



# SOUTHWESTERN ENERGY



Location: Marshall County, WV  
Field: Marshall  
Facility: O E Burge MSH Pad

Slot: Slot #501  
Well: O E Burge U MSH 501H  
Wellbore: O E Burge U MSH 501H PWB

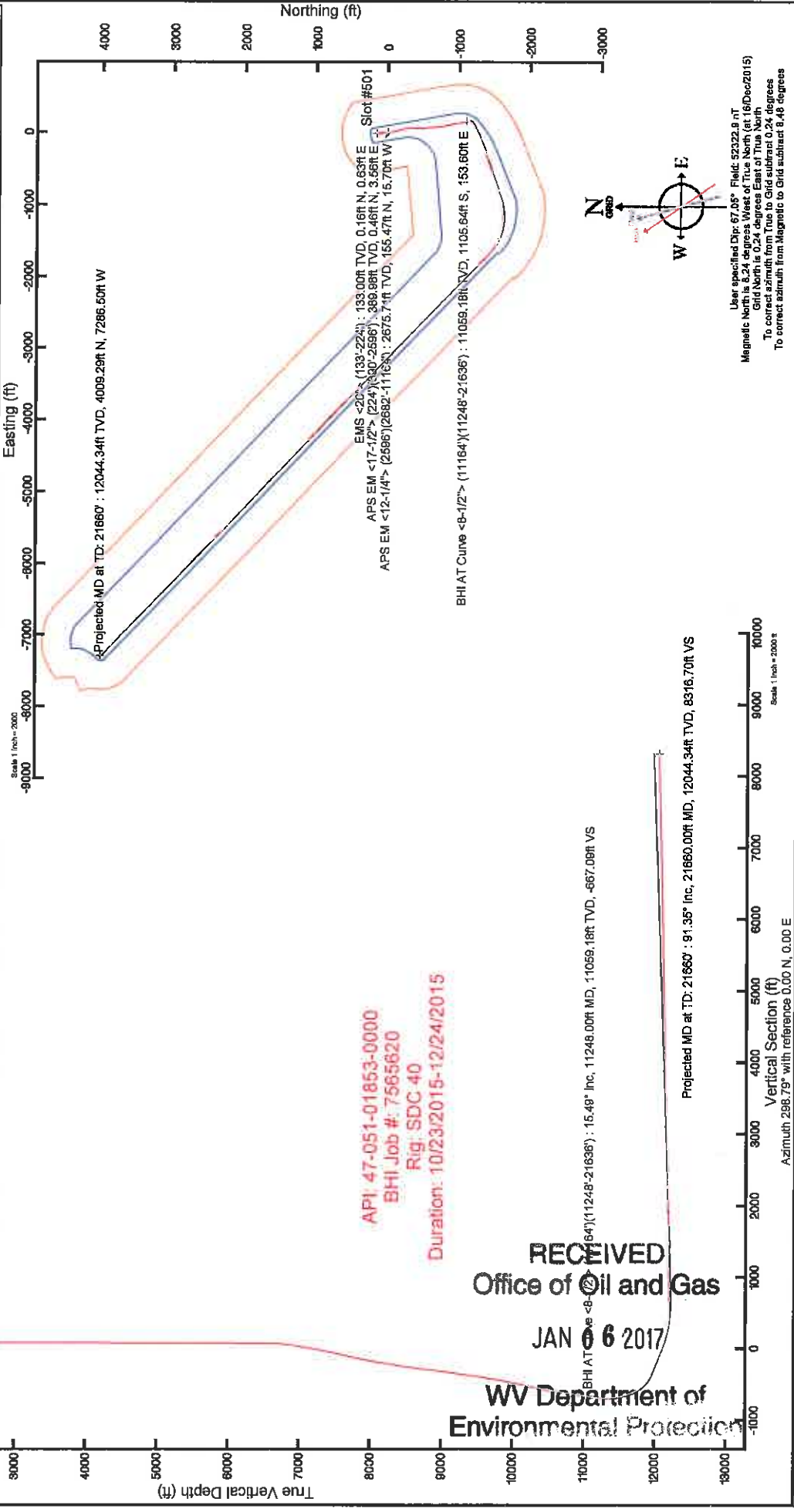


-- EMS <20> (133-224) : 0.73° inc, 133.00ft MD, 133.00ft TVD, -0.48ft VS  
-- APS EM <17-1/2> (224)(390-2596) : 0.68° inc, 390.00ft MD, 399.98ft TVD, -2.90ft VS

-- APS EM <12-1/4> (2596)(2682-1164) : 1.86° inc, 2682.00ft MD, 2675.71ft TVD, 88.68ft VS

Plot reference wellbore is O E Burge U MSH 501H PWB Rev-J-0  
This vertical depths are referenced to SDC 40 (RIKB)  
Measured depths are referenced to SDC 40 (RIKB)  
SDC 40 (RIKB) to Mean Sea Level: 1367.6 feet  
Scale: True distance  
Mean Sea Level to Mud line (At Slot Slot #501): -1341.6 feet  
Depths are in feet  
Coordinates are in feet referenced to Slot  
Created by: abesyan on 07/Jan/2016

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude
O E Burge MSH Pad	1743922.680	14438242.840	39°45'03.262"N
Local N (ft)			80°37'54.257"W
Slot #501	-22.63	51.99	39°45'03.036"N
SDC 40 (RIKB)	1743874.650	14438220.320	26R
Mean Sea Level to Mud line (At Slot Slot #501)			-1341.6ft
SDC 40 (RIKB) to Mean Sea Level			1367.6ft



API: 47-051-01853-0000  
BHI Job #: 7565620  
Rig: SDC 40  
Duration: 10/23/2015-12/24/2015

RECEIVED  
Office of Oil and Gas  
JAN 06 2017  
WV Department of  
Environmental Protection

User specified Dip: 67.05° Field: 52322.8 ft  
Magnetic North is 3.24 degrees East of True North (16 Dec 2015)  
Grid North is 0.24 degrees East of True North  
To correct azimuth from True to Grid subtract 0.24 degrees  
To correct azimuth from Magnetic to Grid subtract 9.48 degrees

**REFERENCE WELLPATH IDENTIFICATION**

Operator	SOUTHWESTERN ENERGY	Slot	Slot #501
Area	Marshall County, WV	Well	O E Burge U MSH 501H
Field	Marshall	Wellbore	O E Burge U MSH 501H AWB
Facility	O E Burge MSH Pad		

**REPORT SETUP INFORMATION**

Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 4.0.1
North Reference	Grid	User	Edsaryar
Scale	0.999612	Report Generated	07/Jan/2016 at 10:40
Convergence at slot	0.24° East	Database/Source file	WA_MPL_EASTERNUS_Defn/O E Burge U MSH 501H AWB.xml

**WELLPATH LOCATION**

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-22.63	51.99	1743974.65	14436220.32	39°45'03.036"N	80°37'53.592"W
Facility Reference Pt			1743922.68	14436242.94	39°45'03.262"N	80°37'54.257"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

**WELLPATH DATUM**

Calculation method	Minimum curvature	SDC 40 (RKB) to Facility Vertical Datum	1367.60ft
Horizontal Reference Pt	Slot	SDC 40 (RKB) to Mean Sea Level	1367.60ft
Vertical Reference Pt	SDC 40 (RKB)	SDC 40 (RKB) to Mud Line at Slot (Slot #501)	26.00ft
MD Reference Pt	SDC 40 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	298.79°

RECEIVED  
Office of Oil and Gas  
JAN 06 2017

Department of  
Environmental Protection



# Actual Wellpath Report

O E Burge U MSH 501H AWP Proj: 21660'  
Page 2 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #501
SOUTHWESTERN ENERGY	Well	O E Burge U MSH 501H
Marshall County, WV	Wellbore	O E Burge U MSH 501H AWB
Marshall		
O E Burge MSH Pad		

