

SOUTHWESTERN ENERGY

Location: Brooke County, WV
 Field: Brooke
 Facility: Samuel Jones BRK Pad

Slot: Slot 3H
 Well: Samuel Jones BRK 3H
 Wellbore: Samuel Jones BRK 3H PWB



API: 47-009-00268-0000
 BH Job #: 109858322
 Rig: SDC 42
 Duration: 6/23/2019 - 6/26/19

Projected MD at TD: 12,959' : 6056.06ft TVD, 5924.08ft N, 2509.00ft W

Premier MWD <17-1/2">(151'-303') : 0.22" Inc, 151.00ft MD, 151.00ft TVD, 0.24ft VS
 Premier MWD <12-1/4">(400'-1762') : 0.30" Inc, 400.00ft MD, 400.00ft TVD, 1.11ft VS

Plot reference wellpath is Samuel Jones BRK 3H PWB Rev-E-0	Grid System: NAD83 / UTM Zone 17 North, US feet
True vertical depths are referenced to SDC 42 (KB)	North Reference: Grid north
Measured depths are referenced to SDC 42 (KB)	Scale: True distance
SDC 42 (KB) to Mean Sea Level: 1230.2 feet	Depths are in feet
Mean Sea Level to Ground level (At Slot, Slot 3H): -1204.2 feet	Created by: hiphop on 2019-07-01
Coordinates are in feet referenced to Slot	Database: WA_WPL_EASTERNUS_Data

Premier MWD <8-3/4">(1849'-6094') : 4.85" Inc, 1849.00ft MD, 1846.21ft TVD, -63.65ft VS

Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Samuel Jones BRK Pad	1762985.776	14596395.998	40°11'25.698"N	80°33'40.002"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)
Slot 3H	30.19	7.84	1762993.617	14596426.181
SDC 42 (KB) to Ground level (At Slot, Slot 3H)			26ft	
Mean Sea Level to Ground level (At Slot, Slot 3H)			-1204.2ft	
SDC 42 (KB) to Mean Sea Level			1230.2ft	

Well Profile Data

Design Comment	MD (ft)	Inc (")	Az (")	TVD (ft)	Local N (ft)	Local E (ft)	D.L.S. (°/100ft)	VS (ft)
On	6094.00	46.790	340.150	5971.58	-370.63	104.66	9.55	-382.10
Proj. to Bottom	6153.00	52.410	340.000	6009.81	-328.41	89.35	9.53	-337.25
End of 3D Arc	6387.61	82.761	330.429	6098.39	-134.93	-2.20	13.46	-123.39
End of 3D Arc	6465.42	90.457	337.548	6103.00	-65.21	-36.20	13.46	-45.92
End of Tangent	12951.43	90.457	337.548	6051.27	5928.96	-2513.19	0.00	6439.62

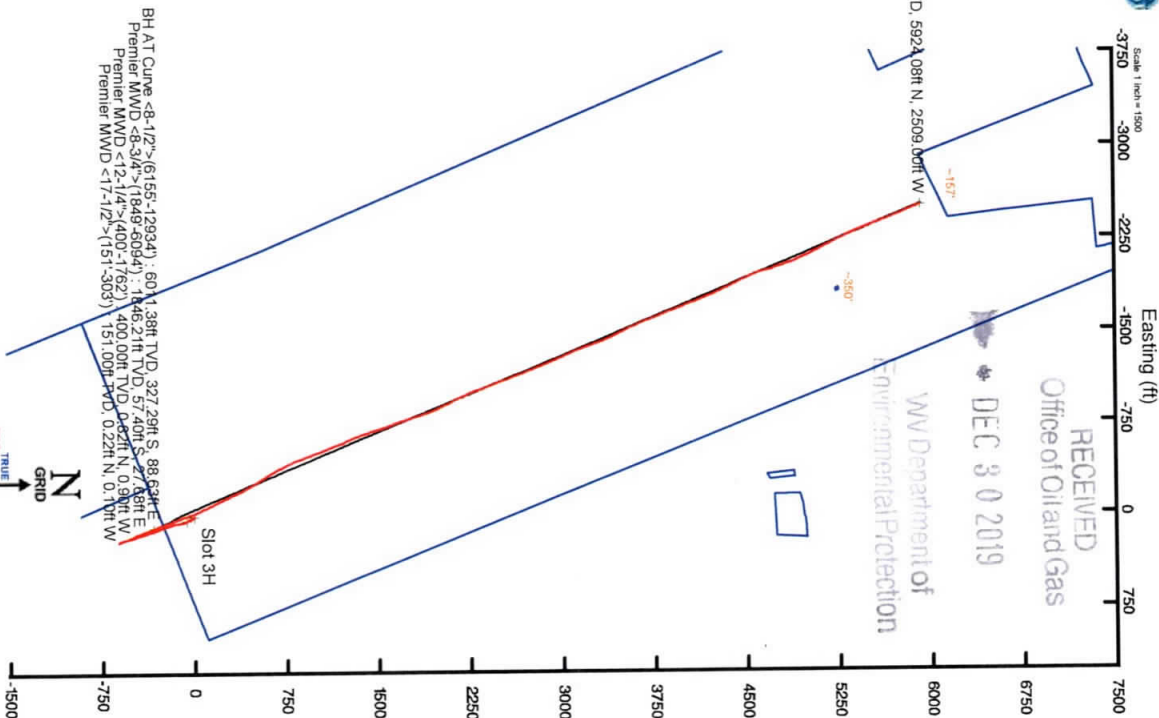
BH AT Curve <8-1/2">(6155'-12934') : 51.74" Inc, 6155.00ft MD, 6011.38ft TVD, -335.94ft VS

