,940.00	23.95	81.770	8,724.96	503.19	1,291.98	14,455,553.72	1,698,572.57	39.80433855	-80.79292803
9,038.00	24.65	75.260	8,814.30	511.24	1,331.43	14,455,561.77	1,698,612.02	39.80436040	-80.79278747
9,133.00	24.70	71.660	8,900.63	522.53	1,369.44	14,455,573.05	1,698,650.02	39.80439116	-80.79265207
9,227.00	24.08	71.660	8,986.24	534.74	1,406.28	14,455,585.27	1,698,686.87	39.80442446	-80.79252078
9,322.00	24.52	72.450	9,072.82	546.79	1,443.47	14,455,597.31	1,698,724.06	39.80445730	-80.79238825
9,416.00	25.36	71.480	9,158.05	559.06	1,481.16	14,455,609.59	1,698,761.75	39.80449077	-80.79225396
9,511.00	25.44	69.640	9,243.87	572.62	1,519.58	14,455,623.15	1,698,800.17	39.80452777	-80.79211705
9,606.00	24.74	69.640	9,329.91	586.64	1,557.35	14,455,637.16	1,698,837.94	39.80456602	-80.79198246
9,701.00	25.18	69.550	9,416.03	600.62	1,594.92	14,455,651.14	1,698,875.51	39.80460417	-80.79184856
9,796.00	24.74	69.460	9,502.16	614.65	1,632.47	14,455,665.18	1,698,913.06	39.80464247	-80.79171474
9,891.00	23.77	69.550	9,588.77	628.32	1,669.03	14,455,678.84	1,698,949.61	39.80467976	-80.79158447
9,985.00	22.81	70.600	9,675.11	640.99	1,703.96	14,455,691.51	1,698,984.55	39.80471434	-80.79145996
10,080.00	22.02	71.750	9,762.94	652.68	1,738.25	14,455,703.21	1,699,018.83	39.80474623	-80.79133780
10,141.00	22.06	73.240	9,819.48	659.57	1,760.07	14,455,710.09	1,699,040.66	39.80476500	-80.79126001
10,207.00	21.89	75.790	9,880.69	666.16	1,783.87	14,455,716.68	1,699,064.46	39.80478296	-80.79117524
10,254.00	21.36	76.400	9,924.38	670.32	1,800.68	14,455,720.85	1,699,081.27	39.80479428	-80.79111534
10,301.00	22.15	72.190	9,968.03	675.05	1,817.44	14,455,725.57	1,699,098.03	39.80480715	-80.79105563
10,348.00	24.22	66.300	10,011.24	681.63	1,834.71	14,455,732.16	1,699,115.30	39.80482513	-80.79099410

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,396.00	28.79	63.400	10,054.19	690.77	1,854.07	14,455,741.29	1,699,134.66	39.80485010	-80.79092508
10,443.00	33.01	63.480	10,094.51	701.56	1,875.65	14,455,752.08	1,699,156.24	39.80487959	-80.79084814
10,491.00	36.88	63.400	10,133.84	713.85	1,900.24	14,455,764.38	1,699,180.83	39.80491319	-80.79076049
10,538.00	41.63	64.890	10,170.23	726.80	1,927.00	14,455,777.32	1,699,207.59	39.80494857	-80.79066509
10,585.00	45.14	67.180	10,204.36	739.89	1,956.50	14,455,790.41	1,699,237.09	39.80498433	-80.79055994
10,632.00	47.96	67.530	10,236.70	753.02	1,987.99	14,455,803.55	1,699,268.58	39.80502020	-80.79044771
10,680.00	51.34	68.490	10,267.78	766.71	2,021.91	14,455,817.24	1,699,302.50	39.80505757	-80.79032683
10,727.00	54.51	69.810	10,296.11	780.05	2,056.95	14,455,830.57	1,699,337.54	39.80509397	-80.79020195
10,775.00	56.97	69.550	10,323.13	793.82	2,094.15	14,455,844.35	1,699,374.74	39.80513156	-80.79006938
10,822.00	58.90	70.250	10,348.08	807.51	2,131.55	14,455,858.03	1,699,412.14	39.80516891	-80.78993609
