



Well: Whistlepig N-05HM (slot B)
 Site: Whistlepig
 Project: Marshall County, West Virginia
 Design: rev1
 Rig: Nabors X14

ANNOTATIONS SURVEYS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Annotation
190.00	0.18	130.31	190.00	-0.19	0.23	-0.30	MWD surveys
19665.00	89.14	315.59	6479.81	6969.22	-8523.95	11010.33	Survey @ 19665.00 MD 6479.81 TVD
19720.00	89.14	315.59	6480.64	7008.51	-8562.44	11065.00	Survey Proj. to 19720.00 MD 6480.64 TVD

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
2	1401.00	0.00	0.00	1401.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2°/100' build
3	2941.24	30.80	171.18	2868.10	-399.40	61.95	2.00	171.184	-301.27	Begin 30.80° tangent
4	6239.05	30.80	171.18	5700.65	-2068.30	320.80	0.00	0.000	-1560.15	Begin 8°/100' build/turn
5	7142.54	50.00	300.34	6486.06	-2130.60	16.07	8.00	141.420	-1364.12	Begin 10°/100' build/turn
6	7580.32	91.00	317.13	6630.00	-1872.84	-292.71	10.00	24.673	-961.90	Begin 91.00° lateral
7	19691.09	91.00	317.13	6418.00	7001.68	-8530.96	0.00	0.000	1036.34	PBHL/TD

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=1368+32.5 @ 1400.50ft (Nabors X14)

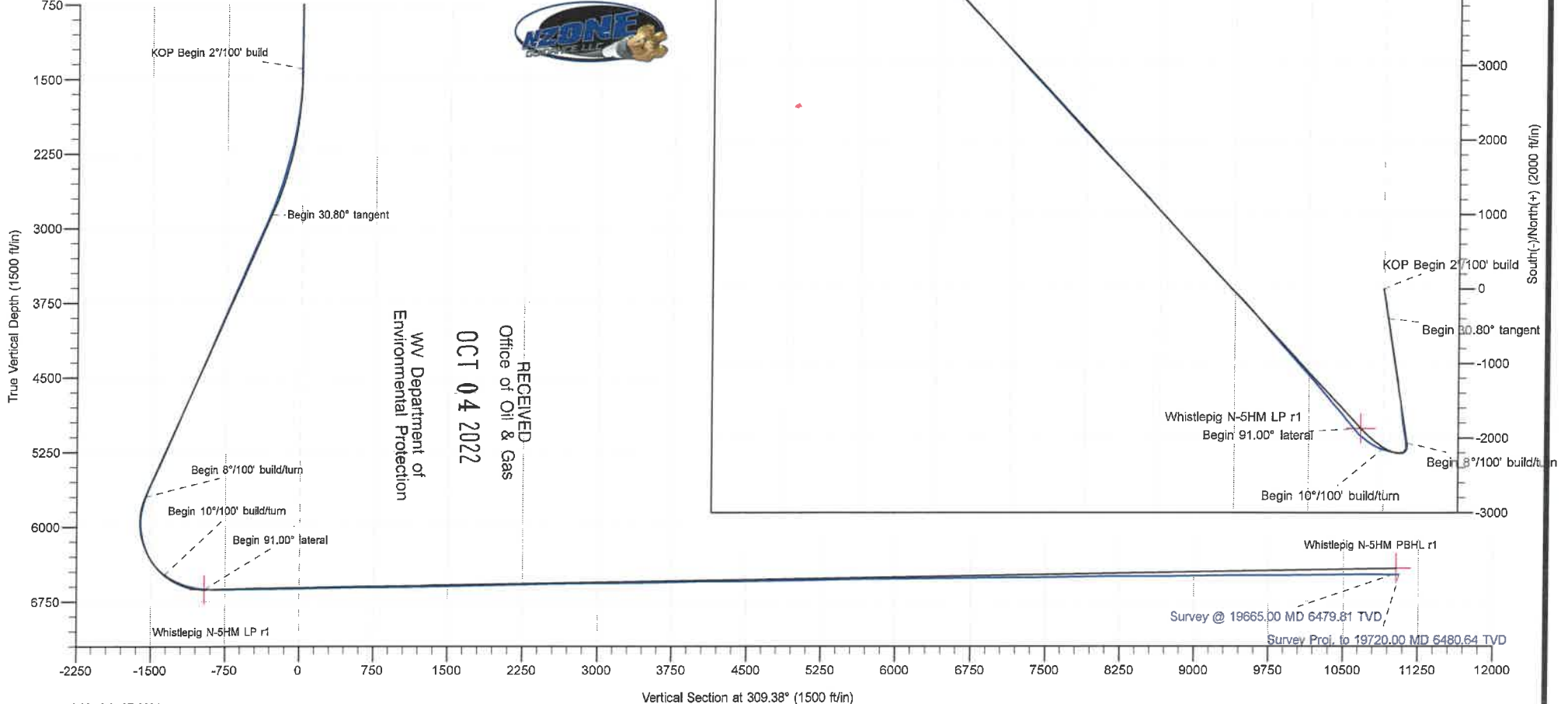
Northing	Easting	Latitude	Longitude
14444973.08	1698582.30	39.77528114	-80.79298048



Azimuths to Grid North
 True North: -0.13°
 Magnetic North: -8.73°

Magnetic Field
 Strength: 51743.5nT
 Dip Angle: 66.54°
 Date: 7/7/2021
 Model: IGRF2020

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.735°



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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Whistlepig N-05HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Site:	Whistlepig	MD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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	Whistlepig				
Site Position:		Northing:	14,444,965.96 usft	Latitude:	39.77526165
From:	Lat/Long	Easting:	1,698,572.65 usft	Longitude:	-80.79301490
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "		

Well	Whistlepig N-05HM (slot B)					
Well Position	+N/-S	0.00 ft	Northing:	14,444,973.08 usft	Latitude:	39.77528114
	+E/-W	0.00 ft	Easting:	1,698,582.30 usft	Longitude:	-80.79298048
Position Uncertainty	0.00 ft		Wellhead Elevation:	ft	Ground Level:	1,368.00 ft
Grid Convergence:	0.132 °					

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	7/7/2021	-8.602	66.536	51,743.54639478

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	309.38	

Survey Program	Date 7/27/2021				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
190.00	1,105.00	MWD surf (Original Hole)	MWD	MWD - Standard	RECEIVED Office of Oil & Gas OCT 04 2022 WV Department of Environmental Protection
1,126.00	2,855.00	MWD int (Original Hole)	MWD	MWD - Standard	
2,921.00	19,665.00	MWD (Original Hole)	MWD	MWD - Standard	
19,720.00	19,720.00	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
190.00	0.18	130.31	190.00	-0.19	0.23	-0.30	0.09	0.09	0.00	
MWD surveys										
237.00	0.13	69.23	237.00	-0.22	0.33	-0.40	0.35	-0.11	-129.96	
281.00	0.22	112.47	281.00	-0.24	0.46	-0.50	0.35	0.20	98.27	
328.00	0.18	153.52	328.00	-0.34	0.57	-0.66	0.31	-0.09	87.34	
373.00	0.26	141.48	373.00	-0.48	0.67	-0.82	0.20	0.18	-26.76	

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Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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)
420.00	0.31	177.07	420.00	-0.69	0.74	-1.01	0.38	0.11	75.72
463.00	0.31	170.57	463.00	-0.92	0.77	-1.18	0.08	0.00	-15.12
510.00	0.40	172.94	510.00	-1.21	0.81	-1.39	0.19	0.19	5.04
553.00	0.35	177.22	553.00	-1.49	0.83	-1.59	0.13	-0.12	9.95
600.00	0.40	196.50	599.99	-1.79	0.79	-1.75	0.29	0.11	41.02
643.00	0.31	189.73	642.99	-2.05	0.73	-1.87	0.23	-0.21	-15.74
690.00	0.35	173.82	689.99	-2.32	0.73	-2.03	0.21	0.09	-33.85
733.00	0.40	190.91	732.99	-2.60	0.71	-2.20	0.28	0.12	39.74
780.00	0.26	178.30	779.99	-2.86	0.68	-2.34	0.33	-0.30	-26.83
828.00	0.40	206.87	827.99	-3.12	0.61	-2.45	0.44	0.29	59.52
875.00	0.31	173.59	874.99	-3.39	0.55	-2.58	0.47	-0.19	-70.81
922.00	0.40	180.94	921.99	-3.68	0.56	-2.77	0.21	0.19	15.64
969.00	0.40	200.98	968.99	-4.00	0.50	-2.93	0.30	0.00	42.64
1,016.00	0.48	197.73	1,015.99	-4.34	0.38	-3.05	0.18	0.17	-6.91
1,063.00	0.44	210.91	1,062.98	-4.68	0.23	-3.15	0.24	-0.09	28.04
1,105.00	0.44	194.74	1,104.98	-4.98	0.11	-3.24	0.29	0.00	-38.50
1,126.00	0.26	219.96	1,125.98	-5.09	0.05	-3.27	1.11	-0.86	120.10
1,172.00	0.13	221.10	1,171.98	-5.21	-0.05	-3.27	0.28	-0.28	2.48
1,219.00	0.22	231.39	1,218.98	-5.31	-0.15	-3.25	0.20	0.19	21.89
1,265.00	0.22	246.94	1,264.98	-5.40	-0.30	-3.19	0.13	0.00	33.80
1,312.00	0.26	232.71	1,311.98	-5.50	-0.47	-3.13	0.15	0.09	-30.28
1,360.00	0.36	212.68	1,359.98	-5.69	-0.64	-3.12	0.30	0.21	-41.73
1,407.00	0.75	191.53	1,406.98	-6.12	-0.78	-3.28	0.92	0.83	-45.00
1,454.00	1.23	175.40	1,453.97	-6.92	-0.80	-3.77	1.17	1.02	-34.32
1,501.00	2.02	173.99	1,500.95	-8.25	-0.67	-4.71	1.68	1.68	-3.00
1,548.00	3.12	171.89	1,547.90	-10.34	-0.41	-6.24	2.35	2.34	-4.47
1,595.00	4.17	170.30	1,594.81	-13.29	0.06	-8.48	2.24	2.23	-3.38
1,642.00	5.36	169.16	1,641.65	-17.13	0.76	-11.46	2.54	2.53	-2.43
1,689.00	6.42	169.78	1,688.40	-21.87	1.64	-15.15	2.26	2.26	1.32
1,736.00	7.60	168.46	1,735.04	-27.50	2.73	-19.56	2.53	2.51	-2.81
1,783.00	8.75	168.02	1,781.57	-34.05	4.09	-24.76	2.45	2.45	-0.94
1,830.00	9.72	167.14	1,827.96	-41.41	5.72	-30.69	2.09	2.06	-1.87
1,877.00	10.59	166.61	1,874.22	-49.48	7.60	-37.27	1.86	1.85	-1.13
1,925.00	11.51	166.79	1,921.33	-58.43	9.72	-44.58	1.92	1.92	0.38
1,972.00	12.52	167.67	1,967.30	-67.98	11.88	-52.31	2.18	2.15	1.87
2,019.00	13.32	167.58	2,013.11	-78.24	14.13	-60.56	1.70	1.70	0.96
2,066.00	14.28	168.72	2,058.75	-89.21	16.43	-69.30	2.12	2.04	2.43
2,113.00	15.64	170.74	2,104.16	-101.15	18.58	-78.54	3.10	2.89	4.30
2,160.00	16.61	171.71	2,149.31	-114.05	20.57	-88.26	2.14	2.06	2.06
2,207.00	17.67	171.18	2,194.22	-127.75	22.63	-98.54	2.28	2.26	-1.13
2,254.00	18.98	170.83	2,238.84	-142.34	24.94	-109.59	2.80	2.79	-0.74
2,302.00	20.08	170.57	2,284.07	-158.18	27.54	-121.64	2.30	2.29	-0.54
2,349.00	21.40	170.57	2,328.03	-174.60	30.27	-134.16	2.81	2.81	0.00
2,396.00	21.57	169.87	2,371.76	-191.56	33.19	-147.18	0.65	0.36	-1.49