Projected MD at TD: 12,959' : 90.40" Inc, 12959.00ft MD, 6056.06ft TVD, 6433.49ft VS

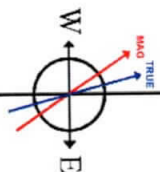
Vertical Section (ft)
 Azimuth 337.04° with reference 0.00 N, 0.00 E

Scale 1 inch = 1250

North (ft)



BH AT Curve <8-1/2">(6155'-12934') : 6011.38ft TVD, 327.29ft S, 88.62ft E
 Premier MWD <8-3/4">(1849'-6094') : 1846.21ft TVD, 57.40ft S, 27.68ft E
 Premier MWD <12-1/4">(400'-1762') : 400.00ft TVD, 0.22ft N, 0.9ft W
 Premier MWD <17-1/2">(151'-303') : 151.00ft TVD, 0.22ft N, 0.1ft W



User specified (HDGM) Dip: 67.50° Field: 52555 nT
 Magnetic North is 8.33 degrees West of True North (at 23/Jun/2019)
 Grid North is 0.28 degrees East of True North
 To correct azimuth from True to Grid subtract 0.28 degrees
 To correct azimuth from Magnetic to Grid subtract 8.61 degrees

Actual Wellpath Report

Samuel Jones BRK 3H AWP Proj: 12959'
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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 3H
Area	Brooke County, WV	Well	Samuel Jones BRK 3H
Field	Brooke	Wellbore	Samuel Jones BRK 3H AWB
Facility	Samuel Jones BRK Pad		

REPORT SETUP INFORMATION			
Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect@ 5.1
North Reference	Grid	User	Hilphop
Scale	0.999617	Report Generated	01/Jul/2019 at 16:50
Convergence at slot	0.28° East	Database/Source file	WA_MPL_EASTERNUUS_Defn/Samuel_Jones_BRK_3H_AWP_Proj_12959_.xml

WELLPATH LOCATION	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	30.19	7.84	1762993.62	14596426.18	40°11'25.996"N	80°33'39.899"W
Facility Reference Pt			1762985.78	14596396.00	40°11'25.698"N	80°33'40.002"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

WELLPATH DATUM			
Calculation method	Minimum curvature	SDC 42 (KB) to Facility Vertical Datum	1230.20ft
Horizontal Reference Pt	Slot	SDC 42 (KB) to Mean Sea Level	1230.20ft
Vertical Reference Pt	SDC 42 (KB)	SDC 42 (KB) to Ground Level at Slot (Slot 3H)	26.00ft
MD Reference Pt	SDC 42 (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	337.04°

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Area	Brooke County, WV	Well	Samuel Jones BRK 3H
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Facility	Samuel Jones BRK Pad		