10,870.00	62.37	69.900	10,371.61	821.77	2,170.87	14,455,872.29	1,699,451.46	39.80520780	-80.78979596
10,917.00	65.36	68.930	10,392.31	836.60	2,210.37	14,455,887.13	1,699,490.95	39.80524830	-80.78965521
10,964.00	67.52	69.550	10,411.10	851.87	2,250.65	14,455,902.39	1,699,531.24	39.80528997	-80.78951165
11,011.00	69.27	69.990	10,428.40	866.98	2,291.65	14,455,917.50	1,699,572.24	39.80533119	-80.78936553
11,059.00	69.23	70.160	10,445.41	882.28	2,333.85	14,455,932.80	1,699,614.44	39.80537293	-80.78921515
11,106.00	69.36	70.160	10,462.03	897.20	2,375.21	14,455,947.72	1,699,655.79	39.80541364	-80.78906777
11,154.00	69.32	69.810	10,478.96	912.57	2,417.41	14,455,963.09	1,699,697.99	39.80545558	-80.78891738
11,201.00	69.32	69.550	10,495.56	927.84	2,458.64	14,455,978.36	1,699,739.23	39.80549725	-80.78877043
11,249.00	68.84	69.640	10,512.70	943.47	2,500.66	14,455,993.99	1,699,781.25	39.80553991	-80.78862067
11,296.00	68.57	70.520	10,529.77	958.39	2,541.83	14,456,008.91	1,699,822.42	39.80558061	-80.78847395
11,343.00	68.70	70.430	10,546.89	973.02	2,583.09	14,456,023.54	1,699,863.67	39.80562052	-80.78832694
11,390.00	67.47	70.600	10,564.43	987.57	2,624.19	14,456,038.09	1,699,904.78	39.80566020	-80.78818045
11,438.00	66.33	70.690	10,583.26	1,002.20	2,665.85	14,456,052.72	1,699,946.43	39.80570011	-80.78803201
11,485.00	66.11	70.250	10,602.22	1,016.58	2,706.38	14,456,067.10	1,699,986.97	39.80573933	-80.78788755
11,533.00	65.05	67.000	10,622.06	1,032.50	2,747.08	14,456,083.02	1,700,027.66	39.80578279	-80.78774252
11,580.00	65.45	63.840	10,641.75	1,050.25	2,785.88	14,456,100.77	1,700,066.47	39.80583129	-80.78760419
11,628.00	66.37	60.940	10,661.34	1,070.56	2,824.71	14,456,121.08	1,700,105.29	39.80588681	-80.78746579
11,675.00	67.43	59.790	10,679.78	1,091.94	2,862.28	14,456,142.46	1,700,142.87	39.80594528	-80.78733182
11,723.00	67.25	55.310	10,698.28	1,115.70	2,899.65	14,456,166.22	1,700,180.23	39.80601028	-80.78719856
11,770.00	67.30	49.510	10,716.45	1,142.13	2,933.98	14,456,192.65	1,700,214.57	39.80608264	-80.78707609
11,817.00	67.74	45.550	10,734.43	1,171.44	2,966.00	14,456,221.96	1,700,246.59	39.80616294	-80.78696182
11,865.00	68.31	43.710	10,752.39	1,203.12	2,997.27	14,456,253.64	1,700,277.86	39.80624973	-80.78685021
11,913.00	69.71	42.130	10,769.59	1,235.94	3,027.79	14,456,286.46	1,700,308.37	39.80633966	-80.78674128
11,960.00	69.41	35.710	10,786.01	1,270.18	3,055.44	14,456,320.70	1,700,336.02	39.80643351	-80.78664253
12,007.00	68.84	29.820	10,802.77	1,307.08	3,079.19	14,456,357.61	1,700,359.78	39.80653471	-80.78655763
12,054.00	69.49	26.570	10,819.50	1,345.79	3,099.94	14,456,396.31	1,700,380.53	39.80664088	-80.78648342
12,102.00	70.68	21.740	10,835.85	1,386.96	3,118.40	14,456,437.48	1,700,398.98	39.80675381	-80.78641736
12,149.00	71.96	17.960	10,850.91	1,428.83	3,133.51	14,456,479.35	1,700,414.09	39.80686870	-80.78636320
