

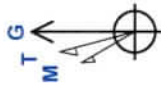


Well: Pendleton S-14 HU (slot E)
Site: Pendleton
Project: Marshall County, West Virginia NAD83 UTM 17N
Design: rev5

Geoidetic 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: CG 127200ft
 Surface: Easting Longitude
 Northing Latitude
 14437076.407 1715271.657 39.753474000 -80.733857000

Total Corr (M-to-G): To convert a Magnetic Direction to a Grid Direction, Subtract 6.81*



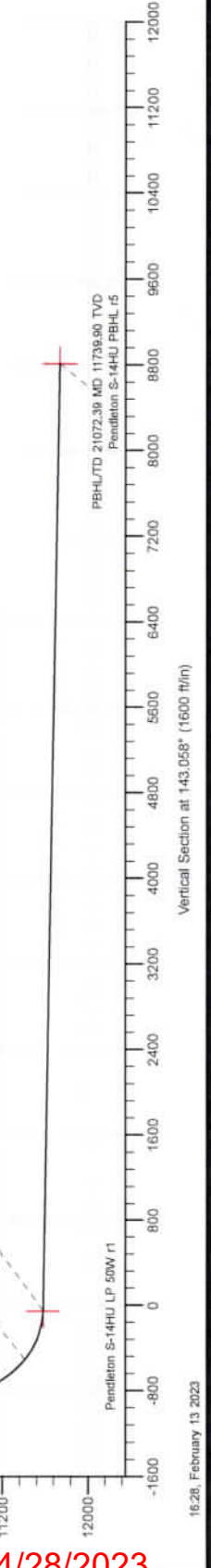
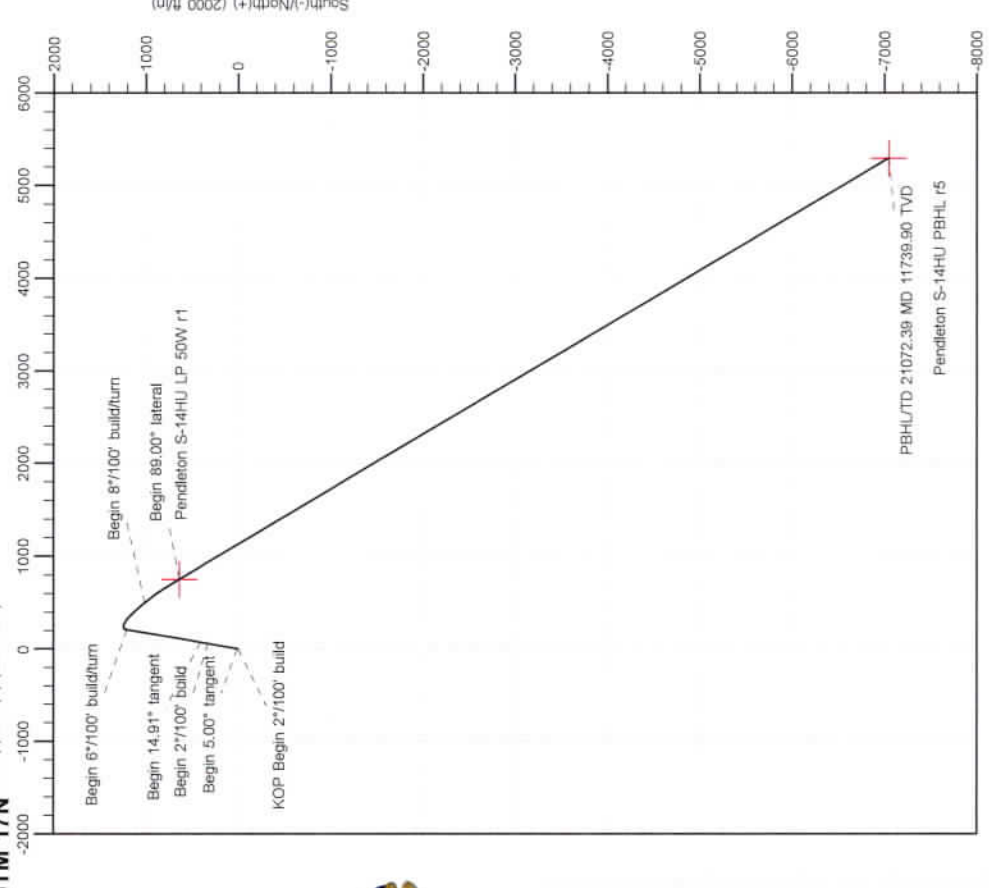
Adjusts to Grid North
 True North: -0.11°
 Magnetic North: -6.81°
 Magnetic Field
 Strength: 51,659.9nT
 Dip Angle: 66.35°
 Date: 2/13/2023
 Model: IGRF2020



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SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Annotation
1	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	
2	3100.00	0.00	0.000	3100.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2'100' build
3	3350.00	5.00	10.620	3349.68	10.71	2.01	2.00	10.62	-7.36	Begin 5.00° tangent
4	7014.26	5.00	10.620	7000.00	324.61	60.87	0.00	0.00	-222.86	Begin 2'100' build
5	7509.93	14.91	9.599	7487.60	408.93	75.52	2.00	-1.55	-281.45	Begin 14.91° tangent
6	10642.07	14.91	9.599	10514.25	1203.67	209.92	0.00	0.00	-835.86	Begin 8'100' buildthum
7	11653.20	50.00	141.348	11413.38	1011.17	501.25	6.00	139.04	-506.91	Begin 8'100' buildthum
8	12149.22	89.00	149.401	11584.01	634.17	756.42	8.00	12.67	-52.23	Begin 89.00° lateral
9	21072.39	89.00	149.401	11739.90	-7045.27	5297.88	0.00	0.00	8814.95	PBHL/TD