WELLPATH DATA (140 stations) + = interpolated/extrapolated station

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(US ft)	(US ft)			(ft)	(°)	(%/100ft)	(%/100ft)	(%/100ft)
0.00+	0.000	334.640	0.00	0.00	0.00	0.00	1762993.62	14596426.18	40°11'25.996"N	80°33'39.899"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	334.640	26.00	0.00	0.00	0.00	1762993.62	14596426.18	40°11'25.996"N	80°33'39.899"W	0.00	0.000	0.00	0.00	0.00
151.00	0.220	334.640	151.00	0.24	0.22	-0.10	1762993.51	14596426.40	40°11'25.998"N	80°33'39.900"W	0.24	334.640	0.18	0.18	-20.29
212.00	0.270	294.940	212.00	0.46	0.38	-0.28	1762993.33	14596426.56	40°11'26.000"N	80°33'39.903"W	0.48	323.534	0.28	0.08	-65.08
303.00	0.180	307.790	303.00	0.75	0.56	-0.59	1762993.03	14596426.74	40°11'26.002"N	80°33'39.907"W	0.81	313.540	0.11	-0.10	14.12
400.00	0.300	311.440	400.00	1.11	0.82	-0.90	1762992.72	14596427.00	40°11'26.004"N	80°33'39.911"W	1.22	312.386	0.12	0.12	3.76
430.00	0.310	308.100	430.00	1.25	0.92	-1.02	1762992.59	14596427.11	40°11'26.005"N	80°33'39.912"W	1.38	312.081	0.07	0.03	-11.13
521.00	0.450	297.830	521.00	1.74	1.24	-1.53	1762992.08	14596427.42	40°11'26.008"N	80°33'39.919"W	1.97	309.031	0.17	0.15	-11.29
616.00	0.700	300.620	615.99	2.50	1.71	-2.36	1762991.25	14596427.89	40°11'26.013"N	80°33'39.929"W	2.92	305.941	0.26	0.26	2.94
711.00	1.050	294.670	710.98	3.61	2.37	-3.65	1762989.96	14596428.55	40°11'26.020"N	80°33'39.946"W	4.36	302.994	0.38	0.37	-6.26
806.00	0.280	291.210	805.97	4.41	2.82	-4.66	1762988.96	14596429.00	40°11'26.024"N	80°33'39.959"W	5.45	301.170	0.81	-0.81	-3.64
901.00	0.260	104.760	900.97	4.44	2.85	-4.67	1762988.95	14596429.03	40°11'26.024"N	80°33'39.959"W	5.47	301.387	0.57	-0.02	182.68
997.00	1.830	128.870	996.95	2.96	1.83	-3.26	1762990.35	14596428.01	40°11'26.014"N	80°33'39.941"W	3.74	299.285	1.66	1.64	25.11
1092.00	3.790	140.390	1091.83	-1.39	-1.54	-0.08	1762993.54	14596424.64	40°11'25.981"N	80°33'39.900"W	1.54	183.038	2.14	2.06	12.13
1188.00	5.360	146.600	1187.53	-8.84	-7.73	4.41	1762998.03	14596418.46	40°11'25.919"N	80°33'39.843"W	8.90	150.291	1.71	1.64	6.47
1284.00	5.450	151.110	1283.10	-17.78	-15.46	9.08	1763002.69	14596410.72	40°11'25.843"N	80°33'39.783"W	17.93	149.577	0.45	0.09	4.70
1379.00	4.830	158.100	1377.72	-26.27	-23.12	12.75	1763006.36	14596403.07	40°11'25.767"N	80°33'39.736"W	26.41	151.125	0.93	-0.65	7.36
1474.00	5.170	162.510	1472.36	-34.53	-30.92	15.53	1763009.14	14596396.28	40°11'25.690"N	80°33'39.701"W	34.60	153.329	0.54	0.36	4.64
1570.00	4.400	159.780	1568.02	-42.51	-38.50	18.10	1763011.71	14596387.70	40°11'25.615"N	80°33'39.668"W	42.54	154.816	0.84	-0.80	-2.84
1666.00	4.010	154.810	1663.76	-49.54	-44.99	20.80	1763014.41	14596381.21	40°11'25.560"N	80°33'39.634"W	49.57	155.184	0.56	-0.41	-5.18
1762.00	4.490	150.740	1759.50	-56.63	-51.31	24.07	1763017.68	14596374.89	40°11'25.488"N	80°33'39.592"W	56.67	154.867	0.59	0.50	-4.24
1849.00	4.850	148.020	1846.21	-63.65	-57.40	27.68	1763021.29	14596368.81	40°11'25.427"N	80°33'39.546"W	63.72	154.983	0.49	0.41	-3.13
1940.00	4.560	146.640	1936.90	-71.01	-63.68	31.71	1763025.31	14596362.52	40°11'25.385"N	80°33'39.494"W	71.14	153.530	0.34	-0.32	-1.52
2036.00	4.590	170.540	2032.61	-78.50	-70.66	34.44	1763028.04	14596355.55	40°11'25.266"N	80°33'39.460"W	78.61	154.016	1.97	0.03	24.90
2132.00	6.320	165.810	2128.17	-87.45	-79.57	36.37	1763029.97	14596346.64	40°11'25.208"N	80°33'39.435"W	87.49	155.439	1.86	1.80	-4.93
2228.00	8.240	163.980	2223.39	-99.51	-91.31	39.56	1763033.16	14596334.91	40°11'25.092"N	80°33'39.395"W	99.51	156.575	2.01	2.00	-1.91
2325.00	9.530	169.780	2319.23	-114.24	-105.89	42.90	1763036.50	14596320.33	40°11'24.947"N	80°33'39.353"W	114.25	157.944	1.62	1.33	5.98
2421.00	8.890	164.970	2413.99	-129.34	-120.88	46.24	1763039.84	14596305.35	40°11'24.799"N	80°33'39.311"W	129.42	159.068	1.04	-0.67	-5.01
2516.00	10.150	173.470	2507.68	-144.64	-136.28	49.09	1763042.69	14596289.95	40°11'24.647"N	80°33'39.275"W	144.86	160.190	1.98	1.33	8.95
2612.00	9.430	167.950	2602.29	-160.47	-152.38	51.70	1763045.29	14596273.86	40°11'24.488"N	80°33'39.243"W	160.91	161.260	1.23	-0.75	-5.75

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Samuel Jones BRK 3H AWP Proj.: 12959'

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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 3H
Area	Brooke County, WV	Well	Samuel Jones BRK 3H
Field	Brooke	Wellbore	Samuel Jones BRK 3H AWB
Facility	Samuel Jones BRK Pad		

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WELLPATH DATA (140 stations)

