



Well: Fitzgerald 18 HU (slot N)  
 Site: Fitzgerald  
 Project: Marshall County, West Virginia  
 Design: rev15  
 Rig: Nabors B28

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=1292.9+26 @ 1318.91ft (Nabors B28)

Northing: 14454531.46  
 Easting: 1741206.76  
 Latitude: 39.80116100  
 Longitude: -80.64114000

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.935°



Azimuths to Grid North  
 True North: -0.23°  
 Magnetic North: -8.94°

Magnetic Field  
 Strength: 51796.3nT  
 Dip Angle: 66.59°  
 Date: 12/25/2020  
 Model: IGRF2020



ANNOTATIONS SURVEYS SIDETRACK 01

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Annotation
1769.00	3.69	228.63	1768.12	-20.46	-24.28	19.87	Tie into original hole @ 1769 MD
21427.00	89.01	149.88	12022.69	-7496.93	130.95	7497.92	Survey @ 21427.00 MD 12022.69 TVD
21502.00	89.01	149.88	12023.99	-7561.80	168.58	7563.66	Survey Proj. to 21502.00 MD 12023.99 TVD

SECTION DETAILS

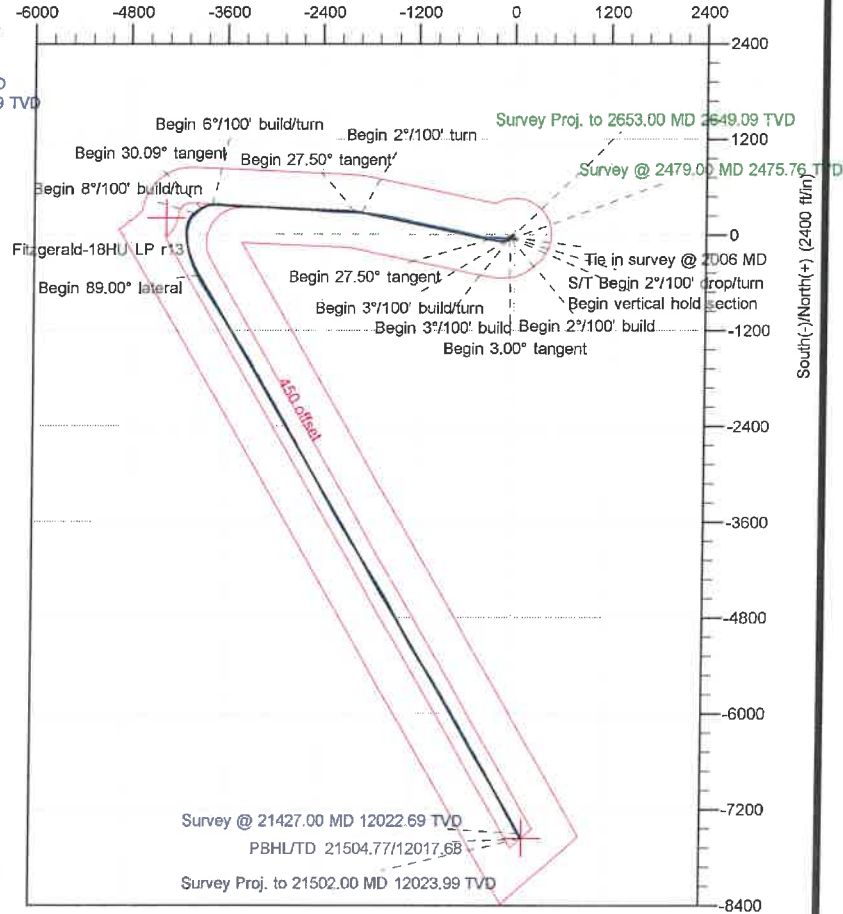
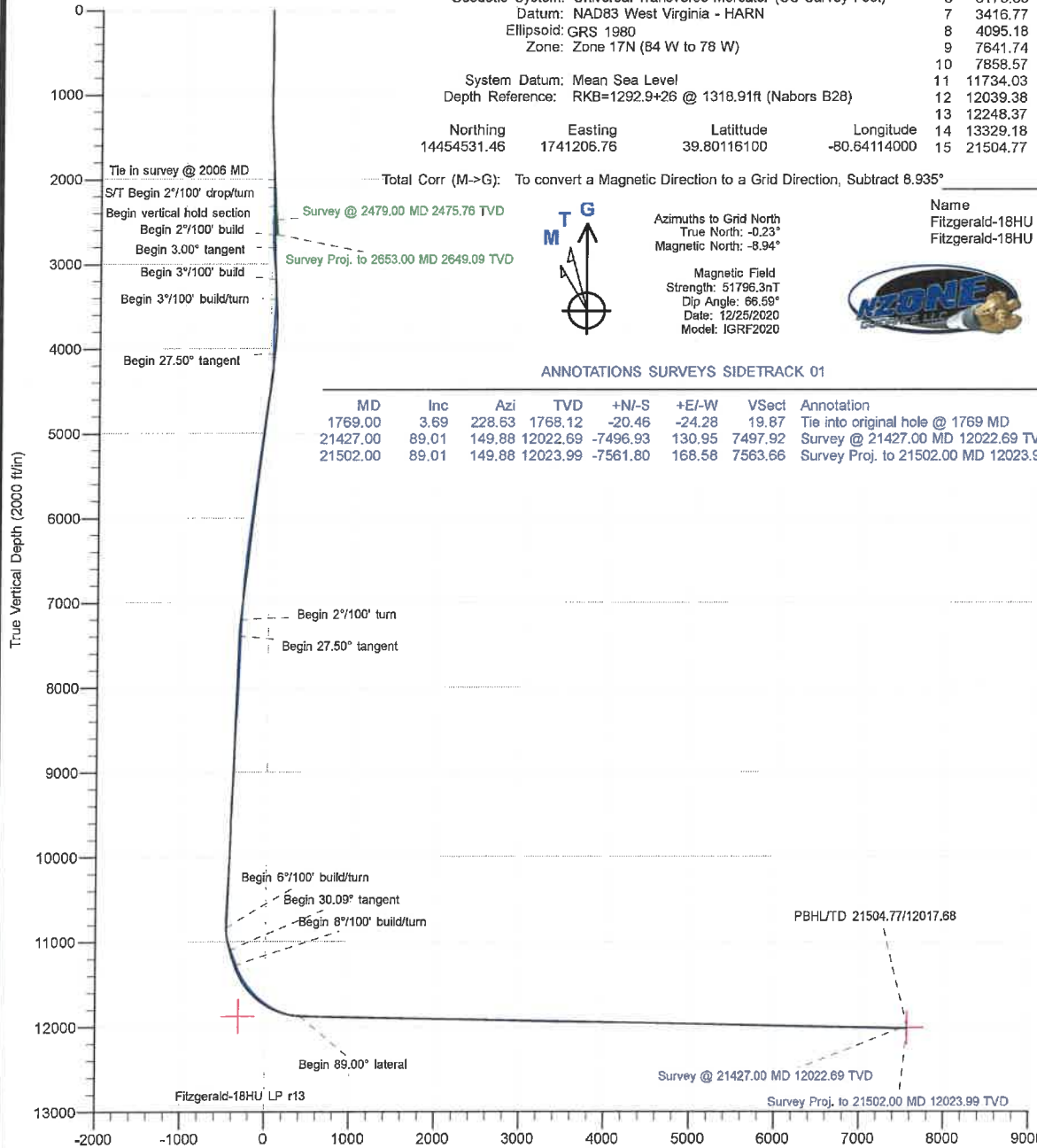
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
1	2006.00	4.35	235.92	2004.42	-30.63	-39.24	0.00	0.000	29.68	Tie in survey @ 2006 MD
2	2090.00	4.43	237.02	2088.17	-34.18	-44.60	0.14	47.014	33.10	S/T Begin 2°/100' drop/turn
3	2311.50	0.00	0.00	2309.45	-38.84	-51.78	2.00	160.000	37.58	Begin vertical hold section
4	2652.05	0.00	0.00	2650.00	-38.84	-51.78	0.00	0.000	37.58	Begin 2°/100' build
5	2802.05	3.00	230.00	2799.93	-41.36	-54.79	2.00	230.000	40.04	Begin 3.00° tangent
6	3178.63	3.00	230.00	3176.00	-54.03	-69.89	0.00	0.000	52.34	Begin 3°/100' build
7	3416.77	10.00	245.00	3412.47	-66.79	-93.43	3.00	21.185	64.53	Begin 3°/100' build/turn
8	4095.18	27.50	282.00	4054.17	-59.04	-302.22	3.00	53.335	51.78	Begin 27.50° tangent
9	7641.74	27.50	282.00	7200.00	281.44	-1904.05	0.00	0.000	-326.97	Begin 2°/100' turn
10	7858.57	27.50	272.60	7392.42	294.13	-2003.07	2.00	-94.171	-342.02	Begin 27.50° tangent
11	11734.03	27.50	272.60	10830.00	375.31	-3790.72	0.00	0.000	-465.99	Begin 6°/100' build/turn
12	12039.38	30.09	234.36	11099.83	333.55	-3924.50	6.00	-99.197	-427.45	Begin 30.09° tangent
13	12248.37	30.09	234.36	11280.65	272.50	-4009.65	0.00	0.000	-368.46	Begin 8°/100' build/turn
14	13329.18	89.00	149.69	11875.00	-505.39	-3944.23	8.00	-85.887	410.77	Begin 89.00° lateral
15	21504.77	89.00	149.69	12017.68	-7562.36	181.18	0.00	0.000	7564.53	PBHL/TD 21504.77/12017.68

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Fitzgerald-18HU LP r13	11875.00	213.57	-4361.29	14454745.02	1736845.48	39.80179449	-80.65666501
Fitzgerald-18HU BHL r13	12017.68	-7562.36	181.18	14446969.11	1741387.95	39.78039100	-80.64060300

ANNOTATIONS SURVEYS ORIGINAL HOLE

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Annotation
172.00	0.27	252.89	172.00	-0.12	-0.39	0.11	MWD surveys
2479.00	5.01	212.19	2475.76	-58.41	-66.59	56.80	Survey @ 2479.00 MD 2475.76 TVD
2653.00	5.01	212.19	2649.09	-71.27	-74.69	69.46	Survey Proj. to 2653.00 MD 2649.09 TVD



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	DB_Dec2220_v16

<b>Project</b>	Marshall County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	Fitzgerald				
<b>Site Position:</b>		<b>Northing:</b>	14,454,567.73 usft	<b>Latitude:</b>	39.80126184
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,741,096.26 usft	<b>Longitude:</b>	-80.64153292
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "		

<b>Well</b>	Fitzgerald 18 HU (slot N)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	14,454,531.46 usft	<b>Latitude:</b>	39.80116100
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	1,741,206.76 usft	<b>Longitude:</b>	-80.64114000
<b>Position Uncertainty</b>	0.00 ft		<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,292.91 ft
<b>Grid Convergence:</b>	0.230 °					

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2020	12/10/2020	-8.705	66.591	51,800.61281085

<b>Design</b>	Surveys Original Hole				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	178.63	

<b>Survey Program</b>	<b>Date</b>	12/25/2020		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
172.00	1,123.00	MWD surf (Original Hole)	MWD	MWD - Standard
1,187.00	2,479.00	MWD (Original Hole)	MWD	MWD - Standard
2,653.00	2,653.00	Projection (Original Hole)	MWD	MWD - Standard