04/28/2023



Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Pendleton S-14 HU (slot E)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1272.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 1272.00ft
Site:	Pendleton	North Reference:	Grid
Well:	Pendleton S-14 HU (slot E)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

Project	Marshall County, West Virginia NAD83 UTM 17N		
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	Pendleton				
Site Position:		Northing:	14,437,088.243 usft	Latitude:	39.753506850
From:	Lat/Long	Easting:	1,715,175.249 usft	Longitude:	-80.734007760
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "		

Well	Pendleton S-14 HU (slot E)					
Well Position	+N/-S	0.00 ft	Northing:	14,437,076.408 usft	Latitude:	39.753474000
	+E/-W	0.00 ft	Easting:	1,715,217.656 usft	Longitude:	-80.733857000
Position Uncertainty	0.00 ft		Wellhead Elevation:	ft	Ground Level:	1,272.00 ft
Grid Convergence:	0.17 °					

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	2/13/2023	-8.64	66.35	51,559.93209468

Design	rev5			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	143.058

Plan Survey Tool Program	Date	2/13/2023		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	21,072.39 rev5 (Original Hole)	MWD	MWD - Standard

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Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Pendleton S-14 HU (slot E)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1272.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 1272.00ft
Site:	Pendleton	North Reference:	Grid
Well:	Pendleton S-14 HU (slot E)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,100.00	0.00	0.000	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,350.00	5.00	10.620	3,349.68	10.71	2.01	2.00	2.00	0.00	10.62	
7,014.26	5.00	10.620	7,000.00	324.61	60.87	0.00	0.00	0.00	0.00	
7,509.93	14.91	9.599	7,487.60	408.93	75.52	2.00	2.00	-0.21	-1.53	
10,642.07	14.91	9.599	10,514.25	1,203.67	209.92	0.00	0.00	0.00	0.00	
11,653.20	50.00	141.348	11,413.38	1,011.17	501.25	6.00	3.47	13.03	139.04	
12,149.22	89.00	149.401	11,584.01	634.17	756.42	8.00	7.86	1.62	12.67	
21,072.39	89.00	149.401	11,739.90	-7,045.27	5,297.88	0.00	0.00	0.00	0.00	Pendleton S-14HU PE

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Planning Report - Geographic

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 Company: Tug Hill Operating LLC
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 Site: Pendleton
 Well: Pendleton S-14 HU (slot E)
 Wellbore: Original Hole
 Design: rev5

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Pendleton S-14 HU (slot E)
 GL @ 1272.00ft
 GL @ 1272.00ft
 Grid
 Minimum Curvature

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MAR 15 2023

WV Department of
 Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.000	0.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
100.00	0.00	0.000	100.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
200.00	0.00	0.000	200.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
300.00	0.00	0.000	300.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
400.00	0.00	0.000	400.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
500.00	0.00	0.000	500.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
600.00	0.00	0.000	600.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
700.00	0.00	0.000	700.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
800.00	0.00	0.000	800.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
900.00	0.00	0.000	900.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
1,000.00	0.00	0.000	1,000.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
1,100.00	0.00	0.000	1,100.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
1,200.00	0.00	0.000	1,200.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
1,300.00	0.00	0.000	1,300.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
1,400.00	0.00	0.000	1,400.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
1,500.00	0.00	0.000	1,500.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
1,600.00	0.00	0.000	1,600.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
1,700.00	0.00	0.000	1,700.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
1,800.00	0.00	0.000	1,800.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
1,900.00	0.00	0.000	1,900.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
2,000.00	0.00	0.000	2,000.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
2,100.00	0.00	0.000	2,100.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
2,200.00	0.00	0.000	2,200.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
2,300.00	0.00	0.000	2,300.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
2,400.00	0.00	0.000	2,400.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
2,500.00	0.00	0.000	2,500.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
2,600.00	0.00	0.000	2,600.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
2,700.00	0.00	0.000	2,700.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
2,800.00	0.00	0.000	2,800.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
2,900.00	0.00	0.000	2,900.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
3,000.00	0.00	0.000	3,000.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
3,100.00	0.00	0.000	3,100.00	0.00	0.00	14,437,076.408	1,715,217.656	39.753474000	-80.733857000
KOP Begin 2°/100' build									
3,200.00	2.00	10.620	3,199.98	1.72	0.32	14,437,078.123	1,715,217.978	39.753478708	-80.733855838
3,300.00	4.00	10.620	3,299.84	6.86	1.29	14,437,083.267	1,715,218.942	39.753492826	-80.733852352
3,350.00	5.00	10.620	3,349.68	10.71	2.01	14,437,087.122	1,715,219.665	39.753503409	-80.733849739
Begin 5.00° tangent									
3,400.00	5.00	10.620	3,399.49	15.00	2.81	14,437,091.405	1,715,220.468	39.753515165	-80.733846836
3,500.00	5.00	10.620	3,499.11	23.56	4.42	14,437,099.972	1,715,222.075	39.753538678	-80.733841031
3,600.00	5.00	10.620	3,598.73	32.13	6.02	14,437,108.538	1,715,223.681	39.753562190	-80.733835225
3,700.00	5.00	10.620	3,698.35	40.70	7.63	14,437,117.104	1,715,225.287	39.753585702	-80.733829420
3,800.00	5.00	10.620	3,797.97	49.26	9.24	14,437,125.670	1,715,226.893	39.753609215	-80.733823614
3,900.00	5.00	10.620	3,897.59	57.83	10.84	14,437,134.237	1,715,228.500	39.753632727	-80.733817809
4,000.00	5.00	10.620	3,997.21	66.40	12.45	14,437,142.803	1,715,230.106	39.753656239	-80.733812003
4,100.00	5.00	10.620	4,096.83	74.96	14.06	14,437,151.369	1,715,231.712	39.753679751	-80.733806198
4,200.00	5.00	10.620	4,196.45	83.53	15.66	14,437,159.936	1,715,233.318	39.753703264	-80.733800392
4,300.00	5.00	10.620	4,296.07	92.09	17.27	14,437,168.502	1,715,234.924	39.753726776	-80.733794587
4,400.00	5.00	10.620	4,395.69	100.66	18.87	14,437,177.068	1,715,236.531	39.753750288	-80.733788781
4,500.00	5.00	10.620	4,495.31	109.23	20.48	14,437,185.634	1,715,238.137	39.753773800	-80.733782976
4,600.00	5.00	10.620	4,594.93	117.79	22.09	14,437,194.201	1,715,239.743	39.753797313	-80.733777170
4,700.00	5.00	10.620	4,694.55	126.36	23.69	14,437,202.767	1,715,241.349	39.753820825	-80.733771365
4,800.00	5.00	10.620	4,794.17	134.93	25.30	14,437,211.333	1,715,242.956	39.753844337	-80.733765559
4,900.00	5.00	10.620	4,893.78	143.49	26.91	14,437,219.899	1,715,244.562	39.753867850	-80.733759754