MD (ft)	Inclination °	Azimuth °	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir °	DLS °/100ft	Build Rate °/100ft	Turn Rate °/100ft
2707.00	10.920	166.300	2695.79	-177.00	-168.73	55.45	1763049.05	14596257.51	40°11'24.326"N	80°33'39.195"W	177.61	161.808	1.60	1.57	-1.74
2803.00	10.270	160.320	2790.16	-194.52	-185.63	60.49	1763054.08	14596240.63	40°11'24.159"N	80°33'39.131"W	195.23	161.951	1.33	-0.68	-6.23
2899.00	10.490	163.640	2884.59	-211.74	-202.07	65.83	1763059.42	14596224.19	40°11'23.996"N	80°33'39.064"W	212.52	161.955	0.66	0.23	3.46
2995.00	9.700	155.960	2979.10	-228.51	-217.84	71.59	1763065.18	14596208.42	40°11'23.840"N	80°33'38.990"W	229.30	161.808	1.62	-0.82	-8.00
3090.00	10.720	161.630	3072.60	-245.32	-233.54	77.63	1763071.22	14596192.73	40°11'23.684"N	80°33'38.914"W	246.10	161.612	1.51	1.07	5.97
3166.00	11.660	166.670	3166.78	-263.79	-251.45	82.68	1763076.27	14596174.83	40°11'23.507"N	80°33'38.850"W	264.70	161.798	1.41	0.98	5.25
3282.00	10.980	161.250	3260.91	-282.47	-269.55	87.86	1763081.44	14596156.74	40°11'23.328"N	80°33'38.784"W	283.51	161.947	1.31	-0.71	-5.65
3378.00	10.280	155.810	3355.27	-300.15	-286.02	94.31	1763087.89	14596140.27	40°11'23.165"N	80°33'38.702"W	301.17	161.751	1.27	-0.73	-5.67
3474.00	9.980	162.330	3449.77	-317.00	-301.76	100.34	1763093.92	14596124.54	40°11'23.009"N	80°33'38.625"W	318.01	161.607	1.23	-0.31	6.79
3570.00	10.850	162.620	3544.19	-334.27	-318.31	105.57	1763099.14	14596107.99	40°11'22.845"N	80°33'38.559"W	335.36	161.652	0.91	0.91	0.30
3666.00	9.460	155.550	3638.69	-351.16	-334.12	111.53	1763105.11	14596092.19	40°11'22.689"N	80°33'38.483"W	352.24	161.540	1.94	-1.45	-7.36
3762.00	9.800	162.110	3733.34	-367.18	-349.07	117.31	1763110.88	14596077.24	40°11'22.541"N	80°33'38.410"W	368.26	161.425	1.20	0.35	6.83
3859.00	9.970	162.990	3828.90	-383.76	-364.96	122.30	1763115.87	14596061.36	40°11'22.384"N	80°33'38.346"W	384.91	161.474	0.23	0.18	0.91
3955.00	10.550	161.690	3923.36	-400.78	-381.25	127.49	1763121.06	14596045.08	40°11'22.222"N	80°33'38.281"W	402.00	161.510	0.65	0.60	-1.35
4050.00	10.400	160.600	4016.78	-418.01	-397.60	133.07	1763126.64	14596028.74	40°11'22.061"N	80°33'38.210"W	419.27	161.495	0.26	-0.16	-1.15
4146.00	10.390	165.600	4111.21	-435.22	-414.15	138.10	1763131.67	14596012.19	40°11'21.897"N	80°33'38.146"W	436.57	161.558	0.94	-0.01	5.21
4242.00	11.170	167.330	4205.51	-452.93	-431.61	142.30	1763135.86	14595994.74	40°11'21.724"N	80°33'38.093"W	454.46	161.753	0.88	0.81	1.80
4338.00	11.520	164.030	4299.64	-471.59	-449.90	146.97	1763140.53	14595976.46	40°11'21.543"N	80°33'38.034"W	473.30	161.909	0.77	0.36	-3.44
4433.00	10.000	158.210	4392.97	-489.25	-466.68	152.65	1763146.20	14595959.68	40°11'21.377"N	80°33'37.962"W	491.01	161.888	1.96	-1.60	-6.13
4529.00	10.610	163.930	4487.42	-506.36	-482.91	158.19	1763151.74	14595943.46	40°11'21.216"N	80°33'37.892"W	508.16	161.863	1.24	0.64	5.96
4625.00	9.100	160.150	4582.00	-522.72	-498.55	163.21	1763156.77	14595927.83	40°11'21.061"N	80°33'37.828"W	524.58	161.873	1.71	-1.57	-3.94
4721.00	10.210	167.220	4676.64	-538.67	-513.99	167.67	1763161.22	14595912.39	40°11'20.909"N	80°33'37.771"W	540.64	161.933	1.69	1.16	7.36
4817.00	11.570	166.590	4770.91	-556.54	-531.65	171.79	1763165.34	14595894.74	40°11'20.734"N	80°33'37.719"W	558.71	162.093	1.42	1.42	-0.66
4913.00	12.850	163.550	4864.74	-576.64	-551.25	177.04	1763170.04	14595875.14	40°11'20.540"N	80°33'37.653"W	578.98	162.195	1.49	1.33	-3.17
5010.00	12.010	160.320	4959.47	-597.44	-571.10	183.50	1763177.05	14595855.30	40°11'20.343"N	80°33'37.571"W	599.86	162.188	1.12	-0.87	-3.33
5106.00	8.950	155.240	5053.86	-614.88	-587.29	189.99	1763183.53	14595839.12	40°11'20.183"N	80°33'37.488"W	617.26	162.074	3.33	-3.19	-5.29
5202.00	7.490	151.690	5148.87	-628.57	-599.58	196.08	1763189.63	14595826.83	40°11'20.061"N	80°33'37.411"W	630.83	161.890	1.61	-1.52	-3.70
5298.00	5.180	154.090	5244.27	-639.13	-608.99	200.95	1763194.48	14595817.43	40°11'19.968"N	80°33'37.349"W	641.28	161.739	2.42	-2.41	2.50
5394.00	2.340	320.220	5340.17	-641.58	-611.38	201.59	1763195.13	14595815.03	40°11'19.945"N	80°33'37.341"W	643.76	161.752	7.78	-2.96	173.05
5491.00	7.790	331.710	5436.76	-633.14	-604.07	197.20	1763190.74	14595822.35	40°11'20.017"N	80°33'37.397"W	635.44	161.921	5.69	5.62	11.85



Southwestern Energy

Actual Wellpath Report

Samuel Jones BRK 3H AWP Proj.: 12959'

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Field	Brooke	Wellbore	Samuel Jones BRK 3H AWB
Facility	Samuel Jones BRK Pad		

WELLPATH DATA (140 stations)