## WELLPATH DATA (262 stations) † = interpolated/extrapolated station

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]
0.00†	0.000	76.010	0.00	0.00	0.00	0.00	1743974.65	14436220.32	39°45'03.036"N	80°37'53.592"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	76.010	26.00	0.00	0.00	0.00	1743974.65	14436220.32	39°45'03.036"N	80°37'53.592"W	0.00	0.000	0.00	0.00	0.00
133.00	0.700	76.010	133.00	-0.48	0.16	0.63	1743975.28	14436220.48	39°45'03.037"N	80°37'53.584"W	0.65	76.010	0.65	0.65	0.00
224.00	0.700	71.710	223.99	-1.27	0.47	1.70	1743976.35	14436220.79	39°45'03.040"N	80°37'53.571"W	1.76	74.656	0.06	0.00	-4.73
390.00	0.660	109.730	389.98	-2.90	0.46	3.56	1743978.21	14436220.78	39°45'03.040"N	80°37'53.547"W	3.59	82.609	0.27	-0.02	22.90
455.00	0.480	74.630	454.98	-3.47	0.41	4.18	1743978.83	14436220.73	39°45'03.040"N	80°37'53.539"W	4.20	84.423	0.59	-0.28	-54.00
516.00	1.580	32.120	515.97	-3.70	1.19	4.87	1743979.52	14436221.51	39°45'03.047"N	80°37'53.530"W	5.02	76.297	2.08	1.80	-69.69
579.00	2.860	12.990	578.92	-3.32	3.46	5.69	1743980.34	14436223.77	39°45'03.070"N	80°37'53.519"W	6.66	58.721	2.32	2.03	-30.37
671.00	4.850	9.430	670.71	-1.41	9.53	6.84	1743981.49	14436229.85	39°45'03.130"N	80°37'53.504"W	11.73	35.675	2.18	2.16	-3.87
764.00	4.960	2.350	763.37	1.69	17.42	7.65	1743982.30	14436237.74	39°45'03.208"N	80°37'53.494"W	19.03	23.703	0.66	0.12	-7.61
857.00	5.420	2.970	855.98	5.39	25.83	8.04	1743982.69	14436246.14	39°45'03.291"N	80°37'53.488"W	27.05	17.296	0.50	0.49	0.67
950.00	5.710	2.740	948.55	9.34	34.84	8.49	1743983.14	14436255.14	39°45'03.380"N	80°37'53.482"W	35.86	13.699	0.31	0.31	-0.25
1043.00	5.700	353.000	1041.10	14.00	43.94	8.17	1743982.81	14436264.24	39°45'03.470"N	80°37'53.486"W	44.69	10.529	1.03	-0.15	-10.42
1135.00	5.580	343.640	1132.66	19.78	52.66	6.37	1743981.01	14436272.96	39°45'03.556"N	80°37'53.508"W	53.04	6.893	0.99	0.01	-10.23
1228.00	5.820	337.680	1225.21	26.66	61.36	3.30	1743977.95	14436281.66	39°45'03.642"N	80°37'53.547"W	61.45	3.080	0.69	0.26	-6.41
1321.00	5.360	339.020	1317.76	33.64	69.78	-0.04	1743974.61	14436290.07	39°45'03.725"N	80°37'53.589"W	69.78	359.964	0.51	-0.49	1.44
1414.00	5.170	339.170	1410.37	40.15	77.75	-3.09	1743971.56	14436298.04	39°45'03.804"N	80°37'53.628"W	77.81	357.724	0.20	-0.20	0.16
1507.00	5.230	340.690	1502.99	46.50	85.67	-5.98	1743968.67	14436305.95	39°45'03.883"N	80°37'53.664"W	85.88	356.006	0.16	0.06	1.63
1600.00	4.280	344.820	1595.67	52.06	93.02	-8.29	1743966.36	14436313.30	39°45'03.955"N	80°37'53.694"W	93.39	354.906	1.09	-1.02	4.44
1692.00	4.110	357.580	1687.42	56.16	99.62	-9.33	1743965.32	14436319.91	39°45'04.021"N	80°37'53.707"W	100.06	354.650	1.03	-0.18	13.87
1785.00	3.260	356.260	1780.22	59.35	105.67	-9.65	1743965.01	14436325.95	39°45'04.081"N	80°37'53.710"W	106.11	354.783	0.81	-0.81	-1.42
1878.00	2.500	5.740	1873.09	61.69	110.61	-9.60	1743965.05	14436330.89	39°45'04.129"N	80°37'53.710"W	111.03	355.038	0.85	-0.66	10.19
1971.00	1.970	351.670	1966.01	63.53	114.41	-9.61	1743965.04	14436334.69	39°45'04.167"N	80°37'53.709"W	114.82	355.198	1.04	-0.84	-15.13
2063.00	1.700	347.780	2058.89	66.12	119.16	-9.96	1743964.69	14436339.44	39°45'04.214"N	80°37'53.714"W	119.58	355.220	2.20	2.17	6.64
2156.00	1.410	347.620	2151.62	69.76	126.19	-10.25	1743964.41	14436346.47	39°45'04.283"N	80°37'53.717"W	126.61	355.358	0.80	0.80	-0.17
2249.00	1.100	347.100	2243.35	73.40	133.18	-10.57	1743964.09	14436353.44	39°45'04.352"N	80°37'53.721"W	133.59	355.464	0.86	-0.86	-0.56
2342.00	0.550	346.530	2336.16	77.34	138.98	-11.87	1743962.78	14436359.25	39°45'04.410"N	80°37'53.737"W	139.49	355.117	1.48	-0.39	-22.12
2433.00	0.090	344.500	2427.01	81.56	143.78	-14.05	1743960.60	14436364.05	39°45'04.457"N	80°37'53.765"W	144.47	354.418	0.52	-0.51	-2.23
2526.00	0.110	345.520	2519.87	85.32	148.49	-15.76	1743958.89	14436368.75	39°45'04.504"N	80°37'53.786"W	149.32	353.941	0.64	0.02	11.85
2572.00	0.060	352.650	2565.81	86.90	150.91	-16.23	1743958.43	14436371.17	39°45'04.528"N	80°37'53.792"W	151.78	353.862	0.84	-0.11	15.50



# Actual Wellpath Report

O E Burge U MSH 501H AWP Proj: 21660'  
Page 3 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #501
Area	Marshall County, WV	Well	O E Burge U MSH 501H
Field	Marshall	Wellbore	O E Burge U MSH 501H AWB
Facility	O E Burge MSH Pad		