12,197.00	71.87	13.910	10,865.82	1,472.69	3,146.03	14,456,523.21	1,700,426.62	39.80698908	-80.78631823
12,244.00	72.00	8.460	10,880.40	1,516.51	3,154.69	14,456,567.03	1,700,435.28	39.80710935	-80.78628701
12,292.00	73.63	5.480	10,894.59	1,562.02	3,160.25	14,456,612.54	1,700,440.84	39.80723430	-80.78626683
12,339.00	75.12	1.780	10,907.25	1,607.18	3,163.11	14,456,657.70	1,700,443.70	39.80735830	-80.78625627
12,386.00	77.05	357.570	10,918.56	1,652.79	3,162.85	14,456,703.31	1,700,443.43	39.80748355	-80.78625683
12,433.00	78.29	353.870	10,928.60	1,698.57	3,159.42	14,456,749.09	1,700,440.00	39.80760929	-80.78626865
12,481.00	78.86	351.240	10,938.11	1,745.21	3,153.32	14,456,795.73	1,700,433.91	39.80773744	-80.78628996
12,528.00	80.44	348.340	10,946.55	1,790.71	3,145.12	14,456,841.23	1,700,425.71	39.80786244	-80.78631876
12,576.00	81.98	344.470	10,953.89	1,836.80	3,133.97	14,456,887.33	1,700,414.56	39.80798910	-80.78635808
12,623.00	84.09	340.250	10,959.59	1,881.25	3,119.83	14,456,931.77	1,700,400.42	39.80811125	-80.78640804
12,671.00	83.74	337.610	10,964.68	1,925.78	3,102.68	14,456,976.31	1,700,383.26	39.80823367	-80.78646875
12,718.00	83.87	335.420	10,969.75	1,968.64	3,084.06	14,457,019.16	1,700,364.64	39.80835147	-80.78653469
12,766.00	84.70	331.990	10,974.53	2,011.45	3,062.90	14,457,061.97	1,700,343.49	39.80846919	-80.78660966
12,813.00	85.80	330.410	10,978.42	2,052.49	3,040.34	14,457,103.01	1,700,320.92	39.80858205	-80.78668965
12,861.00	86.68	328.030	10,981.57	2,093.64	3,015.83	14,457,144.16	1,700,296.41	39.80869521	-80.78677658
12,908.00	87.74	326.890	10,983.86	2,133.21	2,990.58	14,457,183.73	1,700,271.16	39.80880405	-80.78686615
12,955.00	88.92	326.010	10,985.23	2,172.36	2,964.61	14,457,222.88	1,700,245.20	39.80891174	-80.78695827

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,002.00	89.49	324.960	10,985.88	2,211.09	2,937.99	14,457,261.61	1,700,218.57	39.80901826	-80.78705277
13,050.00	89.67	324.870	10,986.23	2,250.36	2,910.40	14,457,300.88	1,700,190.98	39.80912630	-80.78715067
13,145.00	89.41	324.520	10,987.00	2,327.89	2,855.50	14,457,378.41	1,700,136.08	39.80933957	-80.78734551
13,240.00	91.38	324.430	10,986.34	2,405.20	2,800.30	14,457,455.72	1,700,080.89	39.80955225	-80.78754141
13,337.00	91.74	325.050	10,983.70	2,484.38	2,744.32	14,457,534.89	1,700,024.91	39.80977004	-80.78774006
13,432.00	91.78	325.660	10,980.78	2,562.49	2,690.34	14,457,613.01	1,699,970.93	39.80998493	-80.78793162
13,526.00	90.90	325.130	10,978.59	2,639.84	2,636.97	14,457,690.36	1,699,917.56	39.81019769	-80.78812101
13,621.00	90.73	323.460	10,977.23	2,716.97	2,581.54	14,457,767.49	1,699,862.13	39.81040988	-80.78831776
13,716.00	90.81	323.550	10,975.96	2,793.34	2,525.04	14,457,843.86	1,699,805.63	39.81061996	-80.78851830
13,811.00	90.77	323.820	10,974.65	2,869.88	2,468.79	14,457,920.40	1,699,749.37	39.81083053	-80.78871798