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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)
2,443.00	20.12	168.46	2,415.68	-207.99	36.33	-160.03	3.26	-3.09	-3.00
2,490.00	19.86	168.81	2,459.85	-223.74	39.49	-172.47	0.61	-0.55	0.74
2,537.00	20.70	170.04	2,503.94	-239.75	42.48	-184.94	2.00	1.79	2.62
2,584.00	22.68	172.41	2,547.61	-256.92	45.11	-197.87	4.61	4.21	5.04
2,631.00	24.52	174.79	2,590.68	-275.61	47.20	-211.34	4.41	3.91	5.06
2,678.00	25.27	174.43	2,633.31	-295.31	49.05	-225.27	1.63	1.60	-0.77
2,725.00	25.66	173.12	2,675.74	-315.40	51.25	-239.71	1.46	0.83	-2.79
2,772.00	25.97	170.74	2,718.06	-335.66	54.12	-254.78	2.30	0.66	-5.06
2,819.00	26.90	169.78	2,760.14	-356.28	57.67	-270.60	2.18	1.98	-2.04
2,855.00	28.17	170.39	2,792.06	-372.67	60.53	-283.22	3.61	3.53	1.69
2,921.00	29.36	172.24	2,849.92	-404.07	65.31	-306.84	2.25	1.80	2.80
2,968.00	28.87	171.00	2,890.98	-426.69	68.65	-323.76	1.65	-1.04	-2.64
3,062.00	30.23	171.18	2,972.75	-472.49	75.82	-358.37	1.45	1.45	0.19
3,156.00	31.86	172.41	3,053.28	-520.47	82.73	-394.14	1.86	1.73	1.31
3,250.00	31.60	170.83	3,133.24	-569.37	89.93	-430.74	0.93	-0.28	-1.68
3,344.00	30.98	167.93	3,213.57	-617.35	98.92	-468.12	1.73	-0.66	-3.09
3,439.00	29.75	170.57	3,295.54	-664.51	107.89	-504.98	1.91	-1.29	2.78
3,533.00	29.09	168.99	3,377.42	-709.95	116.08	-540.13	1.08	-0.70	-1.68
3,626.00	29.09	170.92	3,458.69	-754.47	123.96	-574.47	1.01	0.00	2.08
3,720.00	30.54	172.41	3,540.24	-800.71	130.72	-609.03	1.73	1.54	1.59
3,814.00	31.82	172.76	3,620.66	-848.97	137.00	-644.50	1.38	1.36	0.37
3,909.00	31.03	171.01	3,701.73	-898.00	143.98	-681.00	1.27	-0.83	-1.84
4,003.00	29.84	168.72	3,782.78	-944.86	152.34	-717.20	1.77	-1.27	-2.44
4,097.00	30.23	170.57	3,864.16	-991.14	160.80	-753.09	1.07	0.41	1.97
4,191.00	30.59	173.03	3,945.23	-1,038.23	167.58	-788.21	1.38	0.38	2.62
4,286.00	30.94	173.12	4,026.86	-1,086.47	173.43	-823.34	0.37	0.37	0.09
4,380.00	29.36	170.22	4,108.15	-1,133.17	180.24	-858.24	2.29	-1.68	-3.09
4,477.00	30.32	170.39	4,192.28	-1,180.75	188.37	-894.70	0.99	0.99	0.18
4,570.00	30.85	172.94	4,272.35	-1,227.56	195.22	-929.69	1.51	0.57	2.74
4,663.00	30.94	173.03	4,352.15	-1,274.96	201.05	-964.27	0.11	0.10	0.10
4,758.00	30.81	172.33	4,433.69	-1,323.31	207.26	-999.75	0.40	0.10	0.74
4,852.00	31.68	172.15	4,514.06	-1,371.62	213.85	-1,035.49	0.93	0.93	-0.19
4,946.00	29.75	169.69	4,594.87	-1,419.02	221.39	-1,071.39	2.45	-2.05	-2.62
5,040.00	30.15	170.57	4,676.32	-1,465.26	229.44	-1,106.94	0.63	0.43	0.64
5,134.00	31.11	172.94	4,757.20	-1,512.65	236.29	-1,142.30	1.64	1.02	2.32
5,228.00	31.64	174.52	4,837.46	-1,561.29	241.63	-1,177.29	1.04	0.56	1.68
5,323.00	30.01	172.50	4,919.04	-1,609.65	247.11	-1,212.21	2.03	-1.72	-2.13
5,417.00	30.85	173.82	5,000.09	-1,656.92	252.77	-1,246.57	1.14	0.89	1.40
5,511.00	32.12	174.61	5,080.25	-1,705.76	257.71	-1,281.38	1.42	1.35	0.84
5,605.00	30.28	172.68	5,160.65	-1,754.15	263.08	-1,316.23	2.23	-1.96	-2.05
5,700.00	31.60	172.33	5,242.13	-1,802.58	269.46	-1,351.88	1.40	1.39	-0.37
5,794.00	30.63	172.15	5,322.61	-1,850.71	276.01	-1,387.48	1.04	-1.03	-0.19
5,888.00	31.11	171.18	5,403.29	-1,898.43	283.01	-1,423.16	0.74	0.51	-1.03