MD (ft)	Inclination [°]	Azimuth [°]	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
5585.00	12.340	341.150	5529.30	-616.77	-588.94	190.93	1763184.48	14595837.46	40°11'20.167"N	80°33'37.476"W	619.12	162.038	5.13	4.84	10.04
5680.00	16.150	342.400	5621.36	-593.48	-566.73	183.65	1763177.20	14595859.67	40°11'20.387"N	80°33'37.569"W	595.75	162.045	4.02	4.01	1.32
5776.00	22.770	337.680	5711.83	-561.57	-536.79	172.55	1763166.10	14595889.60	40°11'20.683"N	80°33'37.710"W	563.84	162.180	7.08	6.90	-4.92
5870.00	29.830	335.860	5796.05	-519.95	-498.58	156.06	1763149.61	14595927.80	40°11'21.062"N	80°33'37.920"W	522.43	162.620	7.56	7.51	-1.94
5967.00	37.240	337.290	5876.85	-466.41	-449.42	134.83	1763128.40	14595976.94	40°11'21.548"N	80°33'38.190"W	469.21	163.300	7.68	7.64	1.47
6062.00	43.740	339.900	5949.06	-404.79	-391.99	112.42	1763105.99	14596034.34	40°11'22.117"N	80°33'38.475"W	407.80	163.997	7.07	6.84	2.75
6094.00	46.790	340.150	5971.58	-382.10	-370.63	104.66	1763098.23	14596055.69	40°11'22.328"N	80°33'38.574"W	385.12	164.232	9.55	9.53	0.78
6155.00	51.740	339.290	6011.38	-335.94	-327.29	88.63	1763082.21	14596099.01	40°11'22.757"N	80°33'38.778"W	339.08	164.848	8.18	8.11	-1.41
6251.00	62.460	339.510	6063.45	-255.52	-251.95	60.32	1763053.91	14596174.33	40°11'23.503"N	80°33'39.138"W	259.07	166.536	11.17	11.17	0.23
6348.00	74.680	341.000	6098.82	-165.55	-167.11	29.92	1763023.53	14596259.13	40°11'24.343"N	80°33'39.524"W	169.77	169.849	12.68	12.60	1.54
6443.00	89.480	340.850	6111.87	-71.93	-78.43	-0.75	1762992.87	14596347.78	40°11'25.221"N	80°33'39.914"W	78.44	180.545	15.58	15.58	-0.16
6539.00	92.830	338.570	6109.94	23.93	11.57	-34.02	1762959.61	14596437.75	40°11'26.112"N	80°33'40.337"W	35.94	288.787	4.22	3.49	-2.38
6635.00	90.990	334.330	6106.74	119.84	99.50	-72.35	1762921.30	14596525.65	40°11'26.983"N	80°33'40.825"W	123.03	323.980	4.81	-1.92	-4.42
6732.00	90.860	334.040	6105.17	216.71	186.81	-114.58	1762879.08	14596612.92	40°11'27.848"N	80°33'41.364"W	219.15	328.477	0.33	-0.13	-0.30
6827.00	90.920	336.910	6103.70	311.65	273.22	-154.01	1762839.67	14596699.30	40°11'28.703"N	80°33'41.866"W	313.64	330.591	3.02	0.06	3.02
6922.00	90.890	334.480	6102.20	406.61	359.78	-193.10	1762800.59	14596785.83	40°11'29.561"N	80°33'42.364"W	408.33	331.777	2.56	-0.03	-2.56
7017.00	90.770	330.360	6100.82	501.27	443.96	-237.07	1762756.64	14596869.97	40°11'30.395"N	80°33'42.926"W	503.29	331.898	4.34	-0.13	-4.34
7112.00	90.460	327.900	6099.80	595.35	525.49	-285.81	1762707.92	14596951.47	40°11'31.203"N	80°33'43.548"W	598.19	331.459	2.61	-0.33	-2.59
7207.00	90.370	329.100	6099.11	689.29	606.49	-335.44	1762658.30	14597032.44	40°11'32.006"N	80°33'44.183"W	693.07	331.054	1.27	-0.09	1.26
7301.00	90.250	331.510	6098.60	782.64	688.14	-382.00	1762611.76	14597114.05	40°11'32.815"N	80°33'44.778"W	787.06	330.964	2.57	-0.13	2.56
7396.00	90.310	334.860	6098.14	877.41	772.91	-424.85	1762568.93	14597198.79	40°11'33.655"N	80°33'45.324"W	881.98	331.803	3.53	0.25	3.53
7492.00	90.550	340.380	6097.42	973.36	861.64	-461.39	1762532.40	14597287.49	40°11'34.533"N	80°33'45.790"W	977.40	331.832	5.76	0.25	5.75
7588.00	90.430	339.560	6096.60	1069.23	951.83	-494.27	1762499.54	14597377.65	40°11'35.426"N	80°33'46.207"W	1072.51	332.558	0.86	-0.12	-0.85
7685.00	90.430	339.170	6095.87	1166.15	1042.61	-528.45	1762465.37	14597468.39	40°11'36.325"N	80°33'46.642"W	1168.88	333.121	0.40	0.00	-0.40
7781.00	90.580	339.410	6095.02	1262.07	1132.40	-568.34	1762431.43	14597558.14	40°11'37.214"N	80°33'47.074"W	1264.37	333.589	0.29	0.16	0.25
7878.00	90.520	337.090	6094.04	1359.04	1222.48	-598.34	1762395.51	14597648.19	40°11'38.106"N	80°33'47.531"W	1361.06	333.921	2.39	-0.06	-2.39
7974.00	90.250	336.890	6093.45	1455.04	1310.84	-635.87	1762358.00	14597736.52	40°11'38.981"N	80°33'48.009"W	1456.93	334.123	0.35	-0.28	-0.21
8070.00	90.370	342.720	6092.93	1550.88	1400.90	-668.99	1762324.88	14597826.54	40°11'39.872"N	80°33'48.430"W	1552.44	334.473	6.07	0.13	6.07
8166.00	90.620	342.840	6092.10	1646.40	1492.59	-697.41	1762286.47	14597918.20	40°11'40.780"N	80°33'48.791"W	1647.49	334.956	0.29	0.26	0.12
8261.00	90.280	339.870	6091.35	1741.11	1582.59	-727.78	1762256.12	14598008.17	40°11'41.670"N	80°33'49.176"W	1741.91	335.304	3.15	-0.36	-3.13