13,905.00	90.73	323.820	10,973.42	2,945.75	2,413.30	14,457,996.26	1,699,693.89	39.81103924	-80.78891492
14,000.00	90.81	324.080	10,972.14	3,022.55	2,357.40	14,458,073.07	1,699,637.99	39.81125052	-80.78911334
14,095.00	90.77	323.820	10,970.83	3,099.35	2,301.50	14,458,149.87	1,699,582.09	39.81146179	-80.78931176
14,190.00	90.73	323.990	10,969.59	3,176.11	2,245.54	14,458,226.62	1,699,526.12	39.81167295	-80.78951040
14,284.00	90.73	323.990	10,968.39	3,252.14	2,190.27	14,458,302.65	1,699,470.86	39.81188211	-80.78970654
14,379.00	90.73	323.900	10,967.18	3,328.93	2,134.37	14,458,379.45	1,699,414.95	39.81209337	-80.78990499
14,474.00	90.73	323.990	10,965.97	3,405.73	2,078.46	14,458,456.25	1,699,359.05	39.81230464	-80.79010344
14,569.00	90.99	324.170	10,964.54	3,482.66	2,022.73	14,458,533.17	1,699,303.32	39.81251625	-80.79030124
14,664.00	91.30	324.080	10,962.64	3,559.62	1,967.07	14,458,610.14	1,699,247.66	39.81272797	-80.79049881
14,758.00	91.21	324.170	10,960.59	3,635.77	1,912.00	14,458,686.29	1,699,192.59	39.81293745	-80.79069429
14,853.00	91.30	324.080	10,958.51	3,712.73	1,856.34	14,458,763.25	1,699,136.93	39.81314916	-80.79089185
14,948.00	91.21	324.340	10,956.42	3,789.77	1,800.80	14,458,840.29	1,699,081.38	39.81336110	-80.79108901
15,043.00	91.25	326.010	10,954.39	3,867.74	1,746.56	14,458,918.25	1,699,027.15	39.81357555	-80.79128150
15,137.00	91.25	326.100	10,952.33	3,945.70	1,694.08	14,458,996.21	1,698,974.67	39.81378999	-80.79146773
15,232.00	91.34	325.930	10,950.19	4,024.45	1,640.99	14,459,074.97	1,698,921.58	39.81400661	-80.79165613
15,327.00	91.38	325.750	10,947.93	4,103.04	1,587.66	14,459,153.55	1,698,868.25	39.81422277	-80.79184539
15,422.00	91.25	326.010	10,945.75	4,181.66	1,534.39	14,459,232.18	1,698,814.98	39.81443904	-80.79203445
15,517.00	91.25	326.100	10,943.68	4,260.45	1,481.36	14,459,310.97	1,698,761.94	39.81465576	-80.79222266
15,612.00	91.25	325.660	10,941.61	4,339.08	1,428.08	14,459,389.60	1,698,708.67	39.81487203	-80.79241173
15,706.00	91.34	326.010	10,939.48	4,416.84	1,375.31	14,459,467.36	1,698,655.89	39.81508591	-80.79259903
15,801.00	91.34	326.190	10,937.26	4,495.67	1,322.33	14,459,546.18	1,698,602.92	39.81530273	-80.79278702
15,896.00	91.25	326.190	10,935.11	4,574.58	1,269.49	14,459,625.10	1,698,550.08	39.81551979	-80.79297457
15,991.00	91.30	326.100	10,933.00	4,653.46	1,216.57	14,459,703.97	1,698,497.16	39.81573673	-80.79316235
16,086.00	91.25	326.100	10,930.89	4,732.29	1,163.60	14,459,782.80	1,698,444.19	39.81595356	-80.79335035
16,180.00	90.68	323.820	10,929.30	4,809.23	1,109.64	14,459,859.75	1,698,390.23	39.81616521	-80.79354187
16,275.00	90.90	324.430	10,927.99	4,886.21	1,053.98	14,459,936.72	1,698,334.57	39.81637695	-80.79373948
16,370.00	90.81	324.170	10,926.58	4,963.34	998.55	14,460,013.86	1,698,279.14	39.81658914	-80.79393625
16,465.00	90.86	324.340	10,925.19	5,040.44	943.06	14,460,090.95	1,698,223.65	39.81680122	-80.79413323