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5,982.00	30.89	171.27	5,483.87	-1,946.28	290.39	-1,459.23	0.24	-0.23	0.10
6,076.00	30.81	170.57	5,564.57	-1,993.87	298.00	-1,495.30	0.39	-0.09	-0.74
6,170.00	30.37	170.83	5,645.48	-2,041.08	305.73	-1,531.23	0.49	-0.47	0.28
6,264.00	26.94	175.40	5,727.97	-2,085.78	311.23	-1,563.84	4.33	-3.65	4.86
6,278.00	26.51	176.37	5,740.47	-2,092.06	311.68	-1,568.17	4.38	-3.07	6.93
6,325.00	24.44	182.61	5,782.91	-2,112.25	311.90	-1,581.15	7.21	-4.40	13.28
6,373.00	22.64	188.67	5,826.92	-2,131.31	310.06	-1,591.81	6.28	-3.75	12.63
6,420.00	20.92	198.43	5,870.58	-2,148.22	306.04	-1,599.44	8.52	-3.66	20.77
6,467.00	18.81	209.24	5,914.79	-2,162.79	299.68	-1,603.77	9.00	-4.49	23.00
6,514.00	17.01	219.26	5,959.52	-2,174.73	291.63	-1,605.12	7.58	-3.83	21.32
6,561.00	16.88	230.07	6,004.50	-2,184.44	282.04	-1,603.87	6.70	-0.28	23.00
6,608.00	17.10	243.52	6,049.46	-2,191.90	270.62	-1,599.77	8.36	0.47	28.62
6,655.00	18.11	253.98	6,094.27	-2,197.00	257.41	-1,592.80	7.06	2.15	22.26
6,702.00	20.75	263.47	6,138.60	-2,199.96	242.11	-1,582.85	8.74	5.62	20.19
6,748.00	22.77	269.18	6,181.33	-2,201.02	225.11	-1,570.38	6.36	4.39	12.41
6,795.00	25.54	276.21	6,224.22	-2,200.05	205.94	-1,554.94	8.49	5.89	14.96
6,842.00	29.27	277.79	6,265.93	-2,197.40	184.47	-1,536.67	8.08	7.94	3.36
6,889.00	33.27	279.64	6,306.10	-2,193.68	160.37	-1,515.68	8.75	8.51	3.94
6,936.00	37.49	281.22	6,344.41	-2,188.74	133.62	-1,491.86	9.19	8.98	3.36
6,983.00	41.19	282.89	6,380.76	-2,182.50	104.49	-1,465.39	8.19	7.87	3.55
7,029.00	45.05	285.35	6,414.33	-2,174.81	74.01	-1,436.95	9.15	8.39	5.35
7,076.00	48.92	286.85	6,446.39	-2,165.27	41.01	-1,405.39	8.56	8.23	3.19
7,124.00	53.49	289.13	6,476.46	-2,153.69	5.45	-1,370.56	10.21	9.52	4.75
7,171.00	57.27	291.42	6,503.16	-2,140.28	-30.82	-1,334.01	8.99	8.04	4.87
7,218.00	60.48	295.46	6,527.45	-2,124.26	-67.71	-1,295.34	10.04	6.83	8.60
7,265.00	65.23	297.48	6,548.89	-2,105.61	-105.12	-1,254.58	10.81	10.11	4.30
7,312.00	68.84	300.65	6,567.23	-2,084.58	-142.93	-1,212.02	9.88	7.68	6.74
7,359.00	70.42	305.13	6,583.60	-2,060.65	-179.91	-1,168.25	9.55	3.36	9.53
7,407.00	72.97	308.29	6,598.68	-2,033.41	-216.43	-1,122.74	8.20	5.31	6.58
7,454.00	77.19	309.08	6,610.78	-2,005.03	-251.87	-1,077.34	9.12	8.98	1.68
7,501.00	81.98	309.87	6,619.27	-1,975.65	-287.54	-1,031.13	10.32	10.19	1.68
7,548.00	84.70	314.88	6,624.72	-1,944.19	-322.01	-984.53	12.07	5.79	10.66
7,595.00	86.64	319.10	6,628.27	-1,909.93	-353.97	-938.09	9.86	4.13	8.98
7,642.00	86.51	319.54	6,631.08	-1,874.35	-384.55	-891.88	0.97	0.94	0.94
7,689.00	89.32	318.84	6,632.79	-1,838.81	-415.24	-845.60	6.16	5.98	-1.49
7,783.00	90.95	319.98	6,632.57	-1,767.43	-476.40	-753.04	2.12	1.73	1.21
7,877.00	90.24	320.07	6,631.59	-1,695.40	-536.78	-660.67	0.76	0.76	0.76
7,971.00	90.73	320.51	6,630.80	-1,623.09	-596.84	-568.37	0.70	0.52	0.47
8,065.00	91.38	320.07	6,629.07	-1,550.79	-656.88	-476.09	0.83	0.69	-0.47
8,157.00	90.51	320.16	6,627.55	-1,480.20	-715.87	-385.71	0.95	-0.95	0.10
8,251.00	91.16	319.98	6,626.18	-1,408.13	-776.20	-293.35	0.72	0.69	-0.19
8,345.00	90.55	319.89	6,624.78	-1,336.20	-836.69	-200.96	0.66	-0.65	-0.10
8,440.00	91.47	319.81	6,623.10	-1,263.60	-897.94	-107.55	0.97	0.97	-0.08

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Whistlepig N-05HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Site:	Whistlepig	MD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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)
8,534.00	90.99	319.01	6,621.08	-1,192.23	-959.09	-15.01	0.99	-0.51	-0.85
8,628.00	89.93	318.49	6,620.33	-1,121.56	-1,021.06	77.73	1.26	-1.13	-0.55
8,723.00	91.03	318.05	6,619.53	-1,050.67	-1,084.29	171.58	1.25	1.16	-0.46
8,817.00	90.81	317.26	6,618.02	-981.20	-1,147.60	264.59	0.87	-0.23	-0.84
8,911.00	91.47	316.90	6,616.15	-912.38	-1,211.60	357.72	0.80	0.70	-0.38
9,005.00	91.25	317.61	6,613.92	-843.37	-1,275.38	450.81	0.79	-0.23	0.76
9,100.00	91.82	318.93	6,611.38	-772.50	-1,338.59	544.63	1.51	0.60	1.39
9,194.00	91.60	319.01	6,608.57	-701.62	-1,400.27	637.27	0.25	-0.23	0.09
9,288.00	89.71	319.54	6,607.50	-630.39	-1,461.59	729.86	2.09	-2.01	0.56
9,383.00	90.33	319.28	6,607.47	-558.25	-1,523.40	823.41	0.71	0.65	-0.27
9,477.00	89.63	319.37	6,607.50	-486.96	-1,584.67	915.99	0.75	-0.74	0.10
9,571.00	90.20	318.14	6,607.64	-416.28	-1,646.64	1,008.74	1.44	0.61	-1.31
9,666.00	90.99	318.49	6,606.65	-345.34	-1,709.81	1,102.58	0.91	0.83	0.37
9,760.00	91.52	317.61	6,604.59	-275.45	-1,772.63	1,195.48	1.09	0.56	-0.94
9,854.00	91.16	317.52	6,602.39	-206.09	-1,836.04	1,288.49	0.39	-0.38	-0.10
9,949.00	91.38	316.29	6,600.29	-136.74	-1,900.93	1,382.65	1.31	0.23	-1.29
10,043.00	91.21	315.76	6,598.16	-69.11	-1,966.18	1,475.99	0.59	-0.18	-0.56
10,138.00	90.90	315.23	6,596.42	-1.37	-2,032.76	1,570.44	0.65	-0.33	-0.56
10,231.00	90.77	316.20	6,595.06	65.20	-2,097.69	1,662.86	1.05	-0.14	1.04
10,326.00	91.52	316.99	6,593.16	134.21	-2,162.96	1,757.08	1.15	0.79	0.83
10,420.00	91.12	317.17	6,591.00	203.02	-2,226.95	1,850.21	0.47	-0.43	0.19
10,514.00	91.65	317.87	6,588.72	272.33	-2,290.41	1,943.24	0.93	0.56	0.74
10,608.00	91.43	317.52	6,586.20	341.82	-2,353.66	2,036.21	0.44	-0.23	-0.37
10,702.00	91.08	317.17	6,584.14	410.94	-2,417.34	2,129.28	0.53	-0.37	-0.37
10,796.00	90.64	317.26	6,582.73	479.92	-2,481.18	2,222.39	0.48	-0.47	0.10
10,891.00	91.69	318.05	6,580.80	550.12	-2,545.16	2,316.38	1.38	1.11	0.83
10,985.00	91.34	317.43	6,578.31	619.66	-2,608.35	2,409.35	0.76	-0.37	-0.66
11,079.00	90.20	317.52	6,577.05	688.93	-2,671.88	2,502.40	1.22	-1.21	0.10
11,172.00	91.82	317.34	6,575.41	757.41	-2,734.78	2,594.47	1.75	1.74	-0.19
11,267.00	91.25	317.61	6,572.86	827.40	-2,798.97	2,688.49	0.66	-0.60	0.28
11,361.00	90.64	316.99	6,571.31	896.47	-2,862.70	2,781.58	0.93	-0.65	-0.66
11,456.00	90.15	317.08	6,570.66	965.98	-2,927.45	2,875.73	0.52	-0.52	0.09
11,550.00	89.93	317.87	6,570.59	1,035.26	-2,990.99	2,968.79	0.87	-0.23	0.84
11,645.00	90.68	317.78	6,570.09	1,105.66	-3,054.77	3,062.75	0.80	0.79	0.09
11,739.00	90.24	318.40	6,569.33	1,175.61	-3,117.55	3,155.67	0.81	-0.47	0.66
11,833.00	91.03	316.73	6,568.29	1,244.98	-3,180.97	3,248.70	1.97	0.81	0.66
11,928.00	90.68	316.20	6,566.87	1,313.85	-3,246.40	3,342.96	0.67	-0.37	-0.56
12,023.00	89.98	315.76	6,566.33	1,382.16	-3,312.42	3,437.33	0.87	-0.74	-0.46
12,118.00	91.56	316.29	6,565.05	1,450.52	-3,378.37	3,531.68	1.75	0.79	0.09
12,212.00	91.08	316.55	6,562.88	1,518.59	-3,443.15	3,624.94	0.58	-0.51	0.28
12,306.00	90.24	316.73	6,561.80	1,586.93	-3,507.69	3,718.18	0.91	-0.89	0.19
12,400.00	92.04	316.38	6,559.93	1,655.16	-3,572.31	3,811.42	1.95	1.91	-0.37
12,494.00	92.18	316.29	6,556.47	1,723.11	-3,637.17	3,904.67	0.18	0.15	-0.10
12,588.00	91.47	316.20	6,553.48	1,790.98	-3,702.14	3,997.95	0.76	-0.76	-0.10