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
172.00	0.27	252.89	172.00	-0.12	-0.39	0.11	0.16	0.16	0.00	
<b>MWD surveys</b>										
202.00	0.26	231.79	202.00	-0.18	-0.51	0.17	0.33	-0.03	-70.33	
232.00	0.35	236.01	232.00	-0.28	-0.64	0.26	0.31	0.30	14.07	
266.00	0.39	255.69	266.00	-0.36	-0.84	0.34	0.39	0.12	57.88	
296.00	0.48	261.06	296.00	-0.41	-1.06	0.38	0.33	0.30	17.90	
326.00	0.35	272.92	326.00	-0.42	-1.27	0.39	0.52	-0.43	39.53	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	DB_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)	
357.00	0.43	252.06	357.00	-0.45	-1.48	0.42	0.52	0.26	-67.29	
387.00	0.39	267.21	386.99	-0.49	-1.69	0.45	0.38	-0.13	50.50	
417.00	0.40	250.25	416.99	-0.53	-1.89	0.49	0.39	0.03	-56.53	
447.00	0.57	243.83	446.99	-0.63	-2.12	0.58	0.59	0.57	-21.40	
477.00	0.57	261.06	476.99	-0.72	-2.40	0.67	0.57	0.00	57.43	
507.00	0.62	277.67	506.99	-0.72	-2.71	0.66	0.60	0.17	55.37	
537.00	0.79	288.04	536.99	-0.64	-3.07	0.57	0.71	0.57	34.57	
567.00	0.79	273.37	566.98	-0.56	-3.47	0.48	0.67	0.00	-48.90	
597.00	0.92	278.81	596.98	-0.51	-3.92	0.42	0.51	0.43	18.13	
627.00	0.87	291.11	626.98	-0.39	-4.37	0.29	0.66	-0.17	41.00	
658.00	0.79	278.11	657.97	-0.28	-4.80	0.16	0.66	-0.26	-41.94	
688.00	0.79	295.60	687.97	-0.16	-5.19	0.04	0.80	0.00	58.30	
718.00	0.70	283.47	717.97	-0.03	-5.55	-0.10	0.60	-0.30	-40.43	
748.00	0.75	299.03	747.97	0.11	-5.90	-0.25	0.67	0.17	51.87	
778.00	1.01	279.69	777.96	0.25	-6.34	-0.40	1.30	0.87	-64.47	
810.00	0.79	288.92	809.96	0.37	-6.82	-0.53	0.82	-0.69	28.84	
841.00	0.35	308.96	840.96	0.50	-7.10	-0.67	1.54	-1.42	64.65	
873.00	0.04	31.84	872.96	0.57	-7.17	-0.74	1.09	-0.97	259.00	
904.00	0.18	334.01	903.96	0.62	-7.18	-0.79	0.52	0.45	-186.55	
935.00	0.22	314.15	934.96	0.71	-7.25	-0.88	0.26	0.13	-64.06	
967.00	0.26	309.40	966.96	0.79	-7.35	-0.97	0.14	0.13	-14.84	
1,012.00	0.35	307.73	1,011.96	0.94	-7.54	-1.12	0.20	0.20	-3.71	
1,061.00	0.40	312.56	1,060.96	1.15	-7.78	-1.34	0.12	0.10	9.86	
1,123.00	0.53	309.84	1,122.95	1.48	-8.16	-1.68	0.21	0.21	-4.39	
1,187.00	0.66	308.96	1,186.95	1.90	-8.67	-2.11	0.20	0.20	-1.38	
1,219.00	0.66	299.91	1,218.95	2.11	-8.98	-2.32	0.33	0.00	-28.28	
1,251.00	0.53	269.50	1,250.95	2.20	-9.29	-2.42	1.05	-0.41	-95.03	
1,282.00	0.70	223.00	1,281.94	2.06	-9.56	-2.29	1.65	0.55	-150.00	
1,314.00	1.27	203.49	1,313.94	1.59	-9.83	-1.83	2.04	1.78	-60.97	
1,345.00	1.67	206.22	1,344.93	0.87	-10.17	-1.12	1.31	1.29	8.81	
1,377.00	2.33	204.72	1,376.91	-0.14	-10.65	-0.12	2.07	2.06	-4.69	
1,408.00	2.94	202.26	1,407.88	-1.45	-11.21	1.18	2.00	1.97	-7.94	
1,440.00	3.47	205.60	1,439.83	-3.08	-11.94	2.79	1.76	1.66	10.44	
1,487.00	4.04	205.16	1,486.73	-5.86	-13.26	5.54	1.21	1.21	-0.94	
1,534.00	4.17	202.88	1,533.61	-8.93	-14.63	8.58	0.44	0.28	-4.85	
1,581.00	3.87	216.15	1,580.49	-11.79	-16.23	11.40	2.07	-0.64	28.23	
1,629.00	3.52	223.97	1,628.39	-14.16	-18.21	13.72	1.28	-0.73	16.29	
1,676.00	3.47	223.71	1,675.30	-16.22	-20.19	15.73	0.11	-0.11	-0.55	
1,722.00	3.69	221.77	1,721.21	-18.33	-22.14	17.80	0.55	0.48	-4.22	
1,769.00	3.69	228.63	1,768.12	-20.46	-24.28	19.87	0.94	0.00	14.60	
1,817.00	4.00	235.84	1,816.01	-22.42	-26.83	21.77	1.20	0.65	15.02	
1,864.00	4.53	236.19	1,862.88	-24.37	-29.72	23.66	1.13	1.13	0.74	
1,911.00	4.79	237.33	1,909.72	-26.47	-32.92	25.67	0.59	0.55	2.43	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B2B)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B2B)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	DB_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)
2,006.00	4.35	235.92	2,004.42	-30.63	-39.24	29.68	0.48	-0.46	-1.48
2,100.00	4.44	237.15	2,098.14	-34.60	-45.25	33.50	0.14	0.10	1.31
2,195.00	4.79	230.91	2,192.84	-39.09	-51.42	37.85	0.64	0.37	-6.57
2,290.00	4.61	221.95	2,287.52	-44.43	-57.05	43.05	0.79	-0.19	-9.43
2,384.00	5.49	212.11	2,381.15	-51.05	-61.97	49.55	1.31	0.94	-10.47
2,479.00	5.01	212.19	2,475.76	-58.41	-66.59	56.80	0.51	-0.51	0.08
<b>Survey @ 2479.00 MD 2475.76 TVD</b>									
2,653.00	5.01	212.19	2,649.09	-71.27	-74.69	69.46	0.00	0.00	0.00
<b>Survey Proj. to 2653.00 MD 2649.09 TVD</b>									

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
172.00	172.00	-0.12	-0.39	MWD surveys
2,479.00	2,475.76	-58.41	-66.59	Survey @ 2479.00 MD 2475.76 TVD
2,653.00	2,649.09	-71.27	-74.69	Survey Proj. to 2653.00 MD 2649.09 TVD

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	DB_Dec2220_v16

<b>Project</b>	Marshall County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	Fitzgerald				
<b>Site Position:</b>		<b>Northing:</b>	14,454,567.73 usft	<b>Latitude:</b>	39.80126184
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,741,096.26 usft	<b>Longitude:</b>	-80.64153292
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.229 °

<b>Well</b>	Fitzgerald 18 HU (slot N)					
<b>Well Position</b>	<b>+N-S</b>	0.00 ft	<b>Northing:</b>	14,454,531.46 usft	<b>Latitude:</b>	39.80116100
	<b>+E-W</b>	0.00 ft	<b>Easting:</b>	1,741,206.76 usft	<b>Longitude:</b>	-80.64114000
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,292.91 ft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>	<b>Dip Angle</b>	<b>Field Strength</b>
	IGRF2020	12/10/2020	(°)	(°)	(nT)
			-8.705	66.591	51,800.61281085

<b>Design</b>	Surveys Original Hole				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N-S</b>	<b>+E-W</b>	<b>Direction</b>	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	178.63	

<b>Survey Program</b>	<b>Date</b>	12/25/2020			
<b>From</b>	<b>To</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
(ft)	(ft)				
172.00	1,123.00	MWD surf (Original Hole)	MWD	MWD - Standard	
1,187.00	2,479.00	MWD (Original Hole)	MWD	MWD - Standard	
2,653.00	2,653.00	Projection (Original Hole)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured</b>	<b>Inclination</b>	<b>Azimuth</b>	<b>Vertical</b>	<b>+N-S</b>	<b>+E-W</b>	<b>Map</b>	<b>Map</b>	<b>Latitude</b>	<b>Longitude</b>	
<b>Depth</b>	<b>(°)</b>	<b>(°)</b>	<b>Depth</b>	<b>(ft)</b>	<b>(ft)</b>	<b>Northing</b>	<b>Easting</b>			
<b>(ft)</b>			<b>(ft)</b>			<b>(usft)</b>	<b>(usft)</b>			
0.00	0.00	0.00	0.00	0.00	0.00	14,454,531.46	1,741,206.76	39.80116100	-80.64114000	
172.00	0.27	252.89	172.00	-0.12	-0.39	14,454,531.34	1,741,206.37	39.80116068	-80.64114138	
<b>MWD surveys</b>										
202.00	0.26	231.79	202.00	-0.18	-0.51	14,454,531.28	1,741,206.25	39.80116051	-80.64114181	
232.00	0.35	236.01	232.00	-0.28	-0.64	14,454,531.18	1,741,206.12	39.80116025	-80.64114227	
266.00	0.39	255.69	266.00	-0.36	-0.84	14,454,531.10	1,741,205.93	39.80116002	-80.64114298	
296.00	0.48	261.06	296.00	-0.41	-1.06	14,454,531.05	1,741,205.70	39.80115990	-80.64114378	
326.00	0.35	272.92	326.00	-0.42	-1.27	14,454,531.04	1,741,205.49	39.80115986	-80.64114454	
357.00	0.43	252.06	357.00	-0.45	-1.48	14,454,531.01	1,741,205.28	39.80115977	-80.64114528	
387.00	0.39	267.21	386.99	-0.49	-1.69	14,454,530.97	1,741,205.07	39.80115967	-80.64114602	



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	DB_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
417.00	0.40	250.25	416.99	-0.53	-1.89	14,454,530.93	1,741,204.87	39.80115956	-80.64114674
447.00	0.57	243.83	446.99	-0.63	-2.12	14,454,530.82	1,741,204.64	39.80115928	-80.64114756
477.00	0.57	261.06	476.99	-0.72	-2.40	14,454,530.74	1,741,204.36	39.80115904	-80.64114857
507.00	0.62	277.67	506.99	-0.72	-2.71	14,454,530.73	1,741,204.05	39.80115904	-80.64114967
537.00	0.79	288.04	536.99	-0.64	-3.07	14,454,530.82	1,741,203.69	39.80115928	-80.64115094
567.00	0.79	273.37	566.98	-0.56	-3.47	14,454,530.90	1,741,203.29	39.80115950	-80.64115237
597.00	0.92	278.81	596.98	-0.51	-3.92	14,454,530.94	1,741,202.84	39.80115963	-80.64115395
627.00	0.87	291.11	626.98	-0.39	-4.37	14,454,531.06	1,741,202.39	39.80115997	-80.64115555
658.00	0.79	278.11	657.97	-0.28	-4.80	14,454,531.18	1,741,201.96	39.80116029	-80.64115709
688.00	0.79	295.60	687.97	-0.16	-5.19	14,454,531.30	1,741,201.57	39.80116062	-80.64115848
718.00	0.70	283.47	717.97	-0.03	-5.55	14,454,531.43	1,741,201.21	39.80116098	-80.64115978
748.00	0.75	299.03	747.97	0.11	-5.90	14,454,531.57	1,741,200.86	39.80116137	-80.64116102
778.00	1.01	279.69	777.96	0.25	-6.34	14,454,531.71	1,741,200.43	39.80116175	-80.64116256
810.00	0.79	288.92	809.96	0.37	-6.82	14,454,531.83	1,741,199.94	39.80116209	-80.64116429
841.00	0.35	308.96	840.96	0.50	-7.10	14,454,531.95	1,741,199.66	39.80116244	-80.64116527
873.00	0.04	31.84	872.96	0.57	-7.17	14,454,532.03	1,741,199.59	39.80116264	-80.64116552
904.00	0.18	334.01	903.96	0.62	-7.18	14,454,532.08	1,741,199.58	39.80116278	-80.64116557
935.00	0.22	314.15	934.96	0.71	-7.25	14,454,532.16	1,741,199.51	39.80116302	-80.64116580
967.00	0.26	309.40	966.96	0.79	-7.35	14,454,532.25	1,741,199.41	39.80116326	-80.64116615
1,012.00	0.35	307.73	1,011.96	0.94	-7.54	14,454,532.40	1,741,199.23	39.80116368	-80.64116682
1,061.00	0.40	312.56	1,060.96	1.15	-7.78	14,454,532.61	1,741,198.98	39.80116425	-80.64116769
1,123.00	0.53	309.84	1,122.95	1.48	-8.16	14,454,532.94	1,741,198.60	39.80116516	-80.64116903
1,187.00	0.66	308.96	1,186.95	1.90	-8.67	14,454,533.36	1,741,198.09	39.80116632	-80.64117086
1,219.00	0.66	299.91	1,218.95	2.11	-8.98	14,454,533.57	1,741,197.78	39.80116690	-80.64117193
1,251.00	0.53	269.50	1,250.95	2.20	-9.29	14,454,533.66	1,741,197.48	39.80116715	-80.64117303
1,282.00	0.70	223.00	1,281.94	2.06	-9.56	14,454,533.52	1,741,197.20	39.80116677	-80.64117400
1,314.00	1.27	203.49	1,313.94	1.59	-9.83	14,454,533.05	1,741,196.93	39.80116548	-80.64117498
1,345.00	1.67	206.22	1,344.93	0.87	-10.17	14,454,532.33	1,741,196.59	39.80116351	-80.64117619
1,377.00	2.33	204.72	1,376.91	-0.14	-10.65	14,454,531.32	1,741,196.11	39.80116074	-80.64117791
1,408.00	2.94	202.26	1,407.88	-1.45	-11.21	14,454,530.01	1,741,195.55	39.80115716	-80.64117994
1,440.00	3.47	205.60	1,439.83	-3.08	-11.94	14,454,528.38	1,741,194.82	39.80115268	-80.64118256
1,487.00	4.04	205.16	1,486.73	-5.86	-13.26	14,454,525.60	1,741,193.50	39.80114506	-80.64118729
1,534.00	4.17	202.88	1,533.61	-8.93	-14.63	14,454,522.53	1,741,192.13	39.80113663	-80.64119221
1,581.00	3.87	216.15	1,580.49	-11.79	-16.23	14,454,519.67	1,741,190.53	39.80112881	-80.64119795
1,629.00	3.52	223.97	1,628.39	-14.16	-18.21	14,454,517.30	1,741,188.56	39.80112233	-80.64120502
1,676.00	3.47	223.71	1,675.30	-16.22	-20.19	14,454,515.24	1,741,186.57	39.80111667	-80.64121212
1,722.00	3.69	221.77	1,721.21	-18.33	-22.14	14,454,513.13	1,741,184.62	39.80111090	-80.64121909
1,769.00	3.69	228.63	1,768.12	-20.46	-24.28	14,454,511.00	1,741,182.48	39.80110508	-80.64122674
1,817.00	4.00	235.84	1,816.01	-22.42	-26.83	14,454,509.04	1,741,179.94	39.80109972	-80.64123583
1,864.00	4.53	236.19	1,862.88	-24.37	-29.72	14,454,507.08	1,741,177.04	39.80109439	-80.64124618
1,911.00	4.79	237.33	1,909.72	-26.47	-32.92	14,454,504.99	1,741,173.84	39.80108868	-80.64125758
2,006.00	4.35	235.92	2,004.42	-30.63	-39.24	14,454,500.83	1,741,167.52	39.80107733	-80.64128015
2,100.00	4.44	237.15	2,098.14	-34.60	-45.25	14,454,496.86	1,741,161.51	39.80106649	-80.64130161
2,195.00	4.79	230.91	2,192.84	-39.09	-51.42	14,454,492.36	1,741,155.34	39.80105421	-80.64132363
2,290.00	4.61	221.95	2,287.52	-44.43	-57.05	14,454,487.02	1,741,149.71	39.80103960	-80.64134375
2,384.00	5.49	212.11	2,381.15	-51.05	-61.97	14,454,480.41	1,741,144.80	39.80102148	-80.64136135
2,479.00	5.01	212.19	2,475.76	-58.41	-66.59	14,454,473.05	1,741,140.17	39.80100132	-80.64137792
<b>Survey @ 2479.00 MD 2475.76 TVD</b>									
2,853.00	5.01	212.19	2,649.09	-71.27	-74.69	14,454,460.19	1,741,132.08	39.80096610	-80.64140693
<b>Survey Proj. to 2653.00 MD 2649.09 TVD</b>									

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	DB_Dec2220_v16

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
172.00	172.00	-0.12	-0.39	MWD surveys
2,479.00	2,475.76	-58.41	-66.59	Survey @ 2479.00 MD 2475.76 TVD
2,653.00	2,649.09	-71.27	-74.69	Survey Proj. to 2653.00 MD 2649.09 TVD

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	DB_Dec2220_v16

<b>Project</b>	Marshall County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	Fitzgerald				
<b>Site Position:</b>		<b>Northing:</b>	14,454,567.73 usft	<b>Latitude:</b>	39.80126184
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,741,096.26 usft	<b>Longitude:</b>	-80.64153292
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "		