Planning Report - Geographic

Database: DB_Decv0422v16
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia NAD83 UTM 17N
 Site: Pendleton
 Well: Pendleton S-14 HU (slot E)
 Wellbore: Original Hole
 Design: rev5

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Pendleton S-14 HU (slot E)
 GL @ 1272.00ft
 GL @ 1272.00ft
 Grid
 Minimum Curvature

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Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,000.00	5.00	10.620	4,993.40	152.06	28.51	14,437,228.466	1,715,246.168	39.753891362	-80.733753948	
5,100.00	5.00	10.620	5,093.02	160.62	30.12	14,437,237.032	1,715,247.774	39.753914874	-80.733748143	
5,200.00	5.00	10.620	5,192.64	169.19	31.72	14,437,245.598	1,715,249.381	39.753938386	-80.733742337	
5,300.00	5.00	10.620	5,292.26	177.76	33.33	14,437,254.164	1,715,250.987	39.753961899	-80.733736531	
5,400.00	5.00	10.620	5,391.88	186.32	34.94	14,437,262.731	1,715,252.593	39.753985411	-80.733730726	
5,500.00	5.00	10.620	5,491.50	194.89	36.54	14,437,271.297	1,715,254.199	39.754008923	-80.733724920	
5,600.00	5.00	10.620	5,591.12	203.46	38.15	14,437,279.863	1,715,255.805	39.754032435	-80.733719115	
5,700.00	5.00	10.620	5,690.74	212.02	39.76	14,437,288.430	1,715,257.412	39.754055948	-80.733713309	
5,800.00	5.00	10.620	5,790.36	220.59	41.36	14,437,296.996	1,715,259.018	39.754079460	-80.733707504	
5,900.00	5.00	10.620	5,889.98	229.15	42.97	14,437,305.562	1,715,260.624	39.754102972	-80.733701698	
6,000.00	5.00	10.620	5,989.60	237.72	44.57	14,437,314.128	1,715,262.230	39.754126485	-80.733695893	
6,100.00	5.00	10.620	6,089.22	246.29	46.18	14,437,322.695	1,715,263.837	39.754149997	-80.733690087	
6,200.00	5.00	10.620	6,188.84	254.85	47.79	14,437,331.261	1,715,265.443	39.754173509	-80.733684281	
6,300.00	5.00	10.620	6,288.46	263.42	49.39	14,437,339.827	1,715,267.049	39.754197021	-80.733678476	
6,400.00	5.00	10.620	6,388.08	271.99	51.00	14,437,348.393	1,715,268.655	39.754220534	-80.733672670	
6,500.00	5.00	10.620	6,487.70	280.55	52.61	14,437,356.960	1,715,270.262	39.754244046	-80.733666865	
6,600.00	5.00	10.620	6,587.32	289.12	54.21	14,437,365.526	1,715,271.868	39.754267558	-80.733661059	
6,700.00	5.00	10.620	6,686.94	297.69	55.82	14,437,374.092	1,715,273.474	39.754291070	-80.733655253	
6,800.00	5.00	10.620	6,786.55	306.25	57.42	14,437,382.658	1,715,275.080	39.754314583	-80.733649448	
6,900.00	5.00	10.620	6,886.17	314.82	59.03	14,437,391.225	1,715,276.686	39.754338095	-80.733643642	
7,000.00	5.00	10.620	6,985.79	323.38	60.64	14,437,399.791	1,715,278.293	39.754361607	-80.733637837	
7,014.26	5.00	10.620	7,000.00	324.61	60.87	14,437,401.013	1,715,278.522	39.754364960	-80.733637009	
Begin 2°/100' build										
7,100.00	6.71	10.229	7,085.29	333.21	62.44	14,437,409.618	1,715,280.101	39.754388581	-80.733631300	
7,200.00	8.71	9.967	7,184.38	346.43	64.79	14,437,422.833	1,715,282.450	39.754424854	-80.733622801	
7,300.00	10.71	9.802	7,282.94	363.05	67.69	14,437,439.455	1,715,285.344	39.754470479	-80.733612328	