16,559.00	90.81	323.990	10,923.82	5,116.64	888.03	14,460,167.15	1,698,168.62	39.81701083	-80.79432857
16,654.00	90.64	323.820	10,922.62	5,193.40	832.07	14,460,243.91	1,698,112.66	39.81722197	-80.79452724
16,749.00	90.86	323.900	10,921.38	5,270.11	776.04	14,460,320.62	1,698,056.64	39.81743300	-80.79472612
16,843.00	90.77	323.640	10,920.04	5,345.93	720.49	14,460,396.44	1,698,001.08	39.81764157	-80.79492334
16,938.00	90.81	323.820	10,918.73	5,422.51	664.30	14,460,473.03	1,697,944.89	39.81785224	-80.79512284
17,033.00	90.77	324.430	10,917.42	5,499.48	608.63	14,460,550.00	1,697,889.22	39.81806397	-80.79532046
17,128.00	90.81	324.690	10,916.11	5,576.87	553.55	14,460,627.39	1,697,834.14	39.81827686	-80.79551599
17,223.00	90.86	324.340	10,914.73	5,654.22	498.41	14,460,704.73	1,697,779.00	39.81848962	-80.79571173
17,317.00	90.81	324.170	10,913.36	5,730.51	443.50	14,460,781.02	1,697,724.09	39.81869946	-80.79590666
17,412.00	90.81	324.340	10,912.01	5,807.60	388.01	14,460,858.12	1,697,668.60	39.81891153	-80.79610366
17,507.00	90.81	323.990	10,910.67	5,884.61	332.40	14,460,935.12	1,697,612.99	39.81912337	-80.79630109
17,601.00	90.77	324.080	10,909.37	5,960.69	277.20	14,461,011.20	1,697,557.79	39.81933263	-80.79649706
17,696.00	90.77	324.080	10,908.10	6,037.61	221.47	14,461,088.13	1,697,502.06	39.81954424	-80.79669490
17,791.00	90.77	324.430	10,906.82	6,114.71	165.98	14,461,165.22	1,697,446.57	39.81975632	-80.79689191
17,885.00	90.90	324.260	10,905.45	6,191.08	111.19	14,461,241.59	1,697,391.79	39.81996639	-80.79708641
17,980.00	90.77	324.340	10,904.07	6,268.22	55.76	14,461,318.73	1,697,336.36	39.82017858	-80.79728320
18,075.00	90.29	324.170	10,903.19	6,345.32	0.27	14,461,395.83	1,697,280.86	39.82039067	-80.79748022

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
18,170.00	90.24	324.260	10,902.75	6,422.39	-55.28	14,461,472.90	1,697,225.31	39.82060265	-80.79767743
18,264.00	90.73	325.400	10,901.95	6,499.22	-109.42	14,461,549.73	1,697,171.17	39.82081400	-80.79786964
18,359.00	90.86	326.360	10,900.63	6,577.86	-162.71	14,461,628.37	1,697,117.89	39.82103029	-80.79805877
18,454.00	90.73	325.840	10,899.32	6,656.70	-215.69	14,461,707.22	1,697,064.91	39.82124714	-80.79824682
18,548.00	90.73	325.750	10,898.12	6,734.44	-268.52	14,461,784.95	1,697,012.07	39.82146095	-80.79843438
18,643.00	90.77	325.930	10,896.87	6,813.04	-321.86	14,461,863.55	1,696,958.73	39.82167714	-80.79862372
18,738.00	90.68	325.750	10,895.67	6,891.65	-375.20	14,461,942.16	1,696,905.39	39.82189334	-80.79881305
18,833.00	90.73	325.930	10,894.50	6,970.25	-428.54	14,462,020.76	1,696,852.05	39.82210953	-80.79900239
18,927.00	91.12	326.100	10,892.99	7,048.18	-481.08	14,462,098.69	1,696,799.52	39.82232388	-80.79918888
19,022.00	91.30	326.190	10,890.98	7,127.06	-533.99	14,462,177.57	1,696,746.60	39.82254082	-80.79937670