<b>Well</b>	Fitzgerald 18 HU (slot N)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	14,454,531.46 usft	<b>Latitude:</b>	39.80116100
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	1,741,206.76 usft	<b>Longitude:</b>	-80.64114000
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,292.91 ft
<b>Grid Convergence:</b>		0.230 °				

<b>Wellbore</b>	Sidetrack 01				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2020	12/25/2020	-8.706	66.587	51,796.34727268

<b>Design</b>	Surveys Sidetrack 01				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	1,769.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	178.63	

<b>Survey Program</b>	<b>Date</b>	2/11/2021			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
172.00	1,123.00	MWD surf (Original Hole)	MWD	MWD - Standard	
1,187.00	1,769.00	MWD (Original Hole)	MWD	MWD - Standard	
1,800.00	2,857.00	MWD ST1 (Sidetrack 01)	MWD	MWD - Standard	
2,953.00	21,427.00	ST1 MWD int (Sidetrack 01)	MWD	MWD - Standard	
21,502.00	21,502.00	Projection (Sidetrack 01)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
172.00	0.27	252.89	172.00	-0.12	-0.39	0.11	0.16	0.16	0.00	0.00
202.00	0.26	231.79	202.00	-0.18	-0.51	0.17	0.33	-0.03	-70.33	
232.00	0.35	236.01	232.00	-0.28	-0.64	0.26	0.31	0.30	14.07	
266.00	0.39	255.69	266.00	-0.36	-0.84	0.34	0.39	0.12	57.88	
296.00	0.48	261.06	296.00	-0.41	-1.06	0.38	0.33	0.30	17.90	



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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)	
326.00	0.35	272.92	326.00	-0.42	-1.27	0.39	0.52	-0.43	39.53	
357.00	0.43	252.06	357.00	-0.45	-1.48	0.42	0.52	0.26	-67.29	
387.00	0.39	267.21	386.99	-0.49	-1.69	0.45	0.38	-0.13	50.50	
417.00	0.40	250.25	416.99	-0.53	-1.89	0.49	0.39	0.03	-56.53	
447.00	0.57	243.83	446.99	-0.63	-2.12	0.58	0.59	0.57	-21.40	
477.00	0.57	261.06	476.99	-0.72	-2.40	0.67	0.57	0.00	57.43	
507.00	0.62	277.67	506.99	-0.72	-2.71	0.66	0.60	0.17	55.37	
537.00	0.79	288.04	536.99	-0.64	-3.07	0.57	0.71	0.57	-34.57	
567.00	0.79	273.37	566.98	-0.56	-3.47	0.48	0.67	0.00	-48.90	
597.00	0.92	278.81	596.98	-0.51	-3.92	0.42	0.51	0.43	18.13	
627.00	0.87	291.11	626.98	-0.39	-4.37	0.29	0.66	-0.17	41.00	
658.00	0.79	278.11	657.97	-0.28	-4.80	0.16	0.66	-0.26	-41.94	
688.00	0.79	295.60	687.97	-0.16	-5.19	0.04	0.80	0.00	58.30	
718.00	0.70	283.47	717.97	-0.03	-5.55	-0.10	0.60	-0.30	-40.43	
748.00	0.75	299.03	747.97	0.11	-5.90	-0.25	0.67	0.17	51.87	
778.00	1.01	279.69	777.96	0.25	-6.34	-0.40	1.30	0.87	-64.47	
810.00	0.79	288.92	809.96	0.37	-6.82	-0.53	0.82	-0.69	28.84	
841.00	0.35	308.96	840.96	0.50	-7.10	-0.67	1.54	-1.42	64.65	
873.00	0.04	31.84	872.96	0.57	-7.17	-0.74	1.09	-0.97	259.00	
904.00	0.18	334.01	903.96	0.62	-7.18	-0.79	0.52	0.45	-186.55	
935.00	0.22	314.15	934.96	0.71	-7.25	-0.88	0.26	0.13	-64.06	
967.00	0.26	309.40	966.96	0.79	-7.35	-0.97	0.14	0.13	-14.84	
1,012.00	0.35	307.73	1,011.96	0.94	-7.54	-1.12	0.20	0.20	-3.71	
1,061.00	0.40	312.56	1,060.96	1.15	-7.78	-1.34	0.12	0.10	9.86	
1,123.00	0.53	309.84	1,122.95	1.48	-8.16	-1.68	0.21	0.21	-4.39	
1,187.00	0.66	308.96	1,186.95	1.90	-8.67	-2.11	0.20	0.20	-1.38	
1,219.00	0.66	299.91	1,218.95	2.11	-8.98	-2.32	0.33	0.00	-28.28	
1,251.00	0.53	269.50	1,250.95	2.20	-9.29	-2.42	1.05	-0.41	-95.03	
1,282.00	0.70	223.00	1,281.94	2.06	-9.56	-2.29	1.65	0.55	-150.00	
1,314.00	1.27	203.49	1,313.94	1.59	-9.83	-1.83	2.04	1.78	-60.97	
1,345.00	1.67	206.22	1,344.93	0.87	-10.17	-1.12	1.31	1.29	8.81	
1,377.00	2.33	204.72	1,376.91	-0.14	-10.65	-0.12	2.07	2.06	-4.69	
1,408.00	2.94	202.26	1,407.88	-1.45	-11.21	1.18	2.00	1.97	-7.94	
1,440.00	3.47	205.60	1,439.83	-3.08	-11.94	2.79	1.76	1.66	10.44	
1,487.00	4.04	205.16	1,486.73	-5.86	-13.26	5.54	1.21	1.21	-0.94	
1,534.00	4.17	202.88	1,533.61	-8.93	-14.63	8.58	0.44	0.28	-4.85	
1,581.00	3.87	216.15	1,580.49	-11.79	-16.23	11.40	2.07	-0.64	28.23	
1,629.00	3.52	223.97	1,628.39	-14.16	-18.21	13.72	1.28	-0.73	16.29	
1,676.00	3.47	223.71	1,675.30	-16.22	-20.19	15.73	0.11	-0.11	-0.55	
1,722.00	3.69	221.77	1,721.21	-18.33	-22.14	17.80	0.55	0.48	-4.22	
1,769.00	3.69	228.63	1,768.12	-20.46	-24.28	19.87	0.94	0.00	14.60	
<b>Tie into original hole @ 1769 MD</b>										
1,800.00	3.03	228.10	1,799.06	-21.67	-25.64	21.05	2.13	-2.13	-1.71	
1,818.00	2.64	230.65	1,817.04	-22.25	-26.31	21.61	2.28	-2.17	14.17	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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)	
1,849.00	1.93	230.21	1,848.02	-23.03	-27.27	22.37	2.29	-2.29	-1.42	
1,880.00	1.63	225.64	1,879.00	-23.68	-27.98	23.00	1.07	-0.97	-14.74	
1,912.00	1.93	229.33	1,910.99	-24.35	-28.72	23.65	1.00	0.94	11.53	
1,959.00	1.85	224.50	1,957.96	-25.40	-29.85	24.68	0.38	-0.17	-10.28	
2,006.00	1.49	226.52	2,004.94	-26.36	-30.83	25.62	0.78	-0.77	4.30	
2,053.00	1.63	234.17	2,051.92	-27.18	-31.81	26.41	0.53	0.30	16.28	
2,101.00	1.49	231.71	2,099.91	-27.96	-32.85	27.17	0.32	-0.29	-5.13	
2,148.00	0.97	270.20	2,146.89	-28.34	-33.73	27.52	2.02	-1.11	81.89	
2,196.00	0.79	292.61	2,194.89	-28.21	-34.44	27.38	0.80	-0.38	46.69	
2,241.00	1.14	304.21	2,239.88	-27.84	-35.10	26.99	0.89	0.78	25.78	
2,290.00	1.85	311.69	2,288.87	-27.04	-36.09	26.17	1.50	1.45	15.27	
2,337.00	2.37	310.54	2,335.83	-25.90	-37.40	25.00	1.11	1.11	-2.45	
2,387.00	2.68	311.86	2,385.79	-24.45	-39.05	23.51	0.63	0.62	2.64	
2,430.00	2.72	303.95	2,428.74	-23.21	-40.65	22.23	0.87	0.09	-18.40	
2,479.00	2.86	289.80	2,477.68	-22.15	-42.76	21.12	1.43	0.29	-28.88	
2,526.00	2.86	277.32	2,524.62	-21.60	-45.03	20.52	1.32	0.00	-26.55	
2,574.00	3.08	265.98	2,572.56	-21.54	-47.51	20.39	1.30	0.46	-23.63	
2,622.00	3.08	254.73	2,620.49	-21.97	-50.04	20.76	1.26	0.00	-23.44	
2,668.00	3.21	243.22	2,666.42	-22.87	-52.38	21.61	1.40	0.28	-25.02	
2,715.00	3.38	230.74	2,713.34	-24.34	-54.62	23.03	1.57	0.36	-26.55	
2,763.00	3.69	225.90	2,761.25	-26.31	-56.83	24.95	0.90	0.65	-10.08	
2,857.00	4.35	217.29	2,855.02	-31.26	-61.16	29.78	0.95	0.70	-9.16	
2,953.00	4.88	213.60	2,950.71	-37.55	-65.63	35.97	0.63	0.55	-3.84	
3,047.00	5.58	208.33	3,044.32	-44.91	-70.01	43.22	0.90	0.74	-5.61	
3,141.00	5.01	218.35	3,137.92	-52.15	-74.72	50.34	1.15	-0.61	10.66	
3,236.00	4.35	241.90	3,232.61	-57.10	-80.48	55.16	2.12	-0.69	24.79	
3,330.00	5.01	265.02	3,326.30	-59.13	-87.71	57.02	2.11	0.70	24.60	
3,425.00	6.94	277.14	3,420.79	-58.78	-97.54	56.43	2.42	2.03	12.76	
3,519.00	9.45	286.20	3,513.82	-55.92	-110.59	53.26	2.99	2.67	9.64	
3,614.00	12.26	285.85	3,607.12	-50.99	-127.78	47.92	2.96	2.96	-0.37	
3,709.00	16.22	282.24	3,699.18	-45.42	-150.46	41.80	4.27	4.17	-3.80	
3,803.00	15.60	276.79	3,789.58	-41.14	-175.84	36.92	1.72	-0.66	-5.80	
3,898.00	15.07	269.67	3,881.21	-39.70	-200.88	34.88	2.06	-0.56	-7.49	
3,945.00	14.37	268.62	3,926.67	-39.88	-212.82	34.77	1.59	-1.49	-2.23	
3,992.00	15.12	269.85	3,972.12	-40.04	-224.78	34.64	1.73	1.60	2.62	
4,039.00	17.05	268.88	4,017.28	-40.19	-237.80	34.48	4.15	4.11	-2.06	
4,087.00	18.46	268.44	4,062.99	-40.53	-252.44	34.47	2.95	2.94	-0.92	