7,400.00	12.71	9.689	7,380.85	383.06	71.12	14,437,459.464	1,715,288.779	39.754525400	-80.733599895	
7,509.93	14.91	9.599	7,487.60	408.93	75.52	14,437,485.339	1,715,293.174	39.754596424	-80.733583984	
Begin 14.91° tangent										
7,600.00	14.91	9.599	7,574.63	431.79	79.38	14,437,508.192	1,715,297.039	39.754659153	-80.733569991	
7,700.00	14.91	9.599	7,671.27	457.16	83.67	14,437,533.565	1,715,301.330	39.754728801	-80.733554454	
7,800.00	14.91	9.599	7,767.90	482.53	87.96	14,437,558.939	1,715,305.621	39.754798449	-80.733538918	
7,900.00	14.91	9.599	7,864.53	507.91	92.26	14,437,584.313	1,715,309.912	39.754868097	-80.733523382	
8,000.00	14.91	9.599	7,961.16	533.28	96.55	14,437,609.686	1,715,314.203	39.754937745	-80.733507845	
8,100.00	14.91	9.599	8,057.79	558.65	100.84	14,437,635.060	1,715,318.494	39.755007393	-80.733492309	
8,200.00	14.91	9.599	8,154.43	584.03	105.13	14,437,660.434	1,715,322.785	39.755077042	-80.733476773	
8,300.00	14.91	9.599	8,251.06	609.40	109.42	14,437,685.807	1,715,327.076	39.755146690	-80.733461236	
8,400.00	14.91	9.599	8,347.69	634.77	113.71	14,437,711.181	1,715,331.367	39.755216338	-80.733445700	
8,500.00	14.91	9.599	8,444.32	660.15	118.00	14,437,736.555	1,715,335.658	39.755285986	-80.733430163	
8,600.00	14.91	9.599	8,540.95	685.52	122.29	14,437,761.928	1,715,339.949	39.755355634	-80.733414626	
8,700.00	14.91	9.599	8,637.59	710.90	126.58	14,437,787.302	1,715,344.240	39.755425282	-80.733399090	
8,800.00	14.91	9.599	8,734.22	736.27	130.88	14,437,812.676	1,715,348.532	39.755494930	-80.733383553	
8,900.00	14.91	9.599	8,830.85	761.64	135.17	14,437,838.049	1,715,352.823	39.755564578	-80.733368017	
9,000.00	14.91	9.599	8,927.48	787.02	139.46	14,437,863.423	1,715,357.114	39.755634226	-80.733352480	
9,100.00	14.91	9.599	9,024.11	812.39	143.75	14,437,888.797	1,715,361.405	39.755703874	-80.733336943	
9,200.00	14.91	9.599	9,120.75	837.76	148.04	14,437,914.170	1,715,365.696	39.755773523	-80.733321406	
9,300.00	14.91	9.599	9,217.38	863.14	152.33	14,437,939.544	1,715,369.987	39.755843171	-80.733305870	
9,400.00	14.91	9.599	9,314.01	888.51	156.62	14,437,964.918	1,715,374.278	39.755912819	-80.733290333	
9,500.00	14.91	9.599	9,410.64	913.89	160.91	14,437,990.291	1,715,378.569	39.755982467	-80.733274796	
9,600.00	14.91	9.599	9,507.27	939.26	165.20	14,438,015.665	1,715,382.860	39.756052115	-80.733259259	
9,700.00	14.91	9.599	9,603.91	964.63	169.50	14,438,041.039	1,715,387.151	39.756121763	-80.733243722	
9,800.00	14.91	9.599	9,700.54	990.01	173.79	14,438,066.412	1,715,391.442	39.756191411	-80.733228185	
9,900.00	14.91	9.599	9,797.17	1,015.38	178.08	14,438,091.786	1,715,395.733	39.756261059	-80.733212648	



Planning Report - Geographic

Database: DB_Decv0422v16
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia NAD83 UTM 17N
 Site: Pendleton
 Well: Pendleton S-14 HU (slot E)
 Wellbore: Original Hole
 Design: rev5

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Pendleton S-14 HU (slot E)
 GL @ 1272.00ft
 GL @ 1272.00ft
 Grid
 Minimum Curvature