19,117.00	91.38	326.280	10,888.76	7,206.01	-586.77	14,462,256.52	1,696,693.82	39.82275797	-80.79956407
19,211.00	91.30	325.930	10,886.56	7,284.02	-639.18	14,462,334.53	1,696,641.41	39.82297251	-80.79975009
19,306.00	91.34	326.360	10,884.37	7,362.89	-692.09	14,462,413.40	1,696,588.50	39.82318944	-80.79993791
19,401.00	91.43	325.750	10,882.08	7,441.67	-745.12	14,462,492.18	1,696,535.47	39.82340613	-80.80012616
19,495.00	91.21	324.430	10,879.91	7,518.74	-798.90	14,462,569.25	1,696,481.69	39.82361810	-80.80031709
19,590.00	91.30	324.260	10,877.83	7,595.91	-854.27	14,462,646.42	1,696,426.33	39.82383037	-80.80051365
19,685.00	91.30	324.170	10,875.67	7,672.96	-909.80	14,462,723.46	1,696,370.79	39.82404230	-80.80071084
19,779.00	91.21	324.340	10,873.62	7,749.23	-964.70	14,462,799.74	1,696,315.89	39.82425210	-80.80090577
19,874.00	91.30	325.050	10,871.53	7,826.74	-1,019.59	14,462,877.25	1,696,261.00	39.82446530	-80.80110065
19,969.00	91.30	324.430	10,869.38	7,904.29	-1,074.42	14,462,954.80	1,696,206.18	39.82467861	-80.80129532
20,064.00	91.43	325.130	10,867.12	7,981.88	-1,129.19	14,463,032.39	1,696,151.40	39.82489202	-80.80148978
20,158.00	91.30	324.690	10,864.88	8,058.77	-1,183.21	14,463,109.28	1,696,097.38	39.82510351	-80.80168158
20,253.00	91.38	324.520	10,862.66	8,136.19	-1,238.22	14,463,186.70	1,696,042.37	39.82531647	-80.80187690
20,348.00	91.38	324.430	10,860.37	8,213.49	-1,293.41	14,463,263.99	1,695,987.19	39.82552907	-80.80207284
20,443.00	91.30	324.340	10,858.15	8,290.70	-1,348.71	14,463,341.20	1,695,931.88	39.82574144	-80.80226922
20,537.00	91.25	324.610	10,856.05	8,367.18	-1,403.32	14,463,417.69	1,695,877.27	39.82595182	-80.80246311
20,631.00	91.21	324.610	10,854.04	8,443.79	-1,457.75	14,463,494.30	1,695,822.85	39.82616255	-80.80265636
20,726.00	91.30	324.520	10,851.96	8,521.18	-1,512.81	14,463,571.69	1,695,767.78	39.82637540	-80.80285188
20,821.00	91.25	324.170	10,849.84	8,598.35	-1,568.17	14,463,648.86	1,695,712.42	39.82658767	-80.80304846
20,916.00	91.30	324.170	10,847.73	8,675.35	-1,623.77	14,463,725.86	1,695,656.82	39.82679948	-80.80324588
21,010.00	91.21	324.340	10,845.67	8,751.63	-1,678.67	14,463,802.13	1,695,601.92	39.82700928	-80.80344083
21,105.00	91.12	323.990	10,843.74	8,828.63	-1,734.28	14,463,879.14	1,695,546.32	39.82722108	-80.80363828
21,200.00	90.73	324.340	10,842.20	8,905.64	-1,789.89	14,463,956.14	1,695,490.71	39.82743289	-80.80383575
21,294.00	90.77	324.080	10,840.97	8,981.88	-1,844.86	14,464,032.38	1,695,435.74	39.82764261	-80.80403094
21,389.00	90.81	324.340	10,839.66	9,058.93	-1,900.41	14,464,109.44	1,695,380.19	39.82785455	-80.80422821
21,484.00	90.07	324.690	10,838.93	9,136.28	-1,955.55	14,464,186.79	1,695,325.04	39.82806731	-80.80442402
21,578.00	90.77	324.430	10,838.25	9,212.87	-2,010.06	14,464,263.37	1,695,270.54	39.82827795	-80.80461756
21,673.00	90.95	324.430	10,836.82	9,290.13	-2,065.31	14,464,340.64	1,695,215.28	39.82849047	-80.80481377