4,134.00	20.48	268.53	4,107.30	-40.94	-268.09	34.51	4.30	4.30	0.19	
4,181.00	22.59	269.41	4,151.02	-41.25	-285.34	34.40	4.54	4.49	1.87	
4,228.00	24.70	270.73	4,194.07	-41.22	-304.19	33.92	4.63	4.49	2.81	
4,276.00	26.32	272.93	4,237.39	-40.54	-324.85	32.75	3.91	3.36	4.58	
4,323.00	27.73	276.62	4,279.26	-38.75	-346.12	30.45	4.66	3.00	7.85	
4,375.00	28.96	280.40	4,325.03	-35.08	-370.52	26.20	4.18	2.37	7.27	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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)	
4,422.00	29.93	282.59	4,365.96	-30.47	-393.16	21.05	3.08	2.06	4.66	
4,469.00	29.22	283.65	4,406.83	-25.21	-415.75	15.24	1.88	-1.51	2.26	
4,516.00	29.40	284.62	4,447.82	-19.59	-438.06	9.09	1.08	0.38	2.06	
4,564.00	30.10	284.70	4,489.49	-13.56	-461.10	2.51	1.46	1.46	0.17	
4,659.00	30.28	283.12	4,571.60	-2.08	-507.47	-10.07	0.86	0.19	-1.66	
4,753.00	29.36	282.68	4,653.16	8.36	-553.03	-21.60	1.01	-0.98	-0.47	
4,848.00	29.44	283.82	4,735.92	19.05	-598.43	-33.37	0.60	0.08	1.20	
4,942.00	29.58	282.59	4,817.73	29.62	-643.50	-45.03	0.66	0.15	-1.31	
5,036.00	29.84	280.31	4,899.38	38.86	-689.15	-55.36	1.23	0.28	-2.43	
5,130.00	30.15	281.19	4,980.79	47.63	-735.32	-65.23	0.57	0.33	0.94	
5,225.00	29.88	282.77	5,063.05	57.49	-781.80	-76.20	0.88	-0.28	1.66	
5,320.00	29.31	282.33	5,145.65	67.69	-827.60	-87.49	0.64	-0.60	-0.46	
5,414.00	29.09	282.15	5,227.71	77.41	-872.42	-98.28	0.25	-0.23	-0.19	
5,510.00	29.53	282.07	5,311.42	87.27	-918.37	-109.24	0.46	0.46	-0.08	
5,604.00	30.85	282.33	5,392.67	97.26	-964.57	-120.34	1.41	1.40	0.28	
5,699.00	29.97	281.01	5,474.60	106.99	-1,011.66	-131.19	1.16	-0.93	-1.39	
5,792.00	29.88	282.42	5,555.20	116.41	-1,057.08	-141.70	0.76	-0.10	1.52	
5,886.00	29.05	282.15	5,637.04	126.25	-1,102.26	-152.62	0.89	-0.88	-0.29	
5,981.00	28.34	282.24	5,720.37	135.89	-1,146.84	-163.32	0.75	-0.75	0.09	
6,075.00	29.05	280.84	5,802.83	144.91	-1,191.06	-173.40	1.04	0.76	-1.49	
6,169.00	29.40	280.40	5,884.86	153.37	-1,236.17	-182.93	0.44	0.37	-0.47	
6,262.00	28.65	280.66	5,966.18	161.61	-1,280.53	-192.24	0.82	-0.81	0.28	
6,357.00	26.94	283.21	6,050.22	170.74	-1,323.87	-202.40	2.19	-1.80	2.68	
6,451.00	26.41	284.70	6,134.22	180.91	-1,364.82	-213.55	0.91	-0.56	1.59	
6,546.00	27.51	284.79	6,218.89	191.88	-1,406.47	-225.51	1.16	1.16	0.09	
6,640.00	28.26	283.65	6,301.98	202.67	-1,449.09	-237.32	0.98	0.80	-1.21	
6,735.00	28.61	282.77	6,385.52	213.01	-1,493.13	-248.71	0.57	0.37	-0.93	
6,830.00	29.22	280.92	6,468.68	222.43	-1,538.08	-259.20	1.14	0.64	-1.95	
6,924.00	28.43	278.46	6,551.03	230.07	-1,582.74	-267.91	1.52	-0.84	-2.62	
7,018.00	27.55	277.23	6,634.04	236.09	-1,626.44	-274.98	1.12	-0.94	-1.31	
7,112.00	25.66	278.55	6,718.08	241.86	-1,668.14	-281.74	2.11	-2.01	1.40	
7,360.00	18.52	279.57	6,947.73	256.41	-1,760.19	-298.49	2.88	-2.88	0.41	
7,387.00	17.45	280.19	6,973.41	257.83	-1,768.41	-300.12	4.03	-3.96	2.30	
7,481.00	18.69	278.91	7,062.77	262.66	-1,797.16	-305.63	1.39	1.32	-1.36	
7,574.00	22.76	277.10	7,149.73	267.19	-1,829.75	-310.94	4.43	4.38	-1.95	
7,618.00	24.30	276.84	7,190.07	269.32	-1,847.18	-313.49	3.51	3.50	-0.59	
7,669.00	25.76	276.70	7,236.28	271.87	-1,868.61	-316.55	2.87	2.86	-0.27	
7,764.00	28.06	276.31	7,320.99	276.73	-1,911.33	-322.43	2.43	2.42	-0.41	
7,858.00	28.10	273.88	7,403.93	280.66	-1,955.39	-327.42	1.22	0.04	-2.59	
7,952.00	29.74	271.37	7,486.21	282.72	-2,000.79	-330.56	2.17	1.74	-2.67	
7,999.00	29.56	271.15	7,527.05	283.23	-2,024.03	-331.63	0.45	-0.38	-0.47	
8,046.00	28.86	270.09	7,568.08	283.48	-2,046.97	-332.43	1.85	-1.49	-2.26	
8,140.00	28.02	271.06	7,650.73	283.92	-2,091.73	-333.94	1.02	-0.89	1.03	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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)
8,234.00	26.82	272.34	7,734.17	285.20	-2,135.00	-336.25	1.42	-1.28	1.36
8,285.00	26.69	272.52	7,779.71	286.17	-2,157.94	-337.77	0.30	-0.25	0.35
8,328.00	26.91	273.18	7,818.09	287.13	-2,177.30	-339.20	0.86	0.51	1.53
8,375.00	27.31	273.14	7,859.93	288.31	-2,198.68	-340.89	0.85	0.85	-0.09
8,422.00	28.46	274.24	7,901.47	289.73	-2,220.62	-342.84	2.68	2.45	2.34
8,705.00	30.89	274.10	8,147.34	299.91	-2,360.35	-356.36	0.86	0.86	-0.05
8,800.00	30.98	274.37	8,228.82	303.52	-2,409.05	-361.14	0.17	0.09	0.28
8,925.00	30.84	274.94	8,336.07	308.73	-2,473.05	-367.88	0.26	-0.11	0.46
8,988.00	31.11	274.19	8,390.08	311.31	-2,505.37	-371.23	0.75	0.43	-1.19
9,035.00	30.80	273.75	8,430.39	312.99	-2,529.48	-373.48	0.82	-0.66	-0.94
9,083.00	30.14	273.27	8,471.76	314.48	-2,553.78	-375.55	1.47	-1.38	-1.00
9,177.00	30.05	272.69	8,553.09	316.93	-2,600.85	-379.13	0.32	-0.10	-0.62
9,271.00	29.78	272.52	8,634.57	319.06	-2,647.68	-382.38	0.30	-0.29	-0.18
9,366.00	28.68	271.59	8,717.47	320.73	-2,694.04	-385.16	1.25	-1.16	-0.98
9,460.00	25.23	270.67	8,801.24	321.59	-2,736.63	-387.04	3.70	-3.67	-0.98
9,569.00	24.17	270.99	8,900.27	322.25	-2,782.17	-388.79	0.98	-0.97	0.29
9,616.00	24.04	272.40	8,943.17	322.81	-2,801.36	-389.82	1.26	-0.28	3.00
9,664.00	23.51	273.80	8,987.10	323.86	-2,820.68	-391.32	1.61	-1.10	2.92
9,709.00	25.40	274.77	9,028.06	325.25	-2,839.26	-393.17	4.29	4.20	2.16
9,757.00	26.63	276.09	9,071.20	327.25	-2,860.21	-395.67	2.83	2.56	2.75
9,797.00	28.08	276.62	9,106.72	329.29	-2,878.48	-398.14	3.68	3.63	1.33
9,852.00	29.88	275.82	9,154.83	332.17	-2,904.97	-401.65	3.35	3.27	-1.45
9,899.00	30.06	276.00	9,195.55	334.59	-2,928.32	-404.63	0.43	0.38	0.38
9,947.00	29.79	275.74	9,237.15	337.04	-2,952.14	-407.65	0.62	-0.56	-0.54
9,996.00	29.44	274.95	9,279.75	339.29	-2,976.25	-410.48	1.07	-0.71	-1.61
10,036.00	28.87	275.12	9,314.68	341.00	-2,995.66	-412.66	1.44	-1.43	0.43
10,130.00	27.55	272.84	9,397.52	344.11	-3,039.98	-416.82	1.81	-1.40	-2.43
10,225.00	27.25	271.61	9,481.86	345.81	-3,083.66	-419.57	0.67	-0.32	-1.29
10,320.00	27.11	271.78	9,566.37	347.09	-3,127.04	-421.89	0.17	-0.15	0.18
10,413.00	28.34	271.34	9,648.69	348.26	-3,170.29	-424.10	1.34	1.32	-0.47
10,507.00	28.96	269.50	9,731.18	348.59	-3,215.35	-425.50	1.15	0.66	-1.96
10,601.00	28.26	271.08	9,813.71	348.81	-3,260.36	-426.80	1.10	-0.74	1.68
10,695.00	27.77	272.57	9,896.69	350.21	-3,304.48	-429.26	0.91	-0.52	1.59
10,790.00	27.69	272.84	9,980.78	352.29	-3,348.64	-432.40	0.16	-0.08	0.28
10,884.00	27.60	273.28	10,064.05	354.62	-3,392.19	-435.77	0.24	-0.10	0.47
10,978.00	27.03	274.24	10,147.57	357.45	-3,435.23	-439.63	0.77	-0.61	1.02
11,073.00	26.72	274.33	10,232.31	360.66	-3,478.06	-443.86	0.33	-0.33	0.09
11,167.00	26.67	274.77	10,316.29	364.01	-3,520.15	-448.22	0.22	-0.05	0.47
11,260.00	26.37	274.95	10,399.50	367.52	-3,561.53	-452.72	0.33	-0.32	0.19
11,354.00	24.96	275.91	10,484.23	371.37	-3,602.06	-457.54	1.56	-1.50	1.02
11,449.00	22.90	275.83	10,571.06	375.31	-3,640.39	-462.40	2.17	-2.17	-0.08
11,516.00	21.62	276.27	10,633.06	377.98	-3,665.62	-465.67	1.93	-1.91	0.66
11,580.00	20.75	276.35	10,692.74	380.52	-3,688.61	-468.76	1.36	-1.36	0.13
11,627.00	24.00	272.57	10,736.20	381.87	-3,706.44	-470.54	7.56	6.91	-8.04