## WELLPATH DATA (262 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]
2596.00	2.780	359.830	2589.78	87.56	152.13	-16.31	1743958.34	14436372.39	39°45'04.540"N	80°37'53.793"W	153.00	353.879	1.92	-1.17	29.92
2682.00	1.860	262.270	2675.71	88.63	155.47	-15.70	1743958.95	14436375.73	39°45'04.575"N	80°37'53.785"W	156.26	354.233	1.61	-1.07	30.74
2775.00	1.080	35.040	2768.68	88.61	157.54	-14.53	1743960.12	14436377.80	39°45'04.595"N	80°37'53.770"W	158.21	354.730	0.87	-0.84	9.43
2868.00	0.700	38.790	2861.66	88.41	158.70	-13.67	1743960.98	14436378.96	39°45'04.605"N	80°37'53.759"W	159.29	355.076	0.41	-0.41	4.03
2960.00	0.330	47.080	2953.66	88.23	159.32	-13.13	1743961.53	14436379.58	39°45'04.611"N	80°37'53.752"W	159.86	355.290	0.41	-0.40	9.01
3053.00	0.320	70.850	3046.66	87.97	159.59	-12.68	1743961.97	14436379.84	39°45'04.613"N	80°37'53.746"W	160.09	355.455	0.14	-0.01	25.56
3146.00	0.340	73.550	3139.66	87.60	159.75	-12.17	1743962.48	14436380.01	39°45'04.615"N	80°37'53.740"W	160.21	355.642	0.03	0.02	2.90
3239.00	0.270	93.800	3232.66	87.21	159.81	-11.69	1743962.96	14436380.07	39°45'04.616"N	80°37'53.734"W	160.24	355.816	0.14	-0.08	21.77
3332.00	0.300	97.660	3325.66	86.79	159.77	-11.23	1743963.42	14436380.02	39°45'04.615"N	80°37'53.728"W	160.16	355.979	0.04	0.03	4.15
3425.00	0.280	106.620	3418.65	86.34	159.67	-10.77	1743963.88	14436379.93	39°45'04.614"N	80°37'53.722"W	160.03	356.140	0.05	-0.02	9.63
3517.00	0.200	110.130	3510.65	85.96	159.55	-10.41	1743964.25	14436379.81	39°45'04.613"N	80°37'53.717"W	159.89	356.268	0.09	-0.09	3.82
3610.00	0.280	110.690	3603.65	85.57	159.41	-10.04	1743964.61	14436379.67	39°45'04.612"N	80°37'53.713"W	159.73	356.396	0.09	0.09	0.60
3703.00	0.240	129.580	3696.65	85.16	159.21	-9.68	1743964.98	14436379.47	39°45'04.610"N	80°37'53.708"W	159.50	356.521	0.10	-0.04	20.31
3795.00	0.350	123.140	3788.65	84.69	158.93	-9.29	1743965.36	14436379.19	39°45'04.607"N	80°37'53.703"W	159.20	356.653	0.12	0.12	-7.00
3888.00	0.200	128.730	3881.65	84.24	158.67	-8.93	1743965.72	14436378.93	39°45'04.604"N	80°37'53.698"W	158.93	356.779	0.16	-0.16	6.01
3983.00	0.130	95.900	3976.65	83.98	158.56	-8.69	1743965.96	14436378.82	39°45'04.603"N	80°37'53.695"W	158.80	356.862	0.12	-0.07	-34.56
4076.00	0.130	112.260	4069.65	83.78	158.51	-8.49	1743966.16	14436378.77	39°45'04.603"N	80°37'53.693"W	158.74	356.934	0.04	0.00	17.59
4169.00	0.140	119.570	4162.65	83.56	158.41	-8.29	1743966.36	14436378.67	39°45'04.602"N	80°37'53.690"W	158.63	357.003	0.02	0.01	7.86
4262.00	0.170	158.710	4255.65	83.34	158.23	-8.15	1743966.51	14436378.49	39°45'04.600"N	80°37'53.688"W	158.44	357.053	0.12	0.03	42.09
4354.00	0.260	161.600	4347.65	83.08	157.90	-8.03	1743966.62	14436378.16	39°45'04.599"N	80°37'53.687"W	158.11	357.089	0.10	0.10	3.14
4447.00	0.380	140.380	4440.65	82.64	157.47	-7.77	1743966.89	14436377.72	39°45'04.592"N	80°37'53.684"W	157.66	357.176	0.18	0.13	-22.82
4540.00	0.360	141.670	4533.64	82.09	157.00	-7.39	1743967.26	14436377.26	39°45'04.588"N	80°37'53.679"W	157.17	357.305	0.02	-0.02	1.39
4633.00	0.400	136.530	4626.64	81.51	156.53	-6.98	1743967.67	14436376.79	39°45'04.583"N	80°37'53.674"W	156.69	357.445	0.06	0.04	-5.53
4725.00	0.200	140.420	4719.64	80.98	156.11	-6.61	1743968.04	14436376.37	39°45'04.579"N	80°37'53.669"W	156.25	357.575	0.11	-0.11	4.23
4820.00	0.220	139.120	4812.64	80.59	155.77	-6.36	1743968.29	14436376.03	39°45'04.575"N	80°37'53.666"W	155.90	357.663	0.09	-0.08	9.16
4913.00	0.200	138.370	4905.64	80.28	155.49	-6.16	1743968.48	14436375.75	39°45'04.573"N	80°37'53.663"W	155.61	357.732	0.05	-0.02	-11.56
5006.00	0.140	138.700	4998.64	80.02	155.33	-5.94	1743968.71	14436375.59	39°45'04.571"N	80°37'53.660"W	155.45	357.809	0.11	-0.06	-31.90
5098.00	0.140	133.350	5091.64	79.80	155.27	-5.73	1743968.92	14436375.53	39°45'04.571"N	80°37'53.658"W	155.38	357.888	0.01	0.00	-5.82
5191.00	0.140	104.800	5184.64	79.58	155.22	-5.51	1743969.15	14436375.48	39°45'04.570"N	80°37'53.655"W	155.31	357.968	0.00	0.00	1.56
5284.00	0.190	125.730	5277.64	79.32	155.10	-5.27	1743969.38	14436375.36	39°45'04.569"N	80°37'53.652"W	155.19	358.053	0.08	0.05	22.53

WV Department of Environmental Protection

## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #501
SOUTHWESTERN ENERGY	Well	O E Burge U MSH 501H
Area	Wellbore	O E Burge U MSH 501H AWB
Field		
Facility		

## WELLPATH DATA (262 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]
5377.00	0.150	105.290	5370.64	79.04	154.98	-5.03	1743969.62	14436375.24	39°45'04.568"N	80°37'53.649"W	155.06	358.141	0.08	-0.04	-22.00
5470.00	0.110	104.270	5463.64	78.84	154.92	-4.83	1743969.83	14436375.18	39°45'04.567"N	80°37'53.646"W	155.00	358.216	0.04	-0.04	-1.10
5562.00	0.180	109.220	5555.64	78.61	154.85	-4.60	1743970.05	14436375.11	39°45'04.566"N	80°37'53.643"W	154.92	358.297	0.08	0.01	5.38
5655.00	0.170	134.050	5648.64	78.33	154.71	-4.37	1743970.29	14436374.97	39°45'04.565"N	80°37'53.640"W	154.77	358.383	0.08	-0.01	26.70
5748.00	0.230	107.710	5741.64	78.02	154.56	-4.09	1743970.56	14436374.82	39°45'04.563"N	80°37'53.637"W	154.61	358.484	0.12	0.06	-28.32
5843.00	0.240	118.220	5836.63	77.63	154.40	-3.73	1743970.92	14436374.66	39°45'04.562"N	80°37'53.632"W	154.45	358.615	0.05	0.01	11.06
5936.00	0.240	124.140	5929.63	77.24	154.20	-3.40	1743971.25	14436374.46	39°45'04.560"N	80°37'53.628"W	154.24	358.737	0.03	0.00	6.37
6029.00	0.270	130.920	6022.63	76.83	153.95	-3.07	1743971.58	14436374.21	39°45'04.557"N	80°37'53.624"W	153.98	358.857	0.05	0.03	7.29
6122.00	0.200	96.530	6115.63	76.47	153.79	-2.75	1743971.91	14436374.05	39°45'04.556"N	80°37'53.619"W	153.81	358.977	0.17	-0.08	-36.98
6215.00	0.140	95.070	6208.63	76.22	153.76	-2.47	1743972.18	14436374.02	39°45'04.555"N	80°37'53.616"W	153.78	359.079	0.06	-0.06	-1.57
6307.00	0.120	74.780	6300.63	76.04	153.77	-2.27	1743972.38	14436374.03	39°45'04.556"N	80°37'53.613"W	153.79	359.156	0.05	-0.02	-22.05
6400.00	0.230	87.460	6393.63	75.81	153.81	-1.99	1743972.66	14436374.07	39°45'04.556"N	80°37'53.610"W	153.82	359.260	0.12	0.12	13.63
6430.00	0.200	131.180	6423.63	75.71	153.78	-1.89	1743972.76	14436374.04	39°45'04.556"N	80°37'53.608"W	153.79	359.297	0.54	-0.10	145.73
6523.00	1.330	164.700	6516.62	74.80	152.63	-1.48	1743973.17	14436372.89	39°45'04.544"N	80°37'53.603"W	152.64	359.445	1.26	1.22	36.04
6616.00	3.170	187.480	6609.55	73.12	149.04	-1.53	1743973.12	14436369.30	39°45'04.509"N	80°37'53.604"W	149.05	359.412	2.16	1.98	24.49
6709.00	5.890	180.680	6702.25	69.93	141.71	-1.92	1743972.73	14436361.98	39°45'04.436"N	80°37'53.610"W	141.73	359.223	2.98	2.92	-7.31
6801.00	10.600	177.700	6793.27	63.34	128.53	-1.64	1743973.01	14436348.80	39°45'04.306"N	80°37'53.607"W	128.54	359.270	5.14	5.12	-3.24
6894.00	15.730	176.450	6883.80	52.17	107.39	-0.51	1743974.14	14436327.67	39°45'04.097"N	80°37'53.593"W	107.39	359.727	5.52	5.52	-1.34
6987.00	17.180	176.480	6972.99	38.08	81.10	1.11	1743975.76	14436301.38	39°45'03.837"N	80°37'53.574"W	81.10	0.785	1.56	1.56	0.03
7080.00	17.720	176.70	7061.71	23.15	53.26	2.85	1743977.50	14436273.56	39°45'03.562"N	80°37'53.553"W	53.34	3.064	0.58	0.58	-0.12
7173.00	17.720	177.160	7150.29	8.14	25.00	4.45	1743979.10	14436245.31	39°45'03.283"N	80°37'53.534"W	25.40	10.088	0.26	0.00	0.85
7265.00	17.670	173.000	7237.94	-7.37	-2.84	6.84	1743981.49	14436217.48	39°45'03.007"N	80°37'53.505"W	7.41	112.543	1.38	-0.05	-4.52
7358.00	17.930	172.700	7326.49	-24.13	-31.05	10.47	1743985.11	14436189.28	39°45'02.728"N	80°37'53.460"W	32.77	161.374	0.37	0.30	-0.68
7451.00	18.770	171.500	7414.75	-41.65	-60.07	14.52	1743989.16	14436160.28	39°45'02.442"N	80°37'53.410"W	61.79	166.414	0.91	0.88	-0.67
7544.00	19.270	165.000	7502.68	-60.81	-89.85	20.01	1743994.65	14436130.50	39°45'02.147"N	80°37'53.341"W	92.05	167.444	1.62	0.54	-4.68
7637.00	19.630	166.040	7590.37	-81.38	-120.04	26.89	1744001.53	14436100.32	39°45'01.848"N	80°37'53.254"W	123.02	167.375	0.42	0.39	-0.49
7730.00	19.200	165.000	7678.08	-102.36	-150.04	34.35	1744008.98	14436070.34	39°45'01.552"N	80°37'53.161"W	153.92	167.106	0.80	-0.46	-1.97
7822.00	18.060	163.050	7765.26	-123.02	-178.30	42.39	1744017.03	14436042.09	39°45'01.272"N	80°37'53.059"W	183.27	166.626	1.43	-1.24	-2.24
7915.00	16.900	166.000	7853.97	-142.47	-205.23	49.78	1744024.41	14436015.17	39°45'01.006"N	80°37'52.966"W	211.18	166.365	1.64	-1.25	3.57
8008.00	16.110	169.000	7943.14	-159.82	-231.04	55.40	1744030.02	14435989.37	39°45'00.750"N	80°37'52.895"W	237.59	166.517	1.20	-0.85	2.99