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Actual Wellpath Report

Samuel Jones BRK 3H AWP Proj: 12959'

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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 3H
Area	Brooke County, WV	Well	Samuel Jones BRK 3H
Field	Brooke	Wellbore	Samuel Jones BRK 3H AWB
Facility	Samuel Jones BRK Pad		

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WELLPATH DATA (140 stations)

MD ft	Inclination °	Azimuth °	TVD ft	Vert Sect ft	North ft	East ft	Grid East US ft	Grid North US ft	Latitude	Longitude	Closure Dist ft	Closure Dir °	DLS °/100ft	Build Rate °/100ft	Turn Rate °/100ft
8358.00	90.340	340.050	6090.82	1837.99	1673.72	-761.02	1762232.89	14598099.26	40°11'42.573"N	80°33'49.599"W	1838.61	335.549	0.20	0.06	0.19
8453.00	90.340	343.010	6090.26	1932.68	1763.82	-791.11	1762202.81	14598189.32	40°11'43.464"N	80°33'49.981"W	1933.11	335.843	3.12	0.00	3.12
8549.00	90.220	342.710	6089.79	2028.19	1855.55	-819.40	1762174.53	14598321.02	40°11'44.372"N	80°33'50.340"W	2028.42	336.174	0.34	-0.12	-0.31
8646.00	90.800	337.790	6088.93	2125.00	1946.81	-852.17	1762141.78	14598372.24	40°11'45.276"N	80°33'50.756"W	2125.15	336.360	5.11	0.60	-5.07
8743.00	90.370	332.520	6087.94	2221.91	2034.80	-892.91	1762101.05	14598460.20	40°11'46.147"N	80°33'51.276"W	2222.09	336.307	5.45	-0.44	-5.43
8837.00	90.370	333.130	6087.33	2315.65	2118.42	-935.84	1762058.14	14598543.79	40°11'46.976"N	80°33'51.824"W	2315.92	336.166	0.65	0.00	0.65
8933.00	89.940	335.080	6087.07	2411.52	2204.78	-977.76	1762016.23	14598630.11	40°11'47.831"N	80°33'52.358"W	2411.86	336.084	2.08	-0.45	2.03
9029.00	90.310	339.870	6086.86	2507.49	2293.43	-1014.53	1761979.48	14598718.73	40°11'48.709"N	80°33'52.827"W	2507.80	336.137	5.00	0.39	4.99
9125.00	90.490	339.530	6086.19	2603.38	2383.46	-1047.83	1761946.19	14598808.73	40°11'49.600"N	80°33'53.250"W	2603.62	336.268	0.40	0.19	-0.35
9221.00	90.370	338.520	6085.47	2699.32	2473.10	-1082.19	1761911.84	14598898.33	40°11'50.487"N	80°33'53.687"W	2699.51	336.366	1.06	-0.12	-1.05
9316.00	90.340	339.710	6084.88	2794.26	2561.85	-1116.06	1761877.99	14598987.05	40°11'51.366"N	80°33'54.118"W	2794.40	336.460	1.25	-0.03	1.25
9412.00	90.400	338.610	6084.26	2890.19	2651.57	-1150.21	1761843.85	14599076.73	40°11'52.254"N	80°33'54.553"W	2890.29	336.550	1.15	0.06	-1.15
9507.00	90.250	338.280	6083.72	2985.16	2739.92	-1185.11	1761808.96	14599165.05	40°11'53.129"N	80°33'54.997"W	2985.24	336.610	0.38	-0.16	-0.35
9603.00	90.430	338.420	6083.15	3081.13	2829.15	-1220.53	1761773.56	14599254.24	40°11'54.013"N	80°33'55.448"W	3081.20	336.664	0.24	0.19	0.15
9700.00	90.580	336.930	6082.30	3178.12	2918.87	-1257.37	1761736.73	14599343.93	40°11'54.901"N	80°33'55.917"W	3178.18	336.695	1.54	0.15	-1.54
9796.00	90.490	335.620	6081.40	3274.10	3006.75	-1296.00	1761698.12	14599431.78	40°11'55.771"N	80°33'56.409"W	3274.17	336.683	1.37	-0.09	-1.36
9892.00	90.310	336.690	6080.73	3370.09	3094.56	-1334.80	1761659.33	14599519.55	40°11'56.641"N	80°33'56.903"W	3370.16	336.668	1.13	-0.19	1.11
9988.00	90.310	341.480	6080.21	3466.00	3184.20	-1369.06	1761625.08	14599609.16	40°11'57.528"N	80°33'57.339"W	3466.05	336.734	4.99	0.00	4.99
10084.00	90.580	341.430	6079.47	3561.71	3275.22	-1399.60	1761594.56	14599700.14	40°11'58.429"N	80°33'57.727"W	3561.73	336.862	0.29	0.28	-0.05
10180.00	90.680	336.960	6078.41	3657.61	3364.93	-1433.68	1761560.49	14599789.81	40°11'59.317"N	80°33'58.161"W	3657.62	336.923	4.66	0.10	-4.66
10276.00	90.310	333.160	6077.58	3753.53	3451.96	-1474.15	1761520.03	14599876.81	40°12'00.179"N	80°33'58.677"W	3753.55	336.875	3.98	-0.39	-3.96
10371.00	90.430	334.360	6076.97	3848.37	3537.16	-1516.16	1761478.05	14599964.98	40°12'01.023"N	80°33'59.213"W	3848.41	336.798	1.27	0.13	1.26
10467.00	90.370	337.350	6076.30	3944.34	3624.75	-1555.42	1761438.80	14600049.54	40°12'01.891"N	80°33'59.713"W	3944.38	336.775	3.12	-0.06	3.11
10563.00	90.310	338.940	6075.73	4040.32	3713.85	-1591.15	1761403.08	14600138.60	40°12'02.773"N	80°34'00.168"W	4040.35	336.808	1.66	-0.06	1.66
10659.00	90.490	338.620	6075.06	4136.27	3803.34	-1625.90	1761368.34	14600228.05	40°12'03.659"N	80°34'00.610"W	4136.29	336.854	0.38	0.19	-0.33
10756.00	90.370	338.550	6074.33	4233.23	3893.64	-1661.32	1761332.94	14600318.32	40°12'04.553"N	80°34'01.061"W	4233.25	336.893	0.14	-0.12	-0.07
10852.00	90.740	338.940	6073.40	4329.19	3983.10	-1696.12	1761298.15	14600407.75	40°12'05.439"N	80°34'01.504"W	4329.19	336.934	0.56	0.39	0.41
10948.00	90.580	339.140	6072.29	4425.12	4072.74	-1730.45	1761263.83	14600497.36	40°12'06.326"N	80°34'01.941"W	4425.12	336.980	0.27	-0.17	0.21
11045.00	90.680	338.030	6071.23	4522.08	4163.04	-1765.87	1761228.43	14600587.62	40°12'07.220"N	80°34'02.391"W	4522.08	337.014	1.15	0.10	-1.14
11141.00	90.710	336.680	6070.06	4618.07	4251.63	-1802.83	1761191.48	14600676.18	40°12'08.098"N	80°34'02.862"W	4618.07	337.022	1.41	0.03	-1.41