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Whistlepig N-05HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Site:	Whistlepig	MD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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)
12,682.00	90.64	315.23	6,551.75	1,858.25	-3,767.76	4,091.35	1.36	-0.88	-1.03
12,776.00	90.64	316.03	6,550.70	1,925.44	-3,833.49	4,184.79	0.85	0.00	0.85
12,871.00	90.07	316.82	6,550.11	1,994.27	-3,898.98	4,279.07	1.03	-0.60	0.83
12,965.00	89.45	316.55	6,550.50	2,062.66	-3,963.46	4,372.30	0.72	-0.66	-0.29
13,059.00	90.42	317.87	6,550.61	2,131.64	-4,027.31	4,465.42	1.74	1.03	1.40
13,153.00	89.98	318.05	6,550.28	2,201.45	-4,090.26	4,558.37	0.51	-0.47	0.19
13,247.00	91.52	317.87	6,549.05	2,271.25	-4,153.20	4,651.30	1.65	1.64	-0.19
13,341.00	90.95	317.34	6,547.02	2,340.66	-4,216.56	4,744.31	0.83	-0.61	-0.56
13,435.00	90.15	317.08	6,546.12	2,409.64	-4,280.41	4,837.43	0.89	-0.85	-0.28
13,529.00	91.78	317.34	6,544.54	2,478.61	-4,344.26	4,930.54	1.76	1.73	0.28
13,623.00	90.99	316.55	6,542.27	2,547.27	-4,408.41	5,023.69	1.19	-0.84	-0.84
13,717.00	91.87	317.70	6,539.92	2,616.13	-4,472.35	5,116.80	1.54	0.94	1.22
13,812.00	91.12	317.26	6,537.44	2,686.13	-4,536.53	5,210.82	0.92	-0.79	-0.46
13,906.00	90.29	316.03	6,536.29	2,754.47	-4,601.06	5,304.05	1.58	-0.88	-1.31
13,999.00	91.52	317.17	6,534.82	2,822.03	-4,664.95	5,396.30	1.80	1.32	1.23
14,094.00	91.34	316.90	6,532.45	2,891.53	-4,729.67	5,490.43	0.34	-0.19	-0.28
14,188.00	91.60	317.96	6,530.03	2,960.73	-4,793.24	5,583.47	1.16	0.28	1.13
14,282.00	91.12	318.40	6,527.80	3,030.76	-4,855.90	5,676.33	0.69	-0.51	0.47
14,376.00	90.64	318.66	6,526.36	3,101.19	-4,918.14	5,769.12	0.58	-0.51	0.28
14,470.00	90.20	318.75	6,525.67	3,171.81	-4,980.18	5,861.88	0.48	-0.47	0.10
14,564.00	91.25	318.40	6,524.48	3,242.29	-5,042.36	5,954.66	1.18	1.12	-0.37
14,657.00	91.30	318.49	6,522.41	3,311.86	-5,104.04	6,046.48	0.11	0.05	0.10
14,751.00	90.95	317.08	6,520.57	3,381.47	-5,167.19	6,139.45	1.55	-0.37	-1.50
14,846.00	90.42	316.38	6,519.43	3,450.63	-5,232.30	6,233.66	0.92	-0.56	-0.74
14,940.00	90.15	315.59	6,518.96	3,518.23	-5,297.61	6,327.03	0.89	-0.29	-0.84
15,034.00	90.37	316.82	6,518.54	3,586.08	-5,362.66	6,420.36	1.33	0.23	1.31
15,129.00	90.68	316.82	6,517.67	3,655.35	-5,427.67	6,514.56	0.33	0.33	0.00
15,223.00	90.33	316.73	6,516.84	3,723.85	-5,492.04	6,607.77	0.38	-0.37	-0.10
15,317.00	90.02	316.90	6,516.55	3,792.39	-5,556.37	6,700.98	0.38	-0.33	0.18
15,411.00	90.68	317.26	6,515.98	3,861.22	-5,620.38	6,794.13	0.80	0.70	0.38
15,504.00	90.02	317.52	6,515.41	3,929.66	-5,683.34	6,886.22	0.76	-0.71	0.28
15,598.00	90.77	317.26	6,514.76	3,998.84	-5,746.98	6,979.30	0.84	0.80	-0.28
15,693.00	89.89	316.55	6,514.21	4,068.21	-5,811.88	7,073.47	1.19	-0.91	-0.75
15,787.00	91.25	317.52	6,513.28	4,136.99	-5,875.94	7,166.63	1.78	1.45	-0.10
15,880.00	90.51	317.43	6,511.85	4,205.52	-5,938.79	7,258.69	0.80	0.80	-0.10
15,973.00	89.76	317.34	6,511.63	4,273.96	-6,001.76	7,350.78	0.81	-0.81	-0.10
16,068.00	90.99	316.90	6,511.01	4,343.58	-6,066.40	7,444.91	1.38	1.12	0.46
16,162.00	90.64	316.29	6,509.67	4,411.86	-6,130.99	7,538.16	0.75	-0.37	0.10
16,256.00	91.52	317.26	6,507.90	4,480.34	-6,195.35	7,631.36	1.39	0.94	1.03
16,350.00	91.34	317.08	6,505.55	4,549.26	-6,259.24	7,724.46	0.27	-0.19	-0.19
16,444.00	91.34	316.99	6,503.35	4,618.03	-6,323.28	7,817.59	0.10	0.00	-0.10
16,539.00	91.25	316.47	6,501.21	4,687.18	-6,388.38	7,911.79	0.56	-0.09	-0.55
16,633.00	90.55	317.17	6,499.73	4,755.72	-6,452.70	8,004.98	1.05	-0.74	0.74

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Whistlepig N-05HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Site:	Whistlepig	MD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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)
16,727.00	90.37	316.99	6,498.98	4,824.55	-6,516.71	8,098.13	0.27	-0.19	-0.19
16,822.00	90.20	316.20	6,498.50	4,893.57	-6,581.99	8,192.38	0.85	-0.18	-0.83
16,916.00	89.23	316.90	6,498.97	4,961.81	-6,646.63	8,285.64	1.27	-1.03	0.74
17,010.00	88.88	316.47	6,500.52	5,030.19	-6,711.11	8,378.86	0.59	-0.37	-0.46
17,104.00	90.59	317.08	6,500.96	5,098.68	-6,775.48	8,472.08	1.93	1.82	0.65
17,198.00	89.67	316.64	6,500.74	5,167.27	-6,839.76	8,565.27	1.08	-0.98	-0.47
17,292.00	91.21	316.73	6,500.02	5,235.66	-6,904.24	8,658.50	1.64	1.64	0.10
17,386.00	91.08	316.47	6,498.14	5,303.95	-6,968.81	8,751.74	0.31	-0.14	-0.28
17,480.00	90.68	315.67	6,496.70	5,371.64	-7,034.02	8,845.09	0.95	-0.43	-0.85
17,575.00	91.25	317.34	6,495.10	5,440.54	-7,099.39	8,939.34	1.86	0.60	1.76
17,669.00	90.73	316.47	6,493.48	5,509.17	-7,163.60	9,032.51	1.08	-0.55	-0.93
17,762.00	90.29	318.40	6,492.65	5,577.66	-7,226.51	9,124.58	2.13	-0.47	2.08
17,857.00	91.12	319.10	6,491.48	5,649.08	-7,289.14	9,218.31	1.14	0.87	0.74
17,951.00	91.12	318.40	6,489.64	5,719.74	-7,351.10	9,311.03	0.74	0.00	-0.74
18,046.00	90.24	318.31	6,488.51	5,790.72	-7,414.23	9,404.86	0.93	-0.93	-0.09
18,140.00	90.46	317.17	6,487.94	5,860.29	-7,477.44	9,497.86	1.24	0.23	-1.21
18,235.00	89.67	317.61	6,487.83	5,930.20	-7,541.75	9,591.93	0.95	-0.83	0.46
18,330.00	89.58	316.29	6,488.45	5,999.62	-7,606.60	9,686.10	1.39	-0.09	-1.39
18,424.00	88.88	316.20	6,489.72	6,067.51	-7,671.60	9,779.41	0.75	-0.74	-0.10
18,520.00	90.07	316.38	6,490.60	6,136.90	-7,737.94	9,874.71	1.25	1.24	0.19
18,614.00	91.30	317.61	6,489.47	6,205.64	-7,802.04	9,967.87	1.85	1.31	1.31
18,708.00	91.21	317.61	6,487.41	6,275.05	-7,865.40	10,060.88	0.10	-0.10	0.00
18,802.00	90.77	316.47	6,485.79	6,343.83	-7,929.45	10,154.02	1.30	-0.47	-1.21
18,896.00	89.71	316.03	6,485.40	6,411.73	-7,994.45	10,247.35	1.22	-1.13	-0.47
18,990.00	91.30	316.29	6,484.57	6,479.52	-8,059.55	10,340.68	1.71	1.69	0.28
19,083.00	91.43	315.59	6,482.35	6,546.33	-8,124.21	10,433.05	0.77	0.14	-0.75
19,177.00	90.86	316.73	6,480.47	6,614.12	-8,189.30	10,526.37	1.36	-0.61	1.21
19,271.00	90.86	317.96	6,479.06	6,683.24	-8,252.99	10,619.45	1.31	0.00	1.31
19,364.00	90.20	316.99	6,478.20	6,751.78	-8,315.84	10,711.51	1.26	-0.71	-1.04
19,457.00	89.85	316.55	6,478.16	6,819.54	-8,379.54	10,803.74	0.60	-0.38	-0.47
19,551.00	89.63	316.03	6,478.59	6,887.48	-8,444.50	10,897.06	0.60	-0.23	-0.55
19,665.00	89.14	315.59	6,479.81	6,969.22	-8,523.95	11,010.33	0.58	-0.43	-0.39
Survey @ 19665.00 MD 6479.81 TVD									
19,720.00	89.14	315.59	6,480.64	7,008.51	-8,562.44	11,065.00	0.00	0.00	0.00
Survey Proj. to 19720.00 MD 6480.64 TVD									

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
190.00	190.00	-0.19	0.23	MWD surveys
19,665.00	6,479.81	6,969.22	-8,523.95	Survey @ 19665.00 MD 6479.81 TVD

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 WV Department of
 Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Whistlepig N-05HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Site:	Whistlepig	MD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

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	Whistlepig				
Site Position:		Northing:	14,444,965.96 usft	Latitude:	39.77526165
From:	Lat/Long	Easting:	1,698,572.65 usft	Longitude:	-80.79301490
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.132 °

Well	Whistlepig N-05HM (slot B)					
Well Position	+N/-S	0.00 ft	Northing:	14,444,973.08 usft	Latitude:	39.77528114
	+E/-W	0.00 ft	Easting:	1,698,582.30 usft	Longitude:	-80.79298048
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	1,368.00 ft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	7/7/2021	-8.602	66.536	51,743.54639478