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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)	
11,674.00	29.63	270.29	10,778.13	382.36	-3,727.63	-471.53	12.17	11.98	-4.85	
11,721.00	34.07	269.59	10,818.04	382.33	-3,752.42	-472.09	9.48	9.45	-1.49	
11,769.00	35.34	266.07	10,857.50	381.28	-3,779.72	-471.70	4.94	2.65	-7.33	
11,816.00	35.69	260.80	10,895.77	378.15	-3,806.82	-469.22	6.55	0.74	-11.21	
11,863.00	35.65	252.53	10,933.97	371.85	-3,833.43	-463.56	10.25	-0.09	-17.60	
11,910.00	35.60	248.40	10,972.18	362.70	-3,859.22	-455.03	5.12	-0.11	-8.79	
11,957.00	34.77	244.62	11,010.60	351.91	-3,884.05	-444.84	4.96	-1.77	-8.04	
12,004.00	32.18	234.87	11,049.83	338.96	-3,906.42	-432.43	12.68	-5.51	-20.74	
12,052.00	31.82	232.76	11,090.54	323.94	-3,926.95	-417.91	2.45	-0.75	-4.40	
12,099.00	30.90	228.98	11,130.67	308.52	-3,945.92	-402.95	4.62	-1.96	-8.04	
12,146.00	30.86	227.93	11,171.01	292.53	-3,963.97	-387.39	1.15	-0.09	-2.23	
12,193.00	27.78	227.93	11,211.99	277.11	-3,981.05	-372.38	6.55	-6.55	0.00	
12,241.00	27.56	227.05	11,254.50	262.05	-3,997.48	-357.72	0.97	-0.46	-1.83	
12,288.00	29.49	227.49	11,295.79	246.82	-4,013.97	-342.89	4.13	4.11	0.94	
12,336.00	30.68	223.44	11,337.33	229.94	-4,031.10	-326.43	4.90	2.48	-8.44	
12,383.00	32.53	215.97	11,377.37	211.00	-4,048.78	-307.87	9.21	3.94	-15.89	
12,431.00	34.86	208.50	11,417.32	188.49	-4,060.91	-285.70	9.90	4.85	-15.56	
12,478.00	37.67	200.15	11,455.24	163.18	-4,072.28	-260.67	12.08	5.98	-17.77	
12,525.00	38.68	196.64	11,492.19	135.62	-4,081.43	-233.34	5.09	2.15	-7.47	
12,572.00	40.26	190.48	11,528.48	106.60	-4,088.40	-204.50	8.98	3.36	-13.11	
12,620.00	41.93	187.85	11,564.66	75.46	-4,093.42	-173.48	5.01	3.48	-5.48	
12,667.00	44.62	184.51	11,598.88	43.44	-4,096.86	-141.55	7.51	5.72	-7.11	
12,715.00	45.67	182.66	11,632.73	9.48	-4,098.98	-107.66	3.50	2.19	-3.85	
12,762.00	47.91	179.67	11,664.92	-24.76	-4,099.66	-73.44	6.65	4.77	-6.36	
12,809.00	50.73	177.12	11,695.55	-60.38	-4,098.65	-37.81	7.27	6.00	-5.43	
12,841.00	52.66	175.72	11,715.39	-85.44	-4,097.08	-12.72	6.94	6.03	-4.38	
12,872.00	54.42	174.58	11,733.81	-110.28	-4,094.96	12.17	6.40	5.68	-3.68	
12,904.00	56.88	172.99	11,751.86	-136.54	-4,092.10	38.49	8.71	7.69	-4.97	
12,951.00	60.53	169.74	11,776.28	-176.23	-4,086.05	78.31	9.76	7.77	-6.91	
12,998.00	63.47	166.14	11,798.35	-216.79	-4,077.37	119.07	9.21	6.26	-7.66	
13,045.00	67.34	163.59	11,817.91	-258.03	-4,066.20	160.56	9.60	8.23	-5.43	
13,093.00	71.56	161.74	11,834.75	-300.92	-4,052.80	203.76	9.50	8.79	-3.85	
13,140.00	75.82	160.25	11,847.95	-343.56	-4,038.11	246.74	9.56	9.06	-3.17	
13,188.00	79.43	158.40	11,858.24	-387.41	-4,021.55	290.98	8.41	7.52	-3.85	
13,235.00	81.76	155.59	11,865.92	-430.08	-4,003.43	334.07	7.70	4.96	-5.98	
13,282.00	84.09	153.22	11,871.71	-472.14	-3,983.28	376.60	7.04	4.96	-5.04	
13,329.00	88.09	151.55	11,874.91	-513.68	-3,961.55	418.64	9.22	8.51	-3.55	
13,377.00	88.97	151.20	11,876.14	-555.80	-3,938.56	461.30	1.97	1.83	-0.73	
13,424.00	88.97	149.26	11,876.99	-596.59	-3,915.23	502.64	4.13	0.00	-4.13	
13,472.00	88.79	148.47	11,877.93	-637.66	-3,890.42	544.30	1.69	-0.38	-1.65	
13,519.00	88.22	147.68	11,879.15	-677.54	-3,865.57	584.76	2.07	-1.21	-1.68	
13,565.00	88.22	147.51	11,880.58	-716.36	-3,840.93	624.15	0.37	0.00	-0.37	
13,659.00	88.00	146.63	11,883.68	-795.21	-3,789.86	704.21	0.96	-0.23	-0.94	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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)	
13,753.00	87.87	147.42	11,887.07	-874.02	-3,738.73	784.22	0.85	-0.14	0.84	
13,848.00	88.35	148.47	11,890.20	-954.49	-3,688.34	865.87	1.21	0.51	1.11	
13,941.00	89.54	148.91	11,891.91	-1,033.93	-3,640.02	946.45	1.36	1.28	0.47	
14,035.00	89.71	148.56	11,892.53	-1,114.28	-3,591.24	1,027.94	0.41	0.18	-0.37	
14,096.00	89.58	147.86	11,892.91	-1,166.12	-3,559.10	1,080.54	1.17	-0.21	-1.15	
14,191.00	89.14	148.12	11,893.97	-1,246.67	-3,508.75	1,162.28	0.54	-0.46	0.27	
14,286.00	89.23	147.77	11,895.32	-1,327.18	-3,458.34	1,243.97	0.38	0.09	-0.37	
14,381.00	89.10	148.03	11,896.70	-1,407.65	-3,407.86	1,325.62	0.31	-0.14	0.27	
14,475.00	89.23	148.03	11,898.07	-1,487.38	-3,358.09	1,406.53	0.14	0.14	0.00	
14,569.00	89.32	147.94	11,899.26	-1,567.08	-3,308.26	1,487.39	0.14	0.10	-0.10	
14,664.00	89.36	150.05	11,900.36	-1,648.50	-3,259.33	1,569.96	2.22	0.04	2.22	
14,759.00	89.23	150.23	11,901.53	-1,730.88	-3,212.04	1,653.45	0.23	-0.14	0.19	
14,853.00	88.84	150.58	11,903.11	-1,812.61	-3,165.62	1,736.26	0.56	-0.41	0.37	
14,948.00	88.70	150.49	11,905.15	-1,895.30	-3,118.90	1,820.05	0.18	-0.15	-0.09	
15,043.00	88.70	150.49	11,907.30	-1,977.95	-3,072.12	1,903.80	0.00	0.00	0.00	
15,137.00	88.62	150.67	11,909.50	-2,059.81	-3,025.96	1,986.74	0.21	-0.09	0.19	
15,232.00	88.66	150.23	11,911.76	-2,142.43	-2,979.12	2,070.46	0.46	0.04	-0.46	
15,326.00	88.66	150.49	11,913.96	-2,224.11	-2,932.65	2,153.23	0.28	0.00	0.28	
15,421.00	88.75	150.14	11,916.10	-2,306.62	-2,885.61	2,236.84	0.38	0.09	-0.37	
15,515.00	89.27	149.97	11,917.73	-2,388.06	-2,838.70	2,319.38	0.58	0.55	-0.18	
15,610.00	89.19	150.14	11,919.00	-2,470.37	-2,791.28	2,402.80	0.20	-0.08	0.18	
15,704.00	89.32	150.14	11,920.23	-2,551.88	-2,744.48	2,485.41	0.14	0.14	0.00	
15,798.00	89.19	150.32	11,921.45	-2,633.47	-2,697.81	2,568.09	0.24	-0.14	0.19	
15,893.00	89.19	150.49	11,922.79	-2,716.07	-2,650.90	2,651.79	0.18	0.00	0.18	
15,987.00	89.23	150.14	11,924.09	-2,797.72	-2,604.35	2,734.54	0.37	0.04	-0.37	
16,080.00	89.01	150.32	11,925.52	-2,878.44	-2,558.18	2,816.34	0.31	-0.24	0.19	
16,175.00	88.70	150.58	11,927.41	-2,961.06	-2,511.34	2,900.06	0.43	-0.33	0.27	
16,270.00	88.62	150.32	11,929.64	-3,043.68	-2,464.50	2,983.78	0.29	-0.08	-0.27	
16,364.00	88.57	150.41	11,931.94	-3,125.36	-2,418.03	3,066.55	0.11	-0.05	0.10	
16,458.00	88.22	150.49	11,934.57	-3,207.10	-2,371.69	3,149.38	0.38	-0.37	0.09	
16,552.00	88.35	150.41	11,937.39	-3,288.84	-2,325.35	3,232.20	0.16	0.14	-0.09	
16,647.00	89.05	150.23	11,939.54	-3,371.36	-2,278.33	3,315.82	0.76	0.74	-0.19	
16,742.00	89.23	150.05	11,940.97	-3,453.73	-2,231.03	3,399.31	0.27	0.19	-0.19	
16,837.00	89.19	150.23	11,942.28	-3,536.12	-2,183.74	3,482.80	0.19	-0.04	0.19	
16,931.00	89.10	150.23	11,943.68	-3,617.70	-2,137.07	3,565.48	0.10	-0.10	0.00	
17,026.00	89.14	150.05	11,945.14	-3,700.08	-2,089.78	3,648.96	0.19	0.04	-0.19	
17,118.00	89.23	148.65	11,946.45	-3,779.22	-2,042.88	3,729.20	1.52	0.10	-1.52	
17,212.00	89.67	147.86	11,947.35	-3,859.15	-1,993.43	3,810.30	0.96	0.47	-0.84	
17,306.00	89.76	147.59	11,947.82	-3,938.62	-1,943.24	3,890.95	0.30	0.10	-0.29	
17,400.00	89.71	147.24	11,948.25	-4,017.83	-1,892.61	3,971.34	0.38	-0.05	-0.37	
17,495.00	89.71	147.51	11,948.73	-4,097.84	-1,841.39	4,052.56	0.28	0.00	0.28	
17,590.00	89.58	147.68	11,949.32	-4,178.04	-1,790.48	4,133.96	0.23	-0.14	0.18	
17,685.00	89.27	147.07	11,950.28	-4,258.05	-1,739.27	4,215.17	0.72	-0.33	-0.64	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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)	
17,779.00	89.32	148.65	11,951.43	-4,337.63	-1,689.27	4,295.93	1.68	0.05	1.68	
17,873.00	89.10	149.00	11,952.73	-4,418.05	-1,640.61	4,377.49	0.44	-0.23	0.37	
17,968.00	88.79	149.18	11,954.48	-4,499.55	-1,591.82	4,460.13	0.38	-0.33	0.19	
18,063.00	88.84	151.37	11,956.44	-4,582.02	-1,544.73	4,543.71	2.31	0.05	2.31	
18,157.00	88.75	151.37	11,958.42	-4,664.51	-1,499.70	4,627.25	0.10	-0.10	0.00	
18,252.00	88.75	151.81	11,960.49	-4,748.05	-1,454.51	4,711.85	0.46	0.00	0.46	
18,346.00	88.75	152.52	11,962.54	-4,831.15	-1,410.63	4,795.98	0.76	0.00	0.76	
18,440.00	88.66	153.22	11,964.67	-4,914.79	-1,367.78	4,880.62	0.75	-0.10	0.74	
18,534.00	88.62	153.04	11,966.90	-4,998.62	-1,325.30	4,965.44	0.20	-0.04	-0.19	
18,629.00	88.53	150.23	11,969.26	-5,082.18	-1,280.19	5,050.06	2.96	-0.09	-2.96	
18,724.00	88.70	147.59	11,971.56	-5,163.50	-1,231.15	5,132.53	2.78	0.18	-2.78	
18,818.00	88.70	148.21	11,973.69	-5,243.11	-1,181.21	5,213.31	0.66	0.00	0.66	
18,913.00	88.70	147.77	11,975.84	-5,323.64	-1,130.87	5,295.03	0.46	0.00	-0.46	
19,007.00	88.75	147.33	11,977.94	-5,402.95	-1,080.45	5,375.52	0.47	0.05	-0.47	
19,102.00	88.79	147.51	11,979.98	-5,482.98	-1,029.30	5,456.75	0.19	0.04	0.19	
19,197.00	88.79	147.94	11,981.98	-5,563.28	-978.58	5,538.25	0.45	0.00	0.45	
19,291.00	88.79	149.18	11,983.97	-5,643.46	-929.57	5,619.58	1.32	0.00	1.32	
19,386.00	88.75	149.79	11,986.01	-5,725.28	-881.34	5,702.53	0.64	-0.04	0.64	
19,479.00	88.70	149.70	11,988.08	-5,805.60	-834.49	5,783.94	0.11	-0.05	-0.10	
19,574.00	88.70	149.61	11,990.23	-5,887.56	-786.51	5,867.03	0.09	0.00	-0.09	
19,668.00	88.75	149.88	11,992.32	-5,968.74	-739.16	5,949.32	0.29	0.05	0.29	
19,762.00	88.66	149.70	11,994.45	-6,049.95	-691.88	6,031.64	0.21	-0.10	-0.19	
19,857.00	88.75	149.61	11,996.59	-6,131.91	-643.89	6,114.73	0.13	0.09	-0.09	
19,951.00	88.79	149.44	11,998.61	-6,212.91	-596.23	6,196.85	0.19	0.04	-0.18	
20,045.00	88.79	149.70	12,000.60	-6,293.94	-548.63	6,279.00	0.28	0.00	0.28	
20,140.00	88.75	149.61	12,002.64	-6,375.91	-500.65	6,362.09	0.10	-0.04	-0.09	
20,234.00	88.75	149.70	12,004.69	-6,457.01	-453.17	6,444.30	0.10	0.00	0.10	
20,329.00	88.70	149.35	12,006.80	-6,538.87	-405.00	6,527.29	0.37	-0.05	-0.37	
20,423.00	89.01	149.70	12,008.68	-6,619.86	-357.34	6,609.41	0.50	0.33	0.37	
20,518.00	89.36	150.05	12,010.03	-6,702.02	-309.66	6,692.68	0.52	0.37	0.37	
20,613.00	89.32	151.46	12,011.12	-6,784.91	-263.26	6,776.66	1.48	-0.04	1.48	
20,707.00	89.19	151.81	12,012.35	-6,867.62	-218.60	6,860.41	0.40	-0.14	0.37	
20,802.00	89.27	151.55	12,013.62	-6,951.24	-173.54	6,945.09	0.29	0.08	-0.27	
20,897.00	89.19	151.20	12,014.90	-7,034.62	-128.03	7,029.53	0.38	-0.08	-0.37	
20,991.00	89.19	151.46	12,016.23	-7,117.09	-82.94	7,113.06	0.28	0.00	0.28	
21,086.00	89.10	151.64	12,017.65	-7,200.60	-37.68	7,197.63	0.21	-0.09	0.19	
21,181.00	89.19	150.23	12,019.06	-7,283.63	8.46	7,281.74	1.49	0.09	-1.48	
21,275.00	89.05	150.23	12,020.51	-7,365.21	55.13	7,364.42	0.15	-0.15	0.00	
21,369.00	89.32	150.05	12,021.84	-7,446.73	101.92	7,447.03	0.35	0.29	-0.19	
21,427.00	89.01	149.88	12,022.69	-7,496.93	130.95	7,497.92	0.61	-0.53	-0.29	
<b>Survey @ 21427.00 MD 12022.69 TVD</b>										
21,502.00	89.01	149.88	12,023.99	-7,561.80	168.58	7,563.66	0.00	0.00	0.00	
<b>Survey Proj. to 21502.00 MD 12023.99 TVD</b>										