21,767.00	91.38	324.960	10,834.91	9,366.83	-2,119.63	14,464,417.33	1,695,160.97	39.82870142	-80.80500663
21,862.00	91.38	324.430	10,832.62	9,444.33	-2,174.51	14,464,494.84	1,695,106.08	39.82891460	-80.80520153
21,956.00	91.38	324.430	10,830.36	9,520.77	-2,229.18	14,464,571.27	1,695,051.42	39.82912484	-80.80539564
22,051.00	91.38	323.730	10,828.07	9,597.68	-2,284.89	14,464,648.19	1,694,995.70	39.82933639	-80.80559350
22,146.00	91.25	324.260	10,825.89	9,674.51	-2,340.72	14,464,725.02	1,694,939.87	39.82954773	-80.80579177
22,241.00	91.34	324.610	10,823.74	9,751.77	-2,395.96	14,464,802.28	1,694,884.63	39.82976023	-80.80598794
22,336.00	91.47	324.520	10,821.41	9,829.15	-2,451.03	14,464,879.66	1,694,829.57	39.82997306	-80.80618347
22,430.00	91.30	324.170	10,819.14	9,905.51	-2,505.80	14,464,956.01	1,694,774.79	39.83018308	-80.80637799
22,525.00	91.34	324.340	10,816.95	9,982.59	-2,561.29	14,465,033.10	1,694,719.31	39.83039510	-80.80657502
22,620.00	91.30	324.260	10,814.76	10,059.72	-2,616.71	14,465,110.22	1,694,663.89	39.83060724	-80.80677184
22,714.00	91.12	325.050	10,812.78	10,136.38	-2,671.07	14,465,186.88	1,694,609.52	39.83081808	-80.80696490
22,809.00	91.25	325.930	10,810.81	10,214.64	-2,724.88	14,465,265.14	1,694,555.71	39.83103334	-80.80715597
22,903.00	91.25	326.010	10,808.76	10,292.52	-2,777.48	14,465,343.03	1,694,503.12	39.83124753	-80.80734271
22,998.00	91.21	326.010	10,806.72	10,371.27	-2,830.57	14,465,421.78	1,694,450.02	39.83146411	-80.80753123
23,093.00	91.25	326.010	10,804.68	10,450.02	-2,883.67	14,465,500.53	1,694,396.93	39.83168070	-80.80771976
23,187.00	91.30	326.280	10,802.59	10,528.07	-2,936.02	14,465,578.57	1,694,344.57	39.83189533	-80.80790565
23,282.00	91.25	326.190	10,800.48	10,607.02	-2,988.81	14,465,657.53	1,694,291.79	39.83211247	-80.80809308

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Michter N-09HU (F)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Site:	Michter	MD Reference:	RKB=1128+25 @ 1153.00ft (H&P 611)
Well:	Michter N-09HU (F)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
23,376.00	91.25	325.930	10,798.43	10,684.99	-3,041.28	14,465,735.49	1,694,239.32	39.83232690	-80.80827938	
23,471.00	91.25	326.010	10,796.36	10,763.70	-3,094.43	14,465,814.20	1,694,186.17	39.83254337	-80.80846811	
23,565.00	91.25	326.010	10,794.30	10,841.62	-3,146.97	14,465,892.12	1,694,133.63	39.83275767	-80.80865466	
23,660.00	91.25	326.010	10,792.23	10,920.37	-3,200.07	14,465,970.87	1,694,080.53	39.83297425	-80.80884320	
23,755.00	91.21	326.360	10,790.19	10,999.28	-3,252.92	14,466,049.78	1,694,027.67	39.83319127	-80.80903088	
23,849.00	91.43	325.400	10,788.03	11,077.08	-3,305.64	14,466,127.58	1,693,974.96	39.83340523	-80.80921805	
23,944.00	91.30	324.690	10,785.76	11,154.92	-3,360.05	14,466,205.42	1,693,920.55	39.83361931	-80.80941129	