**REFERENCE WELLPATH IDENTIFICATION**

Operator	SOUTHWESTERN ENERGY	Slot	Slot #501
Area	Marshall County, WV	Well	O E Burge U MSH 501H
Field	Marshall	Wellbore	O E Burge U MSH 501H AWB
Facility	O E Burge MSH Pad		

**WELLPATH DATA (262 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]
8101.00	16.250	172.070	8032.46	-175.83	-256.60	59.62	1744034.25	14435963.82	39°45'00.497"N	80°37'52.843"W	263.44	166.920	0.89	0.15	3.14
8289.00	18.050	179.440	8212.11	-205.84	-311.79	63.54	1744038.16	14435908.65	39°44'59.952"N	80°37'52.795"W	318.20	168.482	1.50	0.96	3.92
8382.00	18.630	179.210	8300.39	-220.23	-341.05	63.88	1744038.51	14435879.40	39°44'59.663"N	80°37'52.792"W	346.98	169.391	0.63	0.62	-0.25
8475.00	17.970	178.860	8388.68	-234.73	-370.25	64.37	1744039.00	14435850.22	39°44'59.374"N	80°37'52.788"W	375.80	170.137	0.72	-0.71	-0.38
8567.00	16.690	178.830	8476.50	-248.40	-397.65	64.92	1744039.55	14435822.83	39°44'59.103"N	80°37'52.782"W	402.91	170.727	1.39	-1.39	-0.03
8659.00	15.090	176.440	8564.99	-261.41	-422.81	65.94	1744040.56	14435797.68	39°44'58.855"N	80°37'52.770"W	427.92	171.136	1.88	-1.74	-2.60
8752.00	14.140	179.610	8654.98	-273.43	-446.25	66.77	1744041.39	14435774.24	39°44'58.623"N	80°37'52.761"W	451.22	171.491	1.34	-1.02	3.41
8782.00	13.710	179.400	8684.10	-276.96	-453.47	66.83	1744041.45	14435767.03	39°44'58.552"N	80°37'52.761"W	458.37	171.617	1.44	-1.43	-0.70
8875.00	13.910	183.170	8774.41	-287.20	-475.65	66.32	1744040.95	14435744.85	39°44'58.332"N	80°37'52.768"W	480.25	172.062	0.99	0.22	4.05
8968.00	13.040	176.530	8864.85	-297.64	-497.29	66.34	1744040.97	14435723.23	39°44'58.119"N	80°37'52.769"W	501.69	172.401	1.91	-0.94	-7.14
9061.00	13.860	171.260	8955.31	-310.02	-518.77	68.67	1744043.29	14435701.75	39°44'57.906"N	80°37'52.741"W	523.30	172.460	1.58	0.88	-5.67
9150.00	13.080	176.510	9041.86	-321.89	-539.36	70.90	1744045.52	14435681.17	39°44'57.703"N	80°37'52.713"W	544.00	172.511	1.63	-0.88	5.90
9243.00	15.000	177.560	9132.08	-333.76	-561.89	72.06	1744046.68	14435658.65	39°44'57.480"N	80°37'52.699"W	566.49	172.692	2.08	2.06	1.13
9335.00	15.100	175.760	9220.92	-346.46	-585.74	73.45	1744048.07	14435634.81	39°44'57.244"N	80°37'52.683"W	590.32	172.853	0.52	0.11	-1.96
9428.00	14.600	175.570	9310.82	-359.49	-609.50	75.25	1744049.87	14435611.05	39°44'57.009"N	80°37'52.661"W	614.13	172.962	0.54	-0.54	-0.20
9521.00	13.470	175.190	9401.04	-371.90	-631.98	77.06	1744051.68	14435588.58	39°44'56.787"N	80°37'52.639"W	636.66	173.048	1.22	-1.22	-0.41
9614.00	15.400	175.420	9491.10	-384.69	-655.09	78.96	1744053.58	14435565.49	39°44'56.559"N	80°37'52.616"W	659.83	173.127	2.08	2.08	0.25
9706.00	16.880	176.480	9579.47	-398.55	-680.60	80.75	1744055.37	14435539.99	39°44'56.306"N	80°37'52.594"W	685.37	173.233	1.64	1.61	1.15
9801.00	16.940	174.690	9670.36	-413.68	-708.15	82.88	1744057.50	14435512.45	39°44'56.034"N	80°37'52.569"W	712.98	173.325	0.55	0.06	-1.88
9894.00	17.320	172.720	9759.24	-429.43	-735.37	85.89	1744060.51	14435485.24	39°44'55.765"N	80°37'52.531"W	740.37	173.358	0.75	0.41	-2.12
9983.00	16.790	171.610	9844.33	-444.99	-761.23	89.44	1744064.06	14435459.39	39°44'55.509"N	80°37'52.487"W	766.46	173.299	0.70	-0.60	-1.25
10081.00	16.760	168.570	9938.16	-462.67	-789.08	94.31	1744068.92	14435431.55	39°44'55.234"N	80°37'52.427"W	794.69	173.184	0.90	-0.03	-3.10
10173.00	18.240	170.060	10025.90	-480.25	-816.26	99.42	1744074.03	14435404.37	39°44'54.965"N	80°37'52.362"W	822.30	173.055	1.68	1.61	1.62
10236.00	18.240	171.010	10085.73	-492.46	-835.71	102.67	1744077.28	14435384.93	39°44'54.773"N	80°37'52.322"W	842.00	172.996	0.47	0.00	1.51
10282.00	18.330	165.830	10129.41	-501.41	-849.94	105.07	1744079.68	14435370.71	39°44'54.632"N	80°37'52.292"W	856.41	172.953	0.83	0.20	-2.57
10375.00	18.740	168.020	10217.59	-520.37	-878.95	110.75	1744085.36	14435341.71	39°44'54.345"N	80°37'52.221"W	885.90	172.818	0.76	0.44	-1.95
10468.00	17.810	166.200	10305.89	-539.75	-907.38	117.24	1744091.85	14435313.29	39°44'54.064"N	80°37'52.139"W	914.92	172.637	1.17	-1.00	-1.96
10560.00	17.340	166.220	10393.60	-558.54	-934.36	123.87	1744098.47	14435286.33	39°44'53.797"N	80°37'52.056"W	942.53	172.448	0.51	-0.51	0.02
10653.00	15.310	167.670	10482.85	-575.99	-959.82	129.79	1744104.39	14435260.88	39°44'53.545"N	80°37'51.981"W	968.55	172.299	2.23	-2.18	1.56
10746.00	14.520	172.090	10572.72	-591.04	-983.36	134.02	1744108.61	14435237.34	39°44'53.312"N	80°37'51.928"W	992.45	172.239	1.49	-0.85	4.75



# Actual Wellpath Report

O E Burge U MSH 501H AWP Proj: 21660'  
Page 6 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #501
SOUTHWESTERN ENERGY	Well	O E Burge U MSH 501H
Area	Wellbore	O E Burge U MSH 501H AWB
Field		
Facility		