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	DB_Dec2220_v16

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,769.00	1,768.12	-20.46	-24.28	Tie into original hole @ 1769 MD
21,427.00	12,022.69	-7,496.93	130.95	Survey @ 21427.00 MD 12022.69 TVD



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	DB_Dec2220_v16

<b>Project</b>	Marshall County, West Virginia		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	Fitzgerald				
<b>Site Position:</b>		<b>Northing:</b>	14,454,567.73 usft	<b>Latitude:</b>	39.80126184
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,741,096.26 usft	<b>Longitude:</b>	-80.64153292
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.229 °

<b>Well</b>	Fitzgerald 18 HU (slot N)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	14,454,531.46 usft	<b>Latitude:</b>	39.80116100
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	1,741,206.76 usft	<b>Longitude:</b>	-80.64114000
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,292.91 ft

<b>Wellbore</b>	Sidetrack 01				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2020	12/25/2020	-8.706	66.587	51,796.34727268

<b>Design</b>	Surveys Sidetrack 01				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	1,769.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	178.63	

<b>Survey Program</b>	Date 2/11/2021				
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
172.00	1,123.00	MWD surf (Original Hole)	MWD	MWD - Standard	
1,187.00	1,769.00	MWD (Original Hole)	MWD	MWD - Standard	
1,800.00	2,857.00	MWD ST1 (Sidetrack 01)	MWD	MWD - Standard	
2,953.00	21,427.00	ST1 MWD int (Sidetrack 01)	MWD	MWD - Standard	
21,502.00	21,502.00	Projection (Sidetrack 01)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
0.00	0.00	0.00	0.00	0.00	0.00	14,454,531.46	1,741,206.76	39.80116100	-80.64114000	
172.00	0.27	252.89	172.00	-0.12	-0.39	14,454,531.34	1,741,206.37	39.80116068	-80.64114138	
202.00	0.26	231.79	202.00	-0.18	-0.51	14,454,531.28	1,741,206.25	39.80116051	-80.64114181	
232.00	0.35	236.01	232.00	-0.28	-0.64	14,454,531.18	1,741,206.12	39.80116025	-80.64114227	
266.00	0.39	255.69	266.00	-0.36	-0.84	14,454,531.10	1,741,205.93	39.80116002	-80.64114298	
296.00	0.48	261.06	296.00	-0.41	-1.06	14,454,531.05	1,741,205.70	39.80115990	-80.64114378	
326.00	0.35	272.92	326.00	-0.42	-1.27	14,454,531.04	1,741,205.49	39.80115986	-80.64114454	
357.00	0.43	252.06	357.00	-0.45	-1.48	14,454,531.01	1,741,205.28	39.80115977	-80.64114528	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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	
387.00	0.39	267.21	386.99	-0.49	-1.69	14,454,530.97	1,741,205.07	39.80115967	-80.64114602	
417.00	0.40	250.25	416.99	-0.53	-1.89	14,454,530.93	1,741,204.87	39.80115956	-80.64114674	
447.00	0.57	243.83	446.99	-0.63	-2.12	14,454,530.82	1,741,204.64	39.80115928	-80.64114756	
477.00	0.57	261.06	476.99	-0.72	-2.40	14,454,530.74	1,741,204.36	39.80115904	-80.64114857	
507.00	0.62	277.67	506.99	-0.72	-2.71	14,454,530.73	1,741,204.05	39.80115904	-80.64114967	
537.00	0.79	288.04	536.99	-0.64	-3.07	14,454,530.82	1,741,203.69	39.80115928	-80.64115094	
567.00	0.79	273.37	566.98	-0.56	-3.47	14,454,530.90	1,741,203.29	39.80115950	-80.64115237	
597.00	0.92	278.81	596.98	-0.51	-3.92	14,454,530.94	1,741,202.84	39.80115963	-80.64115395	
627.00	0.87	291.11	626.98	-0.39	-4.37	14,454,531.06	1,741,202.39	39.80115997	-80.64115555	
658.00	0.79	278.11	657.97	-0.28	-4.80	14,454,531.18	1,741,201.96	39.80116029	-80.64115709	
688.00	0.79	295.60	687.97	-0.16	-5.19	14,454,531.30	1,741,201.57	39.80116062	-80.64115848	
718.00	0.70	283.47	717.97	-0.03	-5.55	14,454,531.43	1,741,201.21	39.80116098	-80.64115978	
748.00	0.75	299.03	747.97	0.11	-5.90	14,454,531.57	1,741,200.86	39.80116137	-80.64116102	
778.00	1.01	279.69	777.96	0.25	-6.34	14,454,531.71	1,741,200.43	39.80116175	-80.64116256	
810.00	0.79	288.92	809.96	0.37	-6.82	14,454,531.83	1,741,199.94	39.80116209	-80.64116429	
841.00	0.35	308.96	840.96	0.50	-7.10	14,454,531.95	1,741,199.66	39.80116244	-80.64116527	
873.00	0.04	31.84	872.96	0.57	-7.17	14,454,532.03	1,741,199.59	39.80116264	-80.64116552	
904.00	0.18	334.01	903.96	0.62	-7.18	14,454,532.08	1,741,199.58	39.80116278	-80.64116557	
935.00	0.22	314.15	934.96	0.71	-7.25	14,454,532.16	1,741,199.51	39.80116302	-80.64116580	
967.00	0.26	309.40	966.96	0.79	-7.35	14,454,532.25	1,741,199.41	39.80116326	-80.64116615	
1,012.00	0.35	307.73	1,011.96	0.94	-7.54	14,454,532.40	1,741,199.23	39.80116368	-80.64116682	
1,061.00	0.40	312.56	1,060.96	1.15	-7.78	14,454,532.61	1,741,198.98	39.80116425	-80.64116769	
1,123.00	0.53	309.84	1,122.95	1.48	-8.16	14,454,532.94	1,741,198.60	39.80116516	-80.64116903	
1,187.00	0.66	308.96	1,186.95	1.90	-8.67	14,454,533.36	1,741,198.09	39.80116632	-80.64117086	
1,219.00	0.66	299.91	1,218.95	2.11	-8.98	14,454,533.57	1,741,197.78	39.80116690	-80.64117193	
1,251.00	0.53	269.50	1,250.95	2.20	-9.29	14,454,533.66	1,741,197.48	39.80116715	-80.64117303	
1,282.00	0.70	223.00	1,281.94	2.06	-9.56	14,454,533.52	1,741,197.20	39.80116677	-80.64117400	
1,314.00	1.27	203.49	1,313.94	1.59	-9.83	14,454,533.05	1,741,196.93	39.80116548	-80.64117498	
1,345.00	1.67	206.22	1,344.93	0.87	-10.17	14,454,532.33	1,741,196.59	39.80116351	-80.64117619	
1,377.00	2.33	204.72	1,376.91	-0.14	-10.65	14,454,531.32	1,741,196.11	39.80116074	-80.64117791	
1,408.00	2.94	202.26	1,407.88	-1.45	-11.21	14,454,530.01	1,741,195.55	39.80116571	-80.64117994	
1,440.00	3.47	205.60	1,439.83	-3.08	-11.94	14,454,528.38	1,741,194.82	39.80115268	-80.64118256	
1,487.00	4.04	205.16	1,486.73	-5.86	-13.26	14,454,525.60	1,741,193.50	39.80114506	-80.64118729	
1,534.00	4.17	202.88	1,533.61	-8.93	-14.63	14,454,522.53	1,741,192.13	39.80113663	-80.64119221	
1,581.00	3.87	216.15	1,580.49	-11.79	-16.23	14,454,519.67	1,741,190.53	39.80112881	-80.64119795	
1,629.00	3.52	223.97	1,628.39	-14.16	-18.21	14,454,517.30	1,741,188.56	39.80112233	-80.64120502	
1,676.00	3.47	223.71	1,675.30	-16.22	-20.19	14,454,515.24	1,741,186.57	39.80111667	-80.64121212	
1,722.00	3.69	221.77	1,721.21	-18.33	-22.14	14,454,513.13	1,741,184.62	39.80111090	-80.64121909	
1,769.00	3.69	228.63	1,768.12	-20.46	-24.28	14,454,511.00	1,741,182.48	39.80110508	-80.64122674	
<b>Tie into original hole @ 1769 MD</b>										
1,800.00	3.03	228.10	1,799.06	-21.67	-25.64	14,454,509.79	1,741,181.12	39.80110178	-80.64123160	
1,818.00	2.64	230.65	1,817.04	-22.25	-26.31	14,454,509.21	1,741,180.45	39.80110020	-80.64123401	
1,849.00	1.93	230.21	1,848.02	-23.03	-27.27	14,454,508.42	1,741,179.49	39.80109805	-80.64123741	
1,880.00	1.63	225.64	1,879.00	-23.68	-27.98	14,454,507.78	1,741,178.78	39.80109629	-80.64123997	
1,912.00	1.93	229.33	1,910.99	-24.35	-28.72	14,454,507.11	1,741,178.04	39.80109446	-80.64124260	
1,959.00	1.85	224.50	1,957.96	-25.40	-29.85	14,454,506.06	1,741,176.91	39.80109157	-80.64124664	
2,006.00	1.49	226.52	2,004.94	-26.36	-30.83	14,454,505.09	1,741,175.94	39.80108894	-80.64125013	
2,053.00	1.63	234.17	2,051.92	-27.18	-31.81	14,454,504.28	1,741,174.95	39.80108672	-80.64125365	
2,101.00	1.49	231.71	2,099.91	-27.96	-32.85	14,454,503.50	1,741,173.91	39.80108457	-80.64125737	
2,148.00	0.97	270.20	2,146.89	-28.34	-33.73	14,454,503.12	1,741,173.03	39.80108355	-80.64126050	
2,196.00	0.79	292.61	2,194.89	-28.21	-34.44	14,454,503.25	1,741,172.32	39.80108391	-80.64126303	
2,241.00	1.14	304.21	2,239.88	-27.84	-35.10	14,454,503.62	1,741,171.66	39.80108493	-80.64126537	
2,290.00	1.85	311.69	2,288.87	-27.04	-36.09	14,454,504.42	1,741,170.67	39.80108714	-80.64126889	
2,337.00	2.37	310.54	2,335.83	-25.90	-37.40	14,454,505.55	1,741,169.36	39.80109028	-80.64127352	
2,387.00	2.68	311.86	2,385.79	-24.45	-39.05	14,454,507.01	1,741,167.71	39.80109428	-80.64127940	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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	
2,430.00	2.72	303.95	2,428.74	-23.21	-40.65	14,454,508.25	1,741,166.11	39.80109771	-80.64128506	
2,479.00	2.86	289.80	2,477.68	-22.15	-42.76	14,454,509.31	1,741,164.00	39.80110065	-80.64129258	
2,526.00	2.86	277.32	2,524.62	-21.60	-45.03	14,454,509.86	1,741,161.73	39.80110218	-80.64130064	
2,574.00	3.08	265.98	2,572.56	-21.54	-47.51	14,454,509.92	1,741,159.26	39.80110237	-80.64130944	
2,622.00	3.08	254.73	2,620.49	-21.97	-50.04	14,454,509.49	1,741,156.73	39.80110122	-80.64131846	
2,668.00	3.21	243.22	2,666.42	-22.87	-52.38	14,454,508.58	1,741,154.38	39.80109876	-80.64132681	
2,715.00	3.38	230.74	2,713.34	-24.34	-54.62	14,454,507.11	1,741,152.14	39.80109475	-80.64133483	
2,763.00	3.69	225.90	2,761.25	-26.31	-56.83	14,454,505.14	1,741,149.93	39.80108936	-80.64134271	
2,857.00	4.35	217.29	2,855.02	-31.26	-61.16	14,454,500.20	1,741,145.60	39.80107584	-80.64135821	
2,953.00	4.88	213.60	2,950.71	-37.55	-65.63	14,454,493.90	1,741,141.13	39.80105859	-80.64137420	
3,047.00	5.58	208.33	3,044.32	-44.91	-70.01	14,454,486.55	1,741,136.75	39.80103845	-80.64138990	
3,141.00	5.01	218.35	3,137.92	-52.15	-74.72	14,454,479.31	1,741,132.04	39.80101861	-80.64140679	
3,236.00	4.35	241.90	3,232.61	-57.10	-80.48	14,454,474.36	1,741,126.29	39.80100508	-80.64142734	
3,330.00	5.01	265.02	3,326.30	-59.13	-87.71	14,454,472.32	1,741,119.05	39.80099957	-80.64145313	
3,425.00	6.94	277.14	3,420.79	-58.78	-97.54	14,454,472.68	1,741,109.22	39.80100065	-80.64148812	
3,519.00	9.45	286.20	3,513.82	-55.92	-110.59	14,454,475.54	1,741,096.17	39.80100864	-80.64153453	
3,614.00	12.26	285.85	3,607.12	-50.99	-127.78	14,454,480.47	1,741,078.98	39.80102238	-80.64159569	
3,709.00	16.22	282.24	3,699.18	-45.42	-150.46	14,454,486.04	1,741,056.30	39.80103792	-80.64167635	
3,803.00	15.60	276.79	3,789.58	-41.14	-175.84	14,454,490.32	1,741,030.92	39.80104995	-80.64176666	
3,898.00	15.07	269.67	3,881.21	-39.70	-200.88	14,454,491.76	1,741,005.88	39.80105418	-80.64185578	
3,945.00	14.37	268.62	3,926.67	-39.88	-212.82	14,454,491.58	1,740,993.94	39.80105383	-80.64189830	
3,992.00	15.12	269.85	3,972.12	-40.04	-224.78	14,454,491.42	1,740,981.98	39.80105353	-80.64194088	
4,039.00	17.05	268.88	4,017.28	-40.19	-237.80	14,454,491.27	1,740,968.96	39.80105326	-80.64198724	
4,087.00	18.46	268.44	4,062.99	-40.53	-252.44	14,454,490.93	1,740,954.33	39.80105247	-80.64203935	
4,134.00	20.48	268.53	4,107.30	-40.94	-268.09	14,454,490.51	1,740,938.67	39.80105151	-80.64209511	
4,181.00	22.59	269.41	4,151.02	-41.25	-285.34	14,454,490.21	1,740,921.42	39.80105086	-80.64215652	
4,228.00	24.70	270.73	4,194.07	-41.22	-304.19	14,454,490.24	1,740,902.57	39.80105116	-80.64222363	
4,276.00	26.32	272.93	4,237.39	-40.54	-324.85	14,454,490.91	1,740,881.91	39.80105323	-80.64229716	
4,323.00	27.73	276.62	4,279.26	-38.75	-346.12	14,454,492.71	1,740,860.64	39.80105839	-80.64237287	
4,375.00	28.96	280.40	4,325.03	-35.08	-370.52	14,454,496.38	1,740,836.24	39.80106873	-80.64245970	
4,422.00	29.93	282.59	4,365.96	-30.47	-393.16	14,454,500.99	1,740,813.61	39.80108164	-80.64254023	
4,469.00	29.22	283.65	4,406.83	-25.21	-415.75	14,454,506.25	1,740,791.01	39.80109634	-80.64262059	
4,516.00	29.40	284.62	4,447.82	-19.59	-438.06	14,454,511.87	1,740,768.70	39.80111201	-80.64269994	
4,564.00	30.10	284.70	4,489.49	-13.56	-461.10	14,454,517.90	1,740,745.66	39.80112882	-80.64278190	
4,659.00	30.28	283.12	4,571.60	-2.08	-507.47	14,454,529.38	1,740,699.29	39.80116086	-80.64294682	
4,753.00	29.36	282.68	4,653.16	8.36	-553.03	14,454,539.82	1,740,653.73	39.80119003	-80.64310890	