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 Office of Oil and Gas
 MAR 15 2023
 WV Department of
 Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,000.00	14.91	9.599	9,893.80	1,040.75	182.37	14,438,117.160	1,715,400.024	39.756330707	-80.733197111
10,100.00	14.91	9.599	9,990.44	1,066.13	186.66	14,438,142.533	1,715,404.315	39.756400355	-80.733181574
10,200.00	14.91	9.599	10,087.07	1,091.50	190.95	14,438,167.907	1,715,408.607	39.756470003	-80.733166037
10,300.00	14.91	9.599	10,183.70	1,116.88	195.24	14,438,193.280	1,715,412.898	39.756539651	-80.733150500
10,400.00	14.91	9.599	10,280.33	1,142.25	199.53	14,438,218.654	1,715,417.189	39.756609299	-80.733134963
10,500.00	14.91	9.599	10,376.96	1,167.62	203.82	14,438,244.028	1,715,421.480	39.756678947	-80.733119426
10,600.00	14.91	9.599	10,473.60	1,193.00	208.11	14,438,269.401	1,715,425.771	39.756748596	-80.733103889
10,642.07	14.91	9.599	10,514.25	1,203.67	209.92	14,438,280.077	1,715,427.576	39.756777899	-80.733097351
Begin 6°/100' build/turn									
10,650.00	14.56	10.839	10,521.92	1,205.66	210.28	14,438,282.061	1,715,427.934	39.756783344	-80.733096059
10,700.00	12.49	20.186	10,570.53	1,216.91	213.33	14,438,293.310	1,715,430.982	39.756814214	-80.733085093
10,750.00	10.87	32.691	10,619.51	1,225.95	217.74	14,438,302.354	1,715,435.394	39.756839015	-80.733069297
10,800.00	9.89	48.510	10,668.70	1,232.76	223.50	14,438,309.168	1,715,441.159	39.756857679	-80.733048715
10,850.00	9.77	66.128	10,717.97	1,237.33	230.60	14,438,313.732	1,715,448.259	39.756870156	-80.733023402
10,900.00	10.54	82.651	10,767.20	1,239.63	239.02	14,438,316.035	1,715,456.676	39.756876412	-80.732993428
10,950.00	12.01	96.064	10,816.24	1,239.67	248.73	14,438,316.070	1,715,466.387	39.756876429	-80.732958875
11,000.00	13.98	106.176	10,864.97	1,237.43	259.71	14,438,313.837	1,715,477.365	39.756870207	-80.732919838
11,050.00	16.26	113.675	10,913.24	1,232.94	271.92	14,438,309.343	1,715,489.580	39.756857763	-80.732876424
11,100.00	18.74	119.308	10,960.92	1,226.19	285.34	14,438,302.599	1,715,502.998	39.756839132	-80.732828752
11,150.00	21.35	123.637	11,007.89	1,217.22	299.93	14,438,293.623	1,715,517.582	39.756814364	-80.732776952
11,200.00	24.05	127.049	11,054.02	1,206.04	315.64	14,438,282.442	1,715,533.294	39.756783527	-80.732721167
11,250.00	26.80	129.803	11,099.17	1,192.68	332.43	14,438,269.084	1,715,550.089	39.756746706	-80.732661550
11,300.00	29.61	132.075	11,143.23	1,177.18	350.27	14,438,253.588	1,715,567.922	39.756704002	-80.732598263
11,350.00	32.44	133.984	11,186.08	1,159.59	369.09	14,438,235.994	1,715,586.743	39.756655531	-80.732531481
11,400.00	35.30	135.616	11,227.59	1,139.95	388.85	14,438,216.352	1,715,606.501	39.756601428	-80.732461386
11,450.00	38.18	137.033	11,267.65	1,118.31	409.49	14,438,194.716	1,715,627.143	39.756541839	-80.732388171
11,500.00	41.07	138.278	11,306.16	1,094.74	430.96	14,438,171.144	1,715,648.611	39.756476928	-80.732312036
11,550.00	43.98	139.387	11,343.01	1,069.30	453.19	14,438,145.702	1,715,670.846	39.756406873	-80.732233190
11,600.00	46.89	140.385	11,378.09	1,042.05	476.13	14,438,118.458	1,715,693.788	39.756331867	-80.732151849
11,653.20	50.00	141.348	11,413.38	1,011.17	501.25	14,438,087.576	1,715,718.905	39.756246848	-80.732062808
Begin 8°/100' build/turn									
11,700.00	53.66	142.367	11,442.30	982.24	523.96	14,438,058.642	1,715,741.617	39.756167201	-80.731982307
11,750.00	57.57	143.355	11,470.53	949.34	548.86	14,438,025.750	1,715,766.517	39.756076667	-80.731894057
11,800.00	61.50	144.260	11,495.88	914.57	574.30	14,437,990.973	1,715,791.955	39.755980949	-80.731803917
11,850.00	65.43	145.101	11,518.21	878.07	600.15	14,437,954.479	1,715,817.806	39.755880514	-80.731712326
11,900.00	69.36	145.890	11,537.43	840.04	626.29	14,437,916.447	1,715,843.944	39.755775852	-80.731619729
11,950.00	73.29	146.639	11,553.44	800.66	652.59	14,437,877.061	1,715,870.242	39.755667472	-80.731526579
12,000.00	77.23	147.358	11,566.15	760.11	678.92	14,437,836.514	1,715,896.572	39.755555903	-80.731433328
12,050.00	81.18	148.055	11,575.51	718.60	705.15	14,437,795.004	1,715,922.805	39.755441687	-80.731340432
12,100.00	85.12	148.737	11,581.48	676.33	731.16	14,437,752.732	1,715,948.814	39.755325382	-80.731248342
12,149.22	89.00	149.401	11,584.01	634.17	756.42	14,437,710.573	1,715,974.076	39.755209393	-80.731158908
Begin 89.00° lateral									
12,200.00	89.00	149.401	11,584.89	590.47	782.26	14,437,666.873	1,715,999.919	39.755089169	-80.731067423
12,300.00	89.00	149.401	11,586.64	504.40	833.16	14,437,580.812	1,716,050.814	39.754852400	-80.730887255
12,400.00	89.00	149.401	11,588.39	418.34	884.05	14,437,494.750	1,716,101.709	39.754615631	-80.730707088
12,500.00	89.00	149.401	11,590.13	332.28	934.95	14,437,408.688	1,716,152.605	39.754378862	-80.730526923
12,600.00	89.00	149.401	11,591.88	246.22	985.84	14,437,322.627	1,716,203.500	39.754142092	-80.730346759
12,700.00	89.00	149.401	11,593.63	160.16	1,036.74	14,437,236.565	1,716,254.395	39.753905322	-80.730166595
12,800.00	89.00	149.401	11,595.38	74.10	1,087.63	14,437,150.504	1,716,305.290	39.753668552	-80.729986434
12,900.00	89.00	149.401	11,597.12	-11.97	1,138.53	14,437,064.442	1,716,356.185	39.753431781	-80.729806273
13,000.00	89.00	149.401	11,598.87	-98.03	1,189.43	14,436,978.380	1,716,407.080	39.753195010	-80.729626113
13,100.00	89.00	149.401	11,600.62	-184.09	1,240.32	14,436,892.319	1,716,457.975	39.752958239	-80.729445955
13,200.00	89.00	149.401	11,602.36	-270.15	1,291.22	14,436,806.257	1,716,508.870	39.752721467	-80.729265798