## WELLPATH DATA (262 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]
10839.00	14.310	172.490	10662.79	-604.81	-1006.30	137.12	1744111.72	14435214.41	39°44'53.085"N	80°37'51.890"W	1015.60	172.240	0.25	-0.23	0.43
10932.00	14.230	171.650	10752.92	-618.51	-1029.01	140.29	1744114.88	14435191.72	39°44'52.861"N	80°37'51.851"W	1038.52	172.237	0.24	-0.09	-0.90
11025.00	14.040	170.590	10843.10	-632.39	-1051.44	143.79	1744118.38	14435169.29	39°44'52.639"N	80°37'51.807"W	1061.23	172.213	0.35	-0.20	-1.14
11117.00	13.770	170.470	10932.41	-646.08	-1073.25	147.43	1744122.02	14435147.49	39°44'52.423"N	80°37'51.761"W	1083.33	172.179	0.30	-0.29	-0.13
11164.00	14.290	169.760	10978.00	-653.20	-1084.48	149.38	1744125.98	14435136.27	39°44'52.312"N	80°37'51.737"W	1094.72	172.157	1.17	1.11	-1.51
11248.00	15.490	167.790	11059.18	-667.09	-1105.64	153.60	1744128.19	14435115.11	39°44'52.103"N	80°37'51.684"W	1116.26	172.091	1.55	1.43	-2.35
11341.00	12.900	168.270	11149.34	-681.99	-1127.95	158.34	1744132.93	14435092.81	39°44'51.882"N	80°37'51.625"W	1139.01	172.009	2.79	-2.78	0.52
11384.00	11.570	174.180	11191.36	-687.55	-1136.94	159.75	1744134.34	14435083.83	39°44'51.793"N	80°37'51.607"W	1148.11	172.002	4.24	-3.09	13.74
11430.00	12.290	196.270	11236.39	-691.24	-1146.23	158.85	1744133.43	14435074.53	39°44'51.702"N	80°37'51.619"W	1157.19	172.110	9.99	1.57	48.02
11476.00	13.630	213.370	11281.23	-691.87	-1155.46	154.49	1744129.08	14435065.31	39°44'51.610"N	80°37'51.675"W	1165.74	172.384	8.79	2.91	37.17
11523.00	13.950	222.670	11326.88	-690.06	-1164.25	147.60	1744122.20	14435056.52	39°44'51.524"N	80°37'51.764"W	1173.57	172.775	4.76	0.68	19.79
11615.00	15.390	227.810	11415.89	-683.43	-1180.61	131.04	1744105.64	14435040.17	39°44'51.363"N	80°37'51.977"W	1187.86	173.666	2.11	1.57	5.59
11662.00	17.410	230.520	11460.97	-678.79	-1189.27	120.99	1744095.60	14435031.52	39°44'51.278"N	80°37'52.106"W	1195.41	174.191	4.59	4.30	5.77
11708.00	21.390	235.590	11504.35	-672.46	-1198.39	108.75	1744083.36	14435022.40	39°44'51.188"N	80°37'52.263"W	1203.31	174.815	9.39	8.65	11.02
11755.00	25.080	239.690	11547.54	-663.47	-1208.26	93.08	1744067.69	14435012.53	39°44'51.091"N	80°37'52.464"W	1211.84	175.595	8.57	7.85	8.72
11801.00	28.740	241.870	11588.55	-652.43	-1218.40	74.90	1744049.52	14435002.39	39°44'50.992"N	80°37'52.698"W	1220.70	176.482	8.24	7.96	4.74
11848.00	32.320	243.030	11629.03	-639.18	-1229.43	53.73	1744028.36	14434991.37	39°44'50.884"N	80°37'52.969"W	1230.60	177.498	7.72	7.62	2.47
11894.00	35.230	242.930	11667.26	-624.82	-1241.05	30.95	1744005.59	14434979.76	39°44'50.770"N	80°37'53.261"W	1241.43	178.571	6.33	6.33	-0.22
11940.00	39.230	242.510	11703.88	-609.29	-1253.80	6.22	1743980.87	14434967.00	39°44'50.645"N	80°37'53.579"W	1253.82	179.716	8.71	8.70	-0.91
11987.00	43.120	242.800	11739.25	-592.05	-1268.01	-21.26	1743953.40	14434952.80	39°44'50.505"N	80°37'53.931"W	1268.19	180.960	8.29	8.28	0.62
12033.00	47.150	245.470	11771.70	-573.17	-1282.21	-50.59	1743924.08	14434938.61	39°44'50.366"N	80°37'54.308"W	1283.20	182.260	9.68	8.76	5.80
12080.00	50.070	247.300	11802.77	-551.65	-1296.32	-82.90	1743891.78	14434924.51	39°44'50.228"N	80°37'54.722"W	1298.97	183.659	6.86	6.21	3.89
12126.00	52.190	248.140	11831.00	-528.84	-1310.07	-116.50	1743858.20	14434910.76	39°44'50.094"N	80°37'55.153"W	1315.24	185.082	9.07	8.96	1.83
12172.00	54.820	247.870	11856.72	-504.73	-1324.36	-151.85	1743822.86	14434896.48	39°44'49.954"N	80°37'55.606"W	1332.03	186.541	7.91	7.89	-0.59
12219.00	57.310	247.900	11880.52	-479.18	-1339.61	-189.39	1743785.33	14434881.23	39°44'49.805"N	80°37'56.088"W	1352.93	188.047	7.43	7.43	0.06
12265.00	59.280	249.230	11901.55	-453.00	-1354.55	-227.47	1743747.27	14434866.29	39°44'49.658"N	80°37'56.576"W	1373.52	189.533	6.95	6.46	2.89
12311.00	61.720	249.830	11920.26	-425.58	-1369.24	-266.83	1743707.92	14434851.61	39°44'49.515"N	80°37'57.081"W	1395.00	191.027	7.57	7.48	1.30
12358.00	64.430	250.830	11936.66	-396.37	-1384.06	-308.30	1743666.47	14434836.80	39°44'49.370"N	80°37'57.612"W	1417.98	192.558	8.14	7.89	2.13
12404.00	67.810	251.120	11950.40	-366.90	-1398.37	-349.80	1743624.99	14434822.49	39°44'49.230"N	80°37'58.144"W	1441.46	194.044	5.21	5.17	0.63
12451.00	71.560	252.060	11963.21	-336.17	-1412.65	-392.71	1743582.10	14434808.22	39°44'49.091"N	80°37'58.694"W	1466.22	195.536	2.50	1.60	2.00

Environmental Protection Department

## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #501
Area	Marshall County, WV	Well	O E Burge U MSH 501H
Field	Marshall	Wellbore	O E Burge U MSH 501H AWB
Facility	O E Burge MSH Pad		