4,848.00	29.44	283.82	4,735.92	19.05	-598.43	14,454,550.50	1,740,608.34	39.80121988	-80.64327036	
4,942.00	29.58	282.59	4,817.73	29.62	-643.50	14,454,561.08	1,740,563.26	39.80124941	-80.64343070	
5,036.00	29.84	280.31	4,899.38	38.86	-689.15	14,454,570.32	1,740,517.61	39.80127530	-80.64359311	
5,130.00	30.15	281.19	4,980.79	47.63	-735.32	14,454,579.09	1,740,471.44	39.80129988	-80.64375736	
5,225.00	29.88	282.77	5,063.05	57.49	-781.80	14,454,588.95	1,740,424.96	39.80132746	-80.64392272	
5,320.00	29.31	282.33	5,145.65	67.69	-827.60	14,454,599.15	1,740,379.16	39.80135596	-80.64408563	
5,414.00	29.09	282.15	5,227.71	77.41	-872.42	14,454,608.87	1,740,334.35	39.80138315	-80.64424505	
5,510.00	29.53	282.07	5,311.42	87.27	-918.37	14,454,618.73	1,740,288.40	39.80141073	-80.64440851	
5,604.00	30.85	282.33	5,392.67	97.26	-964.57	14,454,628.72	1,740,242.20	39.80143867	-80.64457286	
5,699.00	29.97	281.01	5,474.60	106.99	-1,011.66	14,454,638.45	1,740,195.11	39.80146592	-80.64474038	
5,792.00	29.88	282.42	5,555.20	116.41	-1,057.08	14,454,647.87	1,740,149.68	39.80149228	-80.64490198	
5,886.00	29.05	282.15	5,637.04	126.25	-1,102.26	14,454,657.71	1,740,104.50	39.80151979	-80.64506270	
5,981.00	28.34	282.24	5,720.37	135.89	-1,146.84	14,454,667.35	1,740,059.92	39.80154674	-80.64522130	
6,075.00	29.05	280.84	5,802.83	144.91	-1,191.06	14,454,676.37	1,740,015.70	39.80157199	-80.64537861	
6,169.00	29.40	280.40	5,884.86	153.37	-1,236.17	14,454,684.82	1,739,970.59	39.80159571	-80.64553910	
6,262.00	28.65	280.66	5,966.18	161.61	-1,280.53	14,454,693.07	1,739,926.23	39.80161884	-80.64569693	
6,357.00	26.94	283.21	6,050.22	170.74	-1,323.87	14,454,702.20	1,739,882.89	39.80164438	-80.64585110	
6,451.00	26.41	284.70	6,134.22	180.91	-1,364.82	14,454,712.37	1,739,841.94	39.80167276	-80.64599676	
6,546.00	27.51	284.79	6,218.89	191.88	-1,406.47	14,454,723.33	1,739,800.29	39.80170332	-80.64614490	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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	
6,640.00	28.26	283.65	6,301.98	202.67	-1,449.09	14,454,734.13	1,739,757.68	39.80173342	-80.64629648	
6,735.00	28.61	282.77	6,385.52	213.01	-1,493.13	14,454,744.46	1,739,713.64	39.80176228	-80.64645313	
6,830.00	29.22	280.92	6,468.68	222.43	-1,538.08	14,454,753.88	1,739,668.69	39.80178864	-80.64661305	
6,924.00	28.43	278.46	6,551.03	230.07	-1,582.74	14,454,761.52	1,739,624.02	39.80181010	-80.64677196	
7,018.00	27.55	277.23	6,634.04	236.09	-1,626.44	14,454,767.55	1,739,580.32	39.80182713	-80.64692746	
7,112.00	25.66	278.55	6,718.08	241.86	-1,668.14	14,454,773.31	1,739,538.63	39.80184341	-80.64707584	
7,360.00	18.52	279.57	6,947.73	256.41	-1,760.19	14,454,787.86	1,739,446.57	39.80188436	-80.64740340	
7,387.00	17.45	280.19	6,973.41	257.83	-1,768.41	14,454,789.29	1,739,438.36	39.80188838	-80.64743262	
7,481.00	18.69	278.91	7,062.77	262.66	-1,797.16	14,454,794.12	1,739,409.61	39.80190194	-80.64753492	
7,574.00	22.76	277.10	7,149.73	267.19	-1,829.75	14,454,798.65	1,739,377.02	39.80191474	-80.64765088	
7,618.00	24.30	276.84	7,190.07	269.32	-1,847.18	14,454,800.78	1,739,359.58	39.80192078	-80.64771293	
7,669.00	25.76	276.70	7,236.28	271.87	-1,868.61	14,454,803.33	1,739,338.16	39.80192800	-80.64778918	
7,764.00	28.06	276.31	7,320.99	276.73	-1,911.33	14,454,808.19	1,739,295.44	39.80194182	-80.64794121	
7,858.00	28.10	273.88	7,403.93	280.66	-1,955.39	14,454,812.12	1,739,251.38	39.80195308	-80.64809803	
7,952.00	29.74	271.37	7,486.21	282.72	-2,000.79	14,454,814.17	1,739,205.98	39.80195922	-80.64825965	
7,999.00	29.56	271.15	7,527.05	283.23	-2,024.03	14,454,814.69	1,739,182.73	39.80196087	-80.64834241	
8,046.00	28.86	270.09	7,568.08	283.48	-2,046.97	14,454,814.94	1,739,159.80	39.80196181	-80.64842406	
8,140.00	28.02	271.06	7,650.73	283.92	-2,091.73	14,454,815.38	1,739,115.03	39.80196351	-80.64858343	
8,234.00	26.82	272.34	7,734.17	285.20	-2,135.00	14,454,816.65	1,739,071.77	39.80196748	-80.64873745	
8,285.00	26.69	272.52	7,779.71	286.17	-2,157.94	14,454,817.63	1,739,048.83	39.80197040	-80.64881911	
8,328.00	26.91	273.18	7,818.09	287.13	-2,177.30	14,454,818.59	1,739,029.47	39.80197325	-80.64888804	
8,375.00	27.31	273.14	7,859.93	288.31	-2,198.68	14,454,819.77	1,739,008.08	39.80197673	-80.64896416	
8,422.00	28.46	274.24	7,901.47	289.73	-2,220.62	14,454,821.19	1,738,986.15	39.80198086	-80.64904224	
8,705.00	30.89	274.10	8,147.34	299.91	-2,360.35	14,454,831.37	1,738,846.42	39.80201032	-80.64953959	
8,800.00	30.98	274.37	8,228.82	303.52	-2,409.05	14,454,834.98	1,738,797.72	39.80202075	-80.64971294	
8,925.00	30.84	274.94	8,336.07	308.73	-2,473.05	14,454,840.19	1,738,733.72	39.80203574	-80.64994073	
8,988.00	31.11	274.19	8,390.08	311.31	-2,505.37	14,454,842.77	1,738,701.40	39.80204318	-80.65005577	
9,035.00	30.80	273.75	8,430.39	312.99	-2,529.48	14,454,844.44	1,738,677.28	39.80204803	-80.65014162	
9,083.00	30.14	273.27	8,471.76	314.48	-2,553.78	14,454,845.93	1,738,652.99	39.80205239	-80.65022809	
9,177.00	30.05	272.69	8,553.09	316.93	-2,600.85	14,454,848.38	1,738,605.92	39.80205962	-80.65039565	
9,271.00	29.78	272.52	8,634.57	319.06	-2,647.68	14,454,850.52	1,738,559.09	39.80206598	-80.65056236	
9,366.00	28.68	271.59	8,717.47	320.73	-2,694.04	14,454,852.19	1,738,512.73	39.80207106	-80.65072739	
9,460.00	25.23	270.67	8,801.24	321.59	-2,736.63	14,454,853.05	1,738,470.14	39.80207388	-80.65087903	
9,569.00	24.17	270.99	8,900.27	322.25	-2,782.17	14,454,853.70	1,738,424.59	39.80207617	-80.65104117	
9,616.00	24.04	272.40	8,943.17	322.81	-2,801.36	14,454,854.27	1,738,405.41	39.80207794	-80.65110947	
9,664.00	23.51	273.80	8,987.10	323.86	-2,820.68	14,454,855.31	1,738,386.09	39.80208101	-80.65117825	
9,709.00	25.40	274.77	9,028.06	325.25	-2,839.26	14,454,856.71	1,738,367.51	39.80208505	-80.65124437	
9,757.00	26.63	276.09	9,071.20	327.25	-2,860.21	14,454,858.71	1,738,346.56	39.80209076	-80.65131895	
9,797.00	28.08	276.62	9,106.72	329.29	-2,878.48	14,454,860.75	1,738,328.29	39.80209654	-80.65138396	
9,852.00	29.88	275.82	9,154.83	332.17	-2,904.97	14,454,863.63	1,738,301.80	39.80210474	-80.65147824	
9,899.00	30.06	276.00	9,195.55	334.59	-2,928.32	14,454,866.04	1,738,278.45	39.80211163	-80.65156136	
9,947.00	29.79	275.74	9,237.15	337.04	-2,952.14	14,454,868.49	1,738,254.63	39.80211861	-80.65164613	
9,996.00	29.44	274.95	9,279.75	339.29	-2,976.25	14,454,870.75	1,738,230.52	39.80212507	-80.65173194	
10,036.00	28.87	275.12	9,314.68	341.00	-2,995.66	14,454,872.46	1,738,211.11	39.80212997	-80.65180103	
10,130.00	27.55	272.84	9,397.52	344.11	-3,039.98	14,454,875.56	1,738,166.79	39.80213896	-80.65195877	
10,225.00	27.25	271.61	9,481.86	345.81	-3,083.66	14,454,877.26	1,738,123.11	39.80214410	-80.65211428	
10,320.00	27.11	271.78	9,566.37	347.09	-3,127.04	14,454,878.55	1,738,079.73	39.80214808	-80.65226870	
10,413.00	28.34	271.34	9,648.69	348.26	-3,170.29	14,454,879.72	1,738,036.48	39.80215177	-80.65242267	
10,507.00	28.96	269.50	9,731.18	348.59	-3,215.35	14,454,880.04	1,737,991.42	39.80215314	-80.65258311	
10,601.00	28.26	271.08	9,813.71	348.81	-3,260.36	14,454,880.26	1,737,946.41	39.80215422	-80.65274335	
10,695.00	27.77	272.57	9,896.69	350.21	-3,304.48	14,454,881.67	1,737,902.28	39.80215854	-80.65290045	
10,790.00	27.69	272.84	9,980.78	352.29	-3,348.64	14,454,883.75	1,737,858.13	39.80216474	-80.65305763	
10,884.00	27.60	273.28	10,064.05	354.62	-3,392.19	14,454,886.08	1,737,814.58	39.80217160	-80.65321266	
10,978.00	27.03	274.24	10,147.57	357.45	-3,435.23	14,454,888.90	1,737,771.54	39.80217981	-80.65336587	
11,073.00	26.72	274.33	10,232.31	360.66	-3,478.06	14,454,892.11	1,737,728.71	39.80218908	-80.65351830	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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	
11,167.00	26.67	274.77	10,316.29	364.01	-3,520.15	14,454,895.46	1,737,686.62	39.80219873	-80.65366813	
11,260.00	26.37	274.95	10,399.50	367.52	-3,561.53	14,454,898.98	1,737,645.24	39.80220883	-80.65381540	
11,354.00	24.96	275.91	10,484.23	371.37	-3,602.06	14,454,902.82	1,737,604.71	39.80221981	-80.65395965	
11,449.00	22.90	275.83	10,571.06	375.31	-3,640.39	14,454,906.77	1,737,566.38	39.80223105	-80.65409606	
11,516.00	21.62	276.27	10,633.06	377.98	-3,665.62	14,454,909.44	1,737,541.15	39.80223865	-80.65418589	
11,580.00	20.75	276.35	10,692.74	380.52	-3,688.61	14,454,911.98	1,737,518.16	39.80224588	-80.65426770	
11,627.00	24.00	272.57	10,736.20	381.87	-3,706.44	14,454,913.33	1,737,500.33	39.80224977	-80.65433116	
11,674.00	29.63	270.29	10,778.13	382.36	-3,727.63	14,454,913.82	1,737,479.14	39.80225134	-80.65440658	
11,721.00	34.07	269.59	10,818.04	382.33	-3,752.42	14,454,913.78	1,737,454.35	39.80225150	-80.65449486	
11,769.00	35.34	266.07	10,857.50	381.28	-3,779.72	14,454,912.73	1,737,427.05	39.80224891	-80.65459207	
11,816.00	35.69	260.80	10,895.77	378.15	-3,806.82	14,454,909.61	1,737,399.95	39.80224062	-80.65468861	
11,863.00	35.65	252.53	10,933.97	371.85	-3,833.43	14,454,903.30	1,737,373.34	39.80223358	-80.65478345	
11,910.00	35.60	248.40	10,972.18	362.70	-3,859.22	14,454,894.15	1,737,347.55	39.80219873	-80.65487539	
11,957.00	34.77	244.62	11,010.60	351.91	-3,884.05	14,454,883.37	1,737,322.72	39.80216938	-80.65496395	
12,004.00	32.18	234.87	11,049.83	338.96	-3,906.42	14,454,870.41	1,737,300.35	39.80213403	-80.65504376	
12,052.00	31.82	232.76	11,090.54	323.94	-3,926.95	14,454,855.40	1,737,279.82	39.80209302	-80.65511705	
12,099.00	30.90	228.98	11,130.67	308.52	-3,945.92	14,454,839.98	1,737,260.85	39.80205087	-80.65518481	
12,146.00	30.86	227.93	11,171.01	292.53	-3,963.97	14,454,823.98	1,737,242.80	39.80200713	-80.65524931	
12,193.00	27.78	227.93	11,211.99	277.11	-3,981.05	14,454,808.56	1,737,225.72	39.80196497	-80.65531034	
12,241.00	27.56	227.05	11,254.50	262.05	-3,997.48	14,454,793.50	1,737,209.28	39.80192378	-80.65536905	
12,288.00	29.49	227.49	11,295.79	246.82	-4,013.97	14,454,778.28	1,737,192.80	39.80188214	-80.65542796	
12,336.00	30.68	223.44	11,337.33	229.94	-4,031.10	14,454,761.40	1,737,175.67	39.80183597	-80.65548919	
12,383.00	32.53	215.97	11,377.37	211.00	-4,046.78	14,454,742.46	1,737,159.99	39.80178412	-80.65554526	
12,431.00	34.86	208.50	11,417.32	188.49	-4,060.91	14,454,719.94	1,737,145.86	39.80172244	-80.65559589	
12,478.00	37.67	200.15	11,455.24	163.18	-4,072.28	14,454,694.64	1,737,134.49	39.80165306	-80.65563670	
12,525.00	38.68	196.64	11,492.19	135.62	-4,081.43	14,454,667.08	1,737,125.34	39.80157748	-80.65569697	
12,572.00	40.26	190.48	11,528.48	106.60	-4,088.40	14,454,638.06	1,737,118.37	39.80149786	-80.65569489	
12,620.00	41.93	187.85	11,564.66	75.46	-4,093.42	14,454,606.92	1,737,113.35	39.80141238	-80.65571317	
12,667.00	44.62	184.51	11,598.88	43.44	-4,096.86	14,454,574.89	1,737,109.91	39.80132448	-80.65572586	
12,715.00	45.67	182.66	11,632.73	9.48	-4,098.98	14,454,540.94	1,737,107.79	39.80123125	-80.65573389	
12,762.00	47.91	179.67	11,664.92	-24.76	-4,099.66	14,454,506.70	1,737,107.11	39.80113723	-80.65573678	
12,809.00	50.73	177.12	11,695.55	-60.38	-4,098.65	14,454,471.08	1,737,108.12	39.80103940	-80.65573365	
12,841.00	52.66	175.72	11,715.39	-85.44	-4,097.08	14,454,446.02	1,737,109.69	39.80097056	-80.65572840	
12,872.00	54.42	174.58	11,733.81	-110.28	-4,094.96	14,454,421.18	1,737,111.81	39.80090232	-80.65572122	
12,904.00	56.88	172.99	11,751.86	-136.54	-4,092.10	14,454,394.92	1,737,114.67	39.80083017	-80.65571138	