24,038.00	91.30	324.960	10,783.63	11,231.73	-3,414.19	14,466,282.24	1,693,866.41	39.83383059	-80.80960355	
24,133.00	91.34	324.340	10,781.44	11,309.20	-3,469.14	14,466,359.70	1,693,811.46	39.83404364	-80.80979870	
24,228.00	91.25	324.340	10,779.30	11,386.36	-3,524.51	14,466,436.87	1,693,756.09	39.83425589	-80.80999534	
24,322.00	91.30	324.260	10,777.21	11,462.68	-3,579.34	14,466,513.18	1,693,701.26	39.83446579	-80.81019011	
24,417.00	91.30	324.690	10,775.05	11,539.98	-3,634.53	14,466,590.48	1,693,646.07	39.83467839	-80.81038611	
24,511.00	91.25	324.430	10,772.96	11,616.54	-3,689.02	14,466,667.04	1,693,591.58	39.83488897	-80.81057965	
24,606.00	91.30	324.260	10,770.84	11,693.72	-3,744.39	14,466,744.22	1,693,536.21	39.83510123	-80.81077627	
24,701.00	91.30	324.340	10,768.69	11,770.84	-3,799.81	14,466,821.34	1,693,480.79	39.83531336	-80.81097312	
24,795.00	91.25	324.610	10,766.60	11,847.33	-3,854.41	14,466,897.83	1,693,426.19	39.83552372	-80.81116706	
24,890.00	91.21	324.170	10,764.56	11,924.55	-3,909.72	14,466,975.05	1,693,370.88	39.83573610	-80.81136348	
24,984.00	91.21	323.990	10,762.57	12,000.65	-3,964.85	14,467,051.15	1,693,315.75	39.83594543	-80.81155931	
25,079.00	91.25	324.260	10,760.53	12,077.61	-4,020.51	14,467,128.11	1,693,260.09	39.83615711	-80.81175700	
25,174.00	91.21	324.260	10,758.49	12,154.70	-4,075.98	14,467,205.20	1,693,204.62	39.83636914	-80.81195405	
25,268.00	91.25	324.170	10,756.48	12,230.94	-4,130.94	14,467,281.44	1,693,149.66	39.83657882	-80.81214923	
25,363.00	91.25	324.260	10,754.40	12,307.99	-4,186.48	14,467,358.49	1,693,094.12	39.83679073	-80.81234650	
25,457.00	91.25	324.430	10,752.35	12,384.35	-4,241.26	14,467,434.85	1,693,039.35	39.83700075	-80.81254107	
25,552.00	91.25	324.340	10,750.28	12,461.56	-4,296.56	14,467,512.06	1,692,984.04	39.83721312	-80.81273752	
25,647.00	91.30	324.340	10,748.17	12,538.73	-4,351.93	14,467,589.23	1,692,928.67	39.83742535	-80.81293419	
25,741.00	91.25	323.820	10,746.08	12,614.83	-4,407.07	14,467,665.33	1,692,873.54	39.83763468	-80.81313002	
25,836.00	91.30	324.170	10,743.96	12,691.67	-4,462.90	14,467,742.17	1,692,817.70	39.83784600	-80.81332834	
25,930.00	91.25	324.080	10,741.87	12,767.82	-4,517.97	14,467,818.31	1,692,762.63	39.83805544	-80.81352396	
26,025.00	91.30	324.170	10,739.76	12,844.78	-4,573.63	14,467,895.27	1,692,706.97	39.83826711	-80.81372166	
26,069.00	91.38	324.340	10,738.73	12,880.48	-4,599.32	14,467,930.98	1,692,681.28	39.83836530	-80.81381294	
Survey @ 26069.00 MD 10738.73 TVD										
26,111.00	91.38	324.340	10,737.72	12,914.59	-4,623.80	14,467,965.09	1,692,656.80	39.83845913	-80.81389988	
Survey projected to 26111.00 MD 10737.72 TVD										

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
184.00	184.00	0.02	0.14	MWD surveys	
26,069.00	10,738.73	12,880.48	-4,599.32	Survey @ 26069.00 MD 10738.73 TVD	
26,111.00	10,737.72	12,914.59	-4,623.80	Survey projected to 26111.00 MD 10737.72 TVD	