Planning Report - Geographic

Database: DB_Decv0422v16
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia NAD83 UTM 17N
 Site: Pendleton
 Well: Pendleton S-14 HU (slot E)
 Wellbore: Original Hole
 Design: rev5

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Pendleton S-14 HU (slot E)
 GL @ 1272.00ft
 GL @ 1272.00ft
 Grid
 Minimum Curvature

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 MAR 15 2023
 WV Department of Environmental Protection

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,300.00	89.00	149.401	11,604.11	-356.21	1,342.11	14,436,720.196	1,716,559.765	39.752484696	-80.729085643
13,400.00	89.00	149.401	11,605.86	-442.27	1,393.01	14,436,634.134	1,716,610.660	39.752247924	-80.728905488
13,500.00	89.00	149.401	11,607.61	-528.34	1,443.90	14,436,548.072	1,716,661.555	39.752011151	-80.728725335
13,600.00	89.00	149.401	11,609.35	-614.40	1,494.80	14,436,462.011	1,716,712.450	39.751774379	-80.728545183
13,700.00	89.00	149.401	11,611.10	-700.46	1,545.69	14,436,375.949	1,716,763.346	39.751537606	-80.728365032
13,800.00	89.00	149.401	11,612.85	-786.52	1,596.59	14,436,289.888	1,716,814.241	39.751300833	-80.728184882
13,900.00	89.00	149.401	11,614.59	-872.58	1,647.48	14,436,203.826	1,716,865.136	39.751064059	-80.728004734
14,000.00	89.00	149.401	11,616.34	-958.65	1,698.38	14,436,117.765	1,716,916.031	39.750827285	-80.727824587
14,100.00	89.00	149.401	11,618.09	-1,044.71	1,749.27	14,436,031.703	1,716,966.926	39.750590511	-80.727644441
14,200.00	89.00	149.401	11,619.83	-1,130.77	1,800.17	14,435,945.641	1,717,017.821	39.750353737	-80.727464297
14,300.00	89.00	149.401	11,621.58	-1,216.83	1,851.06	14,435,859.580	1,717,068.716	39.750116963	-80.727284153
14,400.00	89.00	149.401	11,623.33	-1,302.89	1,901.96	14,435,773.518	1,717,119.611	39.749880188	-80.727104011
14,500.00	89.00	149.401	11,625.08	-1,388.95	1,952.85	14,435,687.457	1,717,170.506	39.749643413	-80.726923870
14,600.00	89.00	149.401	11,626.82	-1,475.02	2,003.75	14,435,601.395	1,717,221.401	39.749406637	-80.726743730
14,700.00	89.00	149.401	11,628.57	-1,561.08	2,054.64	14,435,515.333	1,717,272.296	39.749169861	-80.726563592
14,800.00	89.00	149.401	11,630.32	-1,647.14	2,105.54	14,435,429.272	1,717,323.191	39.748933085	-80.726383454
14,900.00	89.00	149.401	11,632.06	-1,733.20	2,156.43	14,435,343.210	1,717,374.087	39.748696309	-80.726203318
15,000.00	89.00	149.401	11,633.81	-1,819.26	2,207.33	14,435,257.149	1,717,424.982	39.748459532	-80.726023184
15,100.00	89.00	149.401	11,635.56	-1,905.32	2,258.22	14,435,171.087	1,717,475.877	39.748222756	-80.725843050
15,200.00	89.00	149.401	11,637.31	-1,991.39	2,309.12	14,435,085.025	1,717,526.772	39.747985978	-80.725662918
15,300.00	89.00	149.401	11,639.05	-2,077.45	2,360.01	14,434,998.964	1,717,577.667	39.747749201	-80.725482787
15,400.00	89.00	149.401	11,640.80	-2,163.51	2,410.91	14,434,912.902	1,717,628.562	39.747512423	-80.725302657
15,500.00	89.00	149.401	11,642.55	-2,249.57	2,461.80	14,434,826.841	1,717,679.457	39.747275645	-80.725122528
15,600.00	89.00	149.401	11,644.29	-2,335.63	2,512.70	14,434,740.779	1,717,730.352	39.747038867	-80.724942401
15,700.00	89.00	149.401	11,646.04	-2,421.70	2,563.60	14,434,654.717	1,717,781.247	39.746802088	-80.724762274