12,951.00	60.53	169.74	11,776.28	-176.23	-4,086.05	14,454,355.23	1,737,120.72	39.80072112	-80.65569039	
12,998.00	63.47	166.14	11,798.35	-216.79	-4,077.37	14,454,314.67	1,737,129.40	39.80060962	-80.65566002	
13,045.00	67.34	163.59	11,817.91	-258.03	-4,066.20	14,454,273.43	1,737,140.57	39.80049626	-80.65562082	
13,093.00	71.56	161.74	11,834.75	-300.92	-4,052.80	14,454,230.54	1,737,153.97	39.80037833	-80.65557371	
13,140.00	75.82	160.25	11,847.95	-343.56	-4,038.11	14,454,187.90	1,737,168.66	39.80026109	-80.65552198	
13,188.00	79.43	158.40	11,858.24	-387.41	-4,021.55	14,454,144.05	1,737,185.22	39.80014048	-80.65546364	
13,235.00	81.76	155.59	11,865.92	-430.08	-4,003.43	14,454,101.38	1,737,203.34	39.80002310	-80.65539971	
13,282.00	84.09	153.22	11,871.71	-472.14	-3,983.28	14,454,059.32	1,737,223.49	39.79990739	-80.65532855	
13,329.00	88.09	151.55	11,874.91	-513.68	-3,961.55	14,454,017.78	1,737,245.22	39.79979308	-80.65525175	
13,377.00	88.97	151.20	11,876.14	-555.80	-3,938.56	14,453,975.66	1,737,268.21	39.79967717	-80.65517048	
13,424.00	88.97	149.26	11,876.99	-596.59	-3,915.23	14,453,934.87	1,737,291.54	39.79956491	-80.65508797	
13,472.00	88.79	148.47	11,877.93	-637.66	-3,890.42	14,453,893.80	1,737,316.35	39.79945184	-80.65500019	
13,519.00	88.22	147.68	11,879.15	-677.54	-3,865.57	14,453,853.92	1,737,341.20	39.79934207	-80.65491228	
13,565.00	88.22	147.51	11,880.58	-716.36	-3,840.93	14,453,815.10	1,737,365.84	39.79923520	-80.65482509	
13,659.00	88.00	146.63	11,883.68	-795.21	-3,789.86	14,453,736.25	1,737,416.91	39.79901811	-80.65464434	
13,753.00	87.87	147.42	11,887.07	-874.02	-3,738.73	14,453,657.44	1,737,468.04	39.79880115	-80.65446340	
13,848.00	88.35	148.47	11,890.20	-954.49	-3,688.34	14,453,576.97	1,737,518.43	39.79857962	-80.65428510	
13,941.00	89.54	148.91	11,891.91	-1,033.93	-3,640.02	14,453,497.53	1,737,566.75	39.79836095	-80.65411416	
14,035.00	89.71	148.56	11,892.53	-1,114.28	-3,591.24	14,453,417.18	1,737,615.53	39.79813978	-80.65394158	
14,096.00	89.58	147.86	11,892.91	-1,166.12	-3,559.10	14,453,365.34	1,737,647.67	39.79799705	-80.65382788	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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	
14,191.00	89.14	148.12	11,893.97	-1,246.67	-3,508.75	14,453,284.79	1,737,698.02	39.79777530	-80.65364973	
14,286.00	89.23	147.77	11,895.32	-1,327.18	-3,458.34	14,453,204.28	1,737,748.43	39.79755367	-80.65347135	
14,381.00	89.10	148.03	11,896.70	-1,407.65	-3,407.86	14,453,123.81	1,737,798.91	39.79733215	-80.65329275	
14,475.00	89.23	148.03	11,898.07	-1,487.38	-3,358.09	14,453,044.08	1,737,848.68	39.79711266	-80.65311667	
14,569.00	89.32	147.94	11,899.26	-1,567.08	-3,308.26	14,452,964.38	1,737,898.51	39.79689326	-80.65294037	
14,664.00	89.36	150.05	11,900.36	-1,648.50	-3,259.33	14,452,882.96	1,737,947.43	39.79666915	-80.65276730	
14,759.00	89.23	150.23	11,901.53	-1,730.88	-3,212.04	14,452,800.58	1,737,994.73	39.79644240	-80.65260006	
14,853.00	88.84	150.58	11,903.11	-1,812.61	-3,165.62	14,452,718.86	1,738,041.15	39.79621747	-80.65243593	
14,948.00	88.70	150.49	11,905.15	-1,895.30	-3,118.90	14,452,636.16	1,738,087.87	39.79598988	-80.65227075	
15,043.00	88.70	150.49	11,907.30	-1,977.95	-3,072.12	14,452,553.51	1,738,134.65	39.79576239	-80.65210534	
15,137.00	88.62	150.67	11,909.50	-2,059.81	-3,025.96	14,452,471.65	1,738,180.81	39.79553711	-80.65194214	
15,232.00	88.66	150.23	11,911.76	-2,142.43	-2,979.12	14,452,389.03	1,738,227.65	39.79530971	-80.65177653	
15,326.00	88.66	150.49	11,913.96	-2,224.11	-2,932.65	14,452,307.36	1,738,274.12	39.79508491	-80.65161221	
15,421.00	88.75	150.14	11,916.10	-2,306.62	-2,885.61	14,452,224.85	1,738,321.16	39.79485781	-80.65144590	
15,515.00	89.27	149.97	11,917.73	-2,388.06	-2,838.70	14,452,143.41	1,738,368.07	39.79463366	-80.65128001	
15,610.00	89.19	150.14	11,919.00	-2,470.37	-2,791.28	14,452,061.10	1,738,415.49	39.79440711	-80.6511235	
15,704.00	89.32	150.14	11,920.23	-2,551.88	-2,744.48	14,451,979.58	1,738,462.29	39.79418275	-80.65094688	
15,798.00	89.19	150.32	11,921.45	-2,633.47	-2,697.81	14,451,898.00	1,738,508.95	39.79395819	-80.65078187	
15,893.00	89.19	150.49	11,922.79	-2,716.07	-2,650.90	14,451,815.40	1,738,555.87	39.79373086	-80.65061601	
15,987.00	89.23	150.14	11,924.09	-2,797.72	-2,604.35	14,451,733.74	1,738,602.41	39.79350611	-80.65045143	
16,080.00	89.01	150.32	11,925.52	-2,878.44	-2,558.18	14,451,653.03	1,738,648.58	39.79328395	-80.65028819	
16,175.00	88.70	150.58	11,927.41	-2,961.06	-2,511.34	14,451,570.40	1,738,695.43	39.79305654	-80.65012258	
16,270.00	88.62	150.32	11,929.64	-3,043.68	-2,464.50	14,451,487.78	1,738,742.27	39.79282914	-80.64995698	
16,364.00	88.57	150.41	11,931.94	-3,125.36	-2,418.03	14,451,406.10	1,738,788.73	39.79260433	-80.64979270	
16,458.00	88.22	150.49	11,934.57	-3,207.10	-2,371.69	14,451,324.36	1,738,835.07	39.79237935	-80.64962886	
16,552.00	88.35	150.41	11,937.39	-3,288.84	-2,325.35	14,451,242.62	1,738,881.41	39.79215439	-80.64946504	
16,647.00	89.05	150.23	11,939.54	-3,371.36	-2,278.33	14,451,160.11	1,738,928.44	39.79192728	-80.64929878	
16,742.00	89.23	150.05	11,940.97	-3,453.73	-2,231.03	14,451,077.73	1,738,975.73	39.79170053	-80.64913157	
16,837.00	89.19	150.23	11,942.28	-3,536.12	-2,183.74	14,450,995.35	1,739,023.03	39.79147379	-80.64896435	
16,931.00	89.10	150.23	11,943.68	-3,617.70	-2,137.07	14,450,913.77	1,739,069.69	39.79124923	-80.64879936	
17,026.00	89.14	150.05	11,945.14	-3,700.08	-2,089.78	14,450,831.39	1,739,116.99	39.79102249	-80.64863215	
17,118.00	89.23	148.65	11,946.45	-3,779.22	-2,042.88	14,450,752.25	1,739,163.88	39.79080466	-80.64846632	
17,212.00	89.67	147.86	11,947.35	-3,859.15	-1,993.43	14,450,672.32	1,739,213.34	39.79058461	-80.64829138	
17,306.00	89.76	147.59	11,947.82	-3,938.62	-1,943.24	14,450,592.84	1,739,263.53	39.79036581	-80.64811381	
17,400.00	89.71	147.24	11,948.25	-4,017.83	-1,892.61	14,450,513.64	1,739,314.15	39.79014775	-80.64793471	
17,495.00	89.71	147.51	11,948.73	-4,097.84	-1,841.39	14,450,433.63	1,739,365.37	39.78992748	-80.64775351	
17,590.00	89.58	147.68	11,949.32	-4,178.04	-1,790.48	14,450,353.42	1,739,416.28	39.78970666	-80.64757340	
17,685.00	89.27	147.07	11,950.28	-4,258.05	-1,739.27	14,450,273.42	1,739,467.50	39.78948639	-80.64739221	
17,779.00	89.32	148.65	11,951.43	-4,337.63	-1,689.27	14,450,193.83	1,739,517.50	39.78926729	-80.64721533	
17,873.00	89.10	149.00	11,952.73	-4,418.05	-1,640.61	14,450,113.42	1,739,566.15	39.78904592	-80.64704326	
17,968.00	88.79	149.18	11,954.48	-4,499.55	-1,591.82	14,450,031.92	1,739,614.94	39.78882159	-80.64687071	
18,063.00	88.84	151.37	11,956.44	-4,582.02	-1,544.73	14,449,949.44	1,739,662.04	39.78859458	-80.64669704	
18,157.00	88.75	151.37	11,958.42	-4,664.51	-1,499.70	14,449,866.96	1,739,707.07	39.78836756	-80.64652410	
18,252.00	88.75	151.81	11,960.49	-4,748.05	-1,454.51	14,449,783.42	1,739,752.25	39.78813765	-80.64635152	
18,346.00	88.75	152.52	11,962.54	-4,831.15	-1,410.63	14,449,700.31	1,739,796.13	39.78790895	-80.64617901	
18,440.00	88.66	153.22	11,964.67	-4,914.79	-1,367.78	14,449,616.68	1,739,838.99	39.78767880	-80.64599200	
18,534.00	88.62	153.04	11,966.90	-4,998.62	-1,325.30	14,449,532.85	1,739,881.46	39.78744813	-80.64581953	
18,629.00	88.53	150.23	11,969.26	-5,082.18	-1,280.19	14,449,449.29	1,739,926.58	39.78721817	-80.64564704	
18,724.00	88.70	147.59	11,971.56	-5,163.50	-1,231.15	14,449,367.97	1,739,975.61	39.78699430	-80.64547455	
18,818.00	88.70	148.21	11,973.69	-5,243.11	-1,181.21	14,449,286.36	1,740,025.55	39.78677514	-80.64530206	
18,913.00	88.70	147.77	11,975.84	-5,323.64	-1,130.87	14,449,207.83	1,740,075.89	39.78655342	-80.64512957	
19,007.00	88.75	147.33	11,977.94	-5,402.95	-1,080.45	14,449,128.52	1,740,126.32	39.78633509	-80.64495708	
19,102.00	88.79	147.51	11,979.98	-5,482.98	-1,029.30	14,449,048.49	1,740,177.46	39.78611474	-80.64478459	
19,197.00	88.79	147.94	11,981.98	-5,563.28	-978.58	14,448,968.19	1,740,228.18	39.78589366	-80.64461210	
19,291.00	88.79	149.18	11,983.97	-5,643.46	-929.57	14,448,888.01	1,740,277.20	39.78567293	-80.64443961	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Fitzgerald 18 HU (slot N)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Site:</b>	Fitzgerald	<b>MD Reference:</b>	RKB=1292.9+26 @ 1318.91ft (Nabors B28)
<b>Well:</b>	Fitzgerald 18 HU (slot N)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Sidetrack 01	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Sidetrack 01	<b>Database:</b>	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
19,386.00	88.75	149.79	11,986.01	-5,725.28	-881.34	14,448,806.18	1,740,325.42	39.78544770	-80.64435890
19,479.00	88.70	149.70	11,988.08	-5,805.60	-834.49	14,448,725.87	1,740,372.27	39.78522663	-80.64419328
19,574.00	88.70	149.61	11,990.23	-5,887.56	-786.51	14,448,643.91	1,740,420.25	39.78500101	-80.64402365
19,668.00	88.75	149.88	11,992.32	-5,968.74	-739.16	14,448,562.73	1,740,467.60	39.78477757	-80.64385625
19,762.00	88.66	149.70	11,994.45	-6,049.95	-691.88	14,448,481.52	1,740,514.89	39.78455402	-80.64368908
19,857.00	88.75	149.61	11,996.59	-6,131.91	-643.89	14,448,399.56	1,740,562.87	39.78432840	-80.64351945
19,951.00	88.79	149.44	11,998.61	-6,212.91	-596.23	14,448,318.56	1,740,610.53	39.78410545	-80.64335094
20,045.00	88.79	149.70	12,000.60	-6,293.94	-548.63	14,448,237.53	1,740,658.13	39.78388239	-80.64318266
20,140.00	88.75	149.61	12,002.64	-6,375.91	-500.65	14,448,155.56	1,740,706.11	39.78365677	-80.64301303
20,234.00	88.75	149.70	12,004.69	-6,457.01	-453.17	14,448,074.46	1,740,753.59	39.78343352	-80.64284518
20,329.00	88.70	149.35	12,006.80	-6,538.87	-405.00	14,447,992.60	1,740,801.76	39.78320820	-80.64267489
20,423.00	89.01	149.70	12,008.68	-6,619.86	-357.34	14,447,911.61	1,740,849.42	39.78298524	-80.64250638
20,518.00	89.36	150.05	12,010.03	-6,702.02	-309.66	14,447,829.45	1,740,897.10	39.78275908	-80.64233786
20,613.00	89.32	151.46	12,011.12	-6,784.91	-263.26	14,447,746.56	1,740,943.51	39.78253096	-80.64217385
20,707.00	89.19	151.81	12,012.35	-6,867.62	-218.60	14,447,663.86	1,740,988.16	39.78230333	-80.64201608
20,802.00	89.27	151.55	12,013.62	-6,951.24	-173.54	14,447,580.23	1,741,033.22	39.78207319	-80.64185688
20,897.00	89.19	151.20	12,014.90	-7,034.62	-128.03	14,447,496.85	1,741,078.73	39.78184371	-80.64169608
20,991.00	89.19	151.46	12,016.23	-7,117.09	-82.94	14,447,414.39	1,741,123.82	39.78161674	-80.64153675
21,086.00	89.10	151.64	12,017.65	-7,200.60	-37.68	14,447,330.87	1,741,169.08	39.78138688	-80.64137687
21,181.00	89.19	150.23	12,019.06	-7,283.63	8.46	14,447,247.84	1,741,215.22	39.78115837	-80.64121381
21,275.00	89.05	150.23	12,020.51	-7,365.21	55.13	14,447,166.26	1,741,261.89	39.78093380	-80.64104887
21,369.00	89.32	150.05	12,021.84	-7,446.73	101.92	14,447,084.75	1,741,308.68	39.78070943	-80.64088347
21,427.00	89.01	149.88	12,022.69	-7,496.93	130.95	14,447,034.54	1,741,337.71	39.78057124	-80.64078066
<b>Survey @ 21427.00 MD 12022.69 TVD</b>									
21,502.00	89.01	149.88	12,023.99	-7,561.80	168.58	14,446,969.68	1,741,375.34	39.78039269	-80.64064785
<b>Survey Proj. to 21502.00 MD 12023.99 TVD</b>									

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,769.00	1,768.12	-20.46	-24.28	Tie into original hole @ 1769 MD
21,427.00	12,022.69	-7,496.93	130.95	Survey @ 21427.00 MD 12022.69 TVD
21,502.00	12,023.99	-7,561.80	168.58	Survey Proj. to 21502.00 MD 12023.99 TVD