Actual Wellpath Report

Samuel Jones BRK 3H AWP Proj: 12959'

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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 3H
Area	Brooke County, WV	Well	Samuel Jones BRK 3H
Field	Brooke	Wellbore	Samuel Jones BRK 3H AWB
Facility	Samuel Jones BRK Pad		

WELLPATH DATA (140 stations)

MD (ft)	Inclination °	Azimuth °	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir °	DLS °/100ft	Build Rate °/100ft	Turn Rate °/100ft
11238.00	90.680	334.350	6068.88	4715.02	4339.90	-1843.02	1761151.30	14600764.41	40°12'08.972"N	80°34'03.375"W	4715.02	336.991	2.40	-0.03	-2.40
11334.00	90.740	333.910	6067.69	4810.89	4426.27	-1884.91	1761109.44	14600850.75	40°12'09.827"N	80°34'03.909"W	4810.90	336.933	0.46	0.06	-0.46
11431.00	89.940	335.310	6067.12	4907.80	4513.89	-1926.50	1761067.86	14600938.34	40°12'10.695"N	80°34'04.440"W	4907.81	336.888	1.66	-0.82	1.44
11527.00	90.340	341.020	6066.88	5003.74	4602.97	-1962.19	1761032.18	14601027.38	40°12'11.577"N	80°34'04.894"W	5003.75	336.912	5.96	0.42	5.95
11623.00	90.490	344.640	6066.19	5099.23	4694.67	-1990.52	1761003.86	14601119.05	40°12'12.485"N	80°34'05.253"W	5099.23	337.023	3.77	0.16	3.77
11719.00	90.340	342.410	6065.49	5194.61	4786.72	-2017.74	1760976.65	14601211.06	40°12'13.396"N	80°34'05.598"W	5194.61	337.143	2.33	-0.16	-2.32
11815.00	91.080	338.670	6064.30	5290.40	4877.22	-2049.72	1760944.69	14601301.52	40°12'14.291"N	80°34'06.005"W	5290.42	337.205	3.97	0.77	-3.90
11912.00	90.580	335.840	6062.90	5387.38	4966.65	-2087.21	1760907.21	14601390.92	40°12'15.177"N	80°34'06.482"W	5387.40	337.206	2.96	-0.52	-2.92
12008.00	90.740	333.200	6061.79	5483.27	5053.30	-2128.51	1760865.93	14601477.54	40°12'16.035"N	80°34'07.009"W	5483.29	337.159	2.75	0.17	-2.75
12104.00	90.250	333.010	6060.96	5579.04	5138.92	-2171.93	1760822.52	14601563.12	40°12'16.883"N	80°34'07.563"W	5579.05	337.089	0.55	-0.51	-0.20
12201.00	90.370	333.520	6060.44	5675.83	5225.55	-2215.57	1760778.90	14601649.92	40°12'17.741"N	80°34'08.120"W	5675.83	337.024	0.54	0.12	0.53
12297.00	90.370	334.330	6059.82	5771.69	5311.77	-2257.76	1760736.72	14601735.91	40°12'18.596"N	80°34'08.659"W	5771.69	336.972	0.84	0.00	0.84
12393.00	90.310	337.900	6059.25	5867.66	5399.53	-2296.63	1760697.87	14601823.64	40°12'19.465"N	80°34'09.154"W	5867.66	336.958	3.72	-0.06	3.72
12489.00	90.250	338.560	6058.78	5963.63	5488.69	-2332.23	1760662.28	14601912.76	40°12'20.347"N	80°34'09.608"W	5963.64	336.979	0.69	-0.06	0.69
12584.00	90.340	339.140	6058.29	6058.58	5577.29	-2366.51	1760628.02	14602001.32	40°12'21.225"N	80°34'10.044"W	6058.59	337.008	0.62	0.09	0.61
12681.00	90.220	338.950	6057.82	6155.52	5667.87	-2401.20	1760593.34	14602091.87	40°12'22.121"N	80°34'10.485"W	6155.52	337.040	0.23	-0.12	-0.20
12776.00	90.430	337.150	6057.28	6250.50	5755.98	-2436.71	1760557.85	14602179.94	40°12'22.994"N	80°34'10.937"W	6250.50	337.055	1.91	0.22	-1.89
12872.00	90.340	336.090	6056.63	6346.50	5844.09	-2474.80	1760519.77	14602268.02	40°12'23.866"N	80°34'11.423"W	6346.50	337.049	1.11	-0.09	-1.10
12934.00	90.400	337.270	6056.23	6408.49	5901.02	-2499.34	1760495.24	14602324.94	40°12'24.430"N	80°34'11.736"W	6408.49	337.045	1.91	0.10	1.90
12959.00	90.400	337.270	6056.06	6433.49	5924.08	-2509.00	1760485.58	14602347.98	40°12'24.658"N	80°34'11.859"W	6433.49	337.046	0.00	0.00	0.00