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	309.38	

Survey Program	Date 7/27/2021				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
190.00	1,105.00	MWD surf (Original Hole)	MWD	MWD - Standard	
1,126.00	2,855.00	MWD int (Original Hole)	MWD	MWD - Standard	
2,921.00	19,665.00	MWD (Original Hole)	MWD	MWD - Standard	
19,720.00	19,720.00	Projection (Original Hole)	MWD	MWD - Standard	

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Survey	OCT 04 2022									
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	0.00	0.00	0.00	0.00	14,444,973.08	1,698,582.30	39.77528114	-80.79298048	
190.00	0.18	130.31	190.00	-0.19	0.23	14,444,972.89	1,698,582.53	39.77528061	-80.79297967	
MWD surveys										
237.00	0.13	69.23	237.00	-0.22	0.33	14,444,972.86	1,698,582.63	39.77528053	-80.79297930	
281.00	0.22	112.47	281.00	-0.24	0.46	14,444,972.84	1,698,582.76	39.77528049	-80.79297885	
328.00	0.18	153.52	328.00	-0.34	0.57	14,444,972.74	1,698,582.88	39.77528021	-80.79297844	
373.00	0.26	141.48	373.00	-0.48	0.67	14,444,972.60	1,698,582.97	39.77527982	-80.79297810	
420.00	0.31	177.07	420.00	-0.69	0.74	14,444,972.39	1,698,583.04	39.77527924	-80.79297784	
463.00	0.31	170.57	463.00	-0.92	0.77	14,444,972.16	1,698,583.07	39.77527861	-80.79297776	

WV Department of
Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Whistlepig N-05HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Site:	Whistlepig	MD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
510.00	0.40	172.94	510.00	-1.21	0.81	14,444,971.87	1,698,583.11	39.77527781	-80.79297761
553.00	0.35	177.22	553.00	-1.49	0.83	14,444,971.59	1,698,583.13	39.77527704	-80.79297753
600.00	0.40	196.50	599.99	-1.79	0.79	14,444,971.29	1,698,583.09	39.77527622	-80.79297767
643.00	0.31	189.73	642.99	-2.05	0.73	14,444,971.03	1,698,583.03	39.77527551	-80.79297789
690.00	0.35	173.82	689.99	-2.32	0.73	14,444,970.76	1,698,583.03	39.77527477	-80.79297792
733.00	0.40	190.91	732.99	-2.60	0.71	14,444,970.48	1,698,583.01	39.77527401	-80.79297797
780.00	0.26	178.30	779.99	-2.86	0.68	14,444,970.22	1,698,582.98	39.77527328	-80.79297807
828.00	0.40	206.87	827.99	-3.12	0.61	14,444,969.96	1,698,582.91	39.77527257	-80.79297833
875.00	0.31	173.59	874.99	-3.39	0.55	14,444,969.69	1,698,582.85	39.77527182	-80.79297855
922.00	0.40	180.94	921.99	-3.68	0.56	14,444,969.40	1,698,582.86	39.77527102	-80.79297851
969.00	0.40	200.98	968.99	-4.00	0.50	14,444,969.08	1,698,582.80	39.77527015	-80.79297873
1,016.00	0.48	197.73	1,015.99	-4.34	0.38	14,444,968.74	1,698,582.68	39.77526921	-80.79297916
1,063.00	0.44	210.91	1,062.98	-4.68	0.23	14,444,968.39	1,698,582.53	39.77526828	-80.79297970
1,105.00	0.44	194.74	1,104.98	-4.98	0.11	14,444,968.10	1,698,582.41	39.77526747	-80.79298015
1,126.00	0.26	219.96	1,125.98	-5.09	0.05	14,444,967.99	1,698,582.36	39.77526715	-80.79298033
1,172.00	0.13	221.10	1,171.98	-5.21	-0.05	14,444,967.87	1,698,582.25	39.77526683	-80.79298069
1,219.00	0.22	231.39	1,218.98	-5.31	-0.15	14,444,967.77	1,698,582.15	39.77526656	-80.79298107
1,265.00	0.22	246.94	1,264.98	-5.40	-0.30	14,444,967.68	1,698,582.00	39.77526632	-80.79298160
1,312.00	0.26	232.71	1,311.98	-5.50	-0.47	14,444,967.58	1,698,581.83	39.77526604	-80.79298220
1,360.00	0.36	212.68	1,359.98	-5.69	-0.64	14,444,967.39	1,698,581.66	39.77526551	-80.79298280
1,407.00	0.75	191.53	1,406.98	-6.12	-0.78	14,444,966.96	1,698,581.52	39.77526435	-80.79298331
1,454.00	1.23	175.40	1,453.97	-6.92	-0.80	14,444,966.16	1,698,581.50	39.77526214	-80.79298339
1,501.00	2.02	173.99	1,500.95	-8.25	-0.67	14,444,964.83	1,698,581.63	39.77525849	-80.79298295
1,548.00	3.12	171.89	1,547.90	-10.34	-0.41	14,444,962.74	1,698,581.89	39.77525275	-80.79298201
1,595.00	4.17	170.30	1,594.81	-13.29	0.06	14,444,959.79	1,698,582.36	39.77524465	-80.79298037
1,642.00	5.36	169.16	1,641.65	-17.13	0.76	14,444,955.95	1,698,583.06	39.77523409	-80.79297791
1,689.00	6.42	169.78	1,688.40	-21.87	1.64	14,444,951.21	1,698,583.94	39.77522107	-80.79297482
1,736.00	7.60	168.46	1,735.04	-27.50	2.73	14,444,945.58	1,698,585.03	39.77520559	-80.79297099
1,783.00	8.75	168.02	1,781.57	-34.05	4.09	14,444,939.03	1,698,586.39	39.77518762	-80.79296619
1,830.00	9.72	167.14	1,827.96	-41.41	5.72	14,444,931.67	1,698,588.02	39.77516738	-80.79296047
1,877.00	10.59	166.61	1,874.22	-49.48	7.60	14,444,923.60	1,698,589.90	39.77514521	-80.79295383
1,925.00	11.51	166.79	1,921.33	-58.43	9.72	14,444,914.65	1,698,592.02	39.77512060	-80.79294637
1,972.00	12.52	167.67	1,967.30	-67.98	11.88	14,444,905.10	1,698,594.18	39.77509439	-80.79293877
2,019.00	13.32	167.58	2,013.11	-78.24	14.13	14,444,894.84	1,698,596.43	39.77506618	-80.79293083
2,066.00	14.28	168.72	2,058.75	-89.21	16.43	14,444,883.87	1,698,598.73	39.77503603	-80.79292274
2,113.00	15.64	170.74	2,104.16	-101.15	18.58	14,444,871.93	1,698,600.88	39.77500324	-80.79291518
2,160.00	16.61	171.71	2,149.31	-114.05	20.57	14,444,859.03	1,698,602.87	39.77496779	-80.79290821
2,207.00	17.67	171.18	2,194.22	-127.75	22.63	14,444,845.33	1,698,604.93	39.77493017	-80.79290098
2,254.00	18.98	170.83	2,238.84	-142.34	24.94	14,444,830.74	1,698,607.24	39.77489007	-80.79289287
2,302.00	20.08	170.57	2,284.07	-158.18	27.54	14,444,814.90	1,698,609.84	39.77484657	-80.79288377
2,349.00	21.40	170.57	2,328.03	-174.60	30.27	14,444,798.48	1,698,612.57	39.77480146	-80.79287420
2,396.00	21.57	169.87	2,371.76	-191.56	33.19	14,444,781.52	1,698,615.49	39.77475485	-80.79286393
2,443.00	20.12	168.46	2,415.68	-207.99	36.33	14,444,765.09	1,698,618.63	39.77470872	-80.79285290
2,490.00	19.86	168.81	2,459.85	-223.74	39.49	14,444,749.34	1,698,621.79	39.77466844	-80.79284176
2,537.00	20.70	170.04	2,503.94	-239.75	42.48	14,444,733.33	1,698,624.78	39.77462245	-80.79283127
2,584.00	22.68	172.41	2,547.61	-256.92	45.11	14,444,716.16	1,698,627.41	39.77457629	-80.79282204
2,631.00	24.52	174.79	2,590.68	-275.61	47.20	14,444,697.47	1,698,629.50	39.77453029	-80.79281478
2,678.00	25.27	174.43	2,633.31	-295.31	49.05	14,444,677.77	1,698,631.36	39.77448429	-80.79280832
2,725.00	25.66	173.12	2,675.74	-315.40	51.25	14,444,657.68	1,698,633.55	39.77443829	-80.79280068
2,772.00	25.97	170.74	2,718.06	-335.66	54.12	14,444,637.42	1,698,636.42	39.77439229	-80.79279302
2,819.00	26.90	169.78	2,760.14	-356.28	57.67	14,444,616.80	1,698,639.97	39.77434629	-80.79278536
2,855.00	28.17	170.39	2,792.06	-372.67	60.53	14,444,600.41	1,698,642.83	39.77429929	-80.79277770
2,921.00	29.36	172.24	2,849.92	-404.07	65.31	14,444,569.01	1,698,647.61	39.77425229	-80.79277004
2,968.00	28.87	171.00	2,890.98	-426.69	68.65	14,444,546.39	1,698,650.95	39.77420529	-80.79276238
3,062.00	30.23	171.18	2,972.75	-472.49	75.82	14,444,500.59	1,698,658.12	39.77415829	-80.79275472