## WELLPATH DATA (262 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Seet [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]
12497.00	74.650	252.280	11975.42	-305.71	-1426.23	-434.93	1743539.89	14434794.64	39°44'48.958"N	80°37'59.236"W	1491.07	196.959	0.50	0.20	0.48
12543.00	74.630	251.960	11987.60	-275.27	-1439.85	-477.14	1743497.70	14434781.03	39°44'48.826"N	80°37'59.777"W	1516.85	198.334	0.67	-0.04	-0.70
12590.00	74.590	252.710	12000.08	-244.05	-1453.60	-520.32	1743454.54	14434767.29	39°44'48.691"N	80°38'00.330"W	1543.92	199.695	1.54	-0.09	1.60
12636.00	74.520	252.220	12012.33	-213.44	-1466.96	-562.60	1743412.27	14434753.93	39°44'48.561"N	80°38'00.872"W	1571.14	200.982	1.04	-0.15	-1.07
12683.00	74.590	250.340	12024.84	-182.84	-1481.50	-605.50	1743369.39	14434739.40	39°44'48.419"N	80°38'01.422"W	1600.46	202.230	3.86	0.15	-4.00
12729.00	74.480	250.360	12037.11	-153.42	-1496.41	-647.25	1743327.65	14434724.50	39°44'48.274"N	80°38'01.958"W	1630.39	203.390	0.24	-0.24	0.04
12775.00	74.460	250.790	12049.43	-123.89	-1511.15	-689.05	1743285.87	14434709.76	39°44'48.130"N	80°38'02.493"W	1660.83	204.512	0.90	-0.04	0.93
12822.00	74.560	252.080	12061.98	-93.21	-1525.57	-731.98	1743242.95	14434695.35	39°44'47.989"N	80°38'03.044"W	1692.09	205.632	2.65	0.21	2.74
12868.00	74.490	251.400	12074.25	-63.00	-1539.46	-774.08	1743200.87	14434681.46	39°44'47.853"N	80°38'03.584"W	1723.12	206.695	1.43	-0.15	-1.48
12915.00	74.620	251.520	12086.77	-32.30	-1553.86	-817.04	1743157.93	14434667.06	39°44'47.713"N	80°38'04.134"W	1755.57	207.736	0.37	0.28	0.26
12961.00	74.520	249.700	12099.01	-2.73	-1568.58	-858.86	1743116.12	14434652.35	39°44'47.569"N	80°38'04.670"W	1788.32	208.702	3.82	-0.22	-3.96
13007.00	74.590	251.100	12111.26	26.71	-1583.46	-900.63	1743074.37	14434637.48	39°44'47.423"N	80°38'05.206"W	1821.67	209.630	2.94	0.15	3.04
13054.00	75.450	256.100	12123.42	58.70	-1596.27	-944.17	1743030.85	14434624.68	39°44'47.299"N	80°38'05.764"W	1854.60	210.604	10.44	1.83	10.64
13100.00	76.930	260.640	12134.40	92.70	-1605.26	-987.91	1742987.12	14434615.68	39°44'47.211"N	80°38'06.324"W	1884.90	211.609	10.11	3.22	9.87
13146.00	76.900	264.850	12144.82	128.92	-1610.92	-1032.35	1742942.71	14434610.03	39°44'47.157"N	80°38'06.894"W	1913.32	212.653	8.91	-0.07	9.15
13193.00	77.000	266.470	12155.43	167.26	-1614.38	-1078.00	1742897.07	14434606.56	39°44'47.125"N	80°38'07.478"W	1941.22	213.733	3.36	0.21	3.45
13239.00	77.500	266.660	12165.59	205.21	-1617.07	-1122.78	1742852.30	14434603.88	39°44'47.100"N	80°38'08.052"W	1968.65	214.773	1.16	1.09	0.41
13286.00	78.000	268.100	12175.56	244.41	-1619.17	-1168.66	1742806.44	14434601.78	39°44'47.081"N	80°38'08.639"W	1996.87	215.821	3.18	1.06	3.06
13332.00	79.390	272.200	12184.58	283.99	-1619.05	-1213.76	1742761.36	14434601.90	39°44'47.084"N	80°38'09.217"W	2023.50	216.858	9.25	3.02	8.91
13378.00	80.350	276.440	12192.67	325.20	-1615.64	-1258.90	1742716.24	14434605.31	39°44'47.120"N	80°38'09.794"W	2048.20	217.926	9.31	2.09	9.22
13425.00	81.720	279.540	12200.00	368.60	-1609.15	-1304.87	1742670.29	14434611.79	39°44'47.186"N	80°38'10.382"W	2071.73	219.039	7.27	2.91	6.74
13474.00	84.540	282.600	12205.86	414.98	-1599.67	-1352.57	1742622.61	14434621.27	39°44'47.281"N	80°38'10.993"W	2094.85	220.215	8.74	5.76	6.63
13518.00	88.120	286.910	12208.68	457.56	-1588.51	-1395.02	1742580.17	14434632.43	39°44'47.393"N	80°38'11.536"W	2114.10	221.289	11.77	8.14	8.52
13564.00	91.260	289.980	12208.95	502.78	-1574.07	-1438.68	1742536.53	14434646.87	39°44'47.538"N	80°38'12.094"W	2132.49	222.427	9.94	6.70	7.35
13610.00	91.660	298.000	12209.63	595.37	-1535.85	-1523.34	1742511.90	14434685.07	39°44'47.919"N	80°38'13.176"W	2163.19	224.766	9.27	0.49	9.26
13749.00	91.660	306.990	12220.96	687.07	-1486.49	-1600.84	1742374.43	14434734.41	39°44'48.410"N	80°38'14.165"W	2184.57	227.121	8.46	0.00	8.47
13842.00	91.630	313.890	12220.28	778.27	-1427.02	-1672.23	1742303.07	14434793.85	39°44'49.000"N	80°38'15.076"W	2198.55	229.524	7.32	-0.03	7.32
13935.00	90.680	315.620	12219.41	867.81	-1361.95	-1738.64	1742236.69	14434858.90	39°44'49.646"N	80°38'15.923"W	2208.57	231.927	2.80	-1.02	2.61
14028.00	90.710	315.890	12198.28	956.77	-1295.38	-1803.57	1742171.79	14434925.44	39°44'50.307"N	80°38'16.751"W	2220.56	234.313	0.19	0.03	0.18
14121.00	90.650	314.800	12197.18	1045.91	-1229.24	-1868.93	1742106.45	14434991.56	39°44'50.963"N	80°38'17.584"W	2236.95	236.666	0.99	-0.06	-0.99

WV Department





# Actual Wellpath Report

O E Burge U MSH 501H AWP Proj: 21660'  
Page 8 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #501
SOUTHWESTERN ENERGY	Well	O E Burge U MSH 501H
Area	Wellbore	O E Burge U MSH 501H AWB
Field		
Facility		

## WELLPATH DATA (262 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]
14213.00	90.650	316.070	12196.13	1134.03	-1163.65	-1933.44	1742041.96	14435057.12	39°44'51.614"N	80°38'18.407"W	2256.61	238.958	1.29	0.00	1.29
14306.00	89.690	315.440	12195.86	1222.98	-1097.03	-1998.33	1741977.10	14435123.71	39°44'52.275"N	80°38'19.234"W	2279.65	241.234	1.23	-1.03	-0.68
14399.00	90.310	312.770	12195.86	1312.67	-1032.31	-2065.10	1741910.35	14435188.41	39°44'52.917"N	80°38'20.085"W	2308.75	243.440	2.95	0.07	-2.87
14492.00	90.280	314.990	12195.38	1402.46	-967.85	-2132.13	1741843.35	14435252.84	39°44'53.557"N	80°38'20.940"W	2341.52	245.585	2.39	-0.03	2.39
14584.00	90.280	313.770	12194.93	1491.07	-903.51	-2197.88	1741777.63	14435317.16	39°44'54.195"N	80°38'21.779"W	2376.34	247.653	1.33	0.00	-1.33
14677.00	90.250	313.980	12194.50	1580.86	-839.05	-2264.92	1741710.61	14435381.59	39°44'54.835"N	80°38'22.634"W	2415.34	249.673	0.23	-0.03	0.23
14770.00	90.250	314.390	12194.09	1670.53	-774.24	-2331.61	1741643.95	14435446.39	39°44'55.478"N	80°38'23.484"W	2456.79	251.631	0.44	0.00	0.44
14863.00	90.310	313.980	12193.64	1760.19	-709.42	-2398.30	1741577.29	14435511.18	39°44'56.121"N	80°38'24.335"W	2501.02	253.522	0.45	0.06	-0.44
14956.00	90.860	313.630	12192.69	1850.01	-645.05	-2465.41	1741510.20	14435575.52	39°44'56.760"N	80°38'25.191"W	2548.40	255.338	0.70	0.59	-0.38
15048.00	90.920	313.720	12191.26	1938.91	-581.52	-2531.94	1741443.69	14435639.02	39°44'57.390"N	80°38'26.039"W	2597.87	257.065	0.12	0.07	0.10
15141.00	91.260	316.170	12189.49	2028.21	-515.84	-2597.75	1741377.91	14435704.68	39°44'58.042"N	80°38'26.878"W	2648.47	258.769	2.66	0.37	2.63
15234.00	91.320	315.660	12187.40	2117.07	-449.06	-2662.44	1741313.25	14435771.44	39°44'58.705"N	80°38'27.703"W	2700.04	260.426	0.55	0.06	-0.55
15327.00	91.290	312.780	12185.28	2206.68	-384.22	-2729.06	1741246.65	14435836.25	39°44'59.348"N	80°38'28.553"W	2755.98	261.986	3.10	-0.03	-3.10
15420.00	91.290	312.630	12183.18	2296.93	-321.16	-2797.39	1741178.35	14435899.28	39°44'59.974"N	80°38'29.424"W	2815.76	263.451	0.16	0.00	-0.16
15512.00	91.230	314.540	12181.16	2385.86	-257.75	-2864.01	1741111.76	14435962.67	39°45'00.603"N	80°38'30.274"W	2875.58	264.857	2.08	-0.07	2.08
15605.00	91.230	315.240	12179.17	2475.19	-192.13	-2929.88	1741045.91	14436028.26	39°45'01.254"N	80°38'31.114"W	2936.17	266.248	0.75	0.00	0.75
15698.00	91.600	314.990	12176.87	2564.41	-126.26	-2995.49	1740980.33	14436094.11	39°45'01.908"N	80°38'31.950"W	2998.15	267.586	0.48	0.40	-0.27
15791.00	91.510	312.880	12174.34	2654.14	-61.76	-3062.43	1740913.41	14436158.58	39°45'02.548"N	80°38'32.804"W	3063.05	268.845	2.27	-0.10	-2.27
15884.00	91.510	312.560	12171.89	2744.38	1.31	-3130.73	1740845.14	14436221.63	39°45'03.174"N	80°38'33.675"W	3130.73	270.024	0.34	0.00	-0.34
15976.00	91.570	313.850	12169.42	2833.45	64.27	-3197.77	1740778.13	14436284.57	39°45'03.799"N	80°38'34.531"W	3198.41	271.151	1.40	0.07	1.40
16069.00	91.540	312.820	12166.90	2923.43	128.07	-3265.38	1740710.54	14436348.34	39°45'04.432"N	80°38'35.393"W	3267.89	272.246	1.11	-0.03	-1.11
16162.00	91.540	312.670	12164.40	3013.65	191.17	-3333.66	1740642.29	14436411.41	39°45'05.058"N	80°38'36.264"W	3339.13	273.282	0.16	0.00	-0.16
16255.00	91.510	312.770	12161.92	3103.89	254.24	-3401.96	1740574.02	14436474.46	39°45'05.684"N	80°38'37.135"W	3411.44	274.274	0.11	-0.03	0.11
16348.00	91.570	313.670	12159.42	3193.92	317.90	-3469.70	1740506.30	14436538.10	39°45'06.316"N	80°38'37.999"W	3484.24	275.235	0.97	0.06	0.97
16440.00	91.290	313.150	12157.13	3282.91	381.10	-3536.52	1740439.51	14436601.28	39°45'06.943"N	80°38'38.852"W	3536.99	276.151	0.64	-0.30	-0.57
16533.00	91.260	314.340	12155.06	3372.74	445.39	-3603.69	1740372.37	14436665.54	39°45'07.581"N	80°38'39.708"W	3631.10	277.046	1.28	-0.03	1.28
16626.00	91.050	314.100	12153.18	3462.37	510.24	-3670.32	1740305.76	14436730.36	39°45'08.225"N	80°38'40.558"W	3705.62	277.914	0.34	-0.23	-0.26
16719.00	91.020	314.270	12151.50	3552.02	575.05	-3737.00	1740239.11	14436795.14	39°45'08.868"N	80°38'41.409"W	3780.99	278.748	0.19	-0.03	0.18
16811.00	91.080	315.300	12149.82	3640.44	639.84	-3802.29	1740173.85	14436859.92	39°45'09.511"N	80°38'42.241"W	3855.75	279.552	1.12	0.07	1.12
16904.00	91.050	314.490	12148.09	3729.77	705.47	-3868.16	1740108.00	14436925.52	39°45'10.162"N	80°38'43.081"W	3931.96	280.336	0.87	-0.03	-0.87