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Actual Wellpath Report

Samuel Jones BRK 3H AWP Proj: 12959'
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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 3H
Area	Brooke County, WV	Well	Samuel Jones BRK 3H
Field	Brooke	Wellbore	Samuel Jones BRK 3H AWB
Facility	Samuel Jones BRK Pad		

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HOLE & CASING SECTIONS - Ref Wellbore: Samuel Jones BRK 3H AWB Ref Wellpath: Samuel Jones BRK 3H AWP Proj: 12959'

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
20in Conductor	26.00	100.00	74.00	26.00	100.00	0.00	0.00	0.00	-0.04
17.5in Open Hole	100.00	386.00	286.00	100.00	386.00	0.08	-0.04	0.78	-0.85
13.375in Casing Intermediate	26.00	366.00	340.00	26.00	366.00	0.00	0.00	0.71	-0.78
12.25in Open Hole	386.00	1832.00	1446.00	386.00	1829.27	0.78	-0.85	-56.18	26.93
9.625in Casing Intermediate	26.00	1812.00	1786.00	26.00	1809.34	0.00	0.00	-54.77	26.08
8.75in Open Hole	26.00	1832.00	4321.00	1829.27	6010.14	-56.18	26.93	-328.76	89.18
8.5in Open Hole	6153.00	12959.00	6806.00	6010.14	6056.06	-328.76	89.18	5924.08	-2509.00
5.5in Casing Production	26.00	12959.00	12933.00	26.00	6056.06	0.00	0.00	5924.08	-2509.00

TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Samuel Jones BRK 3H BHL Rev-4	6051.27	5928.96	-2513.19	1760481.39	14602352.86	40°12'24.707"N	80°34'1.912"W	point
Samuel Jones BRK 3H LP Rev-5	6103.00	-65.21	-36.20	1762957.43	14596361.00	40°11'25.353"N	80°33'40.370"W	point

WELLPATH COMPOSITION - Ref Wellbore: Samuel Jones BRK 3H AWB Ref Wellpath: Samuel Jones BRK 3H AWP Proj: 12959'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	303.00	OWSG MWD rev2 + HRGM	01 Premier MWD <17'-1/2">(151'-303')	Samuel Jones BRK 3H AWB
303.00	1762.00	OWSG MWD rev2 + HRGM	02 Premier MWD <12'-1/4">(400'-1762')	Samuel Jones BRK 3H AWB
1762.00	6094.00	OWSG MWD rev2 + HRGM	03 Premier MWD <8'-3/4">(1849'-6094')	Samuel Jones BRK 3H AWB
6094.00	12934.00	BHL AutoTrak Curve (Short)	04 BH AT Curve <8'-1/2">(6155'-12934')	Samuel Jones BRK 3H AWB
12934.00	12959.00	Blind Drilling (std)	Projection to bit	Samuel Jones BRK 3H AWB



Actual Wellpath Report

Samuel Jones BRK 3H AWP Proj: 12959'

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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 3H
Area	Brooke County, WV	Well	Samuel Jones BRK 3H
Field	Brooke	Wellbore	Samuel Jones BRK 3H AWP
Facility	Samuel Jones BRK Pad		

COMMENTS

Wellpath general comments
 API: 47-009-00268-0000
 BH Job #: 109858322
 Rig: SDC 42
 Duration: 6/23/2019 - 6/26/19

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 WV Department of
 Environmental Protection