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Whistlepig N-05HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Site:	Whistlepig	MD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,156.00	31.86	172.41	3,053.28	-520.47	82.73	14,444,452.61	1,698,665.03	39.77385127	-80.79269033
3,250.00	31.60	170.83	3,133.24	-569.37	89.93	14,444,403.71	1,698,672.23	39.77371692	-80.79266510
3,344.00	30.98	167.93	3,213.57	-617.35	98.92	14,444,355.73	1,698,681.22	39.77358511	-80.79263352
3,439.00	29.75	170.57	3,295.54	-664.51	107.89	14,444,308.57	1,698,690.19	39.77345552	-80.79260196
3,533.00	29.09	168.99	3,377.42	-709.95	116.08	14,444,263.13	1,698,698.38	39.77333069	-80.79257321
3,626.00	29.09	170.92	3,458.69	-754.47	123.96	14,444,218.62	1,698,706.26	39.77320838	-80.79254551
3,720.00	30.54	172.41	3,540.24	-800.71	130.72	14,444,172.37	1,698,713.02	39.77308135	-80.79252183
3,814.00	31.82	172.76	3,620.66	-848.97	137.00	14,444,124.12	1,698,719.30	39.77294878	-80.79249988
3,909.00	31.03	171.01	3,701.73	-898.00	143.98	14,444,075.08	1,698,726.28	39.77281408	-80.79247544
4,003.00	29.84	168.72	3,782.78	-944.86	152.34	14,444,028.22	1,698,734.64	39.77268531	-80.79244607
4,097.00	30.23	170.57	3,864.16	-991.14	160.80	14,443,981.94	1,698,743.10	39.77255816	-80.79241637
4,191.00	30.59	173.03	3,945.23	-1,038.23	167.58	14,443,934.85	1,698,749.88	39.77242881	-80.79239263
4,286.00	30.94	173.12	4,026.86	-1,086.47	173.43	14,443,886.61	1,698,755.73	39.77229629	-80.79237217
4,380.00	29.36	170.22	4,108.15	-1,133.17	180.24	14,443,839.91	1,698,762.54	39.77216798	-80.79234832
4,477.00	30.32	170.39	4,192.28	-1,180.75	188.37	14,443,792.33	1,698,770.67	39.77203728	-80.79231979
4,570.00	30.85	172.94	4,272.35	-1,227.56	195.22	14,443,745.52	1,698,777.52	39.77190867	-80.79229580
4,663.00	30.94	173.03	4,352.15	-1,274.96	201.05	14,443,698.13	1,698,783.35	39.77177848	-80.79227544
4,758.00	30.81	172.33	4,433.69	-1,323.31	207.26	14,443,649.77	1,698,789.56	39.77164565	-80.79225373
4,852.00	31.68	172.15	4,514.06	-1,371.62	213.85	14,443,601.46	1,698,796.15	39.77151293	-80.79223070
4,946.00	29.75	169.69	4,594.87	-1,419.02	221.39	14,443,554.06	1,698,803.69	39.77138270	-80.79220423
5,040.00	30.15	170.57	4,676.32	-1,465.26	229.44	14,443,507.82	1,698,811.74	39.77125568	-80.79217600
5,134.00	31.11	172.94	4,757.20	-1,512.65	236.29	14,443,460.43	1,698,818.59	39.77112549	-80.79215200
5,228.00	31.64	174.52	4,837.46	-1,561.29	241.63	14,443,411.79	1,698,823.93	39.77099186	-80.79213340
5,323.00	30.01	172.50	4,919.04	-1,609.65	247.11	14,443,363.43	1,698,829.41	39.77085901	-80.79211429
5,417.00	30.85	173.82	5,000.09	-1,656.92	252.77	14,443,316.16	1,698,835.07	39.77072916	-80.79209453
5,511.00	32.12	174.61	5,080.25	-1,705.76	257.71	14,443,267.32	1,698,840.01	39.77059500	-80.79207734
5,605.00	30.28	172.68	5,160.65	-1,754.15	263.08	14,443,218.93	1,698,845.38	39.77046207	-80.79205864
5,700.00	31.60	172.33	5,242.13	-1,802.58	269.46	14,443,170.50	1,698,851.76	39.77032904	-80.79203636
5,794.00	30.63	172.15	5,322.61	-1,850.71	276.01	14,443,122.37	1,698,858.31	39.77019682	-80.79201342
5,888.00	31.11	171.18	5,403.29	-1,898.43	283.01	14,443,074.65	1,698,865.31	39.77006573	-80.79198892
5,982.00	30.89	171.27	5,483.87	-1,946.28	290.39	14,443,026.81	1,698,872.69	39.76993428	-80.79196303
6,076.00	30.81	170.57	5,564.57	-1,993.87	298.00	14,442,979.21	1,698,880.30	39.76980352	-80.79193635
6,170.00	30.37	170.83	5,645.48	-2,041.08	305.73	14,442,932.00	1,698,888.03	39.76967382	-80.79190923
6,264.00	26.94	175.40	5,727.97	-2,085.78	311.23	14,442,887.30	1,698,893.53	39.76955102	-80.79188004
6,278.00	26.51	176.37	5,740.47	-2,092.06	311.68	14,442,881.02	1,698,893.98	39.76953377	-80.79188848
6,325.00	24.44	182.61	5,782.91	-2,112.25	311.90	14,442,860.83	1,698,894.20	39.76947833	-80.79188786
6,373.00	22.64	188.67	5,826.92	-2,131.31	310.06	14,442,841.78	1,698,892.36	39.76942601	-80.79189458
6,420.00	20.92	198.43	5,870.58	-2,148.22	306.04	14,442,824.87	1,698,888.34	39.76937960	-80.79190902
6,467.00	18.81	209.24	5,914.79	-2,162.79	299.68	14,442,810.29	1,698,881.98	39.76933960	-80.79193177
6,514.00	17.01	219.26	5,959.52	-2,174.73	291.63	14,442,798.35	1,698,873.93	39.76930686	-80.79196053
6,561.00	16.88	230.07	6,004.50	-2,184.44	282.04	14,442,788.65	1,698,864.34	39.76928027	-80.79199472
6,608.00	17.10	243.52	6,049.46	-2,191.90	270.62	14,442,781.18	1,698,852.92	39.76925985	-80.79203543
6,655.00	18.11	253.98	6,094.27	-2,197.00	257.41	14,442,776.08	1,698,839.71	39.76924593	-80.79208249
6,702.00	20.75	263.47	6,138.60	-2,199.96	242.11	14,442,773.12	1,698,824.41	39.76923789	-80.79213696
6,748.00	22.77	269.18	6,181.33	-2,201.02	225.11	14,442,772.06	1,698,807.41	39.76922510	-80.79219747
6,795.00	25.54	276.21	6,224.22	-2,200.05	205.94	14,442,773.03	1,698,788.24	39.76923788	-80.79226570
6,842.00	29.27	277.79	6,265.93	-2,197.40	184.47	14,442,775.69	1,698,766.77	39.76924530	-80.79234206
6,889.00	33.27	279.64	6,306.10	-2,193.68	160.37	14,442,779.40	1,698,742.67	39.76924536	-80.79242781
6,936.00	37.49	281.22	6,344.41	-2,188.74	133.62	14,442,784.35	1,698,715.92	39.76924536	-80.79252297
6,983.00	41.19	282.89	6,380.76	-2,182.50	104.49	14,442,790.59	1,698,686.79	39.76928673	-80.79262658
7,029.00	45.05	285.35	6,414.33	-2,174.81	74.01	14,442,798.28	1,698,656.31	39.76930805	-80.79273497
7,076.00	48.92	286.85	6,446.39	-2,165.27	41.01	14,442,807.82	1,698,623.31	39.76933446	-80.79285235
7,124.00	53.49	289.13	6,476.46	-2,153.69	5.45	14,442,819.39	1,698,587.75	39.76936647	-80.79297881
7,171.00	57.27	291.42	6,503.16	-2,140.28	-30.82	14,442,832.81	1,698,551.48	39.76940354	-80.79310776
7,218.00	60.48	295.46	6,527.45	-2,124.26	-67.71	14,442,848.83	1,698,514.60	39.76944777	-80.79323891