# Actual Wellpath Report

O E Burge U MSH 501H AWP Proj: 21660'  
Page 9 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #501
Area	Marshall County, WV	Well	O E Burge U MSH 501H
Field	Marshall	Wellbore	O E Burge U MSH 501H AWB
Facility	O E Burge MSH Pad		

## WELLPATH DATA (262 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]
16997.00	91.050	313.460	12146.39	3819.51	770.04	-3935.07	1740041.11	14436990.06	39°45'10.803"N	80°38'43.935"W	4009.70	281.072	1.11	0.00	-1.11
17090.00	91.080	314.840	12144.66	3909.17	834.80	-4001.79	1739974.42	14437054.80	39°45'11.445"N	80°38'44.786"W	4087.93	281.783	1.48	0.03	1.48
17183.00	91.020	312.780	12142.95	3998.97	899.17	-4068.88	1739907.35	14437119.14	39°45'12.084"N	80°38'45.641"W	4167.05	282.462	2.22	-0.06	-2.22
17275.00	91.080	312.920	12141.27	4088.20	961.72	-4136.32	1739839.94	14437181.67	39°45'12.705"N	80°38'46.502"W	4246.65	283.089	0.17	0.07	0.15
17368.00	91.010	313.850	12139.57	4178.18	1025.59	-4203.90	1739772.39	14437245.51	39°45'13.339"N	80°38'47.364"W	4327.19	283.710	1.00	-0.08	1.06
17461.00	91.010	315.400	12137.93	4267.64	1090.91	-4270.07	1739706.24	14437310.81	39°45'13.987"N	80°38'48.208"W	4407.22	284.331	1.67	0.00	1.67
17554.00	91.290	316.400	12136.06	4356.50	1157.68	-4334.78	1739641.56	14437377.55	39°45'14.649"N	80°38'49.033"W	4486.71	284.953	1.12	0.30	1.08
17647.00	91.320	315.620	12133.95	4445.31	1224.57	-4399.35	1739577.01	14437444.42	39°45'15.313"N	80°38'49.856"W	4566.61	285.555	0.84	0.03	-0.84
17739.00	91.290	313.640	12131.85	4533.79	1289.19	-4464.81	1739511.58	14437509.00	39°45'15.954"N	80°38'50.691"W	4647.20	286.106	2.15	-0.03	-2.15
17832.00	91.260	313.670	12129.78	4623.65	1353.37	-4532.08	1739444.34	14437573.16	39°45'16.591"N	80°38'51.549"W	4729.83	286.627	0.05	-0.03	0.03
17925.00	91.230	313.020	12127.76	4713.65	1417.19	-4599.69	1739376.75	14437636.96	39°45'17.224"N	80°38'52.412"W	4813.07	287.124	0.70	-0.03	-0.70
18018.00	91.230	315.490	12125.76	4803.25	1482.07	-4666.28	1739310.19	14437701.81	39°45'17.868"N	80°38'53.261"W	4895.99	287.620	2.66	0.00	2.66
18111.00	91.290	315.800	12123.72	4892.24	1548.55	-4731.28	1739245.21	14437768.27	39°45'18.528"N	80°38'54.090"W	4978.26	288.123	0.34	0.06	0.33
18203.00	91.320	313.660	12121.62	4980.67	1613.28	-4796.62	1739179.90	14437832.97	39°45'19.170"N	80°38'54.923"W	5060.66	288.590	2.33	0.03	-2.33
18296.00	91.260	313.720	12119.53	5070.52	1677.50	-4863.85	1739112.69	14437897.17	39°45'19.807"N	80°38'55.781"W	5145.00	289.029	0.09	-0.06	0.06
18389.00	91.290	312.630	12117.46	5160.58	1741.12	-4931.66	1739044.91	14437960.76	39°45'20.438"N	80°38'56.646"W	5229.98	289.446	1.17	0.03	-1.17
18481.00	91.290	312.920	12115.39	5249.83	1803.58	-4999.17	1738977.43	14438023.20	39°45'21.058"N	80°38'57.507"W	5314.57	289.838	0.32	0.00	0.32
18574.00	91.080	314.070	12113.47	5339.77	1867.58	-5066.62	1738910.00	14438087.17	39°45'21.693"N	80°38'58.367"W	5399.86	290.234	1.26	-0.23	1.24
18667.00	91.050	313.910	12111.74	5429.50	1932.16	-5133.52	1738843.13	14438151.72	39°45'22.334"N	80°38'59.221"W	5485.09	290.625	0.18	-0.03	-0.17
18760.00	90.860	313.910	12110.19	5519.26	1996.65	-5200.51	1738776.17	14438216.19	39°45'22.974"N	80°39'00.075"W	5570.63	291.003	0.20	-0.20	0.00
18852.00	90.740	314.960	12108.90	5607.85	2061.05	-5266.19	1738710.51	14438280.57	39°45'23.613"N	80°39'00.913"W	5655.15	291.374	1.15	-0.13	1.14
18945.00	90.770	314.070	12107.68	5697.36	2126.24	-5332.50	1738644.23	14438345.74	39°45'24.260"N	80°39'01.759"W	5740.78	291.739	0.96	0.03	-0.96
19038.00	90.740	313.050	12106.45	5787.27	2190.33	-5399.89	1738576.87	14438409.79	39°45'24.896"N	80°39'02.619"W	5827.21	292.079	1.10	-0.03	-1.10
19131.00	90.260	311.690	12104.83	5877.66	2252.99	-5468.59	1738508.20	14438472.43	39°45'25.518"N	80°39'03.495"W	5914.51	292.391	1.57	0.56	-1.46
19224.00	90.950	313.350	12103.04	5967.98	2315.82	-5537.12	1738439.69	14438535.25	39°45'26.141"N	80°39'04.369"W	6001.89	292.697	1.82	-0.33	1.78
19316.00	90.230	315.670	12101.28	6056.52	2380.31	-5602.71	1738374.13	14438599.70	39°45'26.781"N	80°39'05.206"W	6087.38	293.018	2.54	0.30	2.52
19409.00	90.140	316.570	12099.36	6145.28	2447.33	-5667.15	1738309.70	14438666.69	39°45'27.446"N	80°39'06.028"W	6173.01	293.357	0.97	-0.10	0.97
19502.00	90.170	316.600	12097.49	6233.81	2514.87	-5731.06	1738245.82	14438734.21	39°45'28.116"N	80°39'06.843"W	6258.56	293.693	0.05	0.03	0.03
19595.00	90.200	315.720	12095.56	6322.55	2581.93	-5795.46	1738181.45	14438801.24	39°45'28.781"N	80°39'07.664"W	6344.58	294.013	0.95	0.03	-0.95
19688.00	90.230	314.440	12093.59	6411.79	2647.77	-5861.11	1738115.82	14438867.06	39°45'29.434"N	80°39'08.501"W	6431.43	294.311	1.38	0.03	-1.38