15,800.00	89.00	149.401	11,647.79	-2,507.76	2,614.49	14,434,568.656	1,717,832.142	39.746565309	-80.724582150
15,900.00	89.00	149.401	11,649.53	-2,593.82	2,665.39	14,434,482.594	1,717,883.037	39.746328530	-80.724402026
16,000.00	89.00	149.401	11,651.28	-2,679.88	2,716.28	14,434,396.533	1,717,933.932	39.746091751	-80.724221903
16,100.00	89.00	149.401	11,653.03	-2,765.94	2,767.18	14,434,310.471	1,717,984.828	39.745854971	-80.724041782
16,200.00	89.00	149.401	11,654.78	-2,852.00	2,818.07	14,434,224.410	1,718,035.723	39.745618191	-80.723861662
16,300.00	89.00	149.401	11,656.52	-2,938.07	2,868.97	14,434,138.348	1,718,086.618	39.745381411	-80.723681543
16,400.00	89.00	149.401	11,658.27	-3,024.13	2,919.86	14,434,052.286	1,718,137.513	39.745144630	-80.723501426
16,500.00	89.00	149.401	11,660.02	-3,110.19	2,970.76	14,433,966.225	1,718,188.408	39.744907849	-80.723321309
16,600.00	89.00	149.401	11,661.76	-3,196.25	3,021.65	14,433,880.163	1,718,239.303	39.744671068	-80.723141194
16,700.00	89.00	149.401	11,663.51	-3,282.31	3,072.55	14,433,794.102	1,718,290.198	39.744434287	-80.722961080
16,800.00	89.00	149.401	11,665.26	-3,368.37	3,123.44	14,433,708.040	1,718,341.093	39.744197505	-80.722780968
16,900.00	89.00	149.401	11,667.01	-3,454.44	3,174.34	14,433,621.978	1,718,391.988	39.743960723	-80.722600856
17,000.00	89.00	149.401	11,668.75	-3,540.50	3,225.23	14,433,535.917	1,718,442.883	39.743723941	-80.722420748
17,100.00	89.00	149.401	11,670.50	-3,626.56	3,276.13	14,433,449.855	1,718,493.778	39.743487158	-80.722240637
17,200.00	89.00	149.401	11,672.25	-3,712.62	3,327.02	14,433,363.794	1,718,544.673	39.743250375	-80.722060529
17,300.00	89.00	149.401	11,673.99	-3,798.68	3,377.92	14,433,277.732	1,718,595.569	39.743013592	-80.721880423
17,400.00	89.00	149.401	11,675.74	-3,884.75	3,428.81	14,433,191.670	1,718,646.464	39.742776809	-80.721700317
17,500.00	89.00	149.401	11,677.49	-3,970.81	3,479.71	14,433,105.609	1,718,697.359	39.742540025	-80.721520213
17,600.00	89.00	149.401	11,679.24	-4,056.87	3,530.60	14,433,019.547	1,718,748.254	39.742303241	-80.721340110
17,700.00	89.00	149.401	11,680.98	-4,142.93	3,581.50	14,432,933.486	1,718,799.149	39.742066457	-80.721160009
17,800.00	89.00	149.401	11,682.73	-4,228.99	3,632.39	14,432,847.424	1,718,850.044	39.741829672	-80.720979909
17,900.00	89.00	149.401	11,684.48	-4,315.05	3,683.29	14,432,761.363	1,718,900.939	39.741592887	-80.720799809
18,000.00	89.00	149.401	11,686.22	-4,401.12	3,734.18	14,432,675.301	1,718,951.834	39.741356102	-80.720619711
18,100.00	89.00	149.401	11,687.97	-4,487.18	3,785.08	14,432,589.239	1,719,002.729	39.741119317	-80.720439615
18,200.00	89.00	149.401	11,689.72	-4,573.24	3,835.97	14,432,503.178	1,719,053.624	39.740882531	-80.720259519
18,300.00	89.00	149.401	11,691.46	-4,659.30	3,886.87	14,432,417.116	1,719,104.519	39.740645745	-80.720079425
18,400.00	89.00	149.401	11,693.21	-4,745.36	3,937.77	14,432,331.054	1,719,155.414	39.740408959	-80.719899332
18,500.00	89.00	149.401	11,694.96	-4,831.42	3,988.66	14,432,244.992	1,719,206.310	39.740172172	-80.719719240
18,600.00	89.00	149.401	11,696.71	-4,917.49	4,039.56	14,432,158.930	1,719,257.205	39.739935386	-80.719539150



Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Pendleton S-14 HU (slot E)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1272.00ft
Project:	Marshall County, West Virginia NAD83 UTM 17N	MD Reference:	GL @ 1272.00ft
Site:	Pendleton	North Reference:	Grid
Well:	Pendleton S-14 HU (slot E)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
18,700.00	89.00	149.401	11,698.45	-5,003.55	4,090.45	14,432,072.869	1,719,308.100	39.739698598	-80.719359061
18,800.00	89.00	149.401	11,700.20	-5,089.61	4,141.35	14,431,986.807	1,719,358.995	39.739461811	-80.719178973
18,900.00	89.00	149.401	11,701.95	-5,175.67	4,192.24	14,431,900.746	1,719,409.890	39.739225023	-80.718998886
19,000.00	89.00	149.401	11,703.69	-5,261.73	4,243.14	14,431,814.684	1,719,460.785	39.738988235	-80.718818800
19,100.00	89.00	149.401	11,705.44	-5,347.80	4,294.03	14,431,728.622	1,719,511.680	39.738751447	-80.718638716
19,200.00	89.00	149.401	11,707.19	-5,433.86	4,344.93	14,431,642.561	1,719,562.575	39.738514659	-80.718458633
19,300.00	89.00	149.401	11,708.94	-5,519.92	4,395.82	14,431,556.499	1,719,613.470	39.738277870	-80.718278551
19,400.00	89.00	149.401	11,710.68	-5,605.98	4,446.72	14,431,470.438	1,719,664.365	39.738041081	-80.718098470
19,500.00	89.00	149.401	11,712.43	-5,692.04	4,497.61	14,431,384.376	1,719,715.260	39.737804291	-80.717918390
19,600.00	89.00	149.401	11,714.18	-5,778.10	4,548.51	14,431,298.314	1,719,766.155	39.737567501	-80.717738312
19,700.00	89.00	149.401	11,715.92	-5,864.17	4,599.40	14,431,212.253	1,719,817.051	39.737330712	-80.717558235
19,800.00	89.00	149.401	11,717.67	-5,950.23	4,650.30	14,431,126.191	1,719,867.946	39.737093921	-80.717378159
19,900.00	89.00	149.401	11,719.42	-6,036.29	4,701.19	14,431,040.130	1,719,918.841	39.736857131	-80.717198085
20,000.00	89.00	149.401	11,721.16	-6,122.35	4,752.09	14,430,954.068	1,719,969.736	39.736620340	-80.717018012
20,100.00	89.00	149.401	11,722.91	-6,208.41	4,802.98	14,430,868.007	1,720,020.631	39.736383549	-80.716837939
20,200.00	89.00	149.401	11,724.66	-6,294.47	4,853.88	14,430,781.945	1,720,071.526	39.736146757	-80.716657869
20,300.00	89.00	149.401	11,726.41	-6,380.54	4,904.77	14,430,695.883	1,720,122.421	39.735909966	-80.716477799
20,400.00	89.00	149.401	11,728.15	-6,466.60	4,955.67	14,430,609.822	1,720,173.316	39.735673174	-80.716297731
20,500.00	89.00	149.401	11,729.90	-6,552.66	5,006.56	14,430,523.760	1,720,224.211	39.735436381	-80.716117663
20,600.00	89.00	149.401	11,731.65	-6,638.72	5,057.46	14,430,437.699	1,720,275.106	39.735199589	-80.715937597
20,700.00	89.00	149.401	11,733.39	-6,724.78	5,108.35	14,430,351.637	1,720,326.001	39.734962796	-80.715757533
20,800.00	89.00	149.401	11,735.14	-6,810.85	5,159.25	14,430,265.575	1,720,376.896	39.734726003	-80.715577469
20,900.00	89.00	149.401	11,736.89	-6,896.91	5,210.15	14,430,179.514	1,720,427.792	39.734489210	-80.715397407
21,000.00	89.00	149.401	11,738.64	-6,982.97	5,261.04	14,430,093.452	1,720,478.687	39.734252416	-80.715217346
21,072.39	89.00	149.401	11,739.90	-7,045.27	5,297.88	14,430,031.152	1,720,515.530	39.734081000	-80.715087000

PBHL/TD 21072.39 MD 11739.90 TVD

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Pendleton S-14HU LP 5i - hit/miss target - Shape	0.00	0.000	11,584.00	634.17	756.42	14,437,710.580	1,715,974.076	39.755209413	-80.731158910
- plan misses target center by 0.01ft at 12149.22ft MD (11584.01 TVD, 634.17 N, 756.42 E)									
- Point									
Pendleton S-14HU PBH - plan hits target center - Point	0.00	0.000	11,739.90	-7,045.27	5,297.88	14,430,031.152	1,720,515.530	39.734081000	-80.715087000

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,100.00	3,100.00	0.00	0.00	KOP Begin 2°/100' build
3,350.00	3,349.68	10.71	2.01	Begin 5.00° tangent
7,014.26	7,000.00	324.61	60.87	Begin 2°/100' build
7,509.93	7,487.60	408.93	75.52	Begin 14.91° tangent
10,642.07	10,514.25	1,203.67	209.92	Begin 6°/100' build/turn
11,653.20	11,413.38	1,011.17	501.25	Begin 8°/100' build/turn
12,149.22	11,584.01	634.17	756.42	Begin 89.00° lateral
21,072.39	11,739.90	-7,045.27	5,297.88	PBHL/TD 21072.39 MD 11739.90 TVD

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