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Whistlepig N-05HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Site:	Whistlepig	MD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,265.00	65.23	297.48	6,548.89	-2,105.61	-105.12	14,442,867.47	1,698,477.18	39.76949922	-80.79337192
7,312.00	68.84	300.65	6,567.23	-2,084.58	-142.93	14,442,888.50	1,698,439.37	39.76955721	-80.79350628
7,359.00	70.42	305.13	6,583.60	-2,060.65	-179.91	14,442,912.43	1,698,402.39	39.76962315	-80.79363770
7,407.00	72.97	308.29	6,598.68	-2,033.41	-216.43	14,442,939.67	1,698,365.87	39.76969820	-80.79376744
7,454.00	77.19	309.08	6,610.78	-2,005.03	-251.87	14,442,968.05	1,698,330.43	39.76977637	-80.79389333
7,501.00	81.98	309.87	6,619.27	-1,975.65	-287.54	14,442,997.43	1,698,294.76	39.76985728	-80.79402003
7,548.00	84.70	314.88	6,624.72	-1,944.19	-322.01	14,443,028.89	1,698,260.29	39.76994388	-80.79414244
7,595.00	86.64	319.10	6,628.27	-1,909.93	-353.97	14,443,063.15	1,698,228.34	39.77003817	-80.79425590
7,642.00	86.51	319.54	6,631.08	-1,874.35	-384.55	14,443,098.73	1,698,197.76	39.77013608	-80.79436444
7,689.00	89.32	318.84	6,632.79	-1,838.81	-415.24	14,443,134.28	1,698,167.06	39.77023389	-80.79447338
7,783.00	90.95	319.98	6,632.57	-1,767.43	-476.40	14,443,205.65	1,698,105.90	39.77043030	-80.79469045
7,877.00	90.24	320.07	6,631.59	-1,695.40	-536.78	14,443,277.68	1,698,045.52	39.77062850	-80.79490477
7,971.00	90.73	320.51	6,630.80	-1,623.09	-596.84	14,443,349.99	1,697,985.46	39.77082746	-80.79511791
8,065.00	91.38	320.07	6,629.07	-1,550.79	-656.88	14,443,422.29	1,697,925.42	39.77102639	-80.79533102
8,157.00	90.51	320.16	6,627.55	-1,480.20	-715.87	14,443,492.88	1,697,866.43	39.77122061	-80.79554037
8,251.00	91.16	319.98	6,626.18	-1,408.13	-776.20	14,443,564.95	1,697,806.10	39.77141892	-80.79575448
8,345.00	90.55	319.89	6,624.78	-1,336.20	-836.69	14,443,636.88	1,697,745.61	39.77161684	-80.79596920
8,440.00	91.47	319.81	6,623.10	-1,263.60	-897.94	14,443,709.48	1,697,684.36	39.77181466	-80.79618458
8,534.00	90.99	319.01	6,621.08	-1,192.23	-959.09	14,443,780.85	1,697,623.22	39.77201298	-80.79640362
8,628.00	89.93	318.49	6,620.33	-1,121.56	-1,021.06	14,443,851.52	1,697,561.24	39.77220744	-80.79662361
8,723.00	91.03	318.05	6,619.53	-1,050.67	-1,084.29	14,443,922.41	1,697,498.01	39.77240253	-80.79684808
8,817.00	90.81	317.26	6,618.02	-981.20	-1,147.60	14,443,991.88	1,697,434.70	39.77259370	-80.79707283
8,911.00	91.47	316.90	6,616.15	-912.38	-1,211.60	14,444,060.70	1,697,370.70	39.77278310	-80.79730004
9,005.00	91.25	317.61	6,613.92	-843.37	-1,275.38	14,444,129.71	1,697,306.92	39.77297302	-80.79752649
9,100.00	91.82	318.93	6,611.38	-772.50	-1,338.59	14,444,200.58	1,697,243.71	39.77316805	-80.79775088
9,194.00	91.60	319.01	6,608.57	-701.62	-1,400.27	14,444,271.46	1,697,182.03	39.77336308	-80.79796983
9,288.00	89.71	319.54	6,607.50	-630.39	-1,461.59	14,444,342.69	1,697,120.71	39.77355908	-80.79818750
9,383.00	90.33	319.28	6,607.47	-558.25	-1,523.40	14,444,414.83	1,697,058.90	39.77375758	-80.79840691
9,477.00	89.63	319.37	6,607.50	-486.96	-1,584.67	14,444,486.12	1,696,997.64	39.77395374	-80.79862439
9,571.00	90.20	318.14	6,607.64	-416.28	-1,646.64	14,444,558.80	1,696,935.66	39.77414822	-80.79884438
9,666.00	90.99	318.49	6,606.65	-345.34	-1,709.81	14,444,627.74	1,696,872.49	39.77434344	-80.79906865
9,760.00	91.52	317.61	6,604.59	-275.45	-1,772.63	14,444,697.63	1,696,809.67	39.77453577	-80.79929168
9,854.00	91.16	317.52	6,602.39	-206.09	-1,836.04	14,444,766.99	1,696,746.26	39.77472664	-80.79951681
9,949.00	91.38	316.29	6,600.29	-136.74	-1,900.93	14,444,836.34	1,696,681.37	39.77491750	-80.79974719
10,043.00	91.21	315.76	6,598.16	-69.11	-1,966.18	14,444,903.97	1,696,616.12	39.77510363	-80.79997889
10,138.00	90.90	315.23	6,596.42	-1.37	-2,032.76	14,444,971.71	1,696,549.54	39.77529007	-80.80021532
10,231.00	90.77	316.20	6,595.06	65.20	-2,097.69	14,445,038.28	1,696,484.61	39.77547328	-80.80044588
10,326.00	91.52	316.99	6,593.16	134.21	-2,162.96	14,445,107.29	1,696,419.35	39.77566319	-80.80067762
10,420.00	91.12	317.17	6,591.00	203.02	-2,226.95	14,445,176.10	1,696,355.35	39.77585257	-80.80090484
10,514.00	91.65	317.87	6,588.72	272.33	-2,290.41	14,445,245.41	1,696,291.89	39.77604329	-80.80113016
10,608.00	91.43	317.52	6,586.20	341.82	-2,353.66	14,445,314.90	1,696,228.65	39.77623453	-80.80135472
10,702.00	91.08	317.17	6,584.14	410.94	-2,417.34	14,445,384.02	1,696,164.97	39.77642472	-80.80158081
10,796.00	90.64	317.26	6,582.73	479.92	-2,481.18	14,445,453.00	1,696,101.13	39.77661455	-80.80180749
10,891.00	91.69	318.05	6,580.80	550.12	-2,545.16	14,445,523.20	1,696,037.15	39.77680772	-80.80203464
10,985.00	91.34	317.43	6,578.31	619.66	-2,608.35	14,445,592.74	1,695,973.96	39.77699909	-80.80225901
11,079.00	90.20	317.52	6,577.05	688.93	-2,671.88	14,445,662.01	1,695,910.43	39.77718971	-80.80248458
11,172.00	91.82	317.34	6,575.41	757.41	-2,734.78	14,445,730.49	1,695,847.53	39.77737945	-80.80270792
11,267.00	91.25	317.61	6,572.86	827.40	-2,798.97	14,445,800.47	1,695,783.34	39.77757074	-80.80293583
11,361.00	90.64	316.99	6,571.31	896.47	-2,862.70	14,445,869.55	1,695,719.60	39.77776082	-80.80316215
11,456.00	90.15	317.08	6,570.66	965.98	-2,927.45	14,445,939.06	1,695,654.86	39.77795082	-80.80339205
11,550.00	89.93	317.87	6,570.59	1,035.26	-2,990.99	14,446,008.34	1,695,591.32	39.77814275	-80.80361765
11,645.00	90.68	317.78	6,570.09	1,105.66	-3,054.77	14,446,078.74	1,695,527.54	39.77833648	-80.80384412
11,739.00	90.24	318.40	6,569.33	1,175.61	-3,117.55	14,446,148.69	1,695,464.75	39.77852897	-80.80406704
11,833.00	91.03	316.73	6,568.29	1,244.98	-3,180.97	14,446,218.06	1,695,401.33	39.77871985	-80.80429223
11,928.00	90.68	316.20	6,566.87	1,313.85	-3,246.40	14,446,286.92	1,695,335.91	39.77890936	-80.80452458