# Actual Wellpath Report

O E Burge U MSH 501H AWP Proj: 21660'  
Page 10 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #501
SOUTHWESTERN ENERGY	Well	O E Burge U MSH 501H
Area	Wellbore	O E Burge U MSH 501H AWB
Field		
Facility		

## WELLPATH DATA (262 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]
19780.00	91.140	313.000	12091.69	6500.66	2711.34	-5927.59	1738049.37	14438930.60	39°45'30.065"N	80°39'09.350"W	6518.25	294.580	1.57	-0.10	-1.57
19873.00	91.170	312.060	12089.81	6590.98	2774.19	-5996.11	1737980.88	14438993.43	39°45'30.689"N	80°39'10.224"W	6606.77	294.828	1.01	0.03	-1.01
19966.00	91.080	313.440	12087.99	6681.22	2837.30	-6064.38	1737912.63	14439056.52	39°45'31.315"N	80°39'11.095"W	6695.30	295.073	1.49	-0.10	1.48
20059.00	91.140	312.890	12086.19	6771.29	2900.91	-6132.20	1737844.84	14439120.10	39°45'31.946"N	80°39'11.960"W	6783.75	295.317	0.59	0.06	-0.59
20151.00	91.380	313.530	12084.16	6860.37	2963.89	-6199.24	1737777.82	14439183.05	39°45'32.571"N	80°39'12.815"W	6871.33	295.553	0.74	0.26	0.70
20244.00	91.420	313.870	12081.89	6950.21	3028.12	-6266.46	1737710.63	14439247.26	39°45'33.209"N	80°39'13.673"W	6959.74	295.791	0.37	0.04	0.37
20337.00	91.480	314.030	12079.54	7039.95	3092.64	-6333.39	1737643.73	14439311.76	39°45'33.849"N	80°39'14.527"W	7048.14	296.027	0.18	0.06	0.17
20430.00	91.940	314.730	12076.76	7129.48	3157.66	-6399.83	1737577.31	14439376.75	39°45'34.494"N	80°39'15.374"W	7136.43	296.262	0.90	0.49	0.75
20523.00	91.910	313.910	12073.64	7219.04	3222.60	-6466.33	1737510.84	14439441.66	39°45'35.138"N	80°39'16.223"W	7224.86	296.490	0.88	-0.03	-0.88
20615.00	91.880	313.870	12070.60	7307.81	3286.34	-6532.59	1737444.60	14439505.38	39°45'35.771"N	80°39'17.068"W	7312.65	296.706	0.05	-0.03	-0.04
20708.00	91.410	314.830	12067.93	7397.36	3351.33	-6599.07	1737378.15	14439570.34	39°45'36.416"N	80°39'17.916"W	7401.29	296.924	1.15	-0.51	1.03
20801.00	91.450	315.390	12065.61	7486.59	3417.19	-6664.68	1737312.57	14439636.18	39°45'37.069"N	80°39'18.753"W	7489.67	297.146	0.60	0.04	0.60
20893.00	91.350	313.780	12063.36	7575.09	3481.75	-6730.18	1737247.09	14439700.72	39°45'37.709"N	80°39'19.588"W	7577.47	297.354	1.75	-0.11	-1.75
20986.00	91.450	314.090	12061.09	7664.83	3546.26	-6797.14	1737180.16	14439765.20	39°45'38.350"N	80°39'20.443"W	7666.62	297.552	0.35	0.11	0.33
21079.06	91.450	313.110	12058.73	7754.71	3610.37	-6864.46	1737112.86	14439829.29	39°45'38.986"N	80°39'21.302"W	7756.01	297.742	1.05	0.00	-1.05
21174.00	91.410	314.100	12056.36	7846.52	3675.87	-6933.23	1737044.12	14439894.76	39°45'39.636"N	80°39'22.179"W	7847.40	297.932	1.04	-0.04	1.04
21269.00	91.420	314.080	12054.02	7938.13	3741.95	-7001.44	1736975.94	14439960.81	39°45'40.291"N	80°39'23.049"W	7938.67	298.122	0.02	0.01	-0.02
21364.00	91.380	313.580	12051.69	8029.84	3807.72	-7069.95	1736907.45	14440026.56	39°45'40.944"N	80°39'23.923"W	8030.13	298.306	0.53	-0.04	-0.53
21459.00	91.510	313.410	12049.30	8121.70	3873.09	-7138.85	1736838.58	14440091.90	39°45'41.592"N	80°39'24.802"W	8121.82	298.481	0.23	0.14	-0.18
21553.00	91.410	314.140	12046.90	8212.48	3938.10	-7206.70	1736770.76	14440156.89	39°45'42.237"N	80°39'25.668"W	8212.50	298.654	0.78	-0.11	0.78
21636.04	91.350	310.210	12044.90	8293.18	3993.80	-7268.18	1736709.30	14440212.56	39°45'42.790"N	80°39'26.452"W	8293.18	298.788	4.73	-0.07	-4.73
21660.06	91.350	310.210	12044.34	8316.70	4009.29	-7286.50	1736690.99	14440228.05	39°45'42.944"N	80°39'26.686"W	8316.70	298.821	0.00	0.00	0.00

RECEIVED  
Office of Oil and Gas  
JAN 06 2017  
WV Department of

**REFERENCE WELLPATH IDENTIFICATION**

Operator	SOUTHWESTERN ENERGY	Slot	Slot #501
Area	Marshall County, WV	Well	O E Burge U MSH 501H
Field	Marshall	Wellbore	O E Burge U MSH 501H AWB
Facility	O E Burge MSH Pad		

**TARGETS**

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
O E Burge U MSH 501H BHL Rev-5		11950.77	4005.63	-7288.19	1736689.39	14440224.39	39°45'42.908"N	80°39'26.708"W	point
O E Burge U MSH 501H LP Rev-5		12210.00	-1426.86	-1671.07	1742304.23	14434794.02	39°44'49.002"N	80°38'15.061"W	point

**WELLPATH COMPOSITION - Ref Wellbore: O E Burge U MSH 501H AWB Ref Wellpath: O E Burge U MSH 501H AWP Proj: 21660'**

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	224.00	EMS (Standard)	01 20" EMS (magnetic ss) <133-224>	O E Burge U MSH 501H AWB
224.00	2596.00	NaviTrak (MagCorr)	02 17-1/2" APS EM (MagCorr) (224)(390-2596)	O E Burge U MSH 501H AWB
2596.00	11164.00	NaviTrak (MagCorr)	03 12-1/4" APS EM (MagCorr) (2596)(2682-11164) Proj:11248'	O E Burge U MSH 501H AWB
11164.00	21636.00	NaviTrak (MagCorr)	04 BHI AT Curve <8-1/2"> (11164)(11248-21636)	O E Burge U MSH 501H AWB
21636.00	21660.00	Blind Drilling (std)	Projection to bit	O E Burge U MSH 501H AWB



**Actual Wellpath Report**  
**O E Burge U MSH 501H AWP Proj: 21660'**  
 Page 12 of 12



REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot #501
Area	Marshall County, WV	Well	O E Burge U MSH 501H
Field	Marshall	Wellbore	O E Burge U MSH 501H AWB
Facility	O E Burge MSH Pad		

**COMMENTS**

Wellpath general comments  
 API: 47-051-01853-0000  
 BHI Job #: 7565620  
 Rig: SDC 40  
 Duration: 10/23/2015-12/24/2015  
 EMS <20"> (133'-224')  
 APS EM <17-1/2"> (224')(390'-2596')  
 APS EM <12-1/4"> (2596')(2682'-11164')  
 BHI AT Curve <8-1/2"> (11164')(11248'-21636')  
 Projected MD at TD: 21660'

RECEIVED  
 Office of Oil and Gas  
 JAN 06 2017  
 WV Department of  
 Environmental Protection