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Whistlepig N-05HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Site:	Whistlepig	MD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,023.00	89.98	315.76	6,566.33	1,382.16	-3,312.42	14,446,355.24	1,695,269.89	39.77909736	-80.80475901
12,118.00	91.56	316.29	6,565.05	1,450.52	-3,378.37	14,446,423.59	1,695,203.94	39.77928549	-80.80499323
12,212.00	91.08	316.55	6,562.88	1,518.59	-3,443.15	14,446,491.67	1,695,139.15	39.77947283	-80.80522329
12,306.00	90.24	316.73	6,561.80	1,586.93	-3,507.69	14,446,560.01	1,695,074.62	39.77966089	-80.80545246
12,400.00	92.04	316.38	6,559.93	1,655.16	-3,572.31	14,446,628.24	1,695,010.00	39.77984866	-80.80568195
12,494.00	92.18	316.29	6,556.47	1,723.11	-3,637.17	14,446,696.19	1,694,945.14	39.78003566	-80.80591228
12,588.00	91.47	316.20	6,553.48	1,790.98	-3,702.14	14,446,764.05	1,694,880.16	39.78022241	-80.80614302
12,682.00	90.64	315.23	6,551.75	1,858.25	-3,767.76	14,446,831.33	1,694,814.54	39.78040757	-80.80637607
12,776.00	90.64	316.03	6,550.70	1,925.44	-3,833.49	14,446,898.52	1,694,748.82	39.78059248	-80.80660951
12,871.00	90.07	316.82	6,550.11	1,994.27	-3,898.98	14,446,967.34	1,694,683.33	39.78078188	-80.80684206
12,965.00	89.45	316.55	6,550.50	2,062.66	-3,963.46	14,447,035.74	1,694,618.85	39.78097008	-80.80707106
13,059.00	90.42	317.87	6,550.61	2,131.64	-4,027.31	14,447,104.71	1,694,555.00	39.78115990	-80.80729781
13,153.00	89.98	318.05	6,550.28	2,201.45	-4,090.26	14,447,174.53	1,694,492.05	39.78135199	-80.80752132
13,247.00	91.52	317.87	6,549.05	2,271.25	-4,153.20	14,447,244.33	1,694,429.11	39.78154406	-80.80774482
13,341.00	90.95	317.34	6,547.02	2,340.66	-4,216.56	14,447,313.73	1,694,365.75	39.78173504	-80.80796983
13,435.00	90.15	317.08	6,546.12	2,409.64	-4,280.41	14,447,382.71	1,694,301.90	39.78192485	-80.80819658
13,529.00	91.78	317.34	6,544.54	2,478.61	-4,344.26	14,447,451.68	1,694,238.05	39.78211463	-80.80842330
13,623.00	90.99	316.55	6,542.27	2,547.27	-4,408.41	14,447,520.34	1,694,173.90	39.78230358	-80.80865114
13,717.00	91.87	317.70	6,539.92	2,616.13	-4,472.35	14,447,589.21	1,694,109.96	39.78249307	-80.80887819
13,812.00	91.12	317.26	6,537.44	2,686.13	-4,536.53	14,447,659.20	1,694,045.78	39.78268567	-80.80910612
13,906.00	90.29	316.03	6,536.29	2,754.47	-4,601.06	14,447,727.54	1,693,981.25	39.78287373	-80.80933528
13,999.00	91.52	317.17	6,534.82	2,822.03	-4,664.95	14,447,795.10	1,693,917.36	39.78305965	-80.80956218
14,094.00	91.34	316.90	6,532.45	2,891.53	-4,729.67	14,447,864.60	1,693,852.64	39.78325088	-80.80979206
14,188.00	91.60	317.96	6,530.03	2,960.73	-4,793.24	14,447,933.80	1,693,789.07	39.78344130	-80.81001781
14,282.00	91.12	318.40	6,527.80	3,030.76	-4,855.90	14,448,003.84	1,693,726.41	39.78363400	-80.81024032
14,376.00	90.64	318.66	6,526.36	3,101.19	-4,918.14	14,448,074.26	1,693,664.17	39.78382777	-80.81046134
14,470.00	90.20	318.75	6,525.67	3,171.81	-4,980.18	14,448,144.88	1,693,602.13	39.78402207	-80.81068162
14,564.00	91.25	318.40	6,524.48	3,242.29	-5,042.36	14,448,215.36	1,693,539.95	39.78421598	-80.81090245
14,657.00	91.30	318.49	6,522.41	3,311.86	-5,104.04	14,448,284.94	1,693,478.27	39.78440742	-80.81112146
14,751.00	90.95	317.08	6,520.57	3,381.47	-5,167.19	14,448,354.54	1,693,415.13	39.78459893	-80.81134572
14,846.00	90.42	316.38	6,519.43	3,450.63	-5,232.30	14,448,423.71	1,693,350.01	39.78478926	-80.81157697
14,940.00	90.15	315.59	6,518.96	3,518.23	-5,297.61	14,448,493.11	1,693,284.70	39.78497529	-80.81180895
15,034.00	90.37	316.82	6,518.54	3,586.08	-5,362.66	14,448,562.43	1,693,219.65	39.78516199	-80.81204001
15,129.00	90.68	316.82	6,517.67	3,655.35	-5,427.67	14,448,631.83	1,693,154.64	39.78535261	-80.81227089
15,223.00	90.33	316.73	6,516.84	3,723.85	-5,492.04	14,448,696.92	1,693,090.27	39.78554108	-80.81249953
15,317.00	90.02	316.90	6,516.55	3,792.39	-5,556.37	14,448,765.46	1,693,025.94	39.78572967	-80.81272801
15,411.00	90.68	317.26	6,515.98	3,861.22	-5,620.38	14,448,834.29	1,692,961.93	39.78591908	-80.81295535
15,504.00	90.02	317.52	6,515.41	3,929.66	-5,683.34	14,448,902.74	1,692,898.97	39.78610769	-80.81317896
15,598.00	90.77	317.26	6,514.76	3,998.84	-5,746.98	14,448,971.92	1,692,835.33	39.78629776	-80.81340497
15,693.00	89.89	316.55	6,514.21	4,068.21	-5,811.88	14,449,041.28	1,692,770.43	39.78648886	-80.81363549
15,787.00	91.25	317.52	6,513.28	4,136.99	-5,875.94	14,449,110.06	1,692,706.37	39.78667789	-80.81386301
15,880.00	90.51	317.43	6,511.85	4,205.52	-5,938.79	14,449,178.60	1,692,643.52	39.78686646	-80.81408624
15,973.00	89.76	317.34	6,511.63	4,273.96	-6,001.76	14,449,247.04	1,692,580.55	39.78705449	-80.81430988
16,068.00	90.99	316.90	6,511.01	4,343.58	-6,066.40	14,449,316.65	1,692,515.91	39.78724631	-80.81453447
16,162.00	90.64	316.29	6,509.67	4,411.86	-6,130.99	14,449,384.93	1,692,451.32	39.78743421	-80.81476887
16,256.00	91.52	317.26	6,507.90	4,480.34	-6,195.35	14,449,453.41	1,692,386.96	39.78762264	-80.81499749
16,350.00	91.34	317.08	6,505.55	4,549.26	-6,259.24	14,449,522.33	1,692,323.08	39.78781226	-80.81522440
16,444.00	91.34	316.99	6,503.35	4,618.03	-6,323.28	14,449,591.10	1,692,259.03	39.78800148	-80.81545189
16,539.00	91.25	316.47	6,501.21	4,687.18	-6,388.38	14,449,660.25	1,692,193.93	39.78819177	-80.81568312
16,633.00	90.55	317.17	6,499.73	4,755.72	-6,452.70	14,449,728.79	1,692,129.61	39.78838303	-80.81591156
16,727.00	90.37	316.99	6,498.98	4,824.55	-6,516.71	14,449,797.62	1,692,065.60	39.78856975	-80.81613892
16,822.00	90.20	316.20	6,498.50	4,893.57	-6,581.99	14,449,866.64	1,692,000.33	39.78875966	-80.81637079
16,916.00	89.23	316.90	6,498.97	4,961.81	-6,646.63	14,449,934.88	1,691,935.68	39.78894743	-80.81660042
17,010.00	88.88	316.47	6,500.52	5,030.19	-6,711.11	14,450,003.26	1,691,871.21	39.78913559	-80.81682944
17,104.00	90.59	317.08	6,500.96	5,098.68	-6,775.48	14,450,071.75	1,691,806.83	39.78932405	-80.81705810

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Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Whistlepig N-05HM (slot B)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Site:	Whistlepig	MD Reference:	RKB=1368+32.5 @ 1400.50ft (Nabors X14)
Well:	Whistlepig N-05HM (slot B)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Dec2220_v16

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
17,198.00	89.67	316.64	6,500.74	5,167.27	-6,839.76	14,450,140.34	1,691,742.56	39.78951277	-80.81728641
17,292.00	91.21	316.73	6,500.02	5,235.66	-6,904.24	14,450,208.73	1,691,678.08	39.78970095	-80.81751546
17,386.00	91.08	316.47	6,498.14	5,303.95	-6,968.81	14,450,277.01	1,691,613.51	39.78988884	-80.81774483
17,480.00	90.68	315.67	6,496.70	5,371.64	-7,034.02	14,450,344.70	1,691,548.30	39.79007510	-80.81797647
17,575.00	91.25	317.34	6,495.10	5,440.54	-7,099.39	14,450,413.61	1,691,482.92	39.79026469	-80.81820870
17,669.00	90.73	316.47	6,493.48	5,509.17	-7,163.60	14,450,482.24	1,691,418.71	39.79045352	-80.81843679
17,762.00	90.29	318.40	6,492.65	5,577.66	-7,226.51	14,450,550.73	1,691,355.81	39.79064196	-80.81866023
17,857.00	91.12	319.10	6,491.48	5,649.08	-7,289.14	14,450,622.14	1,691,293.18	39.79083845	-80.81888268
17,951.00	91.12	318.40	6,489.64	5,719.74	-7,351.10	14,450,692.80	1,691,231.21	39.79103284	-80.81910276
18,046.00	90.24	318.31	6,488.51	5,790.72	-7,414.23	14,450,763.79	1,691,168.09	39.79122813	-80.81932697
18,140.00	90.46	317.17	6,487.94	5,860.29	-7,477.44	14,450,833.36	1,691,104.88	39.79141953	-80.81955150
18,235.00	89.67	317.61	6,487.83	5,930.20	-7,541.75	14,450,903.27	1,691,040.56	39.79161190	-80.81977996
18,330.00	89.58	316.29	6,488.45	5,999.62	-7,606.60	14,450,972.69	1,690,975.71	39.79180290	-80.82001031
18,424.00	88.88	316.20	6,489.72	6,067.51	-7,671.60	14,451,040.58	1,690,910.71	39.79198971	-80.82024123
18,520.00	90.07	316.38	6,490.60	6,136.90	-7,737.94	14,451,109.97	1,690,844.38	39.79218063	-80.82047688
18,614.00	91.30	317.61	6,489.47	6,205.64	-7,802.04	14,451,178.70	1,690,780.27	39.79236975	-80.82070461
18,708.00	91.21	317.61	6,487.41	6,275.05	-7,865.40	14,451,248.11	1,690,716.92	39.79256071	-80.82092967
18,802.00	90.77	316.47	6,485.79	6,343.83	-7,929.45	14,451,316.89	1,690,652.87	39.79274996	-80.82115719
18,896.00	89.71	316.03	6,485.40	6,411.73	-7,994.45	14,451,384.79	1,690,587.87	39.79293679	-80.82138811
18,990.00	91.30	316.29	6,484.57	6,479.52	-8,059.55	14,451,452.59	1,690,522.76	39.79312333	-80.82161941
19,083.00	91.43	315.59	6,482.35	6,546.33	-8,124.21	14,451,519.40	1,690,458.11	39.79330716	-80.82184910
19,177.00	90.86	316.73	6,480.47	6,614.12	-8,189.30	14,451,587.19	1,690,393.01	39.79349367	-80.82208036
19,271.00	90.86	317.96	6,479.06	6,683.24	-8,252.99	14,451,656.31	1,690,329.33	39.79368385	-80.82230659
19,364.00	90.20	316.99	6,478.20	6,751.78	-8,315.84	14,451,724.84	1,690,266.47	39.79387241	-80.82252988
19,457.00	89.85	316.55	6,478.16	6,819.54	-8,379.54	14,451,792.60	1,690,202.78	39.79405885	-80.82275618
19,551.00	89.63	316.03	6,478.59	6,887.48	-8,444.50	14,451,860.55	1,690,137.82	39.79424580	-80.82298694
19,665.00	89.14	315.59	6,479.81	6,969.22	-8,523.95	14,451,942.29	1,690,058.36	39.79447070	-80.82326924
Survey @ 19665.00 MD 6479.81 TVD									
19,720.00	89.14	315.59	6,480.64	7,008.51	-8,562.44	14,451,981.57	1,690,019.88	39.79457880	-80.82340597
Survey Proj. to 19720.00 MD 6480.64 TVD									

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
190.00	190.00	-0.19	0.23	MWD surveys
19,665.00	6,479.81	6,969.22	-8,523.95	Survey @ 19665.00 MD 6479.81 TVD
19,720.00	6,480.64	7,008.51	-8,562.44	Survey Proj. to 19720.00 MD 6480.64 TVD

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